# TEST REPORT
## EN 61010-1 / IEC 61010-1
## Safety requirements for electrical equipment for measurement, control, and laboratory use
## Part 1: General requirements

**Reference No.** ..... : UT106073-1

Compiled by (+ signature) ..... :

Tony Cheng / Supervisor

Approved by (+ signature) ..... :

Steven Chang

Date of Issue ..... : January 4 , 2018

Total number of pages ..... : 116 pages

**Applicant's name** ..... : Sturdy Industrial Co., Ltd.

**Address** ..... : No. 168, Sec. 1, Zhongxing Rd., Wugu District, New Taipei City 24872, Taiwan

**Test specification:**

**Standard** ..... : EN 61010-1:2010 , IEC 61010-1:2010 (Third Edition)

**Test procedure** ..... : According to above

**Non-standard test method**…….. ..... : N/A

**Testing laboratory name** ..... : Universal Testing Inc.

( TAF Certification No. 1994 )

Address ..... : 2F, No. 13, Lane 28, Sec.1, Huanshan Road, Nei-Hu, Taipei 114, Taiwan

Testing location ..... : as above

**Test item description** ..... : Autoclave Sterilizer

**Trade Mark** ..... : STURDY

**Manufacturer** ..... : Same as the applicant

**Model/Type reference** ..... : SA-260MB , SA-260MB-G, SA-300MB , SA-302MB

**Ratings** ..... : 220 – 240 V , 50 / 60 Hz, 12 A ( SA-260MB ) , 13 A (SA-260MB-G) ,14.1 A (SA-300MB , SA-302MB)

| **List of Attachments (including a total number of pages in each attachment - Table 1):** | | |
|---|---|---|
| Document No. | Documents included / attached to this report (description) | Page Numbers |
| 1 | Photos | 13 pages |

**Summary of testing:**

**Passed**

**Test Report History:**
This report may consist of more than one report and is valid only with additional or previous issued reports:

| Ref. No. | Item |
|---|---|
| | |

**Summary of compliance with National Differences**

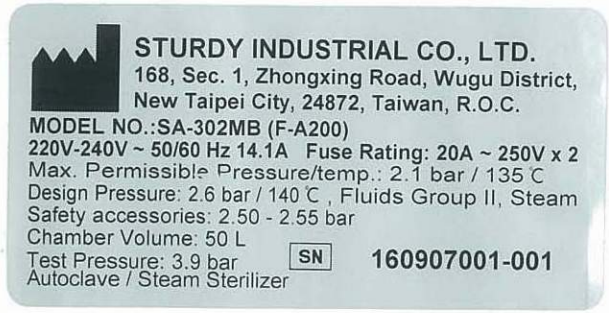
**List of countries addressed:**

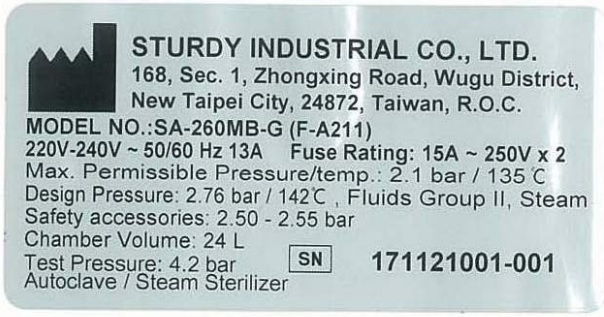
none

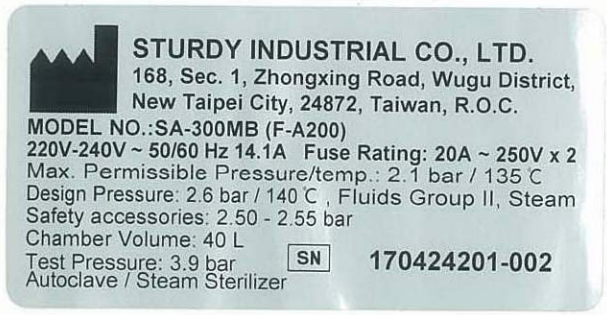
☐ **The product fulfils the requirements of _____ (insert standard number and edition and delete the text in parenthesis or delete the whole sentence if not applicable)**

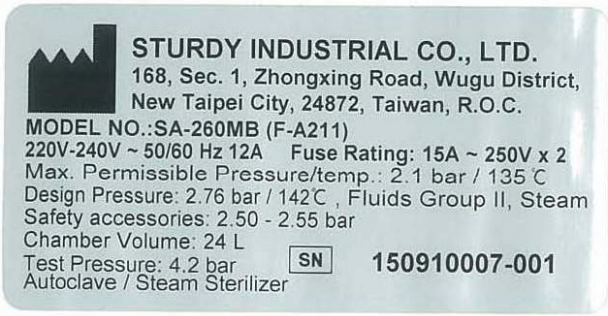
**Copy of marking plate**

**The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.**




| | |
|---|---|
| **Test item particulars:** | |
| Type of item ..... | Laboratory Use Equipment |
| Description of equipment function..... | To sterilize heat and moisture stable reusable items( including dental handpieces) that are compatible with steam sterilizers |
| Connection to MAINS supply..... | Cord -connected ( Non detachable cord set ) |
| Overvoltage category ..... | II |
| POLLUTION DEGREE..... | 2 |
| Means of protection ..... | Class I (PE connected) |
| Environmental conditions ..... | Normal |
| For use in wet locations..... | No |
| Equipment mobility ..... | fixed |
| Operating conditions..... | Continuous |
| Overall size of equipment (W x D x H)..... | SA-260MB, SA-260MB-G - 533 mm (W) x 442 mm (H) x 655 mm (D)<br>SA-300MB- 600 mm (W) x 485 mm (H) x 790 mm (D)<br>SA-302MB- 600 mm (W) x 485 mm (H) x 885 mm (D) |
| Mass of equipment (kg)..... | 64 kg ( SA-260MB, SA-260MB-G), 91.5 kg ( SA-300MB),94 kg ( SA-302MB) |
| Marked degree of protection to IEC 60529 ..... | None |
| **Possible test case verdicts:** | |
| - 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) |
| **Testing:** | |
| Date of receipt of test item..... | July 7, 2017 |
| Date (s) of performance of tests..... | July 10 , 2017– January 3, 2018 |

**General remarks:**

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see ENCLOSURE #)" refers to additional information appended to the report.
"(see Form A.xx)" refers to a table appended to the report.
Bottom lines for measurement tables Form A.xx are optional if used as record.

Throughout this report a ☐ comma / ☐ point is used as the decimal separator.

**General product information:**

It is a Class I equipment with metal enclosure. It incorporates a pressure vessel using steam and intended for the treatment of medical materials and for laboratory processes. It is without automatic loading and unloading system. For indoor use only. All models are completely the same except the heater and size of the chamber and the enclosure. SA-260MB-G is the same as SA-260MB except using an extra vacuum pump. See attachment for difference Tests were done with Model SA-260MB and SA-300MB as the representative except where noted.

Description of model differences.

**MB series model No. : SA-260MB, SA-300MB, SA-302MA (with vacuum pu**

| Model | SA-260MB | SA-260MB-G |
|---|---|---|
| Photo |  |  |
| Chamber Capacity (L) | 24 | 24 |
| External Dimensions (mm) | 533 (W) ×442 (H) × 655 (D) | 533 (W) ×442 (H) × 655 (D) |
| Chamber Size (mm) | 260 Diameter × 450 Depth | 260 Diameter × 450 Depth |
| Net Weight (kg) | 57 | 57 |
| Gross Weight (kg) | 64 | 64 |
| Voltage / Freq. / Current | 220 - 240 V ac, 50/60 Hz, 12 A, 2760W | 220 - 240 V ac, 50/60 Hz, 13 A, 2970W |
| Fuses | 15A × 2, No Fuse Breaker | 15A × 2, No Fuse Breaker |
| Vacuum pump | THOMAS 80110110 or<br>THOMAS 82110110 or<br>Lan chang elec. co. ltd SJ-100B | THOMAS 80110110 or<br>THOMAS 82110110 or<br>Lan chang elec. co. ltd SJ-100B |

**ump)**

| SA-300MB | SA-302MB |
|---|---|
|  |  |
| 40 | 50 |
| 600 (W) ×485 (H) × 790 (D) | 600 (W) ×485 (H) × 885 (D) |
| 300 Diameter × 570 Depth | 300 Diameter × 710 Depth |
| 82.5 | 85 |
| 91.5 | 94 |
| 220 - 240 V ac, 50/60 Hz, 14.1 A , 3226W | |
| 20A × 2, No Fuse Breaker | |
| THOMAS 80110110 | |

Description of special features.
(HV circuits, high pressure systems etc.)

N/A

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.4 | Testing in SINGLE FAULT CONDITIONS | | P |
| 4.4.1 | Fault tests | (see Form A.1) | P |
| 4.4.2 | Application of SINGLE FAULT CONDITIONS | | P |
| 4.4.2.1 | SINGLE FAULT CONDITIONS not covered by 4.4.2.2 to 4.4.2.14 | (see Form A.1) | — |
| 4.4.2.2 | PROTECTIVE IMPEDANCE | | N/A |
| 4.4.2.3 | PROTECTIVE CONDUCTOR | (see Form A.6) | P |
| 4.4.2.4 | Equipment or parts for short-term or intermittent operation | Continuous operation | N/A |
| 4.4.2.5 | Motors | | P |
| | – stopped while fully energized | | P |
| | – prevented from starting | | N/A |
| | – one phase interrupted (multi-phase) | | N/A |
| 4.4.2.6 | Capacitors | | P |
| 4.4.2.7 | MAINS transformers | One in the certified power supply board | N/A |
| 4.4.2.7.2 | Short circuit | (see Form A.39) | N/A |
| 4.4.2.7.3 | Overload | (see Form A.26B and A.40) | N/A |
| 4.4.2.8 | Outputs | | N/A |
| 4.4.2.9 | Equipment for more than one supply | | N/A |
| 4.4.2.10 | Cooling | (see Form A.26A) | P |
| | – air holes closed | | P |
| | – fans stopped | | P |
| | – coolant stopped | | N/A |
| | – loss of cooling liquid | | N/A |
| 4.4.2.11 | Heating devices | | P |
| | – timer overridden | | P |
| | – temperature controller overridden | | P |
| 4.4.2.12 | Insulation between circuits and parts | | N/A |
| 4.4.2.13 | Interlocks | | P |
| 4.4.2.14 | Voltage selectors | | N/A |
| 4.4.3 | Duration of tests | (see Form A.1) | — |
| 4.4.4 | Conformity after application of fault conditions | (see Forms A.1; A.6, A.18) | P |

| | | | |
|---|---|---|---|
| 5 | MARKING AND DOCUMENTATION | | P |
| 5.1.1 | Required equipment markings | Required markings are printed on back adhesive paper label and put on the rear cover. | P |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - Visible from the exterior; or | All required markings are visible. | P |
| | - Visible after removing cover or opening door | | N/A |
| | - Visible after removal from a rack or panel | Not for rack or panel mounted. | N/A |
| | Not put on parts which can be removed by an operator | Marking is not put on door. | P |
| | Letter symbols (IEC 60027) used | Letter symbols are in accordance with IEC 60027. | P |
| | Graphic symbols (IEC 61010-1: Table 1) used | Graphic symbol 14 in accordance with Table 1. | P |
| 5.1.2 | Identification | | P |
| | Equipment is identified by: | | — |
| | iii) Manufacturer's or supplier's name or trademark | STURDY APEX GROUP | P |
| | iv) Model number, name or other means | SA-260MB , SA-260MB-G ,SA-300MB , SA-302MB | P |
| | Manufacturing location identified | One location only | N/A |
| 5.1.3 | MAINS supply | | P |
| | Equipment is marked as follows: | | P |
| | a) Nature of supply: | | — |
| | I- a.c. RATED MAINS frequency or range of frequencies ..... | 50/ 60 Hz | P |
| | II- d.c. with symbol 1 | | N/A |
| | b) RATED supply voltage(s) or range ..... | 220 - 240 V ac | P |
| | c) Max. RATED power (W or VA) or input current..... | 12 A ( SA-260MB) , 13 A ( SA-260MB-G) ,14.1 A (SA-300MB , SA-302MB) | P |
| | The marked value not less than 90 % of the maximum value | (see Form A.2) | N/A |
| | If more than one voltage range: | One range | — |
| | Separate values marked; or | | N/A |
| | Values differ by less than 20 % | (see Form A.2) | N/A |
| | d)OPERATOR-set for different RATED supply voltages: | | — |
| | Indicates the equipment set voltage | | N/A |
| | Portable equipment indication is visible from the exterior | | N/A |
| | Changing the setting changes the indication | | N/A |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | e) Accessory MAINS socket-outlets accepting standard MAINS plugs are marked: | Not used | N/A |
| | With the voltage if it is different from the MAINS supply voltage..... | | N/A |
| | For use only with specific equipment | | N/A |
| | If not marked for specific equipment it is marked with: | | N/A |
| | The maximum rated current or power; or | | N/A |
| | Symbol 14 with full details in the documentation | | N/A |
| 5.1.4 | Fuses | | N/A |
| | Operator replaceable fuse marking (see also 5.4.5) ..... | Two 15A (SA-260MB, SA-260MB-G) or 20A(SA-300MB, SA-302MB) non-self-resetting circuit breakers are used. | N/A |
| 5.1.5 | TERMINALS, connections and operating devices | | P |
| 5.1.5.1 | General | | P |
| | Where necessary for safety, indication of purpose of TERMINALS, connectors, controls and indicators marked | Markings are legible and durable close to the terminals | P |
| | If insufficient space, symbol 14 used | | N/A |
| | Push-buttons and actuators of emergency stop devices and indicators: | | — |
| | used only to indicate a warning of danger or | | N/A |
| | the need for urgent action | | N/A |
| | coloured red | | N/A |
| | coded as specified in IEC 60073 | | N/A |
| | Supplementary means of coding provided, if meaning of colour relates (see IEC 60073): | | N/A |
| | to safety of persons; or | | N/A |
| | safety of the environment | | N/A |
| 5.1.5.2 | TERMINALS | | P |
| | MAINS supply TERMINAL identified | Non-detachable mains power cord is used. Cord connected directly to circuit breakers inside. | N/A |
| | Other TERMINAL marking: | | N/A |
| | a) FUNCTIONAL EARTH TERMINALS (symbol 5 used) | | N/A |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | b) PROTECTIVE CONDUCTOR TERMINALS: | | P |
| | Symbol 6 is placed close to or on the TERMINAL; or | Marked close to the PE terminal. | P |
| | Part of appliance inlet | See above. | N/A |
| | c) TERMINALS of control circuits (symbol 7 used) | No such terminal is provided. | N/A |
| | d) HAZARDOUS LIVE TERMINALS supplied from the interior | No hazardous voltage from inside. | N/A |
| | Standard MAINS socket outlet; or | | N/A |
| | RATINGS marked; or | | N/A |
| | Symbol 14 used | | N/A |
| 5.1.6 | Switches and circuit breakers | symbols are marked near the power On/Off switch button | P |
| | If disconnecting device, off position clearly marked | See above | P |
| | If push-button used as power supply switch: | | N/A |
| | Symbol 9 and 15 used for on-position | | N/A |
| | Symbol 10 and 16 used for off-position | | N/A |
| | Pair of symbols 9, 15 and 10, 16 close together | | P |
| 5.1.7 | Equipment protected by DOUBLE INSULATION or REINFORCED INSULATION | | N/A |
| | Protected throughout (symbol 11 used) | | N/A |
| | Only partially protected (symbol 11 not used) | | N/A |
| 5.1.8 | Field-wiring TERMINAL boxes | Not provided | N/A |
| | If TERMINAL or ENCLOSURE exceeds 60 °C: | (see Form A.26A) | N/A |
| | Cable temperature RATING marked..... | | N/A |
| | Marking visible before and during connection or beside TERMINAL | | N/A |
| 5.2 | Warning markings | | P |
| | Visible when ready for NORMAL USE | Visible | P |
| | Are near or on applicable parts | | P |
| | Symbols and text correct dimensions and colour: | Printed in black on silver background paper. | P |
| | a) symbols min 2,75 mm and text 1,5 mm high and contrasting in colour with background | | P |
| | b) symbols and text moulded, stamped or engraved in material min. 2,0 mm high and | | N/A |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 0,5 mm depth or raised if not contrasting in colour | | N/A |
| | If necessary marked with symbol 14 | | P |
| | Statement to isolate or disconnect if access by using a tool to HAZARDOUS LIVE parts is permitted | | N/A |
| 5.3 | Durability of markings | | P |
| | The required markings remain clear and legible in NORMAL USE | (see Form A.3) | P |
| 5.4 | Documentation | | P |
| 5.4.1 | General | | P |
| | Equipment is accompanied by documentation for safety purposes for OPERATOR or RESPONSIBLE BODY | | P |
| | Safety documentation for service personnel authorized by the manufacturer | | P |
| | Documentation necessary for safe operation is provided in printed media or | | P |
| | in electronic media if available at any time | | N/A |
| | Documentation includes: | | — |
| | a) intended use | | P |
| | b) technical specification | | P |
| | c) name and address of manufacturer or supplier | | P |
| | d) information specified in 5.4.2 to 5.4.6 | | P |
| | e) information to mitigate residual RISK (see also subclause 17) | | P |
| | f) accessories for safe operation of the equipment specified | | P |
| | g) guidance provided to check correct function of the equipment, if incorrect reading may cause a HAZARD from harmful or corrosive substances of HAZARDOUS live parts | | P |
| | h) instructions for lifting and carrying | | N/A |
| | Warning statements and a clear explanation of warning symbols: | | — |
| | Provided in the documentation; or | | P |
| | Information is marked on the equipment | | P |
| 5.4.2 | Equipment ratings | | P |
| | Documentation includes: | | — |
| | a) Supply voltage or voltage range ..... | 220 – 240 V | P |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Frequency or frequency range ..... | 50 / 60 Hz | P |
| | Power or current rating ..... | 12 A ( SA-260MB) , 13 A ( SA-260MB-G) , 14.1 A (SA-300MB , SA-302MB) | P |
| | b) Description of all input and output connections in accordance to 6.6.1 a) | | P |
| | c) RATING of insulation of external circuits in accordance to 6.6.1 b) | | N/A |
| | d) Statement of the range of environmental conditions (see 1.4) | | P |
| | e) Degree of protection (IEC 60529) | Ordinary protection | N/A |
| | f) if impact rating less than 5 J: | | N/A |
| | IK code in accordance to IEC 62262 marked or | | N/A |
| | symbol 14 of table 1 marked, with | | N/A |
| | RATED energy level and test method stated | | N/A |
| 5.4.3 | Equipment installation | | P |
| | Documentation includes instructions for: | | P |
| | a) assembly, location and mounting requirements | | P |
| | b) protective earthing | | P |
| | c) connections to supply | | P |
| | d) PERMANENTLY CONNECTED EQUIPMENT: | | N/A |
| | 1) Supply wiring requirements | | N/A |
| | 2) If external switch or circuit-breaker, requirements and location recommendation | | N/A |
| | e) ventilation requirements | | P |
| | f) special services (e. g. air, cooling liquid) | | N/A |
| | g) instructions relating to sound level | | N/A |
| 5.4.4 | Equipment operation | | P |
| | Instructions for use include: | | P |
| | a) identification and description of operating controls | | P |
| | b) positioning for disconnection | | P |
| | c) instructions for interconnection | | N/A |
| | d) specification of intermittent operation limits | | N/A |
| | e) explanation of symbols used | | P |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | f) replacement of consumable materials | | P |
| | g) cleaning and decontamination | | P |
| | h) listing of any poisonous or injurious gases and quantities | | N/A |
| | i) RISK reduction procedures relating to flammable liquids (see 9.5) | | N/A |
| | j) RISK reduction procedures relating burn from surfaces permitted to exceed limits of 10.1 | | N/A |
| | Additional precautions for IEC 60950 conforming equipment in regard to moistures and liquids | | N/A |
| | A statement about protection impairment if used in a manner not specified by the manufacturer | | P |
| 5.4.5 | Equipment maintenance and Service | | P |
| | Instructions for RESPONSIBLE BODY include: | | — |
| | Instructions sufficient in detail permitting safe maintenance and inspection and continued safety: | | P |
| | Instruction against the use of detachable MAINS supply cord with inadequate rating | Non-detachable cord used | N/A |
| | Specific battery type of user replaceable batteries | No battery used | N/A |
| | Any manufacturer specified parts | | P |
| | Rating and characteristics of fuses | | P |
| | Instructions include following subjects permitting safe servicing and continued safety: | | P |
| | a) product specific RISKS may affect service personnel | | P |
| | b) protective measures for these RISKS | | P |
| | c) verification of the safe state after repair | | P |
| 5.4.6 | Integration into systems or effects resulting from special conditions | No such condition | N/A |
| | Aspects described in documentation | | N/A |

| | | | |
|---|---|---|---|
| 6 | PROTECTION AGAINST ELECTRIC SHOCK | | P |
| 6.1 | General | (see Form A.14 and A.15) | P |
| 6.1.1 | Requirements | | — |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Protection against electric shock maintained in NORMAL CONDITION and SINGLE FAULT CONDITION | | P |
| | ACCESSIBLE parts not HAZARDOUS LIVE | | P |
| | Voltage, current, charge or energy below the limits in NORMAL CONDITION and in SINGLE FAULT CONDITION between: | | — |
| | ACCESSIBLE parts and earth | | P |
| | two ACCESSIBLE parts on same piece of the equipment within a distance of 1,8 m | | N/A |
| | Conformity is checked by the determination of 6.2 and 6.3 followed by the tests of 6.4 to 6.11 | | P |
| 6.1.2 | Exceptions | | P |
| | Following HAZARDOUS LIVE parts may be ACCESSIBLE to an OPERATOR: | | N/A |
| | a) parts of lamps and lamp sockets after lamp removal | No such parts | N/A |
| | b) parts to be replaced by OPERATOR only by the use of tool and warning marking | No such parts | N/A |
| | Those parts not HAZARDOUS LIVE 10 s after interruption of supply | (see Form A.5 ) | P |
| | Capacitance test if charge is received from internal capacitor | (see Form A.4 and A.5) | P |
| 6.2 | Determination of ACCESSIBLE parts | (see Form A.4) | P |
| 6.2.1 | General | | P |
| | Unless obviously determination of ACCESSIBLE parts as specified in 6.2.2 to 6.2.4 | | P |
| 6.2.2 | Examination | | P |
| | - with jointed test finger (as specified B.2) | | P |
| | - with rigid test finger (as specified B.1) and a force of 10 N | | P |
| 6.2.3 | Openings above parts that are HAZARDOUS LIVE | No top openings | N/A |
| | - test pin with length of 100 mm and 4 mm in diameter applied | | N/A |
| 6.2.4 | Openings for pre-set controls | No opening for pre-set controls. | N/A |
| | - test pin with length of 100 mm and 3 mm in diameter applied | | N/A |
| 6.3 | Limit values for ACCESSIBLE parts | | P |
| 6.3.1 | Levels in NORMAL CONDITION | (see Form A.5) | P |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | a) Voltage limits less than 33 V r.m.s. and 46,7 V peak or 70 V d.c. | | P |
| | for WET LOCATIONS voltage limits less than 16 V r.m.s. and 22,6 V peak or 35 V d.c. | | N/A |
| | Voltages are not HAZARDOUS LIVE the levels of: | | — |
| | b) Current less than 0,5 mA r.m.s. for sinusoidal, 0,7 mA peak non sinusoidal or mixed frequencies or 2 mA d.c. when measured with measuring circuit A.1 or A.2 if less than 100 Hz | | P |
| | for WET LOCATIONS measuring circuit A.4 used | | N/A |
| | 70 mA r.m.s. when measured with circuit A.3 for higher frequencies | | N/A |
| | or | | N/A |
| | c) Levels of capacitive charge or energy less: | | N/A |
| | 1) 45 µC for voltages up to 15 kV peak or d.c. or line A of Figure 3 | | N/A |
| | 2) 350 mJ stored energy for voltages above 15 kV peak or d.c. | | N/A |
| 6.3.2 | Levels in SINGLE FAULT CONDITION | (see Form A.6) | P |
| | a) Voltage limits less than 55 V r.m.s. and 78 V peak or 140 V d.c. | | P |
| | for WET LOCATIONS voltage limits less than 33 V r.m.s. and 46,7 V peak or 70 V d.c. | | N/A |
| | Voltages are not HAZARDOUS LIVE the levels of: | | — |
| | b) Current less than 3,5 mA r.m.s. for sinusoidal, 5 mA peak non sinusoidal or mixed frequencies or 15 mA d.c. when measured with measuring circuit A.1 or A.2 if less than 100 Hz | | P |
| | for WET LOCATIONS measuring circuit A.4 used | | N/A |
| | 500 mA r.m.s. when measured with circuit A.3 for higher frequencies | | N/A |
| | or | | N/A |
| | c) Levels of capacitive charge or energy less line B of Figure 3 | | N/A |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.4 | Primary means of protection | | P |
| 6.4.1 | ACCESSIBLE parts prevented from being HAZARDOUS LIVE by one or more of following means: | | P |
| | a) ENCLOSURES or PROTECTIVE BARRIERS (see 6.4.2) | | P |
| | b) BASIC INSULATION (see 6.4.3) | | P |
| | c) Impedance (see 6.4.4) | | N/A |
| 6.4.2 | ENCLOSURES or PROTECTIVE BARRIERS | (see Form A.15 and A.16) | P |
| | - meet rigidity requirements of 8.1 | | P |
| | - meet requirements for BASIC INSULATION, if protection is provided by insulation | | P |
| | - meet requirements of 6.7 for CREEPAGE and CLEARANCES between ACCESSIBLE parts and HAZARDOUS live parts, if protection is provided by limited access | | P |
| 6.4.3 | BASIC INSULATION | (see Form A.15 and A.16) | P |
| | - meet CLEARANCE, CREEPAGE DISTANCE and solid insulation requirements of 6.7 | | P |
| 6.4.4 | Impedance | (see Form A.12 and A.15) | N/A |
| | Impedance used as primary means of protection meets all of following requirements: | | — |
| | a) limits current or voltage to level of 6.3.2 | (see Form A.6) | N/A |
| | b) RATED for maximum WORKING VOLTAGE and the amount of power it will dissipate | | N/A |
| | c) CLEARANCE, CREEPAGE DISTANCE between terminations of the impedance meet requirements of BASIC INSULATION of 6.7 | (see Form A.15) | N/A |
| 6.5 | Additional means of protection in case of SINGLE FAULT CONDITION | | P |
| 6.5.1 | ACCESSIBLE parts are prevented from becoming HAZARDOUS live by the primary means of protection and supplemented by one of: | | P |
| | a) PROTECTIVE BONDING (see 6.5.2) | | P |
| | b) SUPPLEMENTARY INSULATION (see 6.5.3) | | N/A |
| | c) automatic disconnection of the supply (see 6.5.5) | | N/A |
| | d) current- or voltage-limiting device (see 6.5.6) | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Alternatively one of the single means of protection is used: | | P |
| | e) REINFORCED INSULATION (see 6.5.3) | | P |
| | f) PROTECTIVE IMPEDANCE (see 6.5.4) | | N/A |
| 6.5.2 | PROTECTIVE BONDING | (see Forms A.7, A.8, A.9, A.10 or A.11) | P |
| 6.5.2.1 | ACCESSIBLE conductive parts, may become HAZARDOUS LIVE in SINGLE FAULT CONDITION: | | P |
| | Bonded to the PROTECTIVE CONDUCTOR TERMINAL; or | | P |
| | Separated by conductive screen or barrier bonded to PROTECTIVE CONDUCTOR TERMINAL | | N/A |
| 6.5.2.2 | Integrity of PROTECTIVE BONDING | | P |
| | a) PROTECTIVE BONDING consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses | | P |
| | b) Soldered connections: | | N/A |
| | Independently secured against loosening | | P |
| | Not used for other purposes | | P |
| | c) Screw connections are secured | | P |
| | d) PROTECTIVE BONDING not interrupted; or | | P |
| | exempted as removable part carries MAINS SUPPLY input connection | | N/A |
| | e) Any movable PROTECTIVE BONDING connection specifically designed, and meets 6.5.2.4 | | N/A |
| | f) No external metal braid of cables used (not regarded as PROTECTIVE BONDING) | | P |
| | g) IF MAINS SUPPLY passes through: | | P |
| | Means provided for passing protective conductor; | | N/A |
| | Impedance meets 6.5.2.4 | | P |
| | h) Protective conductors bare or insulated, if insulated, green/yellow | | P |
| | Exceptions: | | N/A |
| | 1) earthing braids; | | N/A |
| | 2) internal protective conductors etc.; | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Green/yellow not used for other purposes | | P |
| | TERMINAL suitable for connection of a PROTECTIVE CONDUCTOR, and meets 6.5.2.3 | | N/A |
| 6.5.2.3 | PROTECTIVE CONDUCTOR TERMINAL | | P |
| | a) Contact surfaces are metal | | P |
| | b) Appliance inlet used | | N/A |
| | c) For rewirable cords and PERMANENTLY CONNECTED EQUIPMENT, PROTECTIVE CONDUCTOR TERMINAL is close to MAINS supply TERMINALS | | N/A |
| | d) If no MAINS supply is required, any PROTECTIVE CONDUCTOR TERMINAL: | | N/A |
| | Is near terminals of circuit for which protective earthing is necessary | | P |
| | External if other terminals external | | N/A |
| | e) Equivalent current-carrying capacity to MAINS supply TERMINALS | (see Form A.7) | P |
| | f) If plug-in, makes first and breaks last | | P |
| | g) If also used for other bonding purposes, PROTECTIVE CONDUCTOR: | | N/A |
| | Applied first; | | N/A |
| | Secured independently; | | N/A |
| | Unlikely to be removed by servicing | | N/A |
| | h) PROTECTIVE CONDUCTOR of measuring circuit: | | N/A |
| | 1) Current RATING equivalent to measuring circuit TERMINAL; | | N/A |
| | 2) PROTECTIVE BONDING: | | N/A |
| | Not interrupted; or | | N/A |
| | i) FUNCTIONAL EARTH TERMINALS allow independent connection | | N/A |
| | j) If a binding screw used for PROTECTIVE CONDUCTOR TERMINAL: | | -- |
| | Suitable size for bond wire | 1.5 $mm^2$ wire used | P |
| | Not smaller than M 4 | M5 used | P |
| | At least 3 turns of screw engaged | | P |
| | Passes tightening torque test | (see Form A.8) | P |
| | k) Contact pressure not capable being reduced by deformation of materials | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.5.2.4 | Impedance of PROTECTIVE BONDING of plug-connected equipment | (see Form A.9) | N/A |
| | Impedance between PROTECTIVE CONDUCTOR TERMINAL and each ACCESSIBLE part where PROTECTIVE BONDING is specified, is: | | — |
| | less than 0,1 Ohm; or | | N/A |
| | less than 0,2 Ohm if equipment is provided with non detachable cord | | P |
| 6.5.2.5 | Bonding impedance of PERMANENTLY CONNECTED EQUIPMENT | (see Form A.10) | P |
| 6.5.2.6 | Transformer PROTECTIVE BONDING screen | (see Form A.11) | N/A |
| | Transformer provided with screen for PROTECTIVE BONDING: | | N/A |
| | screen bonding consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses (see 6.5.2.2 a ) | | N/A |
| | screen bonding with soldered connection (see 6.5.2.2 b ) is: | | N/A |
| | - Independently secured against loosening | | N/A |
| | - Not used for other purposes | | N/A |
| 6.5.3 | SUPPLEMENTARY and REINFORCED INSULATION | | P |
| | Meet CLEARANCE, CREEPAGE DISTANCE and solid insulation requirements of 6.7 | | P |
| 6.5.4 | PROTECTIVE IMPEDANCE | (see Form A.12) | N/A |
| | Limits current or voltage to level of 6.3.1 in NORMAL and to level of 6.3.2 in SINGLE FAULT CONDITION | | N/A |
| | CLEARANCE, CREEPAGE DISTANCE between terminations of the impedance meet requirements of DOUBLE or REINFORCED INSULATION of 6.7 | (see Form A.15) | N/A |
| | The PROTECTIVE IMPEDANCE consists of one or more of the following: | (see Table 1 and Form A.12) | — |
| | a) appropriate single component suitable for safety and reliability for protection, it is: | | N/A |
| | 1) RATED twice the maximum WORKING VOLTAGE | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 2) resistor RATED for twice the power dissipation for maximum WORKING VOLTAGE | | N/A |
| | b) combination of components | | N/A |
| | Single electronic device not used as PROTECTIVE IMPEDANCE | | N/A |
| 6.5.5 | Automatic disconnection of the supply | Circuit breaker | P |
| | a) RATED to disconnect the load within time specified in Figure 2 | | P |
| | b) RATED for the maximum load conditions of the equipment | Rated 15A ( SA-260MB, SA-260MB-G) or 20A ( SA-300MB, SA-302MB) | P |
| 6.5.6 | Current- or voltage-limiting devices | (see Form A.12) | P |
| | Device complies with all of: | | P |
| | a) RATED to limit the current or voltage to the level of 6.3.2 | (see Form A.6) | P |
| | b) RATED for the maximum WORKING VOLTAGE; and | | P |
| | RATED for the maximum operational current if applicable | | P |
| | c) CLEARANCE, CREEPAGE DISTANCE between terminations of the impedance meet requirements of SUPPLEMENTARY INSULATION of 6.7 | (see Form A.14, A.15) | P |
| 6.6 | Connections to external circuits | | N/A |
| 6.6.1 | Connections do not cause ACCESSIBLE parts of the following to become HAZARDOUS LIVE in NORMAL CONDITION or SINGLE FAULT CONDITION: | | N/A |
| | - the external circuits | | N/A |
| | - the equipment | | N/A |
| | Protection achieved by separation of circuits; or | | N/A |
| | short circuit of separation does not cause a HAZARD | | N/A |
| | Instructions or markings for each terminal include: | | N/A |
| | a) RATED conditions for TERMINAL | | N/A |
| | b) Required RATING of external circuit insulation | | N/A |
| 6.6.2 | TERMINALS for external circuits | | N/A |
| | TERMINALS which receive a charge from an internal capacitor are not HAZARDOUS LIVE after 10 s of interrupting supply connection | (see Form A.5) | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.6.3 | Circuits with terminals which are HAZARDOUS LIVE | | N/A |
| | These circuits are: | | N/A |
| | Not connected to ACCESSIBLE conductive parts; or | | N/A |
| | Connected to ACCESSIBLE conductive parts, but are not MAINS CIRCUITS and have one TERMINAL contact at earth potential | | N/A |
| | No ACCESSIBLE conductive parts are HAZARDOUS LIVE | | N/A |
| 6.6.4 | ACCESSIBLE terminals for stranded conductors | | N/A |
| | No RISK of accidental contact because: | | N/A |
| | Located or shielded | | N/A |
| | Self-evident or marked whether or not connected to ACCESSIBLE conductive parts | | N/A |
| | ACCESSIBLE TERMINALS will not work loose | | N/A |
| 6.7 | Insulation requirements | (see Form A.14) | P |
| 6.7.1 | The nature of insulation | | P |
| 6.7.1.1 | Insulation between ACCESSIBLE parts or between separate circuits consist of CLEARANCES, CREEPAGE DISTANCES and solid insulation if provided as protection against a HAZARD | | P |
| 6.7.1.2 | CLEARANCES | | P |
| | Required CLEARANCES reflecting factors of 6.7.1.1 | (see Form A.14, A.15) | P |
| | Equipment rated for operating altitude greater than 2000 m correction factor of Table 3 of 61010-1 applied | Under 1000 m | N/A |
| 6.7.1.3 | CREEPAGE DISTANCES | | P |
| | Required CREEPAGE DISTANCES reflecting factors of 6.7.1.1 a) to d) | (see Form A.14, A.15) | P |
| | CTI material group reflected by requirements | Material Group IIIb considered if no other sufficient evidence provided | P |
| | CTI test performed | | N/A |
| 6.7.1.4 | Solid insulation | | P |
| | Required solid insulation reflecting factors of 6.7.1.1 a) to d) | (see Form A.14, A.15) | P |
| 6.7.1.5 | Requirements for insulation according to type of circuit | (see Form A.14, A.15) | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | a) 6.7.2 MAINS circuits of OVERVOLTAGE CATEGORY II up to nominal supply voltage of 300 V | | P |
| | b) 6.7.3 secondary circuits separated from circuits defined in a) by transformer | | N/A |
| | c) K.1 MAINS circuits of OVERVOLTAGE CATEGORY III and IV or OVERVOLTAGE CATEGORY II over 300 V | | N/A |
| | d) K.2 secondary circuits separated from circuits defined in c) by transformer | | N/A |
| | e) K.3 circuits having one or more of: | | N/A |
| | 1) maximum TRANSIENT OVERVOLTAGE is limited to known level below the level of MAINS CIRCUIT | | N/A |
| | 2) maximum TRANSIENT OVERVOLTAGE above the level of MAINS CIRCUIT | | N/A |
| | 3) WORKING VOLTAGE is the sum of more than one circuit or a mixed voltage | | N/A |
| | 4) WORKING VOLTAGE includes recurring peak voltage, may include non-sinusoidal or non-periodic waveform | | N/A |
| | 5) WORKING VOLTAGE with a frequency above 30 kHz | | N/A |
| 6.7.2 | Insulation for MAINS CIRCUITS of OVERVOLTAGE CATEGORY II with a nominal supply voltage up to 300 V | | P |
| 6.7.2.1 | CLEARANCES and CREEPAGE DISTANCES | (see Form A.14, A.15) | P |
| | Values for MAINS CIRCUITS of table 4 are met | | P |
| | Coatings to achieve reduction to POLLUTION DEGREE 1 comply with requirements of Annex H | Not used | N/A |
| 6.7.2.2 | Solid insulation | | P |
| 6.7.2.2.1 | Withstands electrical and mechanical stresses in normal use and all RATED environmental conditions of 1.4 | | P |
| | Equipment passed voltage tests of 6.8.3 with values of Table 5 | (see Form A.18) | P |
| | Complies as applicable: | | P |
| | a) ENCLOSURE or PROTECTIVE BARRIER of Clause 8 | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | b) moulded and potted parts requirements of 6.7.2.2.2 | | N/A |
| | c) inner layers of printed wiring boards requirements of 6.7.2.2.3 | | N/A |
| | d) thin-film insulation requirements of 6.7.2.2.4 | | P |
| 6.7.2.2.2 | Moulded and potted parts | | N/A |
| | Conductors between same two layers are separated by at least 0,4 mm after moulding is completed | | N/A |
| 6.7.2.2.3 | Inner insulating layers of printed wiring boards | | N/A |
| | Separated by at least 0,4 mm between same two layers | | N/A |
| | REINFORCED INSULATION have adequate electric strength; one of following methods used: | | N/A |
| | a) thickness of insulation is at least 0,4 mm | | N/A |
| | b) insulation is assembled of minimum two separate layers, each RATED for test voltage of Table 5 for BASIC INSULATION | | N/A |
| | c) insulation is assembled of minimum two separate layers, where the combination is rated for test voltage of Table 5 for REINFORCED INSULATION | | N/A |
| 6.7.2.2.4 | Thin-film insulation | | N/A |
| | Conductors between same two layers are separated by applicable CLEARANCES and CREEPAGE DISTANCE of 6.7.2.1 | | N/A |
| | REINFORCED INSULATION have adequate electric strength; one of following methods used: | | N/A |
| | a) thickness through the insulation at least 0,4 mm | | N/A |
| | b) insulation is assembled of min two separate layers, each RATED for test voltage of Table 5 for BASIC INSULATION | | N/A |
| | c) insulation is assembled of min three separate layers, where the combination of two layers passed voltage tests of 6.8.3 with values of Table 5 for REINFORCED INSULATION | (see Form A.18) | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.7.3 | Insulation for secondary circuits derived from MAINS CIRCUITS of OVERVOLTAGE CATEGORY II up to 300 V | | N/A |
| 6.7.3.1 | Secondary circuits where separation from MAINS CIRCUITS is achieved by a transformer providing: | | — |
| | - REINFORCED INSULATION | | N/A |
| | - DOUBLE INSULATION | | N/A |
| | - screen connected to the PROTECTIVE CONDUCTOR TERMINAL | | N/A |
| 6.7.3.2 | CLEARANCES | | N/A |
| | a) meet the values of Table 6 for BASIC INSULATION and SUPPLEMENTARY INSULATION; or | | N/A |
| | twice the values of Table 6 for REINFORCED INSULATION | | N/A |
| | or | | — |
| | b) pass the voltage tests of 6.8 with values of Table 6; with following adjustments: | (see Form A.18) | N/A |
| | 1) values for REINFORCED INSULATION are 1,6 times the values for BASIC INSULATION | | N/A |
| | 2) if operating altitude is greater than 2000 m values of CLEARANCES multiplied with factor of Table 3 | Under 1000 m | N/A |
| | 3) minimum CLEARANCE is 0,2 mm for POLLUTION DEGREE 2 and 0,8 mm for POLLUTION DEGREE 3 | | N/A |
| 6.7.3.3 | CREEPAGE DISTANCES | | N/A |
| | Based on WORKING VOLTAGE meets the values of Table 7 for BASIC and SUPPLEMENTARY INSULATION | | N/A |
| | Values for REINFORCED INSULATION are twice the values of BASIC INSULATION | | N/A |
| | Coatings to achieve reduction to POLLUTION DEGREE 1 comply with requirements of Annex H | Not used | N/A |
| 6.7.3.4 | Solid insulation | | N/A |
| 6.7.3.4.1 | Withstands electrical and mechanical stresses in normal use and all RATED environmental conditions of 1.4 | | N/A |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | a) Equipment passed voltage test of 6.8.3.1 for 5 s with VALUES of Table 6 for BASIC and SUPPLEMENTARY INSULATION | (see Form A.18) | N/A |
| | values for REINFORCED INSULATION are 1,6 times the values of BASIC INSULATION | | N/A |
| | b) if WORKING VOLTAGE exceeds 300 V, equipment passed voltage test of 6.8.3.1 for 1 min with a test voltage of 1,5 times working voltage for BASIC or SUPPLEMENTARY INSULATION | (see Form A.18) | N/A |
| | value for REINFORCED INSULATION are twice the WORKING VOLTAGE | | N/A |
| | Complies as applicable: | | N/A |
| | 1) ENCLOSURE or PROTECTIVE BARRIER of Clause 8 | | N/A |
| | 2) moulded and potted parts requirements of 6.7.3.4.2 | | N/A |
| | 3) inner layers of printed wiring boards requirements of 6.7.3.4.3 | | N/A |
| | 4) thin-film insulation requirements of 6.7.3.4.4 | | N/A |
| 6.7.3.4.2 | Moulded and potted parts | | N/A |
| | Conductors between same two layers are separated by applicable distances of Table 8 | | N/A |
| 6.7.3.4.3 | Inner insulation layers of printed wiring boards | | N/A |
| | Separated by at least by applicable distances of Table 8 between same two layers | | N/A |
| | REINFORCED INSULATION have adequate electric strength; one of following methods used: | | N/A |
| | a) thickness at least applicable distance of Table 8 | | N/A |
| | b) insulation is assembled of minimum two separate layers, each RATED for test voltage of Table 6 for BASIC INSULATION | | N/A |
| | c) insulation is assembled of min two separate layers, where the combination is RATED for 1,6 times the test voltage of Table 6 | | N/A |
| 6.7.3.4.4 | Thin-film insulation | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Conductors between same two layers are separated by applicable CLEARANCES and CREEPAGE DISTANCE of 6.7.3.2 and 6.7.3.3 | | N/A |
| | REINFORCED INSULATION have adequate electric strength; one of following methods used: | | N/A |
| | a) thickness at least applicable distance of Table 8 | | N/A |
| | b) insulation is assembled of min two separate layers, each RATED for test voltage of Table 6 for BASIC INSULATION | | N/A |
| | c) insulation is assembled of min three separate layers, where the combination of two layers passed voltage tests with 1,6 time values of Table 6: | (see Form A.18) | N/A |
| | a.c. test of 6.8.3.1; or | | N/A |
| | d.c. test of 6.8.3.2 for circuits stressed only by d.c. voltages | | N/A |
| 6.8 | Procedure for dielectric strength tests | (see Forms A.14 and A.18) | P |
| 6.9 | Constructional requirements for protection against electric shock | | P |
| 6.9.1 | If a failure could cause a HAZARD: | | P |
| | a) Security of wiring connections | | P |
| | b) Screws securing removable covers | No such part | N/A |
| | c) Accidental loosening | | P |
| | d) CLEARANCES and CREEPAGE DISTANCES not reduced below the values of basic insulation by loosening of parts or wires | | P |
| 6.9.2 | Insulating materials | | P |
| | Material not to be used for safety relevant insulation: | | P |
| | a) Easily damaged materials not used | | P |
| | b) Non-impregnated hygroscopic materials not used | | P |
| 6.9.3 | Colour coding | | P |
| | Green-and-yellow insulation shall not be used except: | | P |
| | a) protective earth conductors; | | P |
| | b) PROTECTIVE BONDING conductors; | | P |
| | c) potential equalization conductors; | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | d) functional earth conductors | | N/A |
| 6.10 | Connection to MAINS supply source and connections between parts of equipment | | P |
| 6.10.1 | MAINS supply cords | | P |
| | RATED for maximum equipment current (see 5.1.3 c) | | P |
| | Cable complies with IEC 60227 or IEC 60245 | | P |
| | Heat-resistant if likely to contact hot parts | | P |
| | Temperature RATING (cord and inlet)..... | | P |
| | Green/yellow used only for connection to PROTECTIVE CONDUCTOR TERMINALS | | P |
| | Detachable cords with IEC 60320 MAINS connectors: | | — |
| | Conform to IEC 60799; or | | N/A |
| | Have the current RATING of the MAINS connector | | N/A |
| 6.10.2 | Fitting of non-detachable MAINS supply cords | | P |
| 6.10.2.1 | Cord entry | | P |
| | a) Inlet or bushing with a smoothly rounded opening; or | | P |
| | b) Insulated cord guard protruding >5 D | | P |
| 6.10.2.2 | Cord anchorage | | P |
| | Protective earth conductor is the last to take the strain | | P |
| | a) Cord is not clamped by direct pressure from a screw | | P |
| | b) Knots are not used | | P |
| | c) Cannot push the cord into the equipment to cause a HAZARD | | P |
| | d) No failure of cord insulation in anchorage with metal parts | | P |
| | e) Not to be loosened without a tool | | P |
| | f) Cord replacement does not cause a HAZARD and method of strain relief is clear | | P |
| | Push-pull and or torque test | (see Form A.19) | P |
| 6.10.3 | Plugs and connectors | | P |
| | MAINS supply plugs, connectors etc., conform with relevant specifications | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | If equipment supplied at voltages below 6.3.2.a) or from a sole source: | | — |
| | Plugs of supply cords do not fit MAINS sockets above rated SUPPLY voltage | | N/A |
| | MAINS type plugs used only for connection to MAINS supply | | N/A |
| | Plug pins which receive a charge from an internal capacitor | (see Form A.5) | N/A |
| | Accessory MAINS socket outlets: | | — |
| | a) Marking if accepts a standard MAINS supply plug (see 5.1.3e) | | N/A |
| | b) Input has a protective earth conductor if outlet has EARTH TERMINAL CONTACT | | N/A |
| 6.11 | Disconnection from supply source | | P |
| 6.11.1 | Disconnects all current-carrying conductors | | P |
| 6.11.2 | Exceptions | | N/A |
| 6.11.3 | Requirements according to type of equipment | | P |
| 6.11.3.1 | PERMANENTLY CONNECTED EQUIPMENT and multi-phase equipment | | N/A |
| | Employs switch or circuit-breaker | Circuit breaker used | N/A |
| | If switch or circuit-breaker is not part of the equipment, documentation requires: | | — |
| | a) Switch or circuit-breaker to be included in building installation | | N/A |
| | b) Suitable location easily reached | | N/A |
| | c) Marking as disconnecting for the equipment | | N/A |
| 6.11.3.2 | Single-phase cord-connected equipment | | P |
| | Equipment is provided with one of the following: | | P |
| | a) Switch or circuit-breaker | | P |
| | b) Appliance coupler (disconnectable without tool) | | N/A |
| | c) Separable plug (without locking device) | | N/A |
| 6.11.4 | Disconnecting devices | | P |
| 6.11.4.1 | Disconnecting device part of equipment | | P |
| | Electrically close to the SUPPLY | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Power-consuming components not electrically located between the supply source and the disconnecting device | | P |
| | Except electromagnetic interference suppression circuits permitted to be located on the supply side of the disconnecting device | | P |
| 6.11.4.2 | Switches and circuit-breakers | | P |
| | When used as disconnection device: | | — |
| | Meets IEC 60947-1 and IEC 60947-3 | | P |
| | Marked to indicate function..... | | P |
| | Not incorporated in MAINS cord | | P |
| | Does not interrupt PROTECTIVE EARTH CONDUCTOR | | P |
| 6.11.4.3 | Appliance couplers and plugs | | P |
| | Where an appliance coupler or separable plug is used as the disconnecting device (see 6.11.3.2): | | P |
| | Readily identifiable and easily reached by the operator | | P |
| | Single-phase portable equipment cord length not more than 3 m | | P |
| | PROTECTIVE EARTH CONDUCTOR connected first and disconnected last | | P |
| | | | |
| 7 | PROTECTION AGAINST MECHANICAL HAZARDS | | P |
| 7.1 | Equipment does not cause a mechanical HAZARD in NORMAL nor in SINGLE FAULT CONDITION | | P |
| | Conformity is checked by 7.2 to 7.7 | | P |
| 7.2 | Sharp edges | | P |
| | Easily touched parts are smooth and rounded | | P |
| | Do not cause injury during NORMAL USE and | | P |
| | Do not cause injury during SINGLE FAULT CONDITION | | P |
| 7.3 | Moving parts | No moving parts | N/A |
| 7.3.1 | HAZARDS from moving parts limited to a tolerable level with the conditions specified in 7.3.2 and 7.3.5 | | N/A |
| | RISK assessment in accordance with 7.3.3 carried out | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.3.2 | Exceptions | | N/A |
| | Access to HAZARDOUS moving parts permitted under following circumstances: | | N/A |
| | a) obviously intended to operate on parts or materials external of the equipment | | N/A |
| | inadvertent touching of moving parts minimized by equipment design (e .g. guards or handles) | | N/A |
| | b) If OPERATOR access is unavoidable outside NORMAL USE following precautions have been taken: | | N/A |
| | 1) Access requires TOOL | | N/A |
| | 2 ) Statement about training in the instructions | | N/A |
| | 3 ) Warning markings on covers prohibiting access by untrained OPERATORS | | N/A |
| | or symbol 14 with full details in documentation | | N/A |
| 7.3.3 | RISK assessment for mechanical HAZARDS to body parts | | N/A |
| | RISK is reduced to a tolerable level by protective measures as specified in Table 12 | | N/A |
| | Minimum protective measures: | | — |
| | A. Low level measures | | N/A |
| | B. Moderate measures | | N/A |
| | C. Stringent measures | | N/A |
| 7.3.4 | Limitation of force and pressure | (see Form A.20) | N/A |
| | Following levels are met in NORMAL and SINGLE FAULT CONDITION: | | N/A |
| | Continuous contact pressure below 50 N / cm² with force below 150 N | | N/A |
| | Temporary force below 250 N for an area at least of<br>3 cm² for a maximum duration of 0,75 s | | N/A |
| 7.3.5 | Gap limitations between moving parts | (see Form A.20) | N/A |
| 7.3.5.1 | Access normally allowed | | N/A |
| | If levels of 7.3.4 exceeded and body part may be inserted minimum gap as specified in Table 13 assured in NORMAL and in SINGLE FAULT CONDITION | | N/A |
| 7.3.5.2 | Access normally prevented | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Maximum gap as specified in Table 14 assured in NORMAL and in SINGLE FAULT CONDITION | | N/A |
| 7.4 | Stability | | P |
| | Equipment not secured to building structure is physical stable | | P |
| | Stability maintained after opening of drawers etc. by automatic means, or | No such means provided | N/A |
| | warning marking requires the application of means | | N/A |
| | Compliance checked by following tests as applicable: | | — |
| | a) 10° tilt test for other than handheld equipment | | P |
| | b) multi-directional force test for equipment exceeds height of 1 m and mass of 25 kg | | N/A |
| | c) downward force test for floor-standing equipment | | N/A |
| | d) overload test with 4 times maximum load for castor or support that supports greatest load | | N/A |
| | e) castor or support that supports greatest load removed from equipment | | N/A |
| 7.5 | Provisions for lifting and carrying | | N/A |
| 7.5.1 | Equipment more than 18 kg : | | — |
| | Has means for lifting or carrying; or | | N/A |
| | Directions in documentation | | N/A |
| 7.5.2 | Handles and grips | | N/A |
| | Handles or grips withstand four times weight | | N/A |
| 7.5.3 | Lifting devices and supporting parts | | N/A |
| | RATED for maximum load; or | | N/A |
| | tested with four times maximum static load | | N/A |
| 7.6 | Wall mounting | | N/A |
| | Mounting brackets withstand four times weight | | N/A |
| 7.7 | Expelled parts | No expelled parts | N/A |
| | Equipment contains or limits the energy | | N/A |
| | Protection not removable without the aid of a tool | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8 | RESISTANCE TO MECHANICAL STRESSES | | P |
| 8.1 | Equipment does not cause a HAZARD when subjected to mechanical stresses in NORMAL USE | | P |
| | Normal protection level is 5 J | Tests done with 5 J | P |
| | Levels below 5 J but not less than 1 J are acceptable if all of following criteria are met: | | N/A |
| | a) lower level justified by RISK assessment of manufacturer | | N/A |
| | b) equipment installed in its intended application is not easily touched | | N/A |
| | c) only occasional access during NORMAL USE | | N/A |
| | d) IK code in accordance to IEC 62262 marked or symbol 14 used with full information in the documentation | | N/A |
| | For non-metallic ENCLOSURES rated below 2 °C ambient temperature value chosen for minimum RATED temperature | | N/A |
| | Impact energies between IK values, the IK code marked for nearest lower value | | N/A |
| | Conformity is checked by performing following tests: | | — |
| | 1) static test of 8.2.1 | | P |
| | 2) impact test of 8.2.2 with 5 J except for HAND-HELD EQUIPMENT | | P |
| | if impact energy not selected to 5 J alternate method of IEC 62262 used | | N/A |
| | 3) drop test of 8.3.1 or 8.3.2 except for FIXED EQUIPMENT with mass over 100 kg | | P |
| | Equipment RATED with an impact rating of IK 08 that obviously meets the criteria | | N/A |
| | After the tests inspection with following results: | | — |
| | - HAZARDOUS LIVE parts above the limits of 6.3.2 not ACCESSIBLE | | P |
| | - insulation pass the voltage tests of 6.8 | (see Form A.30) | P |
| | i) no leaks of corrosive and harmful substances | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | ii) ENCLOSURE shows no cracks resulting in a HAZARD | | P |
| | iii) CLEARANCES not less than their permitted values | | P |
| | iv) insulation of internal wiring remains undamaged | | P |
| | v) PROTECTIVE BARRIERS not damaged or loosened | | P |
| | vi) No moving parts exposed, except permitted by 7.3 | | P |
| | vii) no damage which could cause spread of fire | | P |
| 8.2 | ENCLOSURE rigidity test | | P |
| 8.2.1 | Static test | (see Form A.21A) | P |
| | - 30 N with 12 mm rod to each part of ENCLOSURE | | P |
| | - in case of doubt test conducted at maximum RATED ambient temperature | | P |
| 8.2.2 | Impact test | (see Form A.21A) | P |
| | Impact applied to any part of ENCLOSURE causing a HAZARD if damaged | | P |
| | Impact energy level and corresponding IK code..... | 5J (IK08) | P |
| | Non-metallic ENCLOSURES cooled to minimum RATED ambient temperature if below 2 °C | | N/A |
| 8.3 | Drop test | (see Form A.21B) | P |
| 8.3.1 | Other than HAND-HELD and DIRECT-PLUG-IN EQUIPMENT | | P |
| | Tests conducted with a drop height or angle of..... | Test with a height of 25 mm | P |
| 8.3.2 | HAND-HELD and DIRECT-PLUG-IN EQUIPMENT | | N/A |
| | Non-metallic ENCLOSURES cooled to minimum RATED ambient temperature if below 2 °C | | N/A |
| | Drop test conducted with an height of 1 m | | N/A |

| | | | |
|---|---|---|---|
| 9 | PROTECTION AGAINST THE SPREAD OF FIRE | | P |
| 9.1 | No spread of fire in NORMAL and SINGLE FAULT CONDITION | | P |
| | MAINS supplied equipment meets requirements of 9.6 additionally | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Conformity is checked by minimum one or a combination of the following (see Figure 11): | (see Form A.22) | P |
| | a) SINGLE FAULT test of 4.4; or | (see Forms A.1) | P |
| | b) Application of 9.2 (eliminating or reducing the sources of ignition); or | | N/A |
| | c) Application of 9.3 (containment of fire within the equipment) | | P |
| 9.2 | Eliminating or reducing the sources of ignition within the equipment | | P |
| | a) 1) Limited-energy circuit (see 9.4); or | | N/A |
| | 2) BASIC INSULATION provided for parts of different potential; or | (see Forms A.14 and A.18) | P |
| | Bridging the insulation does not cause ignition | (see Form A.1) | N/A |
| | b) Surface temperature of liquids and parts (see 9.5) | | N/A |
| | c) No ignition in circuits designed to produce heat | (see Form A.1) | N/A |
| 9.3 | Containment of the fire within the equipment, should it occur | | P |
| 9.3.1 | Spread of fire outside equipment reduced to a tolerable level if: | | P |
| | a) Energizing of the equipment is controlled by an OPERATOR held switch | | N/A |
| | b) ENCLOSURE is conform with constructional requirements of 9.3.1; and | | P |
| | Requirements of 9.5 are met | | N/A |
| 9.3.2 | Constructional requirements | | P |
| | a) Connectors and insulating material have flammability classification V-2 or better | All comply with UL 94V-2 or better (see Table: 1 or Form A.23) | P |
| | b) Insulated wires and cables are flame retardant (VW-1 or equivalent) | All comply with UL VW-1 (see Table: 1 or Form A.23) | P |
| | c) ENCLOSURE meets following requirements: | (see Form A.22) | P |
| | 1) Bottom and sides in arc of 5 ° (see Figure 13) to non-limited circuits (9.4) meets: | numerous slots under the chamber each measuring 5.0 x 50mm .No fire source over the openings . | P |
| | i) no openings; or | | N/A |
| | ii) perforated as specified in Table 16; or | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | iii) metal screen with a mesh; or | | N/A |
| | iv) baffles as specified in Figure 12 | | N/A |
| | 2) Material of ENCLOSURE and any baffle or flame barrier is made of: | | P |
| | Metal (except magnesium); or | | P |
| | Non-metallic materials have flammability classification V-1 or better | (see Table: 1 or Form A.22) | P |
| | 3) ENCLOSURE and any baffle or flame barrier have adequate rigidity | | P |
| 9.4 | Limited-energy circuit | (see Form A.24) | N/A |
| | a) Potential not more than 30 r.m.s. and 42,4 V peak, or 60 V dc | | N/A |
| | b) Current limited by one of following means: | | N/A |
| | 1) Inherently or by impedance (see Table 17); or | | N/A |
| | 2) Overcurrent protective device (see Table 18); or | | N/A |
| | 3) A regulating network limits also in SINGLE FAULT CONDITION (see Table 17) | | N/A |
| | c) Is separated by at least BASIC INSULATION | | N/A |
| | Fuse or a nonadjustable electromechanical device is used | | N/A |
| 9.5 | Requirements for equipment containing or using flammable liquids | | N/A |
| | Flammable liquids contained in or specified for use with equipment do not cause spread of fire | (see Form A.25) | N/A |
| | RISK is reduced to a tolerable level : | | N/A |
| | a) The temperature of surface or parts in contact with flammable liquids is 25 °C below fire point | | N/A |
| | b) The quantity of liquid is limited | | N/A |
| | c) Flames are contained within the equipment | | N/A |
| | Detailed instructions for RISK-reduction provided | | N/A |
| 9.6 | Overcurrent protection | | P |
| 9.6.1 | MAINS supplied equipment protected | | P |
| | BASIC INSULATION between MAINS parts of opposite polarity provided | (see Forms A.14 and A.15) | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Devices not in the protective conductor | | P |
| | Fuses or single-pole circuit-breakers not fitted in neutral (multi-phase) | | N/A |
| 9.6.2 | PERMANENTLY CONNECTED EQUIPMENT | | N/A |
| | Overcurrent protection device: | | N/A |
| | Fitted within the equipment; or | | N/A |
| | Specified in manufacturer's instructions | | N/A |
| 9.6.3 | Other equipment | | N/A |
| | Protection within the equipment | | N/A |
| 10 | EQUIPMENT TEMPERATURE LIMITS AND RESISTANCE TO HEAT | | P |
| 10.1 | Surface temperature limits for protection against burns | | P |
| | Easily touched surfaces within the limits in NORMAL and in SINGLE FAULT CONDITION: | (see Form A.26A) | P |
| | - at an specified ambient temperature of 40 °C | | P |
| | - for equipment rated above 40 °C ambient temperature limits not exceeded raised by the difference to 40 °C | | N/A |
| | Heated surfaces necessary for functional reasons exceeding specified values: | | P |
| | Are recognizable as such by appearance or function; or | | P |
| | Are marked with symbol 13 | Warning symbol provided on heated surface | P |
| | Guards are not removable without tool | No such guards used | N/A |
| 10.2 | Temperatures of windings | | P |
| | Limits not exceeded in: | (see Form A.26B) | P |
| | NORMAL CONDITION | | P |
| | SINGLE FAULT CONDITION | | P |
| 10.3 | Other temperature measurements | | P |
| | Following measurements conducted if applicable: | (see Form A.26A) | P |
| | a) Value of 60 °C of field-wiring terminal box not exceeded | | N/A |
| | b) Surface of flammable liquids and parts in contact with this liquids | | N/A |
| | c) Surface of non-metallic ENCLOSURES | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | d) Parts made of insulating material supporting parts connected to MAINS supply | | P |
| | e) Terminals carrying a current more than 0,5 A | | P |
| 10.4 | Conduct of temperature tests | | P |
| 10.4.1 | Tests conducted under reference test conditions and manufacturer's instructions | (see Form A.26A) | P |
| 10.4.2 | Temperature measurement of heating equipment | | P |
| | Tests conducted in test corner | (see Form A.26A) | P |
| 10.4.3 | Equipment intended for installation in a cabinet or wall | | N/A |
| | Equipment built in as specified in installation instructions | (see Form A.26A) | N/A |
| 10.5 | Resistance to heat | | P |
| 10.5.1 | Integrity of CLEARANCE and CREEPAGE DISTANCES | (see Form A.16) | P |
| 10.5.2 | Non-metallic ENCLOSURES | Metal enclosure (see Form A.27) except the control panel in SA-260MB & SA-260MB-G is plastic | P |
| | Within 10 min after treatment: | | — |
| | Equipment subjected to suitable stresses of 8.2 and 8.3 complying with criteria of 8.1 | | P |
| 10.5.3 | Insulating material | | P |
| | a) Parts supporting parts connected to MAINS supply | Terminal boards | P |
| | b) TERMINALS carrying a current more than 0,5 A | | P |
| | Examination of material data; or | | N/A |
| | in case of doubt: | | P |
| | 1) Ball pressure test; or | (see Form A.28) | P |
| | 2) Vicat softening test of ISO 306 | (see Form A.29) | N/A |
| 11 | PROTECTION AGAINST HAZARDS FROM FLUIDS | | P |
| 11.1 | Protection to OPERATORS and surrounding area provided by EQUIPMENT | | P |
| | All fluids specified by manufacturer considered | Equipment containing water. | P |
| 11.2 | Cleaning | (see Form A.30) | P |
| 11.3 | Spillage | (see Form A.30) | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 11.4 | Overflow | No insulation breakdown after the overflow of the chamber liquid (see Form A.30) | P |
| 11.5 | Battery electrolyte | | N/A |
| | Battery electrolyte leakage presents no HAZARD | | N/A |
| 11.6 | Specially protected equipment | (see Form A.30) | N/A |
| 11.7 | Fluid pressure and leakage | | P |
| 11.7.1 | Maximum pressure..... | (see Form A.31) | P |
| | Maximum pressure of any part does not exceed $P_{RATED}$ | | P |
| 11.7.2 | Leakage and rupture at high pressure | | P |
| | Fluid-containing parts subjected to hydraulic test if: | Tests passed without leakage or rupture (see Form A.31) | P |
| | a) product of pressure and volume > 200 kPal; and | All over 200 kPal | P |
| | b) pressure > 50 kPa | Rated 200 kPa ( about 2.1 kgf/cm$^2$ ) | P |
| | Parts of refrigerating systems meets pressure-related requirements of IEC 60335-24 or IEC 60335-2-89 | | N/A |
| 11.7.3 | Leakage from low-pressure parts | (see Form A.32) | N/A |
| 11.7.4 | Overpressure safety device | Pressure controller (PC) as electric protection and Pressure relief valve ( in reservoir) as mechanical protection in pipe system | P |
| | Does not operate in NORMAL USE | Rated working pressure 2.1kgf/cm$^2$. Overpressure safety switch works at 2.2± 0.15 kgf/cm$^2$. | P |
| | a) Connected as close as possible to parts intended to be protected | | P |
| | b) Easy access for inspection, maintenance and repair | | P |
| | c) Adjustment only with TOOL | | P |
| | d) No discharge towards person | | P |
| | e) No HAZARD from deposit of discharged material | | P |
| | f) Adequate discharge capacity | | P |
| | No shut-off valve between overpressure safety device and protected parts | | P |
| 12 | PROTECTION AGAINST RADIATION, INCLUDING LASER SOURCES, AND AGAINST SONIC AND ULTRASONIC PRESSURE | | N/A |
| 12.1 | Equipment provides protection | | N/A |
| 12.2 | Equipment producing ionizing radiation | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 12.2.1 | Ionizing radiation | (see Form A.33) | N/A |
| 12.2.1.1 | Equipment meets the following requirements: | | N/A |
| | a) if intended to emit radiation meets requirements of 12.2.1.2; or | | N/A |
| | tested, classified and marked in accordance to IEC 60405 | | N/A |
| | b) if only emits stray radiation meets requirements of 12.2.1.3 | | N/A |
| 12.2.1.2 | Equipment intended to emit radiation | | N/A |
| | Effective dose rate of radiation measured ... | | N/A |
| | If dose rate exceeds 5 µSv/h marked with the following: | | N/A |
| | a) Symbol 17 (ISO 361) | | N/A |
| | b) Abbreviations of the radionuclides..... | | N/A |
| | c) With maximum dose at 1 m; or..... | | N/A |
| | with dose rate value between 1 µSv/h and 5 µSv/h in m..... | | N/A |
| 12.2.1.3 | Equipment not intended to emit radiation | (see Form A.34) | N/A |
| | Limit for unintended stray radiation of 1 µSv/h at any easily reached point kept ..... | | N/A |
| 12.2.2 | Accelerated electrons | | N/A |
| | Compartments opened only by the use of a TOOL | | N/A |
| 12.3 | Ultraviolet (UV) radiation | | N/A |
| | No unintentional HAZARDOUS escape of UV radiation: | | — |
| | - checked by inspection; and | | N/A |
| | - evaluation of RISK assessment documentation | | N/A |
| 12.4 | Microwave radiation | | N/A |
| | Power density does not exceed 10 W/m$^2$ .. | | N/A |
| 12.5 | Sonic and ultrasonic pressure | | N/A |
| 12.5.1 | Sound level | (see Form A.35) | N/A |
| | No HAZARDOUS sound emission | | P |
| | Maximum sound pressure level measured and calculated for maximum sound power level as specified in ISO 3746 or ISO 9614-1 | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Instruction describes measures for protection | | N/A |
| 12.5.2 | Ultrasonic pressure | (see Form A.36) | N/A |
| | Equipment not intended to emit ultrasound does not exceed limit of 110 dB between 20 kHz and 100 kHz | | N/A |
| | Equipment intended to emit ultrasound: | | N/A |
| | Outside useful beam does not exceed limit of 110 dB between 20 kHz and 100 kHz | | N/A |
| | If inside useful beam above values exceeded: | | N/A |
| | Marked with Symbol 14 of Table 1 | | N/A |
| | and following information in the documentation: | | N/A |
| | a) dimensions of useful beam | | N/A |
| | b) area where ultrasonic pressure exceed 110 dB | | N/A |
| | c) maximum sound pressure inside beam area | | N/A |
| 12.6 | Laser sources | | N/A |
| | Equipment meets requirements of IEC 60825-1 | | N/A |
| 13 | PROTECTION AGAINST LIBERATED GASES AND SUBSTANCES, EXPLOSION AND IMPLOSION | | N/A |
| 13.1 | Poisonous and injurious gases and substances | | N/A |
| | No poisonous or injurious gases or substances liberated in NORMAL CONDITION | | N/A |
| | Attached data/test reports demonstrate conformity | | N/A |
| 13.2 | Explosion and implosion | | N/A |
| 13.2.1 | Components | | N/A |
| | Components liable to explode: | | — |
| | Pressure release device provided; or | | N/A |
| | Apparatus incorporates operator protection (see also 7.7) | | N/A |
| | Pressure release device: | | — |
| | Discharge without danger | | N/A |
| | Cannot be obstructed | | N/A |
| 13.2.2 | Batteries and battery charging | (see Form A.37) | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | If explosion or fire HAZARD could occur: | | — |
| | Protection incorporated in the equipment; or | | N/A |
| | Instructions specify batteries with built-in protection | | N/A |
| | In case of wrong type of battery used: | | — |
| | No HAZARD; or | | N/A |
| | Warning by marking and within instructions | | N/A |
| | Equipment with means to charge rechargeable batteries: | | — |
| | Warning against the charging of non-rechargeable batteries; and | | N/A |
| | Type of rechargeable battery indicated; or | | N/A |
| | Symbol 14 used | | N/A |
| | Battery compartment design | | N/A |
| | Single component failure | | N/A |
| | Polarity reversal test | | N/A |
| 13.2.3 | Implosion of cathode ray tubes | | N/A |
| | If maximum face dimensions > 160 mm ..... | | — |
| | Intrinsically protected and correctly mounted; or | | N/A |
| | ENCLOSURE provides protection: | | N/A |
| | If non-intrinsically protected: | | — |
| | Screen not removable without TOOL | | N/A |
| | If glass screen, not in contact with surface of tube | | N/A |
| 14 | COMPONENTS AND SUBASSEMBLIES | | P |
| 14.1 | Where safety is involved, components and subassemblies meet relevant requirements | (see Table 1) | P |
| 14.2 | Motors | Vacuum pump used. | P |
| 14.2.1 | Motor temperatures | | P |
| | Does not present a HAZARD when stopped or prevented from starting; or | (see Form A.1; A.26B) | P |
| | Protected by over-temperature or thermal protection device conform with 14.3 | | P |
| 14.2.2 | Series excitation motors | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Connected direct to device, if overspeeding causes a HAZARD | | N/A |
| 14.3 | Overtemperature protection devices | (see Form A.38) | P |
| | Devices operating in a SINGLE FAULT CONDITION | A thermostat is incorporated in the windings of the vacuum pump. The power board provides overtemperature protection. Both are IEC certified and work properly during the single fault conditions. (see Form A.37) | P |
| | a) Reliable function is ensured | | P |
| | b) RATED to interrupt maximum current and voltage | | P |
| | c) Does not operate in NORMAL USE | | P |
| | If self-resetting device used to prevent a HAZARD, protected part requires intervention before restarting | Not a self-resetting type | N/A |
| 14.4 | Fuse holders | No fuse is replaceable by operators | N/A |
| | No access to HAZARDOUS LIVE parts | | N/A |
| 14.5 | MAINS voltage selecting devices | Not used | N/A |
| | Accidental change not possible | | N/A |
| 14.6 | MAINS transformers tested outside equipment | Tested in the equipment(see Forms A.39 and A.40 ) | N/A |
| 14.7 | Printed circuit boards | | P |
| | Data shows conformity with V-1 of IEC 60695-11-10 or better; or | Meets 94V-1 min. in UL796 | P |
| | Test shows conformity with V-1 of IEC 60695-11-10 or better | (see Form A.23) | N/A |
| | Not applicable for printed wiring boards with limited-energy circuits (9.4) | | N/A |
| 14.8 | Circuits or components used as TRANSIENT OVERVOLTAGE limiting devices | Not used | N/A |
| | Test conducted between each pair of MAINS SUPPLY TERMINALS | (see Form A.41) | N/A |
| | No HAZARD resulting from rupture or overheating of the component: | | N/A |
| | - no bridging of safety relevant insulation | | N/A |
| | - no heat to other parts above the self-ignition points | | N/A |

| | | | |
|---|---|---|---|
| 15 | PROTECTION BY INTERLOCKS | | P |
| 15.1 | Interlocks are designed to remove a HAZARD before OPERATOR exposed | | P |
| 15.2 | Prevention of reactivation | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 15.3 | Reliability | The door can not open if K9 fail | N/A |
| | Single fault unlikely to occur; or | | N/A |
| | Cannot cause a HAZARD | | N/A |
| 16 | HAZARDS RESULTING FROM APPLICATION | | P |
| 16.1 | REASONABLY FORESEEABLE MISUSE | | P |
| | No HAZARDS arising from settings not intended and not described in the instructions | | P |
| | Other cases of REASONABLY FORESEEABLE MISUSE addressed by RISK assessment | | P |
| 16.2 | Ergonomic aspects | | P |
| | Factors giving rise to a HAZARD the RISK assessment is reflecting those aspects: | | P |
| | a) limitation of body dimensions | | P |
| | b) displays and indicators | | P |
| | c) accessibility and conventions of controls | | P |
| | d) arrangement of TERMINALS | | P |
| 17 | RISK ASSESSMENT | | N/A |
| | RISK assessment conducted, if HAZARD might arise and not covered by Clauses 6 to 16 | All hazards fully addressed in Clauses 6 to 16 | N/A |
| | TOLERABLE RISK achieved by iterative documented process covering the following: | | N/A |
| | a) RISK analysis | | N/A |
| | Identifies HAZARDS and estimates RISK | | N/A |
| | b) RISK evaluation | | N/A |
| | Plan to judge acceptability of resulting RISK level based on the estimated severity and likelihood of a RISK | | N/A |
| | c) RISK reduction | | N/A |
| | Initial RISK reduced by counter measures; | | N/A |
| | Repeated RISK evaluation without new RISKS introduced | | N/A |
| | RISKS remaining after RISK assessment addressed in instructions to RESPONSIBLE BODY: | | N/A |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Information contained how to mitigate these RISKS | | N/A |
| | Following principles in methods of RISK reduction applied by manufacturer in given order: | | N/A |
| | 1) RISKS eliminated or reduced as far as possible | | N/A |
| | 2) Protective measures taken for RISKS that cannot be eliminated | | N/A |
| | 3) User information about residual RISK due to any defect of the protective measures | | N/A |
| | Indication of particular training is required | | N/A |
| | Specification of the need for personal protective equipment | | N/A |
| | Conformity checked by evaluation of the RISK assessment documentation | | N/A |
| ANNEX F | ROUTINE TESTS | | P |
| | Manufacturer ´s declaration | | P |

| | | | |
|---|---|---|---|
| ANNEX H | QUALIFICATION OF CONFORMAL COATINGS FOR PROTECTION AGAINST POLLUTION | | N/A |
| H.1 | General | | N/A |
| | Conformal coatings meet the requirements of Clause H.2 and H.3. | | N/A |
| H.2 | Technical properties | | N/A |
| | Technical properties of conformal coatings are suitable for the intended application. In particular: | | — |
| | a) Manufacturer indicate that it is a coating for PWBs; | | N/A |
| | b) RATED operating temperature include the temperature range of the indicated application; | | N/A |
| | c) CTI, insulation resistance and dielectric strength are suitable for the intended application; | | N/A |
| | d) Coating have adequate UV resistance, if it is exposed to sunlight; | | N/A |
| | e) Flammability RATING of the coating is at least the required flammability RATING of the applied PWB. | | N/A |

| | | | |
|---|---|---|---|
| H.3 | Qualification of coatings | (see Form A.42) | N/A |
| | Coating complies with the conformity requirements. | | N/A |

| | | | |
|---|---|---|---|
| ANNEX K | INSULATION REQUIREMENTS NOT COVERED BY CLAUSE 6.7 | (see Form A.15 and A.18) | N/A |
| | | | |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| 4.4 | **TABLE: Testing in SINGLE FAULT CONDITION – Results** | | | **Form A.1.** | P |
|---|---|---|---|---|---|
| Test subclause | Fault No. | Fault description | Td 4.4.3 (NOTE) | How was test terminated Comments | Meets 4.4.4 |
| Model SA-300MB | | | | | |
| 4.4.2.3 | 1 | Protective earth disconnected | 0 hr 5 min | Normal operation until temperature becomes stability, no spread of fire. The values of clause 6.3.2 are not exceeded. | P |
| 4.4.2.5 | 2 | Vacuum pump rotor locked | 1 hr 55 min | Vacuum function invalid. Error message “Over heat” shown on LCM. Alarm works. Unit shut down. See appended Table 10 for measured temperatures. | P |
| 4.4.2.6 | 3 | Capacitor (Vacuum Pump start capacitor) short circuited | 1 hr 37 min | Vacuum function invalid. Error message “Over heat” shown on LCM. Alarm works. Unit shut down. See appended Table 10 for measured temperatures. | P |
| 4.4.2.10 | 4 | Openings blocked | 5 hr 59 min | Normal operation. Input current 14.2 A . See appended Table 10 for measured temperatures. | P |
| 4.4.2.10 | 5 | Fan locked | 0 hr 5 min | Error message “ Fan 1 fault ” shown on LCM. Unit shut down. | P |
| 4.4.2.11 | 6 | Thermostat TC1 opened | 0 hr 5 min | Error message “ SSR 1 fault ” shown on LCM. Unit shut down. | P |
| 4.4.2.13 | 7 | Interlock failure ( door lock motor short circuited) | 7 hr 14 min | Normal operation. Door not opened during operation. | P |
| 4.4.2.13 | 8 | Interlock failure ( door lock motor opened) | 2 hr 55 min | Normal operation. Door not opened during operation. | P |
| 4.4.1 | 9 | The equipment operates at 90% and 110% of the rated voltage (198Vac and 264Vac) for one cycle. The voltage then set to 90% of the rated voltage for 5 min. The voltage is reduced gradually at a rate of approximately 10V per min until the equipment fails to operate normally. The voltage then reset to the rated voltage with the equipment still switched on | 5 hr 35 min | The equipment shut down at 112V. It works normally after reset to rated voltage. See appended Table 10 for measured temperatures. | P |
| 4.4.1 | 10 | Failure of other supply (Heating without water ) | 0 hr 5 min | Error message “ 400 ” shown on LCM. Unit shut down. | P |

| 4.4 | **TABLE: Testing in SINGLE FAULT CONDITION – Results** | | | **Form A.1.** | P |
|---|---|---|---|---|---|
| Test subclause | Fault No. | Fault description | Td 4.4.3 (NOTE) | How was test terminated Comments | Meets 4.4.4 |
| Model SA-260MB | | | | | |
| 4.4.2.3 | 11 | Protective earth disconnected | 0 hr 5 min | Normal operation until temperature becomes stability, no spread of fire. The values of clause 6.3.2 are not exceeded. | P |
| 4.4.2.5 | 12 | Vacuum pump (80110110) rotor locked | 2 hr 35 min | Vacuum function invalid. Error message “Error 220” shown on LCM. Alarm works. Unit shut down. See appended Table 10 for measured temperatures. | P |
| 4.4.2.5 | 13 | Vacuum pump (SJ-100B) rotor locked | 1 hr 55 min | Vacuum function invalid. Error message “Error 220” shown on LCM. Alarm works. Unit shut down. See appended Table 10 for measured temperatures. | P |
| 4.4.2.6 | 14 | Capacitor (Vacuum Pump 80110110 start capacitor) short circuited | 3 hr 13 min | Vacuum function invalid. Error message “220” shown on LCM. Alarm works. Unit shut down. See appended Table 10 for measured temperatures. | P |
| 4.4.2.6 | 15 | Capacitor (Vacuum Pump SJ-100B start capacitor) short circuited | 1 hr 37 min | Vacuum function invalid. Error message “220” shown on LCM. Alarm works. Unit shut down. See appended Table 10 for measured temperatures. | P |
| 4.4.2.10 | 16 | Openings blocked | 5 hr 58 min | Normal operation. Input current 12.19A See appended Table 10 for measured temperatures. | P |
| 4.4.2.10 | 17 | Fan locked | 0 hr 5 min | Error message “ 150 ” shown on LCM. Alarm works. Unit shut down. | P |
| 4.4.2.13 | 18 | Interlock failure ( door lock motor short circuited) | 5 hr 17 min | Normal operation. Door not opened during operation. | P |
| 4.4.2.13 | 19 | Interlock failure ( door lock motor opened) | 2 hr 55 min | Normal operation. Door not opened during operation. | P |
| 4.4.2.11 | 20 | Thermostat TC1 opened | 0 hr 5 min | Error message “ SSR 1 fault ” shown on LCM. Unit shut down. | P |
| 4.4.1 | 21 | The equipment operates at 90% and 110% of the rated voltage (198Vac and 264Vac) for one cycle. The voltage then set to 90% of the rated voltage for 5 min. The voltage is reduced gradually at a rate of approximately 10V per min until the equipment fails to operate normally. The voltage then reset to the rated voltage with the equipment still switched on | 5 hr 35 min | The equipment shut down at 118V. It works normally after reset to rated voltage. See appended Table 10 for measured temperatures. | P |
| 4.4.1 | 22 | Failure of other supply (Heating without water ) | 0 hr 5 min | Error message “ 400 ” shown on LCM. Unit shut down. | P |

| 4.4 | **TABLE: Testing in SINGLE FAULT CONDITION – Results** | | | **Form A.1.** | P |
|---|---|---|---|---|---|
| Test subclause | Fault No. | Fault description | Td 4.4.3 (NOTE) | How was test terminated Comments | Meets 4.4.4 |
| 4.4.2.5 | 23 | Vacuum pump (82110110) rotor locked | 1 hr 30 min | Vacuum function invalid after 10 min. Error message “Error 220” shown on LCM. Alarm works. Unit shut down. See appended Table 10 for measured temperatures. | P |
| 4.4.2.6 | 24 | Capacitor (Vacuum Pump 82110110 start capacitor) short circuited | 1 hr 30 min | Vacuum function invalid after 10 min. Error message “220” shown on LCM. Alarm works. Unit shut down. See appended Table 10 for measured temperatures. | P |
| NOTE Td = Test duration in hh:mm:ss<br>Record dielectric strength test on Form A.19 and temperature tests on Form A.27A and or A.27.B.<br>Record in the comments column for each test whether carried out during or after SINGLE FAULT CONDITION. | | | | | |
| Supplementary information: | | | | | |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| 220 - 240Clause | Requirement — Test | Result — Remark | Verdict |

| | | | |
|---|---|---|---|
| **5.1.3c)** | **TABLE: MAINS supply** | **Form A.2** | P |
| | Marked rating ..... | 220 – 240 V | — |
| | Phase ..... | single | — |
| | Frequency ..... | 50 / 60 Hz | — |
| | Current ..... | 12 A ( SA-260MB ) , 13 A ( SA-260MB-G ) , 14.1A (SA-300MB, SA-302MB) | — |
| | Power ..... | W | — |
| | Power ..... | VA | — |

| Test | Voltage | Frequency | Current | Power in | Power in | Comments |
|---|---|---|---|---|---|---|
| No. | V | Hz | A | W | VA | |
| SA- 260MB | | | | | | With 8011 pump |
| | 198 | 50 | 10.12 | 2002 | | |
| | 198 | 60 | 10.12 | 2002 | | |
| | 220 | 50 | 11.21 | 2465 | | |
| | 220 | 60 | 11.21 | 2465 | | |
| | 240 | 50 | 12.19 | 2923 | | |
| | 240 | 60 | 12.19 | 2923 | | |
| | 264 | 50 | 13.40 | 3521 | | |
| | 264 | 60 | 13.40 | 3521 | | |
| SA-260MB | 198 | 50 | 10.08 | 1992 | | With SJ-100B pump |
| | 198 | 60 | 10.08 | 1992 | | |
| | 220 | 50 | 11.22 | 2468 | | |
| | 220 | 60 | 11.22 | 2468 | | |
| | 240 | 50 | 12.15 | 2916 | | |
| | 240 | 60 | 12.12 | 2916 | | |
| | 264 | 50 | 13.38 | 3518 | | |
| | 264 | 60 | 13.38 | 3518 | | |
| SA-260MB-G | 198 | 50 | 10.72 | 2119 | | With 82110110 pump |
| | 198 | 60 | 10.66 | 2085 | | |
| | 220 | 50 | 11.81 | 2588 | | |
| | 220 | 60 | 11.94 | 2617 | | |
| | 240 | 50 | 12.92 | 3105 | | |
| | 240 | 60 | 12.93 | 3093 | | |
| | 264 | 50 | 14.21 | 3723 | | |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| 220 - 240Clause | Requirement — Test | Result — Remark | Verdict |

| 5.1.3c) | **TABLE: MAINS supply** | | **Form A.2** | P |
|---|---|---|---|---|
| | Marked rating ..... | 220 – 240 V | | — |
| | Phase ..... | single | | — |
| | Frequency ..... | 50 / 60 Hz | | — |
| | Current ..... | 12 A ( SA-260MB ) , 13 A ( SA-260MB-G ) , 14.1A (SA-300MB, SA-302MB) | | — |
| | Power ..... | W | | — |
| | Power ..... | VA | | — |

| Test | Voltage | Frequency | Current | Power in | Power in | Comments |
|---|---|---|---|---|---|---|
| No. | V | Hz | A | W | VA | |
| | 264 | 60 | 14.09 | 3690 | | |
| SA-300MB | 198 | 50 | 11.78 | 2329 | | |
| | 198 | 60 | 11.78 | 2329 | | |
| | 220 | 50 | 13.07 | 2872 | | |
| | 220 | 60 | 13.07 | 2872 | | |
| | 240 | 50 | 14.20 | 3408 | | |
| | 240 | 60 | 14.20 | 3408 | | |
| | 264 | 50 | 15.58 | 4113 | | |
| | 264 | 60 | 15.58 | 4113 | | |
| | | | | | | |

NOTE – Measurements are only required for marked ratings.

Supplementary information:
Max load is set at 134℃ sterilization temperature

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| **5.3** | **TABLE: Durability of markings** | **Form A.3** | P |
|---|---|---|---|

| Marking method (see NOTE) | Agent |
|---|---|
| 1) Adhesive label | A Water |
| 2) Ink printed | B Isopropyl alcohol 70% |
| 3) Laser marked | C (specify agent) |
| 4) Filmcoated (plastic foil control panel) | D (specify agent) |
| 5) Imprinted on plastic (moulded in) | E (specify agent) |
| | |

NOTE – Where applicable include print method, label material, ink or paint type, fixing method, adhesive and surface to which marking is fixed.

| Marking location | Marking method (see above) |
|---|---|
| Identification (5.1.2) | 1 |
| MAINS supply (5.1.3) | 1 |
| Fuses (5.1.4) | 1 |
| terminals and operating devices (5.1.5.2) | -- |
| Switches and circuit breakers (5.1.6) | -- |
| Double/reinforced equipment (5.1.7) | -- |
| Field wiring Terminal boxes (5.1.8) | -- |
| Warning marking (5.2) | 1 |
| Battery charging (13.2.2) | -- |
| | |

| Method | Test agent | Remains legible | Label loose | Curled edges | Comments |
|---|---|---|---|---|---|
| | | Verdict | Verdict | Verdict | |
| 1 | B | P | P | P | Pass |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | |
|---|---|---|
| **6.2** | **TABLE: List of ACCESSIBLE parts** **Form A.4** | |
| 6.1.2 | Exceptions | — |
| 6.2 | Determination of ACCESSIBLE parts | — |

| Item | Description | Determination method (NOTE 5) | Exception under 6.1.2 (NOTE 4) |
|---|---|---|---|
| 1 | Enclosure | Test finger | no |
| 2 | Panel surface | Test finger | no |
| | | | |
| | | | |
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NOTE 1 – Test fingers and pins are to be applied without force unless a force is specified (see 6.2.2)
NOTE 2 – Special consideration should be given to inadequate insulation and high voltage parts (see 6.2)
NOTE 3 – Parts are considered to be ACCESSIBLE if they could be touched in the absence of any covering which is not considered to provide suitable insulation (see 6.4).
NOTE 4 – Capacitor test may be required (see Form A.5).
NOTE 5 – The determination methods are:
V = visual; R = rigid test finger; J = jointed test finger; P3 = pin 3 mm diameter; P4 = pin 4 mm diameter.

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | | |
|---|---|---|---|
| **6** | **TABLE: Values in NORMAL CONDITION** | **Form A.5** | P |
| 6.1.2 | Exceptions | 11.2 Cleaning and decontamination | — |
| 6.3.1 | Values in NORMAL CONDITION (see NOTE 1) | 11.3 Spillage | — |
| 6.6.2 | Terminals for external circuit | 11.4 Overflow | — |
| 6.10.3 | Plugs and connections | | — |

| Item | Voltage | | | Current | | | | Capacitance | | 10 s / 5 s test (NOTE) | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (see Form A.4) | V r.m.s. | V peak | V d.c. | Test circuit A1/A2/A3 | mA r.m.s. | mA peak | mA d.c. | μC | mJ | V | μC | mJ | |
| 1 | -- | 1.9 | -- | -- | --- | -- | --- | -- | -- | -- | -- | -- | Model SA-300MB |
| 2 | -- | 1.3 | -- | -- | --- | -- | --- | -- | -- | -- | -- | -- | Model SA-300MB |
| 1 | -- | 1.6 | -- | -- | --- | -- | --- | -- | -- | -- | -- | -- | Model SA-260MB |
| 2 | -- | 4.7 | -- | -- | --- | -- | --- | -- | -- | -- | -- | -- | Model SA-260MB |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

NOTE – A 10 s test is specified in 6.1.2 a) b). A. 5 s test is specified in 6.10.3. The capacitance level versus voltage below the limits given from figure 3 of IEC 61010-1.

Supplementary information:
Voltages on mains plug 5 s after disconnection of the supply are
Mains switch OFF / ON
L to N 6 Vp / 6 Vp
L to G 6 Vp / 4 Vp
N to G 4 Vp / 6 Vp

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| 6.3.2 | **TABLE: Values in SINGLE FAULT CONDITION** | | | | | | | | | | **Form A.6** | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Item | Subclause and | Voltage | | | Transient (see NOTE) | | Current | | | | Capacitance | |
| (see Form A.4) | fault No. (see Form A.1) | V r.m.s. | V peak | V d.c. | V | s | Test circuit A1/A2/A3 | mA r.m.s. | mA peak | mA d.c. | µF (see NOTE) | Comments |
| 1 | 1 | 102 | 152 | | -- | --- | A2 | 0.86 | 3.2 | -- | --- | |
| 2 | 1 | 35.2 | 52 | | -- | --- | A2 | 0.13 | 1.8 | -- | --- | |
| 1 | 2 | -- | 2.1 | | -- | --- | -- | -- | -- | -- | --- | |
| 2 | 2 | -- | 1.3 | | -- | --- | -- | -- | -- | -- | --- | |
| 1 | 3 | -- | 2.3 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 3 | -- | 1.5 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 4 | -- | 2.0 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 4 | -- | 1.3 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 5 | -- | 1.7 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 5 | -- | 1.0 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 6 | -- | 2.4 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 6 | -- | 1.5 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 7 | -- | 2.5 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 7 | -- | 1.6 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 8 | -- | 1.7 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 8 | -- | 1.3 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 9 | -- | 2.0 | | -- | -- | -- | -- | -- | -- | -- | |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| 6.3.2 | **TABLE: Values in SINGLE FAULT CONDITION** | | | | | | | | | | **Form A.6** | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Item | Subclause and | Voltage | | | Transient (see NOTE) | | Current | | | | Capacitance | |
| (see Form A.4) | fault No. (see Form A.1) | V r.m.s. | V peak | V d.c. | V | s | Test circuit A1/A2/A3 | mA r.m.s. | mA peak | mA d.c. | µF (see NOTE) | Comments |
| 2 | 9 | -- | 1.5 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 10 | -- | 2.7 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 10 | -- | 1.6 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 11 | 131 | 186 | | -- | -- | A2 | 0.4 | 2.8 | -- | -- | |
| 2 | 11 | 22.6 | 35 | | -- | -- | A2 | 0.15 | 1.7 | -- | -- | |
| 1 | 12 | -- | 2.1 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 12 | -- | 4.6 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 13 | -- | 1.9 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 13 | -- | 5.0 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 14 | -- | 1.8 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 14 | -- | 4.3 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 15 | -- | 4.4 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 15 | -- | 2.0 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 16 | -- | 4.8 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 16 | -- | 2.3 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 17 | | 5.1 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 17 | | 1.9 | | -- | -- | -- | -- | -- | -- | -- | |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

**6.3.2** **TABLE: Values in SINGLE FAULT CONDITION** **Form A.6** P

| Item | Subclause and | Voltage | | | Transient (see NOTE) | | Current | | | | Capacitance | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (see Form A.4) | fault No. (see Form A.1) | V r.m.s. | V peak | V d.c. | V | s | Test circuit A1/A2/A3 | mA r.m.s. | mA peak | mA d.c. | µF (see NOTE) | Comments |
| 1 | 18 | | 5.4 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 18 | | 1.9 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 19 | | 4.6 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 19 | | 1.4 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 20 | | 3.9 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 20 | | 1.6 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 21 | | 4.8 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 21 | | 1.5 | | -- | -- | -- | -- | -- | -- | -- | |
| 1 | 22 | | 4.9 | | -- | -- | -- | -- | -- | -- | -- | |
| 2 | 22 | | 2.4 | | -- | -- | -- | -- | -- | -- | -- | |

NOTE – Transient voltages must be below the limits given from Figure 2 and the capacitance below the limits from figure 3 of IEC 61010-1.

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| 6.5.2.2 | **TABLE: Cross-sectional area of bonding conductors** | **Form A.7** | P |
|---|---|---|---|

| Conductor location | CROSS-SECTIONAL AREA mm² | VERDICT |
|---|---|---|
| Protective earth conductor | 1.5 mm $^2$ | P |
| | | |
| | | |
| | | |
| | | |

Supplementary information:

| 6.5.2.3 | **TABLE: Tighting torque test** | **Form A.8** | P |
|---|---|---|---|

| Conductor location | Size of screw | Tighting torque Nm | Verdict |
|---|---|---|---|
| Earth Screw ( SA-300MB & SA-260MB) | 5.0 mm | 2.0 | P |
| | | | |
| | | | |
| | | | |
| | | | |

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| **6.5.2.4** | **TABLE: Bonding impedance of plug connected equipment** | **Form A.9** | P |
|---|---|---|---|

| ACCESSIBLE part under test | Test current A | Voltage attained after 1 min V | Calculated resistance (Maximum 0,1 or 0,2 Ω) Ω (NOTE 1) | Verdict |
|---|---|---|---|---|
| Power cord earth conductor end – enclosure ( SA-300MB) | 25 | 1.13 | 0.0452 | Passed |
| Power cord earth conductor end – enclosure ( SA-260MB) | 25 | 1.09 | 0.0436 | Passed |
| | | | | |

NOTE 1 – For none-detachable power cord the impedance between protective conductor plug pin of MAINS cord and each ACCESSIBLE part shall not exeed 0,2 Ohm.

Supplementary information:

| **6.5.2.5** | **TABLE: Bonding impedance of permanently connected equipment** | **Form A.10** | N/A |
|---|---|---|---|

| ACCESSIBLE part under test | Test current A | Voltage attained after 1 min (maximum 10 V) V | Verdict |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Supplementary information:

| **6.5.2.6** | **TABLE: Transformer PROTECIVE BONDING screen** | **Form A.11** | N/A |
|---|---|---|---|

| ACCESSIBLE part under test | Test current (see NOTE) A | Voltage attained after 1 min (maximum 10 V) V | Calculated resistance (maximum 0,1 Ω) Ω | Verdict |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

NOTE – Test current must be twice the value of the over current protection means of the winding. Test is specified in 6.5.2.6 a) or b).

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| 6.5.4 | **TABLE: protective impedance** | **Form A.12** | N/A |
|---|---|---|---|

A single component

| Component | Location | Measured | | Calculated | Rated | | Verdict | Comments |
|---|---|---|---|---|---|---|---|---|
| | | Working voltage V | Current A | Power dissipation W | Working voltage V | Power dissipation W | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

A combination of components

| Component | Location | Comments |
|---|---|---|
| | | |
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| | | |

NOTE – A PROTECTIVE IMPEDANCE shall not be a single electronic device that employs electron conduction in a vacuum, gas or semiconductor.

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| 6.5.6 | **TABLE: Current- or voltage-limiting device** | **Form A.13** | N/A |
|---|---|---|---|

| Component | Location | Measured | | Rated | | Verdict | Comments |
|---|---|---|---|---|---|---|---|
| | | Working voltage V | Current A | Working voltage V | Current A | | |
| | | | | | | | |
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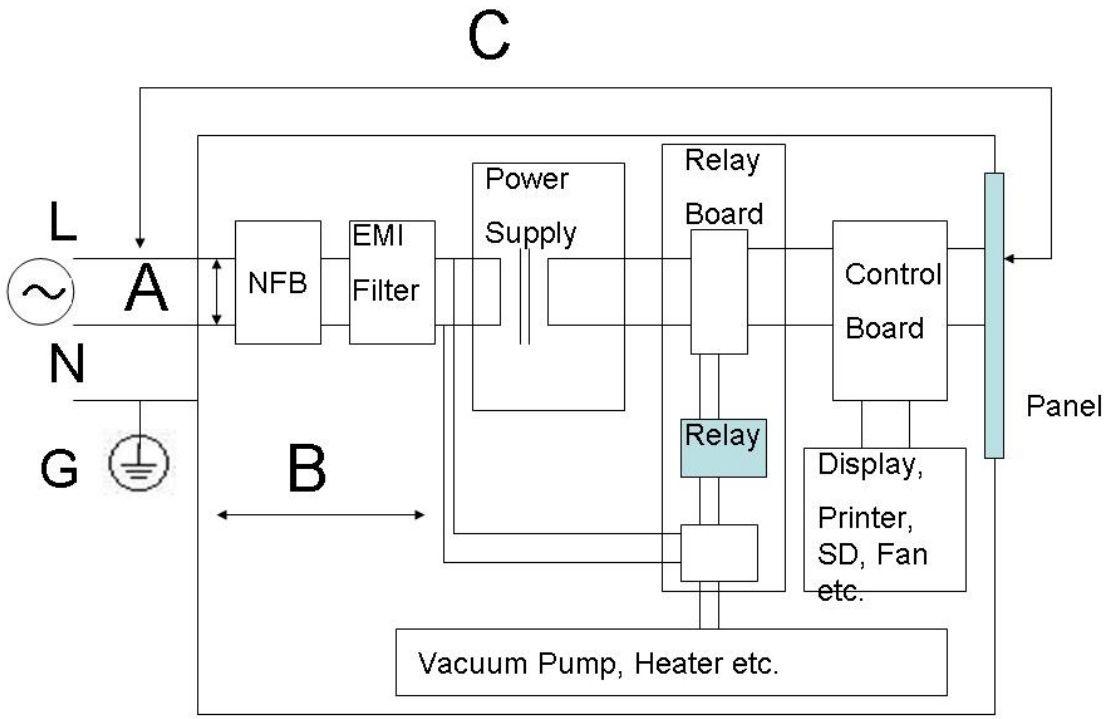
Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| 6.7 | **TABLE: Insulation requirements- Block diagram of system** | **Form A.14** | P |
|---|---|---|---|




Pollution degree ..... : 2 | Overvoltage category .....: II

| Area | Location | Insulation type | WORKING VOLTAGE | | | Test voltage | Comments (NOTE 3) |
|---|---|---|---|---|---|---|---|
| | | (NOTE 1) | RMS V | Peak V | Frequency Hz | (NOTE 2) V | |
| SA-300MB | | | | | | | |
| A | Line to Neutral before NFB | BI | 240 | | 60 | 1500Vac | P |
| B | Pri – Earth | BI | 240 | | 60 | 1500Vac | P |
| C | Pri – Sec. (Control panel ) | RI | 240 | | 60 | 3000Vac | P |
| C | Pri – Sec. (RS232 port ) | RI | 240 | | 60 | 3000Vac | P |
| SA-260MB | | | | | | | |
| A | Line to Neutral before NFB | BI | 240 | | 60 | 1500Vac | P |
| B | Pri – Earth | BI | 240 | | 60 | 1500Vac | P |
| C | Pri – Sec. (Control panel ) | RI | 240 | | 60 | 3000Vac | P |
| C | Pri – Sec. (RS232 port ) | RI | 240 | | 60 | 3000Vac | P |

NOTE 1 – Type of insulation:
BI = BASIC INSULATION
DI = DOUBLE INSULATION
PI = PROTECTIVE IMPEDANCE
RI = Reinforced INSULATION
SI = Supplementary INSULATION
see also Form A.15 for further details

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

NOTE 3 - OVERVOLTAGE CATEGORIES or POLLUTION DEGREES which differ should be shown under "Comments"

Supplementary Information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | | | |
|---|---|---|---|---|
| **6.7** | **TABLE: Insulation requirements- Clearances and Creepages** | | **Form A.15** | P |
| 6.2.2 | Examination | 6.5.4 | Protective impedance | — |
| 6.4.2 | ENCLOSURES and protective barriers | 6.5.6 | Current- or voltage-limiting device | — |
| 6.4.4 | Impedance | 9.6.1 | BASIC INSULATION between opposite polarity | — |

| Area | Location | Insulation type | WORKING VOLTAGE (NOTE 2) | | | Clearance | | Creepage | | CTI | Verdict | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (See Form A.14) | (NOTE 1) | RMS V | Peak V | Frequency kHz | Required mm | Measured mm | Required mm | Measured mm | | | |
| A | Between Line to Neutral before NFB | BI | 240 | | 60 Hz | 1.5 | -- | 3.0 | -- | IIIb | P | Certified NFB used |
| B | Between Primary to earthed metal | BI | 240 | | 60 Hz | 1.5 | 3.0 | 3.0 | 3.0 | IIIb | P | |
| B | Between heater live parts to earthed metal | BI | 240 | | 60 Hz | 1.5 | 5.8 | 3.0 | 5.8 | IIIb | P | |
| B | Between pump enclosure to earthed metal | BI | 240 | | 60 Hz | 1.5 | 31.0 | 3.0 | 31.0 | IIIb | P | |
| C | Between Primary to secondary on Relay Board | RI/DI | 240 | | 60 Hz | 3.0 | 6.0 | 6.0 | 6.0 | IIIb | P | Relay RL1 – RL5 primary to secondary side |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

NOTE 1 – refer to Form A.14 for type of insulation shown in the insulation diagram

NOTE 2 - to be used for definition of required insulation (see Form A.14)

| Input supply voltage…….: | 240 V | 60 Hz |
|---|---|---|

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | | | |
|---|---|---|---|---|
| **6.7** | **TABLE: Insulation requirements- Clearances and Creepages** | | **Form A.16** | P |
| 6.4.2 | ENCLOSURES or PROTECTIVE BARRIERS | 9.6.1 | Overcurrent protection basic insulation between MAINS parts | — |
| 8 | Mechanical resistance to shock and impact | 10.5.1 | Integrity of CLEARANCES and CREEPAGE distances | — |

| Area | Location | Insulation type | Mechanical tests (NOTE) | | | | | Test at max. | Measured after test (if required) | | Verdict | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (See Form A.14) | | Applied force | Rigidity (8.2) | | Drop (8.3) | | RATED ambient | CREEPAGE DISTANCE | CLEARANCE | | |
| | | | N | Static (8.2.1) | Impact (8.2.2) | Normal (8.3.1) | Hand-held/ Plug-in | (10.5.1) | mm | mm | | |
| A | Between Line to Neutral before NFB | BI | | 30N | 5J | -- | -- | 40 ℃ | -- | -- | P | |
| B | Between Primary to earthed metal | BI | | 30N | 5J | -- | -- | 40 ℃ | 3.0 | 3.0 | P | |
| B | Between heater live parts to earthed metal | BI | | 30N | 5J | -- | -- | 40 ℃ | 5.8 | 5.8 | P | |
| B | Between pump enclosure to earthed metal | RI/DI | | 30N | 5J | -- | -- | 40 ℃ | 31.0 | 31.0 | P | |
| C | Between Primary to secondary on Relay Board | RI/DI | | 30N | 5J | -- | -- | 40 ℃ | 6.0 | 6.0 | P | |
| | | | | | | | | | | | | |

NOTE – Refer to Form A.19 for dielectric strength tests following the above tests.

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement – Test | Result — Remark | Verdict |

| | | | |
|---|---|---|---|
| **6.7.2.2.2** | **TABLE: Reliability of potted components** | **Form A.17 (optional)** | N/A |
| **14.1 b)** | **Components and subassemblies** | | |

| Temperature Cycling Test | |
|---|---|
| Manufacturer..... : | |
| Type ..... : | |
| Construction..... : | |
| Potting compound..... : | |
| CREEPAGE distances measured..... : | |
| CLEARANCES measured..... : | |
| Thickness through insulation ..... : | |
| Adhesive test Pass/Fail ..... : | |
| Test temperature T °C ..... : | |

| Cycles at U= AC 500 V | | | | Leakage current (500 V) mA | | | |
|---|---|---|---|---|---|---|---|
| Number of cycles | Date | | | 68 h / 125 °C | 1 h / 25 °C | 2 h / 0 °C | 1 h / 25 °C |
| 1. Cycle from | | to | | | | | |
| 2. Cycle from | | to | | | | | |
| 3. Cycle from | | to | | | | | |
| 4. Cycle from | | to | | | | | |
| 5. Cycle from | | to | | | | | |
| 6. Cycle from | | to | | | | | |
| 7. Cycle from | | to | | | | | |
| 8. Cycle from | | to | | | | | |
| 9. Cycle from | | to | | | | | |
| 10. Cycle from | | to | | | | | |

| After Cycling Test : | | |
|---|---|---|
| Humidity conditioning | 48 h | |
| Requirements for dielectric strength (s. insulation diagram) | Test voltage V r.m.s | Verdict |
| Basic insulation _____ V r.m.s. | | |
| Additional insulation _____ V r.m.s. | | |
| Reinforced insulation _____ V r.m.s. | | |

NOTE - to be used for evaluation of components containing insulation through solid insulation, when the component standard require thermal cycling test. Ref Clause 14.1 and Figure 15, option b)

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | | |
|---|---|---|---|
| **6.8** | **TABLE: Dielectric strength tests** | **Form A.18** | P |
| 4.4.4.1 b) | Conformity after application of SINGLE FAULT CONDITIONS[1] | | P |
| 6.4 | Primary means of protection[2] | | P |
| 6.6 | Connections to external circuits | | N/A |
| 6.7. | Insulation requirements[2] (see Annnex K) | | P |
| 6.10.2 | Fitting of non-detachable MAINS supply cords[1] | | P |
| 9.2 a) 2) | Eliminating or reducing the sources of ignition within the equipment | | N/A |
| 9.4 c) | Limited-energy circuit | | N/A |
| 9.6.1 | Overcurrent protection basic insulation between MAINS - parts | | P |
| | Test site altitude .....: | 0 m (1013 hPa) | — |
| | Test voltage correction factor (see Table 10) .....: | | — |

| Location or references from Forms A.1 and A.14 | Clause or sub-clause | Humidity Yes/No | Working voltage V | Test voltage r.m.s./peak/ d.c. | Before humidity/ after humidity / after 6.10.2.2/ after 8.2.1/ after 8.2.2 heating / after 10.5.2 / after 11.2 / Comments | Verdict |
|---|---|---|---|---|---|---|
| SA-260MB | | | | | | |
| L to N before fuse | 6.8/6.10.2.2 /8.2.1/8.2.2/ 10.5.2/11.2 | Yes | 240V | 1500Vac | P/P/P/P/P/P/P | P |
| L/N to earthed enclosure | 6.8/6.10.2.2 /8.2.1/8.2.2/ 10.5.2/11.2 | Yes | 240V | 1500Vac | P/P/P/P/P/P/P | P |
| L/N to control panel | 6.8/6.10.2.2 /8.2.1/8.2.2/ 10.5.2/11.2 | Yes | 240V | 3000Vac | P/P/P/P/P/P/P | P |
| SA-300MB | | | | | | |
| L to N before fuse | 6.8/6.10.2.2 /8.2.1/8.2.2/ 10.5.2/11.2 | Yes | 240V | 1500Vac | P/P/P/P/P/P/P | P |
| L/N to earthed enclosure | 6.8/6.10.2.2 /8.2.1/8.2.2/ 10.5.2/11.2 | Yes | 240V | 1500Vac | P/P/P/P/P/P/P | P |
| L/N to control panel | 6.8/6.10.2.2 /8.2.1/8.2.2/ 10.5.2/11.2 | Yes | 240V | 3000Vac | P/P/P/P/P/P/P | P |

[1] Record the fault, test or treatment applied before the dielectric strength test. [2] Humidity preconditioning required.
NOTE: Test duration may be recorded.

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| **6.10.2** | **TABLE: Cord anchorage** | | | | **Form A.19** | P |
|---|---|---|---|---|---|---|

| Location | Mass kg | Pull N | Verdict | Torque Nm | Verdict | Comment |
|---|---|---|---|---|---|---|
| Power cord (SA-260MB) | 64 | 100 N | P (0.7mm) | 0.35 | P (0.9 mm) | |
| Power cord (SA-300MB) | 91.5 | 100 N | P (0.7mm) | 0.35 | P (0.9 mm) | |
| | | | | | | |
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| Dielectric strength test for 1 min. (6.8.3.1)..... : | | V r.m.s. | |
|---|---|---|---|

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | |
|---|---|---|
| **7.** | **TABLE: Protection against mechanical HAZARDS** **Form A.20** | N/A |
| 7.3.4 | Limitation of force and presure | — |
| 7.3.5 | Gap limitations between moving parts | — |

| | Clause 7.3.4 | | Clause 7.3.5.1 | | | | | | | | Clause 7.3.5.2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Continuous | Temporary | Minimum gaps (mm) | | | | | | | | Maximum gaps (mm) | | | | |
| Part / Location | Contact presure max. 50 N /cm² @ max. 150 N | max. 250 N / 3 cm² @ max. 0,75 s | Torso 500 | Head 300 | Leg 180 | Foot 120 | Toes 50 | Arm 120 | Hand 100 | Finger 25 | Head 120 | Foot 35 | Finger 4 | Verdict | Comments |
| | | | | | | | | | | | | | | | |
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Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement – Test | Result - Remark | Verdict |
| | | | |
| **8.2** | **ENCLOSURE rigidity test** | **Form A.21A** | P |
| 8.2.1 | Static test | 30N | |
| | Material of enclosure .....: | Metal & plastic | — |
| | Preparation for the test: | | — |
| | Operated at ambient temperature .....: | 40 ° C h | — |
| Location | | Comments | Verdict |
| 1) power switch | | No split. No deform. | P |
| 2) control panel | | No split. No deform. | P |
| | | | |
| Supplementary information:<br>Tests done to both SA-260MB & SA-300MB | | | |
| **8.2.2** | **Dynamic test** | | P |
| | Material of enclosure .....: | Metal & plastic | — |
| | Corresponding IK-code .....: | (IK08 ) 5 J | — |
| | Preparation for the test: | | — |
| | Cooled to (temperature) .....: | ° C | — |
| Location | | Comments | Verdict |
| 1) Top | | No split. No deform. | P |
| 2) Side left / right | | No split. No deform. | P |
| 3) Front | | No split. No deform. | P |
| | | | |
| Supplementary information:<br>Tests done to both SA-260MB & SA-300MB | | | |

| EN / IEC 61010-1 | | | | |
|---|---|---|---|---|
| Clause | Requirement – Test | | Result - Remark | Verdict |
| | | | | |
| **8.3** | **Drop test** | | **Form A.21B** | P |
| 8.3.1 | Other equipment | | | |
| Location | Raised up to | | Comments | — |
| | mm | 30 ° | | — |
| 1) front | 25 | -- | No split. No deform. | P |
| 2) back | 25 | -- | No split. No deform. | P |
| 3) left | 25 | -- | No split. No deform. | P |
| 4) right | 25 | -- | No split. No deform. | P |
| Supplementary information:<br>Tests done to both SA-260MB & SA-300MB | | | | |
| 8.3.2 | Hand-held EQUIPMENT and direct plug-in equipment | | | N/A |
| | Material of enclosure .....: | | Metal / non-metallic | — |
| | Preparation for the test: | | | — |
| | Cooled to (temperature) .....: | | ° C | — |
| Location | | | Comments | Verdict |
| 1) Side | | | | |
| 2) Edge | | | | |
| 3) Corner | | | | |
| Supplementary information:<br>Tests done to both SA-260MB & SA-300MB | | | | |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| **9** | **TABLE: Protection against the spread of fire** | | | **Form A.22** | P |
|---|---|---|---|---|---|
| Item | Source of HAZARD or area of the equipment considered (circuit, component, liquid etc.) | Protection Method (9.1 a, b or c) | Protection details | | Verdict |
| | All electrical components | 9.1 c | 1) fire enclosure provided<br>2) Protective device works or no fire hazard during the test | | P |
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Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | | |
|---|---|---|---|
| **9.3.2** | **TABLE: Constructional requirements** | **Form A.23** | N/A |
| 14.7 | Printed circuit boards | | |

| | | |
|---|---|---|
| Material tested ..... : | | — |
| Generic name ..... : | | — |
| Material manufacturer..... : | | — |
| Type ..... : | | — |
| Colour ..... : | | — |
| Conditioning details ..... : | | — |

| | | Sample | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| Thickness of specimen | mm | | | | | | |
| Duration of flaming after first Application | s | | | | | | |
| Duration of flaming plus glowing After second application | s | | | | | | |
| Specimen burns to holding clamp | Yes/No | | | | | | |
| Cotton ignited | Yes/No | | | | | | |
| Sample result | Pass/Fail | | | | | | |

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| 9.4 | **TABLE: Limited-energy circuit** | | | | **Form A.24** | N/A |
|---|---|---|---|---|---|---|
| Item | 9.4 a) | 9.4 b) Current limitation (NOTE) | | 9.4 c) | Decision | |
| or Location (see Form A.22) | Maximum potential in circuit voltage r.m.s./d.c. V | Maximum available current A | Overload protection after 120 s A | Circuit separation | Yes/No | Comments |
| | | | | | | |
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NOTE – Maximum values see Tables 17 and 18.of 61010-1

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| 9.5 | **TABLE: Requirements for equipment containing or using flammable liquids** | | **Form A.25** | N/A |
|---|---|---|---|---|
| Type of liquid | 9.5 Flammable liquids | | | Verdict |
| | b) Quantity | c) Containment | | |
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| Supplementary information: | | | | |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | |
|---|---|---|
| **10.** | **TABLE : Temperature Measurements – Model SA-300MB Form A.26A** | P |
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| | | | |
|---|---|---|---|
| Operating conditions: | Normal operation | | |
| Frequency.....: | 1) 60 Hz 2) 60 Hz | Test room ambient temperature (ta)...: | 1) 27.1 °C 2) 31.4℃ |
| Voltage .....: | 1) 198V 2) 264V | Test duration .....: | 1) 3 hr 37 min<br>2) 5 hr 47 min |

| Part / Location | *1 )* $t_m / t_c$ °C | *2)* $t_m / t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| Circuit breaker body | 60.0 / 72.9 | 67.9 /76.5 | 105 | P | |
| EMI filter body | 47.9 / 60.8 | 51.0 /59.6 | 105 | P | |
| Internal wire near chamber | 74.3 / 87.2 | 76.8 /85.4 | 105 | P | |
| T1 primary coil ( power board) | 72.7 / 85.6 | 78.0 /86.6 | 105 | P | |
| T1 secondary coil (power board ) | 73.5 / 86.4 | 78.5 /87.1 | 105 | P | |
| C5 body (power board) | 61.8 / 74.7 | 66.0 /74.6 | 105 | P | |
| PCB near RL5 (Main board ) | 51.6 / 64.5 | 52.7 /61.3 | 105 | P | |
| PCB near RV7 (Main board ) | 45.5 / 58.4 | 45.8 /54.4 | 105 | P | |
| PCB near RL1 (Main board ) | 48.4 /61.3 | 49.5 /58.1 | 105 | P | |
| J29 side body ( Main board ) | 43.8 / 56.7 | 44.8 /53.4 | 105 | P | |
| R001 side body ( Main board ) | 44.0 / 56.9 | 44.6 /53.2 | 105 | P | |
| U42 body (control board) | 54.0 / 66.9 | 55.3 /63.9 | 105 | P | |
| U10 body (printer board) | 40.1 / 53.0 | 42.0 /50.6 | 105 | P | |
| R1 body | 45.0 / 57.9 | 50.4 /59.0 | 105 | P | |
| SSR1 body | 49.4 / 62.3 | 48.7 /57.3 | 105 | P | |
| SSR2 body | 45.8 / 58.7 | 49.0 /57.6 | 105 | P | |
| Terminal near EMI filter | 41.5 / 54.4 | 42.3 /50.9 | 105 | P | |
| Vacuum pump coil | 79.0 / 91.9 | 106.0/ 115.2 | 155 | P | |
| Vacuum pump starting capacitor | 37.2 / 52.0 | 43.8 /58.6 | 70 | P | Repeat test at 25.2℃with capacitor fixed in new location |
| Connector near chamber | 51.8 / 64.7 | 56.2 /64.8 | 105 | P | |
| Fan enclosure | 54.2 / 67.1 | 57.4 /66.0 | 105 | P | |
| Solenoid valve near chamber | 51.9 / 64.8 | 56.4 /65.0 | 105 | P | |
| TC1 body | 45.5 / 58.4 | 46.3 /54.9 | 105 | P | |
| Pressure control unit | 51.9 / 64.8 | 55.8 /64.4 | 150 | P | |
| Panel surface | 35.4 / 48.3 | 35.7 /44.3 | 85 | P | |
| Control button | 35.5 / 48.4 | 35.8 /44.4 | 70 | P | |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | |
|---|---|---|
| **10.** | **TABLE : Temperature Measurements – Model SA-300MB Form A.26A** | P |
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| | | | |
|---|---|---|---|
| Operating conditions: | Normal operation | | |
| Frequency.....: | 1) 60 Hz 2) 60 Hz | Test room ambient temperature (ta)...: | 1) 27.1 °C 2) 31.4℃ |
| Voltage .....: | 1) 198V 2) 264V | Test duration .....: | 1) 3 hr 37 min<br>2) 5 hr 47 min |

| Part / Location | *1 )* $t_m$ / $t_c$ °C | *2)* $t_m$ / $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| Metal enclosure (top) | 62.3 / 75.2 | 61.9 /70.5 | 80 | -- | Heating is intended purpose |
| Door knob | 47.8 / 60.7 | 46.6 /55.2 | 80 | P | |
| Power switch | 35.6 / 48.5 | 36.3 /44.9 | 70 | P | |
| ambient | 27.1 / 40.0 | 31.4 /40.0 | -- | -- | |

NOTE 1 - $t_m$ = measured temperature
$t_c$ = $t_m$ corrected ($t_m$–$t_a$+ **40 °C** or max. RATED ambient)
$t_{max}$ = maximum permitted temperature
NOTE 2 - see also 14.1 with reference to component operating conditions
NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary
NOTE 4 - see Form A.21B for details of winding temperature measurements

Supplementary information:
Equipment running at 134℃ and at dry mode

| | | |
|---|---|---|
| **10.** | **TABLE : Temperature Measurements – Model SA-260MB Form A.26A With pump 80110110** | P |
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| | | | |
|---|---|---|---|
| Operating conditions: | Normal operation | | |
| Frequency.....: | 1) 60 Hz 2) 60 Hz | Test room ambient temperature (ta)...: | 1) 27.9 °C 2) 31.4℃ |
| Voltage .....: | 1) 198V 2) 264V | Test duration .....: | 1) 7 hr 20 min<br>2) 5 hr 30 min |

| Part / Location | *1 )* $t_m$ / $t_c$ °C | *2)* $t_m$ / $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| Circuit breaker body | 45.8 / 58.7 | 50.1 / 62.2 | 105 | P | |
| EMI filter body | 47.5 / 60.4 | 51.8 / 63.9 | 105 | P | |
| Internal wire near chamber | 71.9 / 84.8 | 76.2 / 88.3 | 105 | P | |
| T1 primary coil ( power board) | 72.7 / 85.6 | 88.1 / 100.2 | 105 | P | |
| T1 secondary coil (power board ) | 68.2 / 81.1 | 81.5 / 92.6 | 105 | P | |
| C5 body (power board) | 64.5 / 77.4 | 77.9 / 90.0 | 105 | P | |
| PCB near RL5 (Main board ) | 55.9 / 66.8 | 60.7 / 72.8 | 105 | P | |
| PCB near RV7 (Main board ) | 50.6 / 63.5 | 56.0 / 68.1 | 105 | P | |
| PCB near RL1 (Main board ) | 47.9 /60.8 | 53.1 / 65.3 | 105 | P | |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | |
|---|---|---|
| **10.** | **TABLE : Temperature Measurements – Model SA-300MB Form A.26A** | P |
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| | | | |
|---|---|---|---|
| Operating conditions: | Normal operation | | |
| Frequency.....: | 1) 60 Hz 2) 60 Hz | Test room ambient temperature (ta)...: | 1) 27.1 °C 2) 31.4℃ |
| Voltage .....: | 1) 198V 2) 264V | Test duration .....: | 1) 3 hr 37 min<br>2) 5 hr 47 min |

| Part / Location | *1 )* $t_m$ / $t_c$ °C | *2)* $t_m$ / $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| J29 side body ( Main board ) | 45.0 / 57.9 | 55.8 / 67.9 | 105 | P | |
| R001 side body ( Main board ) | 46.5 / 59.4 | 52.5 / 64.6 | 105 | P | |
| U42 body (control board) | 58.3 / 71.2 | 61.8 / 73.9 | 105 | P | |
| U10 body (printer board) | 42.5 / 55.4 | 46.3 / 58.4 | 105 | P | |
| R1 body | 68.0 / 80.9 | 88.0 / 100.1 | 105 | P | |
| SSR1 body | 57.0 / 69.9 | 61.0 / 73.1 | 105 | P | |
| SSR2 body | 50.6 / 63.5 | 56.4 / 68.5 | 105 | P | |
| Terminal near EMI filter | 44.8 / 57.7 | 52.8 / 64.9 | 105 | P | |
| Vacuum pump coil | 80.0 / 92.9 | 109.8 / 111.9 | 155 | P | |
| Vacuum pump starting capacitor | 44.1 / 59.0 | 54.2 / 69.1 | 75 | P | Repeat test at 25.1℃with capacitor fixed in new location |
| Connector near chamber | 51.9 / 64.8 | 55.9 / 68.0 | 105 | P | |
| Fan enclosure | 55.4 / 68.3 | 60.4 / 72.5 | 105 | P | |
| Solenoid valve near chamber | 68.0 / 80.9 | 73.1 / 85.2 | 105 | P | |
| TC1 body | 52.0 / 64.9 | 56.8 / 68.9 | 105 | P | |
| Pressure control unit | 70.5 / 83.4 | 74.3 / 86.4 | 150 | P | |
| Panel surface | 35.2 / 48.1 | 36.3 / 48.4 | 85 | P | |
| Control button | 35.7 / 48.6 | 37.5 / 49.6 | 70 | P | |
| Metal enclosure (top) | 51.0 / 63.9 | 53.4 / 65.5 | 80 | -- | Heating is intended purpose |
| Door knob | 40.7 / 53.6 | 41.5 / 53.6 | 80 | P | |
| Power switch | 33.8 / 46.7 | 37.1 / 49.2 | 70 | P | |
| ambient | 27.1 / 40.0 | 27.9 /40.0 | -- | -- | |

NOTE 1 - $t_m$ = measured temperature
$t_c$ = $t_m$ corrected ($t_m$–$t_a$+ **40 °C** or max. RATED ambient)
$t_{max}$ = maximum permitted temperature
NOTE 2 - see also 14.1 with reference to component operating conditions
NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary
NOTE 4 - see Form A.21B for details of winding temperature measurements

Supplementary information:
Equipment running at 134℃ and at dry mode

| | | |
|---|---|---|
| **10.** | **TABLE : Temperature Measurements – Model SA-260MB Form A.26A With pump SJ-100B** | P |
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| | | | |
|---|---|---|---|
| Operating conditions: | Normal operation | | |
| Frequency.....: | 1) -- 2) 60 Hz | Test room ambient temperature (ta)....: | 1)-- °C 2) 28.8℃ |
| Voltage .....: | 1) -- 2) 264V | Test duration .....: | 1) --<br>2) 6 hr 14 min |

| Part / Location | *1 )* $t_m$ / $t_c$ °C | *2)* $t_m$ / $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| Circuit breaker body | | 43.4 / 54.6 | 105 | P | |
| EMI filter body | | 48.0 / 59.2 | 105 | P | |
| Internal wire near chamber | | 74.1 / 85.3 | 105 | P | |
| T1 primary coil ( power board) | | 81.0 / 92.2 | 105 | P | |
| T1 secondary coil (power board ) | | 74.2 / 85.4 | 105 | P | |
| C5 body (power board) | | 70.0 / 81.2 | 105 | P | |
| PCB near RL5 (Main board ) | | 56.3 / 67.5 | 105 | P | |
| PCB near RV7 (Main board ) | | 50.0 / 61.2 | 105 | P | |
| PCB near RL1 (Main board ) | | 50.2/ 61.4 | 105 | P | |
| J29 side body ( Main board ) | | 42.0 / 53.2 | 105 | P | |
| R001 side body ( Main board ) | | 41.6 / 52.8 | 105 | P | |
| U42 body (control board) | | 56.0 / 67.2 | 105 | P | |
| U10 body (printer board) | | 44.8 / 56.0 | 105 | P | |
| R1 body | | 87.9 / 99.1 | 105 | P | |
| SSR1 body | | 57.8 / 69.0 | 105 | P | |
| SSR2 body | | 68.5 / 79.7 | 105 | P | |
| Terminal near EMI filter | | 46.2 / 57.4 | 105 | P | |
| Vacuum pump coil | | 146.0 / 157.2 | 155 | P | |
| Vacuum pump starting capacitor | | 54.1 / 69.1 | 75 | P | Repeat test at 25.0℃with capacitor fixed in new location |
| Connector near chamber | | 54.0 / 65.2 | 105 | P | |
| Fan enclosure | | 60.5 / 71.7 | 105 | P | |
| Solenoid valve near chamber | | 60.3 / 71.5 | 105 | P | |
| TC1 body | | 56.0 / 67.2 | 105 | P | |
| Pressure control unit | | 76.0 / 87.2 | 150 | P | |
| Panel surface | | 36.2 / 47.4 | 85 | P | |
| Control button | | 40.3 / 51.5 | 70 | P | |
| Metal enclosure (top) | | 50.2 / 61.4 | 80 | -- | Heating is intended purpose |

| **10.** | **TABLE : Temperature Measurements – Model SA-260MB Form A.26A With pump SJ-100B** | P |
|---|---|---|
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| Operating conditions: | Normal operation | | |
|---|---|---|---|
| Frequency.....: | 1) -- 2) 60 Hz | Test room ambient temperature (ta)...: | 1)-- °C 2) 28.8℃ |
| Voltage .....: | 1) -- 2) 264V | Test duration .....: | 1) --<br>2) 6 hr 14 min |

| Part / Location | *1 )* $t_m$ / $t_c$ °C | *2)* $t_m$ / $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| Door knob | | 41.9 / 53.1 | 80 | P | |
| Power switch | | 34.0 / 45.2 | 70 | P | |
| ambient | | 28.8 / 40.0 | -- | -- | |

NOTE 1 - $t_m$ = measured temperature
$t_c$ = $t_m$ corrected ($t_m$–$t_a$+ **40 °C** or max. RATED ambient)
$t_{max}$ = maximum permitted temperature
NOTE 2 - see also 14.1 with reference to component operating conditions
NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary
NOTE 4 - see Form A.21B for details of winding temperature measurements

Supplementary information:

Equipment running at 134℃ and at dry mode

| **10.** | **TABLE : Temperature Measurements – Model SA-260MB-G Form A.26A With pump 82110110** | P |
|---|---|---|
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| Operating conditions: | Normal operation | | |
|---|---|---|---|
| Frequency.....: | 1) -- 2) 50 Hz | Test room ambient temperature (ta)...: | 1)-- °C 2) 24.9℃ |
| Voltage .....: | 1) -- 2) 264V | Test duration .....: | 1) --<br>2) 5 hr 0 min |

| Part / Location | *1 )* $t_m$ / $t_c$ °C | *2)* $t_m$ / $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| Circuit breaker body | | 36.1 / 51.2 | 105 | P | |
| EMI filter body | | 28 / 43.1 | 105 | P | |
| Internal wire near chamber | | 33 / 48.1 | 105 | P | |
| T1 primary coil ( power board) | | 53.6/ 68.7 | 105 | P | |
| T1 secondary coil (power board ) | | 54.2 / 69.3 | 105 | P | |
| C5 body (power board) | | 35.3 / 50.4 | 105 | P | |
| PCB near RL5 (Main board ) | | 29.4 / 44.5 | 105 | P | |
| PCB near RV7 (Main board ) | | 28.7 / 43.8 | 105 | P | |
| PCB near RL1 (Main board ) | | 43.8 / 58.9 | 105 | P | |
| J29 side body ( Main board ) | | 29.3 / 44.4 | 105 | P | |
| R001 side body ( Main board ) | | 30.5 / 45.6 | 105 | P | |

| | | |
|---|---|---|
| **10.** | **TABLE : Temperature Measurements – Model SA-260MB-G Form A.26A With pump 82110110** | P |
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| | | | |
|---|---|---|---|
| Operating conditions: | Normal operation | | |
| Frequency.....: | 1) -- 2) 50 Hz | Test room ambient temperature (ta)...: | 1)-- °C 2) 24.9℃ |
| Voltage .....: | 1) -- 2) 264V | Test duration .....: | 1) --<br>2) 5 hr 0 min |

| Part / Location | *1 )* $t_m$ / $t_c$ °C | *2)* $t_m$ / $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| U42 body (control board) | | 39.3 / 54.4 | 105 | P | |
| U10 body (printer board) | | 32.1 / 47.2 | 105 | P | |
| SSR1 body | | 41.4 / 56.5 | 105 | P | |
| SSR2 body | | 42.8 / 57.9 | 105 | P | |
| Terminal near EMI filter | | 29.4 / 44.5 | 105 | P | |
| Vacuum pump coil | | 83.6 / 98.7 | 155 | P | |
| Vacuum pump starting capacitor | | 39.6 / 54.7 | 75 | P | Repeat test at 25.0℃with capacitor fixed in new location |
| Connector near chamber | | 34.4 / 49.5 | 105 | P | |
| Fan enclosure | | 38.9 / 54 | 105 | P | |
| Solenoid valve near chamber | | 37.4 / 52.5 | 105 | P | |
| Solenoid valve near heater | | 68.1 / 83.2 | 105 | P | |
| Pressure control unit | | 45.2 / 60.3 | 150 | P | |
| Panel surface | | 26.5 / 41.6 | 85 | P | |
| Control button | | 26.9 / 42 | 70 | P | |
| Metal enclosure (top) | | 30.9 / 46 | 80 | -- | Heating is intended purpose |
| Door knob | | 34.2 / 49.3 | 80 | P | |
| Power switch | | 23.2 / 38.3 | 70 | P | |
| ambient | | 24.9 / 40.0 | -- | -- | |

NOTE 1 - $t_m$ = measured temperature
$t_c$ = $t_m$ corrected ($t_m$–$t_a$+ **40 °C** or max. RATED ambient)
$t_{max}$ = maximum permitted temperature
NOTE 2 - see also 14.1 with reference to component operating conditions
NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary
NOTE 4 - see Form A.21B for details of winding temperature measurements

Supplementary information:

Equipment running at 134℃ and at dry mode

| **10.** | **TABLE : Temperature Measurements – Form A.26A** | P |
|---|---|---|
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| Operating conditions: | Abnormal operation . See below . | | |
|---|---|---|---|
| Frequency.....: | 60 Hz | Test room ambient temperature (ta)...: | See below |
| Voltage .....: | 240 V | Test duration .....: | See below |

| Part / Location | $t_m$ °C | $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| Vacuum pump locked (SA-300MB) 1 hr 55 min | | | | | |
| T1 primary coil ( power board) | 65.2 | 75.4 | 140 | P | |
| T1 secondary coil (power board ) | 41.0 | 51.2 | 140 | P | |
| Vacuum pump coil | 113.5 | 123.7 | 190 | P | |
| Fan enclosure | 38.0 | 48.2 | 105 | P | |
| Panel surface | 32.0 | 42.2 | 105 | P | |
| Control button | 32.0 | 42.2 | 70 | P | |
| Metal enclosure (top) | 29.8 | 40.0 | 105 | -- | Heating is intended purpose |
| Door knob | 32.2 | 42.4 | 80 | P | |
| Power switch | 31.7 | 41.9 | 70 | P | |
| ambient | 29.8 | 40.0 | -- | -- | |
| Vacuum pump starting capacitor short-circuited (SA-300MB) 1 hr 37 min | | | | | |
| T1 primary coil ( power board) | 67.5 | 77.5 | 140 | P | |
| T1 secondary coil (power board ) | 69.0 | 79.0 | 140 | P | |
| Vacuum pump coil | 132.5 | 142.5 | 190 | P | |
| Fan enclosure | 41.8 | 51.8 | 105 | P | |
| Panel surface | 32.0 | 42.0 | 105 | P | |
| Control button | 32.0 | 42.0 | 70 | P | |
| Metal enclosure (top) | 31.1 | 41.1 | 105 | -- | Heating is intended purpose |
| Door knob | 31.9 | 41.9 | 80 | P | |
| Power switch | 31.2 | 41.2 | 70 | P | |
| ambient | 30.0 | 40.0 | -- | -- | |
| Openings blocked (SA-300MB) 5 hr 59 min | | | | | |
| T1 primary coil ( power board) | 113.0 | 121.5 | 140 | P | |
| T1 secondary coil (power board ) | 117.9 | 126.4 | 140 | P | |
| Panel surface | 45.4 | 53.9 | 105 | P | |
| Control button | 42.8 | 51.3 | 70 | P | |
| Metal enclosure (top) | 70.0 | 78.5 | 105 | -- | Heating is intended purpose |
| Door knob | 48.5 | 57.0 | 80 | P | |

| | | |
|---|---|---|
| **10.** | **TABLE : Temperature Measurements – Form A.26A** | P |
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| | | | |
|---|---|---|---|
| Operating conditions: | Abnormal operation . See below . | | |
| Frequency.....: | 60 Hz | Test room ambient temperature (ta)...: | See below |
| Voltage .....: | 240 V | Test duration .....: | See below |

| Part / Location | $t_m$ °C | $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| Power switch | 49.1 | 57.6 | 70 | P | |
| ambient | 31.5 | 40.0 | -- | -- | |
| Door lock motor short-circuited (SA-300MB) 7 hr 14 min | | | | | |
| T1 primary coil ( power board) | 79.5 | 87.1 | 140 | P | |
| T1 secondary coil (power board ) | 81.9 | 89.5 | 140 | P | |
| Panel surface | 35.2 | 42.8 | 105 | P | |
| Control button | 33.3 | 40.9 | 70 | P | |
| Metal enclosure (top) | 61.8 | 69.4 | 105 | -- | Heating is intended purpose |
| Door knob | 45.6 | 53.2 | 80 | P | |
| Power switch | 36.0 | 43.6 | 70 | P | |
| ambient | 32.4 | 40.0 | -- | -- | |
| Door lock motor opened (SA-300MB) 2 hr 55 min | | | | | |
| T1 primary coil ( power board) | 78.4 | 87.6 | 140 | P | |
| T1 secondary coil (power board ) | 80.8 | 90.0 | 140 | P | |
| Panel surface | 35.2 | 44.4 | 105 | P | |
| Control button | 35.6 | 44.8 | 70 | P | |
| Metal enclosure (top) | 63.7 | 72.9 | 105 | -- | Heating is intended purpose |
| Door knob | 47.0 | 56.2 | 80 | P | |
| Power switch | 36.6 | 45.8 | 70 | P | |
| ambient | 30.8 | 40.0 | -- | -- | |
| Partial failure of the mains supply ( 90% voltage) (SA-300MB) 5 hr 35 min | | | | | |
| T1 primary coil ( power board) | 78.1 | 88.5 | 140 | P | |
| T1 secondary coil (power board ) | 80.2 | 90.6 | 140 | P | |
| Panel surface | 36.4 | 46.8 | 105 | P | |
| Control button | 33.5 | 43.9 | 70 | P | |
| Metal enclosure (top) | 64.0 | 74.4 | 80 | -- | Heating is intended purpose |
| Door knob | 47.1 | 57.5 | 80 | P | |
| Power switch | 37.5 | 47.9 | 70 | P | |
| ambient | 29.6 | 40.0 | -- | -- | |
| Vacuum pump locked (SA-260MB with Pump Model 80110110 ) 2 hr 35 min | | | | | |

| | | |
|---|---|---|
| **10.** | **TABLE : Temperature Measurements – Form A.26A** | P |
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| | | | |
|---|---|---|---|
| Operating conditions: | Abnormal operation . See below . | | |
| Frequency.....: | 60 Hz | Test room ambient temperature (ta)...: | See below |
| Voltage .....: | 240 V | Test duration .....: | See below |

| Part / Location | $t_m$ °C | $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| T1 primary coil ( power board) | 58.4 | 72.1 | 140 | P | |
| T1 secondary coil (power board ) | 55.9 | 69.6 | 140 | P | |
| Vacuum pump coil | 101.0 | 114.7 | 190 | P | |
| Fan enclosure | 56.2 | 69.9 | 105 | P | |
| Panel surface | 30.8 | 44.5 | 105 | P | |
| Control button | 31.5 | 45.2 | 70 | P | |
| Metal enclosure (top) | 36.5 | 50.2 | 80 | -- | Heating is intended purpose |
| Door knob | 29.1 | 42.8 | 80 | P | |
| Power switch | 29.6 | 43.3 | 70 | P | |
| ambient | 26.3 | 40.0 | -- | -- | |
| Vacuum pump locked (SA-260MB with Pump Model SJ-100B ) 1 hr 55 min | | | | | |
| T1 primary coil ( power board) | 59.6 | 71.3 | 140 | P | |
| T1 secondary coil (power board ) | 56.4 | 68.1 | 140 | P | |
| Vacuum pump coil | 147.0 | 158.7 | 190 | P | |
| Fan enclosure | 32.5 | 44.2 | 105 | P | |
| Panel surface | 31.4 | 43.1 | 105 | P | |
| Control button | 32.3 | 44.0 | 70 | P | |
| Metal enclosure (top) | 33.9 | 45.6 | 80 | -- | Heating is intended purpose |
| Door knob | 30.5 | 42.2 | 80 | P | |
| ambient | 28.3 | 40.0 | -- | -- | |
| Vacuum pump starting capacitor short-circuited (SA-260MB with Pump Model 80110110 ) 3 hr 13 min | | | | | |
| T1 primary coil ( power board) | 59.4 | 71.9 | 140 | P | |
| T1 secondary coil (power board ) | 56.0 | 68.5 | 140 | P | |
| Vacuum pump coil | 129.0 | 141.5 | 190 | P | |
| Fan enclosure | 62.5 | 75.0 | 105 | P | |
| Panel surface | 31.7 | 44.2 | 105 | P | |
| Control button | 32.4 | 44.9 | 70 | P | |
| Metal enclosure (top) | 36.6 | 49.1 | 80 | -- | Heating is intended purpose |
| Door opener | 29.6 | 42.1 | 80 | P | |
| Power switch | 30.8 | 43.3 | 70 | P | |

| | | |
|---|---|---|
| **10.** | **TABLE : Temperature Measurements – Form A.26A** | P |
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| | | | |
|---|---|---|---|
| Operating conditions: | Abnormal operation . See below . | | |
| Frequency.....: | 60 Hz | Test room ambient temperature (ta)...: | See below |
| Voltage .....: | 240 V | Test duration .....: | See below |

| Part / Location | $t_m$ °C | $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| ambient | 27.5 | 40.0 | -- | -- | |
| Vacuum pump starting capacitor short-circuited (SA-260MB with Pump Model SJ-100B ) 1 hr 37 min | | | | | |
| T1 primary coil ( power board) | 60.0 | 71.9 | 140 | P | |
| T1 secondary coil (power board ) | 57.7 | 69.6 | 140 | P | |
| Vacuum pump coil | 160.0 | 171.9 | 190 | P | |
| Fan enclosure | 31.6 | 43.5 | 105 | P | |
| Panel surface | 31.8 | 43.7 | 105 | P | |
| Control button | 32.7 | 44.6 | 70 | P | |
| Metal enclosure (top) | 36.2 | 48.1 | 80 | -- | Heating is intended purpose |
| Door knob | 30.6 | 42.5 | 80 | P | |
| Power switch | 31.1 | 43.0 | 70 | P | |
| ambient | 28.1 | 40.0 | -- | -- | |
| Openings blocked (SA-260MB) 5 hr 58 min | | | | | |
| T1 primary coil ( power board) | 91.0 | 104.0 | 140 | P | |
| T1 secondary coil (power board ) | 88.2 | 101.2 | 140 | P | |
| Panel surface | 42.2 | 55.2 | 105 | P | |
| Control button | 40.1 | 53.1 | 70 | P | |
| Metal enclosure (top) | 57.9 | 70.9 | 80 | -- | Heating is intended purpose |
| Door knob | 40.3 | 53.3 | 80 | P | |
| Power switch | 51.5 | 64.5 | 70 | P | |
| ambient | 27.0 | 40.0 | -- | -- | |
| Door lock motor short-circuited ( SA-260MB) 5 hr 17 min | | | | | |
| T1 primary coil ( power board) | 74.1 | 88.2 | 140 | P | |
| T1 secondary coil (power board ) | 67.7 | 81.8 | 140 | P | |
| Panel surface | 34.8 | 48.9 | 105 | P | |
| Control button | 35.2 | 49.3 | 70 | P | |
| Metal enclosure (top) | 51.0 | 65.1 | 80 | -- | Heating is intended purpose |
| Door knob | 40.4 | 54.5 | 80 | P | |
| Power switch | 32.7 | 46.8 | 70 | P | |
| ambient | 25.9 | 40.0 | -- | -- | |

| | | |
|---|---|---|
| **10.** | **TABLE : Temperature Measurements – Form A.26A** | P |
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| | | | |
|---|---|---|---|
| Operating conditions: | Abnormal operation . See below . | | |
| Frequency.....: | 60 Hz | Test room ambient temperature (ta)...: | See below |
| Voltage .....: | 240 V | Test duration .....: | See below |

| Part / Location | $t_m$ °C | $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| Door lock motor opened ( SA-260MB) 2 hr 55 min | | | | | |
| T1 primary coil ( power board) | 75.0 | 89.4 | 140 | P | |
| T1 secondary coil (power board ) | 67.7 | 82.1 | 140 | P | |
| Panel surface | 34.8 | 49.2 | 105 | P | |
| Control button | 35.1 | 49.5 | 70 | P | |
| Metal enclosure (top) | 50.5 | 64.9 | 80 | -- | Heating is intended purpose |
| Door knob | 40.2 | 54.6 | 80 | P | |
| Power switch | 31.7 | 46.1 | 70 | P | |
| ambient | 25.6 | 40.0 | -- | -- | |
| Partial failure of the mains supply ( 90% voltage) (SA-260MB) 5 hr 35 min | | | | | |
| T1 primary coil ( power board) | 77.5 | 89.8 | 140 | P | |
| T1 secondary coil (power board ) | 71.0 | 83.3 | 140 | P | |
| Panel surface | 36.2 | 48.5 | 105 | P | |
| Control button | 33.8 | 46.1 | 70 | P | |
| Metal enclosure (top) | 51.8 | 64.1 | 80 | -- | Heating is intended purpose |
| Door knob | 40.4 | 52.7 | 80 | P | |
| Power switch | 33.5 | 45.8 | 70 | P | |
| ambient | 27.7 | 40.0 | -- | -- | |
| Vacuum pump locked (SA-260MB-G with Pump Model 82110110 ) 1 hr 30 min | | | | | |
| T1 primary coil ( power board) | 55.0 | 72 | 140 | P | |
| T1 secondary coil (power board ) | 53.4 | 70.4 | 140 | P | |
| Vacuum pump coil | 84 | 101 | 190 | P | |
| Fan enclosure | 23.2 | 40.2 | 105 | P | |
| Panel surface | 26.7 | 43.7 | 105 | P | |
| Control button | 27.3 | 44.3 | 70 | P | |
| Metal enclosure (top) | 28.2 | 45.2 | 80 | -- | Heating is intended purpose |
| Door knob | 25.9 | 42.9 | 80 | P | |
| ambient | 23.0 | 40.0 | -- | -- | |
| Vacuum pump starting capacitor short-circuited (SA-260MB-G with Pump Model 82110110 ) 1 hr 30 min | | | | | |
| T1 primary coil ( power board) | 58 | 74.7 | 140 | P | |

| | | |
|---|---|---|
| **10.** | **TABLE : Temperature Measurements – Form A.26A** | P |
| 10.1 | Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.2 | Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION | |
| 10.3 | Other temperature measurements | |

| | | | |
|---|---|---|---|
| Operating conditions: | Abnormal operation . See below . | | |
| Frequency.....: | 60 Hz | Test room ambient temperature (ta)...: | See below |
| Voltage .....: | 240 V | Test duration .....: | See below |

| Part / Location | $t_m$ °C | $t_c$ °C | $t_{max}$ °C | Verdict | Comments |
|---|---|---|---|---|---|
| T1 secondary coil (power board ) | 56.1 | 72.8 | 140 | P | |
| Vacuum pump coil | 134.2 | 150.9 | 190 | P | |
| Fan enclosure | 25.6 | 42.3 | 105 | P | |
| Panel surface | 28 | 44.7 | 105 | P | |
| Control button | 29.1 | 45.8 | 70 | P | |
| Metal enclosure (top) | 34.1 | 50.8 | 80 | -- | Heating is intended purpose |
| Door knob | 27.6 | 44.3 | 80 | P | |
| Power switch | 26.1 | 42.8 | 70 | P | |
| ambient | 28.1 | 40.0 | -- | -- | |

NOTE 1 - $t_m$ = measured temperature
$t_c$ = $t_m$ corrected ($t_m$–$t_a$+ **40 °C** or max. RATED ambient)
$t_{max}$ = maximum permitted temperature
NOTE 2 - see also 14.1 with reference to component operating conditions
NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary
NOTE 4 - see Form A.21B for details of winding temperature measurements

Supplementary information:

Equipment running at 134℃ and at dry mode

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | |
|---|---|---|
| **10.2** | **TABLE: Temperature of windings** **Form A.26B**<br>**Resistance method Temperature Measurements** | N/A |
| 4.4.2.7 | MAINS transformers | |
| 14.2.1 | Motor temperatures | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Operating conditions..: | | | | | | | | |
| Frequency.....: | Hz | Test room ambient temperature (ta1/ta2).: | | | | | / | °C (initial / final) |
| Voltage.....: | V | Test duration.....: | | | | | h | min |
| Part / Designation | Rcold Ω | Rwarm Ω | Current A | tr K | tc °C | tmax °C | Verdict | Comments |
| | | | | | | | | |
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NOTE 1- $R_{cold}$ = initial resistance
$R_{warm}$ = final resistance
$t_r$ = temperature rise
$t_c$ = $t_r$ corrected ($t_c$= $t_r$ - { $t_{a2}$ - $t_{a1}$} + [40 °C or max RATED ambient])
$t_{max}$ = maximum permitted temperature
NOTE 2 - Indicate insulation class (IEC 60085) under comments (optional)
NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | | | | |
|---|---|---|---|---|---|
| **10.5.2** | **TABLE: Resistance to heat of non-metallic ENCLOSURES** | | | **Form A.27** | P |
| | Test method used: | | | | — |
| | Non operative treatment.....: | [ X ] | | | |
| | Empty ENCLOSURE .....: | [ ] | | | |
| | Operative treatment.....: | [ ] | | | |
| | Temperature during tests .....: | 70 ℃ | | | — |

| Description | Material | Comments | Verdict |
|---|---|---|---|
| SA-260MB whole unit, temperature during test 70 ℃ | Chi Mei Corporation, PA-765 | Intact. No deform | P |
| | | | |
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|---|---|---|---|---|---|
| | Dielectric strength test (6.8) ..... | | V | r.m.s./peak/d.c. | |

NOTE – Within 10 minutes of the end of treatment sutiable tests in acc. to 8.2 and 8.3 must be conducted and pass criteria of 8.1.

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | | |
|---|---|---|---|
| **10.5.3** | **TABLE: Insulating Materials** | **Form A.28** | P |
| 10.5.3 1) | Ballpressure test | | |
| | Max. allowed impression diameter.....: | 2 mm | — |

| Part | Test temperature °C | Impression Diameter (mm) | Verdict |
|---|---|---|---|
| Terminal Board (after the EMI filter) | 125 | 1.9 | P |
| Terminal Board (Primary, Relay board) | 125 | 1.4 | P |
| | | | |
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Supplementary information:

See Table 1 for material description

| | | |
|---|---|---|
| 10.5.3 2) | Vicat softening test (ISO 306) | Form A.29 N/A |

| Part | Vicat softening temperature °C | Thickness of sample (mm) | Verdict |
|---|---|---|---|
| | | | |
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Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | |
|---|---|---|
| **8** | **TABLE: Mechanical resistance to shock and impact** **Form A.30** | P |
| **11** | **Protection against HAZARDS from fluids** | |

Voltage tests can be carried out once after performing the tests of clause **8** and clause **11**. However, if voltage tests are carried out separately after each set of tests, two forms can be used.

| | Clause 8 tests | | | | Clause 11 tests | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location (see form A.14) | Static (8.2.1) 30 N | Impact (8.2.2) | Normal (8.3.1) | Handheld Plug-in | Cleaning (11.2) | Spillage (11.3) | Overflow (11.4) | IEC 60529 (11.6) | Working voltage V | Test voltage V | Verdict | Comments |
| Enclosure ( metal, earthed ) | 30N | 5J | N/A | N/A | P | P | P | N/A | 240V | 1500Vac | passed | |
| Enclosure ( plastic, unearthed ) | 30N | 5J | N/A | N/A | P | P | P | N/A | 240V | 3000Vac | passed | |
| | | | | | | | | | | | | |
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NOTE – Use r.m.s., d.c. or peak to indicate the used test voltage.

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| 11.7.2 | **TABLE: Leakage and rupture at high pressure** | **Form A.31** | P |
|---|---|---|---|

| Part | Maximum permissible working pressure Mpa | Test pressure MPa | Leakage Yes / No | Deformation Yes / No | Burst Yes / No | Comments |
|---|---|---|---|---|---|---|
| Container 24L SA-260MB SA-260MB-G | 2.2 kg / cm $^2$ | 4.4 kg /cm $^2$ | NO | NO | NO | Passed No leakage or rupture |
| Container 40L SA-300MB | 2.2 kg / cm $^2$ | 4.4 kg /cm $^2$ | NO | NO | NO | Passed No leakage or rupture |
| Container 50L SA-382VMB | 2.2 kg / cm $^2$ | 4.4 kg /cm $^2$ | NO | NO | NO | Passed No leakage or rupture |
| | | | | | | |
| | | | | | | |
| | | | | | | |

NOTE – see also Annex G with requirements for USA and Canada.

Supplementary information:

Over pressure protection 2.2 kgf / cm $^2$

| 11.7.3 | **Leakage from low-pressure parts** | **Form A.32** | N/A |
|---|---|---|---|

| Part | Test pressure Mpa | Leakage Yes / No | Comments |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | | |
|---|---|---|---|
| **12.2.1** | **TABLE: Ionizing radiation** | **Form A 33** | N/A |
| 12.2.1.2 | Equipment intended to emit radiation | | |

| Locations tested | Measured values µSv/h | Verdict | Comments |
|---|---|---|---|
| | | | |
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Supplementary information:

| | | | |
|---|---|---|---|
| 12.2.1.3 | Equipment not intended to emit radiation | **Form A 34** | N/A |
| | Max. allowed effective dose rate at 100 mm……: | 1 µSv/h | — |

| Locations tested | Measured values µSv/h | Verdict | Comments |
|---|---|---|---|
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Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| **12.5.1** | **TABLE: Sound level** | **Form A.35** | N/A |
|---|---|---|---|

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

Supplementary information:

| **12.5.2** | **Ultrasonic pressure** | **Form A.36** | **N/A** |
|---|---|---|---|

| Locations tested | Measured values | | Comments |
|---|---|---|---|
| | dB | kHz | |
| At operator's normal position | | | |
| At 1 m from the ENCLOSURE | | | |
| a) | | | |
| b) | | | |
| c) | | | |
| d) | | | |
| e) | | | |

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

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | | |
|---|---|---|---|
| **13.2.2** | **TABLE: Batteries** | **Form A.37** | N/A |
| | Battery load and charging circuit diagram: | | |
| | | | |
| | Battery type .....: | | — |
| | Battery manufacturer/model/catalogue No. .....: | | — |
| | Battery ratings .....: | | — |
| | Reverse polarity instalment test | | |

| Single component failures | Verdict | |
|---|---|---|
| Component | Open circuit | Short circuit |
| | | |
| | | |
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Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| **14.3** | **TABLE: Overtemperature protection devices** | **Form A.38** | N/A |
|---|---|---|---|

Reliability test

| Component | Type (NOTE) | Verdict | Comments |
|---|---|---|---|
| | | | |
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NOTE:
NSR = non-self-resetting (10 times)
NR = non-resetting (1 time)
SR = self-resetting (200 times)

Supplementary information:

All over-temperature protection devices are IEC certified separately.

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | |
|---|---|---|
| **4.4.2.7** | **TABLE: MAINS transformer** **Form A.39** | N/A |
| 4.4.2.7.2 | Short circuit | N/A |
| 14.6 | MAINS transformers tested outside equipment | N/A |
| Type .....: | | — |
| Manufacturer.....: | | — |
| Test in equipment | | N/A |
| Test on bench | | N/A |
| Test repeated inside equipment (see 14.6) | | N/A |
| Optional – Insulation class (IEC 60085) of the lowest rated winding .....: | | — |

| | | | | |
|---|---|---|---|---|
| Winding identification | | | | |
| Type of Protector for winding (NOTE 1) | | | | |
| Elapsed time | | | | |
| Current, A primary | | | | |
| secondary | | | | |
| Winding temperature, °C primary | | | | |
| (see NOTE 2) secondary | | | | |
| Tissue paper / cheesecloth OK ? (Pass / Fail) | | | | |
| Voltage tests (see NOTE 3) | | | | |
| Primary to secondary _____ V ____ | | | | |
| Primary to core _____ V ____ | | | | |
| Secondary to secondary _____ V ____ | | | | |
| Secondary to core _____ V ____ | | | | |
| Verdict | | | | |

NOTE 1: Primary fuse - PF / ( ) A
Secondary fuse - SF / ( ) A
Overtemperature protection - OP / ( ) °C
Impedance protection - Z

NOTE 2: Indicate method of measurement TC = with thermocouple
R = resistance method
If resistance method is used, record resistance in cold and warm condition in FormA.27B!

NOTE 3: Record the voltage applied and the type of voltage (r.m.s. / d.c. / peak) and for results use NB = no breakdown or B = breakdown

Supplementary information:

Mains transformer evaluation is among part of the power board certification

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| **4.4.2.7** | **TABLE: MAINS transformer** | | | | **Form A.40** | N/A |
| 4.4.2.7.3 | Overload tests (for MAINS transformers) | | | | | N/A |
| 14.6 | MAINS transformers tested outside equipment | | | | | N/A |
| Type ..... : | | | | | | — |
| Manufacturer..... : | | | | | | — |
| Test in equipment | | | | | | N/A |
| Test on bench | | | | | | N/A |
| Test repeated inside equipment (see 14.6) | | | | | | N/A |
| Optional – Insulation class (IEC 60085) of the lowest rated winding ..... : | | | | | | — |
| Winding identification | | | | | | |
| Type of Protector for winding (NOTE 1) | | | | | | |
| Elapsed time | | | | | | |
| Current, A primary | | | | | | |
| secondary | | | | | | |
| Winding temperature, °C primary | | | | | | |
| (see NOTE 2) secondary | | | | | | |
| Tissue paper / cheesecloth OK ? (Pass / Fail) | | | | | | |
| Voltage tests (see NOTE 3) | | | | | | |
| Primary to secondary | _____ V ____ | | | | | |
| Primary to core | _____ V ____ | | | | | |
| Secondary to secondary | _____ V ____ | | | | | |
| Secondary to core | _____ V ____ | | | | | |
| Verdict | | | | | | |

NOTE 1: Primary fuse - PF / ( ) A
Secondary fuse - SF / ( ) A
Overtemperature protection - OP / ( ) °C
Impedance protection - Z

NOTE 2: Indicate method of measurement TC = with thermocouple
R = resistance method
If resistance method is used, record resistance in cold and warm condition in FormA.27B!

NOTE 3: Record the voltage applied and the type of voltage (r.m.s. / d.c. / peak) and for results use NB = no breakdown or B = breakdown

Supplementary information:

Mains transformer evaluation is among part of the power board certification

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| 14.8 | **TABLE: Transient overvoltage limiting devices** | **Form A.41** | N/A |
|---|---|---|---|

| Component / Designation | Overvoltage Category | MAINS voltage V rms | Test voltage V | $t_m$ °C | $t_c$ °C | $t_{max}$ °C | Rupture Yes / No | Circuit breaker tripped | Verdict | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
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Test room ambient temperature ….: °C

NOTE - $t_m$ = measured temperature

$t_c$ = $t_m$ corrected ($t_m$–$t_a$+ **40 °C** or max. RATED ambient)

$t_{max}$ = maximum permitted temperature

Conformity is checked by applying 5 positive and 5 negative impulses with the applicable impulse withstand voltage, spaced up to 1 min apart, from a hybrid impulse generator (see IEC 61180-1).

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement – Test | Result — Remark | Verdict |

| **Annex H** | **TABLE: Qualification of conformal coating for protection against pollution** | **Form A.42** | N/A |
|---|---|---|---|

| Technical properties | | |
|---|---|---|
| Manufacturer | | — |
| Type | | — |
| Meet requirements of ANSI / UL 746E | [yes / no] | |
| Manufacturer declaration of coating material | [yes / no] | |
| Operating temperature of coating | [ ] °C | |
| Comparative tracking index (CTI) | [ ] | |
| Insulation resistance | [ ] Ω | |
| Dielectric strength | [ ] V | |
| UV resistance (if required) | [yes / no] | |
| Flammability rating | | |
| Preparation of the test specimens conducted | [yes / no] | |

| Item | Test conditioning | Parameter | Td | Samples | | | | | | Verdict | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | h | 1 | 2 | 3 | 4 | 5 | 6 | | |
| 1 | Scratch resistance | | | | | | | | | | |
| | Visual inspection | | | | | | | | | | |
| 2 | Cold | | 24 | | | | | | | | |
| 3 | Dry heat | | 48 | | | | | | | | |
| 4 | Rapid temp. change | | | | | | | | | | |
| 5 | Damp heat | | 24 | | | | | | | | |
| 6 | Adhesion of coating | 5 N | | | | | | | | | |
| | Visual inspection | | | | | | | | | | |
| 7 | Humidity | | 48 | | | | | | | | |
| 8 | Insulation resistance | >= 100 Ω | | | | | | | | | |
| | Visual inspection | | | | | | | | | | |
| | | | | | | | | | | | |

NOTE Td = Test duration time

Supplementary information:

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement – Test | Result — Remark | Verdict |

| | **TABLE: Additional or special tests conducted** | **Form A.43** | N/A |
|---|---|---|---|
| Clause and name of test | Test type and condition | Observed results | — |
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| Supplementary information: | | | |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | **TABLE: 1 – List of components and circuits relied on for safety** | | | | | | P |
|---|---|---|---|---|---|---|---|
| Unique component reference or location | Application/function | Manufacturer / trademark (NOTE 1) | Type / model | Technical data (NOTE 2) | Standard | Mark(s) of conformity evidence of acceptance (NOTE 3 and 4) | |
| Enclosure & Door | | Various | Various | painted steel, thickness 1.0 mm min. | | -- | |
| Chamber | | Various | Various | SUS304, thickness 1.5 mm min. | | -- | |
| Control Panel ( SA-260MB) | | Chi Mei Corporation | PA-765 | 94V-0, 80 ℃, thickness 1.5 mm min | UL 94 | UL | |
| Power Cord Anchorage | | Kai Suh Suh Enterprise Co., Ltd. | SR-7R1 | -- | | UL | |
| Power Cord Set | -- | -- | -- | -- | | -- | |
| - plug(220V model) | | various | Euro plug | 16A, 250V | | VDE, OVE, D, N, S, FI | |
| Alternate(110V model) | | various | NEMA plug | 15A, 250V | | UL | |
| - cord ( 220V model) | | various | H05VV-F | 3G/ 1.5 $mm^2$ 105℃ | | VDE, OVE, D, N, S, FI | |
| Alternate(110V model) | | various | SJT | 3G/ 2.0 $mm^2$ 105℃ | | UL,CSA | |
| Internal wiring | | various | UL Style 2651 | 22 AWG min. 105 ℃ min. VW-1 | | UL | |
| tubing | | various | various | 600V, 125 ℃ | | UL/CUL | |
| Circuit Breaker | | Kuoyuh | 98 series | 15A(SA-260MB) or 20A(SA-300MB,SA-302MB), 250V | IEC60947-2 | TUV, UL,VDE | |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | **TABLE: 1 – List of components and circuits relied on for safety** | | P |
|---|---|---|---|

| Unique component reference or location | Application/function | Manufacturer / trademark (NOTE 1) | Type / model | Technical data (NOTE 2) | Standard | Mark(s) of conformity evidence of acceptance (NOTE 3 and 4) |
|---|---|---|---|---|---|---|
| - alternate | | TOPSTONE | L1 series | 15A(SA-260MB) or 20A(SA-300MB,SA-302MB), 250V | | UL |
| Power Switch | to control the actuating of R1 relay only | GLOSO TECH INC | TR26-22J-23DIL / TR26-21C-25DIL series | 16A / 250VAC | | UL, CSA ,VDE |
| - alternate | | MOLVENO OEM S.L.R | A8-series | 1 A, 250V | | CE96 , VDE |
| - alternate | | DECA SWITCHAB | P16LAR1-1ab | 5A/250VAC | | UL,VDE |
| Relay | | Song Chuan | 735 series | 20A/277VAC | | UL, CAS, FIMKO |
| - alternate | | Omron | MKS2P | 10A,250VAC | | UL , TUV |
| - alternate | | TTI | TR90-12VDC –SB-A4 | 40A, 250V | | UL,CSA |
| - alternate | | Song Chuan | 832-1A-C | 30A, 250V | | UL, CSA, VDE |
| - alternate | | Song Chuan | 834-1A-B-C | 10A, 277V ac, 30V dc | | TUV, UL |
| - alternate | | Song Chuan | 841-S-1A-B-D | 30A, 250V AC | | TUV,UL |
| EMI Filter | | Powertek Group | CP5-3044B | 30A/125/250V | | |
| -X capacitor | | | Various | 0.22uF and 0.47uF | | VDE |
| -Y capacitor | | | Various | 680PF* 2 | | VDE |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | **TABLE: 1 – List of components and circuits relied on for safety** | | P |
|---|---|---|---|

| Unique component reference or location | Application/function | Manufacturer / trademark (NOTE 1) | Type / model | Technical data (NOTE 2) | Standard | Mark(s) of conformity evidence of acceptance (NOTE 3 and 4) |
|---|---|---|---|---|---|---|
| alternate | | Powertek Group Co.,Ltd. | CP2-1522D | 15A 125/250V | | |
| Varistor (ZNR1,ZNR2) | | Marcon | TNR14V471K<br>TNR15G471K<br>TNR12V471K | 300V ac | | VDE,UL,CSA |
| Thermostat (TC1 ) | | 1.E.G.O Elektro-Geratebau GMBH | 55.10262.06<br>55.13262.01<br>55.13282.040 | AC 240V min<br>16A, 250V. | | VDE, OVE, S, N, D, CSA, UL |
| | | C A E M SRL | TU-XXX-YYYZ | 16A, 250V, 230° C | | UL/CUL |
| | | Ston Electronics Co., Ltd. | STC-400R, | AC 250V | | CE |
| | | Rainbow | TS-320s | AC 240V min<br>16A, 250V. | | VDE, OVE, S, N, D, UL , CSA |
| | | Wako electronics | CH-15 | 10A/250V | | VDE |
| | | | CS-7SA | 6A / 250VAC | | VDE, UL,CSA |
| | | YOKOGAWA Electric | UT-150 | 1A/240V AC | | UL,CSA |
| | | RKC instrument | CB100 | 1A/240V AC | | UL |
| Solenoid Value | | Chyannq Shyr Industry Co.,Ltd. | WP-A2-D | 24/110/220/230/240 V<br>50/60 Hz | | NEMKO |
| - alternate | | Fluid Power Co., Ltd. | SA-8B | DC 24V | | FI |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | **TABLE: 1 – List of components and circuits relied on for safety** | | P |
|---|---|---|---|

| Unique component reference or location | Application/function | Manufacturer / trademark (NOTE 1) | Type / model | Technical data (NOTE 2) | Standard | Mark(s) of conformity evidence of acceptance (NOTE 3 and 4) |
|---|---|---|---|---|---|---|
| - alternate | | Fluid Power Co., Ltd. | MD-8B | DC 24V | | |
| PCB | | Various | Various | V-1, 105℃ min. | | UL |
| Relay ( PCB ) RL1-RL6 | | Song Chuan | 834-1A-B-C | 10A, 277V ac, 30V dc | | TUV, UL |
| POWER SUPPLIES | | Hitron Electronics | HMI63-S240250(B) Class II | input 100-240V 50/60 Hz 1.2-0.6A output 2.5A /24.0V, 60W max | IEC 60601-1 | CE, UL |
| Micro switch | | Panasonic electric works co. LTD | AM51612C53N | 16A, 250V ac | | VDE, UL |
| - alternate | | OMRON CORP | V-152-1A5-T | 15A, 250VAC | | UL,CUL |
| Pressure transducer | | HAWK GAUGE CO., LTD | PT15RABA0FKC51V, | -1/+6kg/C㎡ | | CE |
| Pressure switch | | Hsinglu machinery Co.,Ltd. | TCL4010 | ON 2.1 kgf/cm$^2$ OFF 2.2± 0.15 kg f/cm$^2$ | EN60730 | TUV |
| DC Fan | | Dynaeon | DF2408BA<br>DF2412SM | 24V DC, 0.17A,<br>24VDC, 0.32A | | TUV ,UL |
| - alternate | | Delta electronics | AFB1224SH | 24V dc, 0.24A | | UL |
| - alternate | | GULF ELECTRICS | GD241225EB | 24V dc, 0.36A | | TUV, UL/CUL |

| EN / IEC 61010-1 | | | |
|---|---|---|---|
| Clause | Requirement — Test | Result — Remark | Verdict |

| | **TABLE: 1 – List of components and circuits relied on for safety** | | | | | | P |
|---|---|---|---|---|---|---|---|
| Unique component reference or location | Application/function | Manufacturer / trademark (NOTE 1) | Type / model | Technical data (NOTE 2) | Standard | Mark(s) of conformity evidence of acceptance (NOTE 3 and 4) | |
| Vacuum Pump | | Thomas Imp. Inc. | 80110110 | 230V 50 Hz 1270 rpm Insulation class F with thermal switch 140℃ | | | |
| - capacitor | | Ducati energia | 16.33.1229 | 4 uF 425V min 70 ℃ | EN 60252-1 | VDE, UL/CUL etc. | |
| - alternate ( SA-260MB , SA-260MB-G only ) | | Lan Chang Elec. Co.,Ltd. | SJ-100B | 220V 50/60 Hz 1720 rpm Insulation class F with thermal switch 135 ℃ | | | |
| - capacitor | | Seika Electric Co.,Ltd. | CF | 7.0 uF 450V 75 ℃ | | UL/CUL | |
| - alternate ( SA-260MB , SA-260MB-G only ) | | Thomas Imp. Inc. | 82110110 | 230V 50/60 Hz 1570 rpm Insulation class F with thermal switch 150 ℃ | | | |
| Plastic enclosure of reservoir | | Dynachem & Co., Ltd. | PP-704 | 94V-0 or better 120 ℃,0.75 mm thick min | UL 94 | UL | |
| Terminal Board (after EMI filter) | | Great Dragon Electrical | GGD-40 | 600V 25 A<br>PA66 94V-0, 105℃ | | UL | |
| Terminal Board (primary side , Relay board) | | Dinkle Enterprise | DT-35 | 300V 10 A min<br>PA66 94V-0, 105℃ | | UL | |

NOTE → 1 List all different manufacturers of the above components → 4 asterisk indicates mark assuring agreed level of surveillance
→ 2 May include electrical, mechanical values
→ 3 List licence no or method of acceptance

# Attachment Photos

SA-260MB Overall View ( Front and Side )

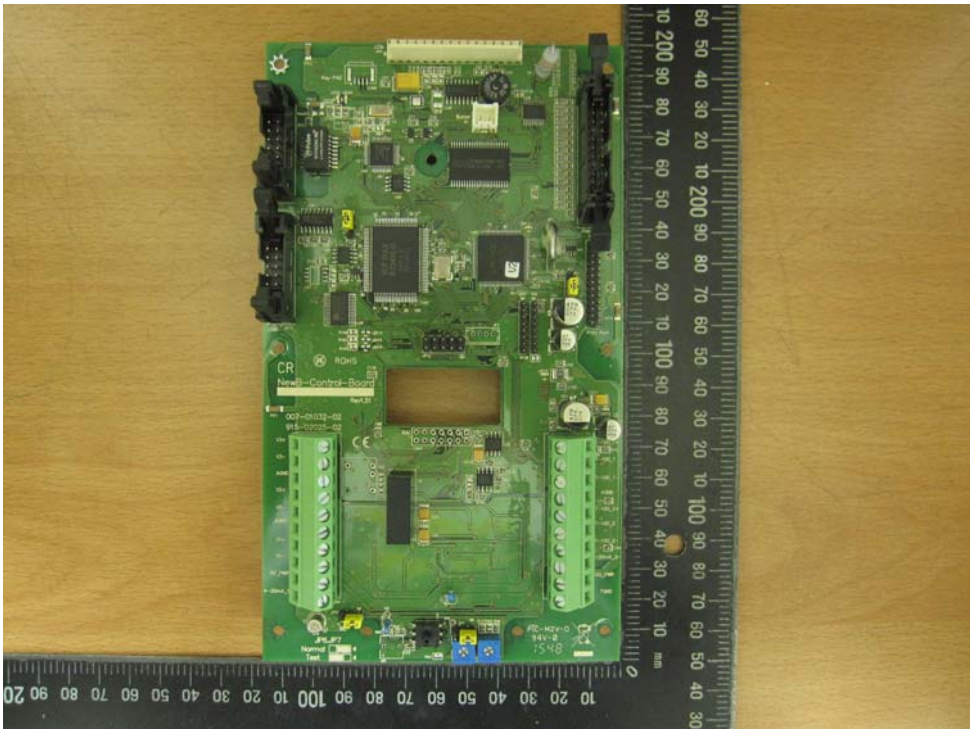
SA-260MB Overall View ( Back and Bottom )


SA-260MB ( Behind the door )

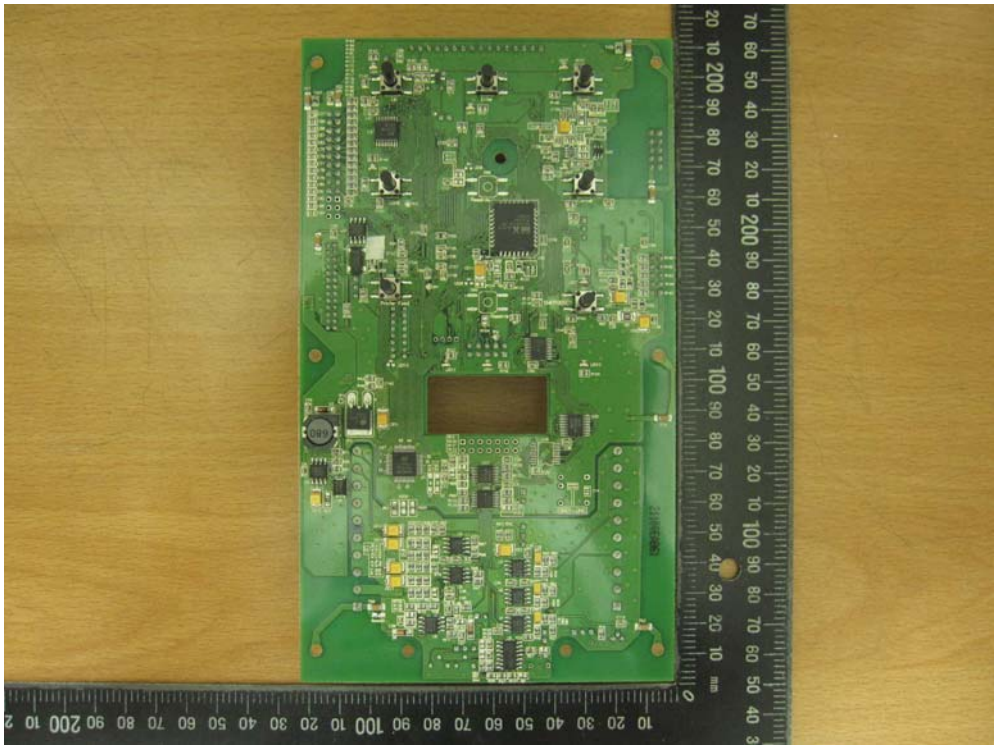

SA-260MB ( Internal – back )

SA-260MB ( Internal – right )

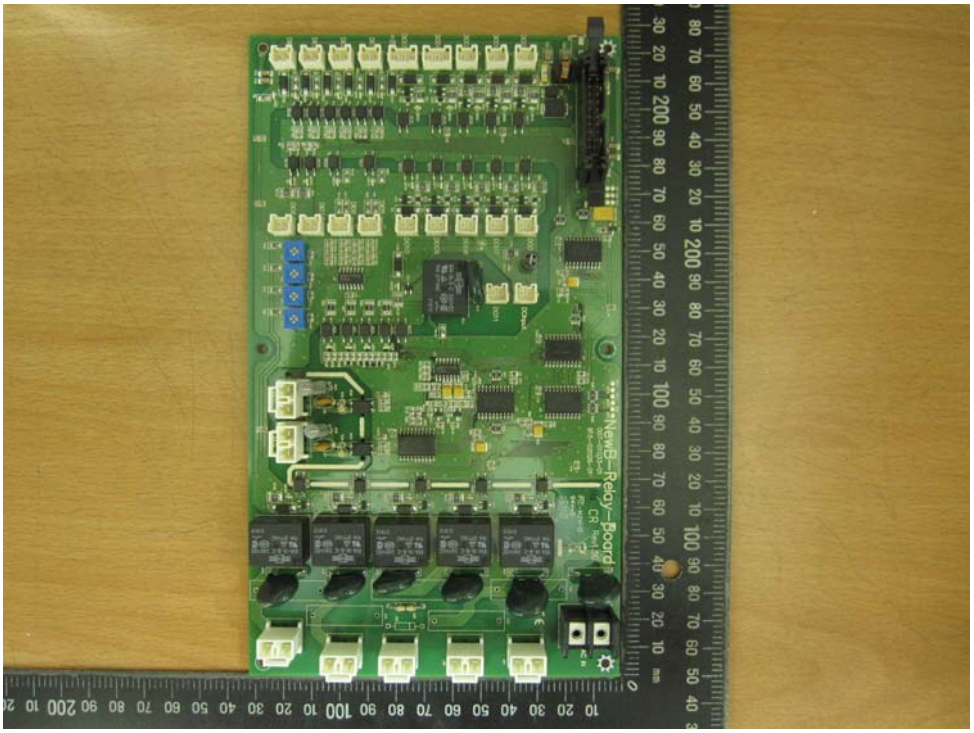
SA-260MB ( Internal – left )



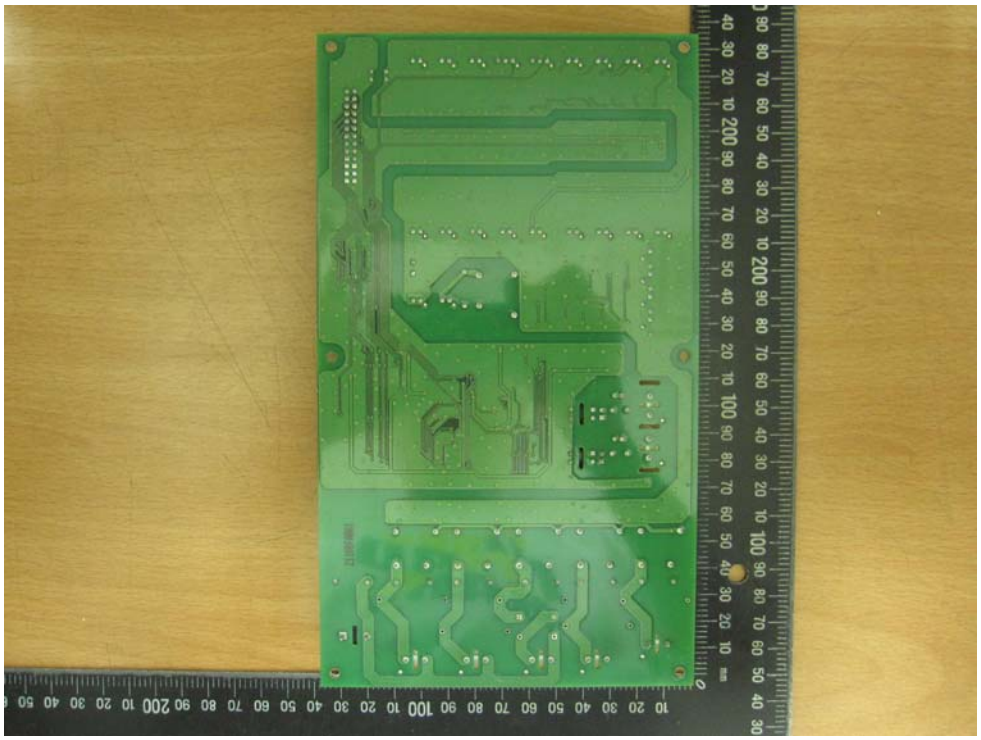
Control Board (1)



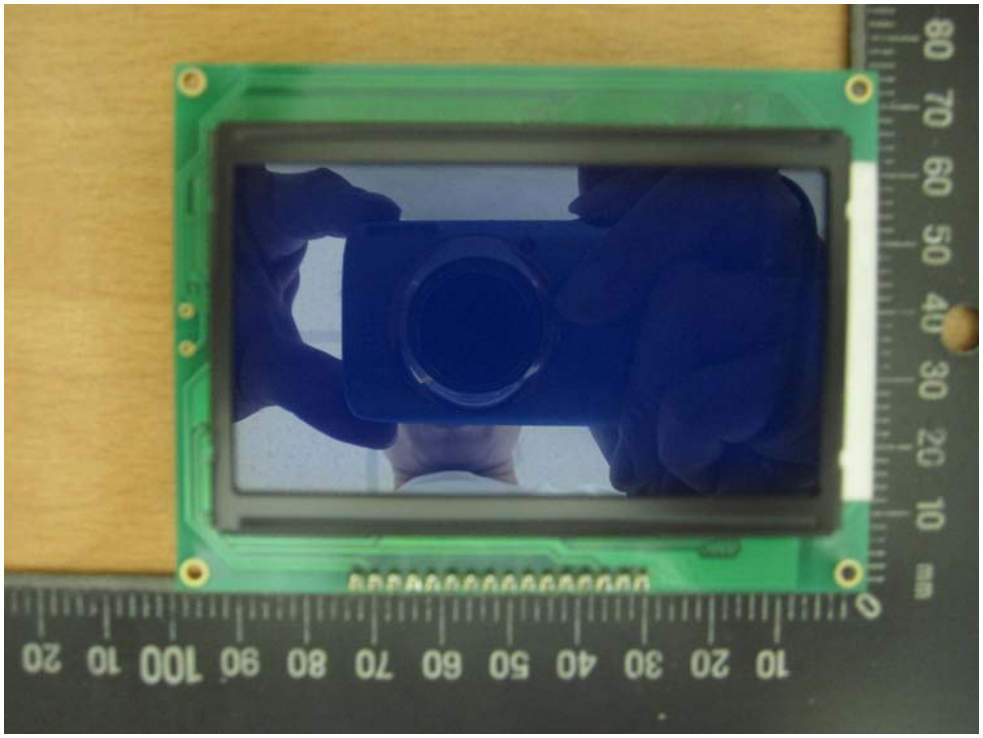
Control Board (2)



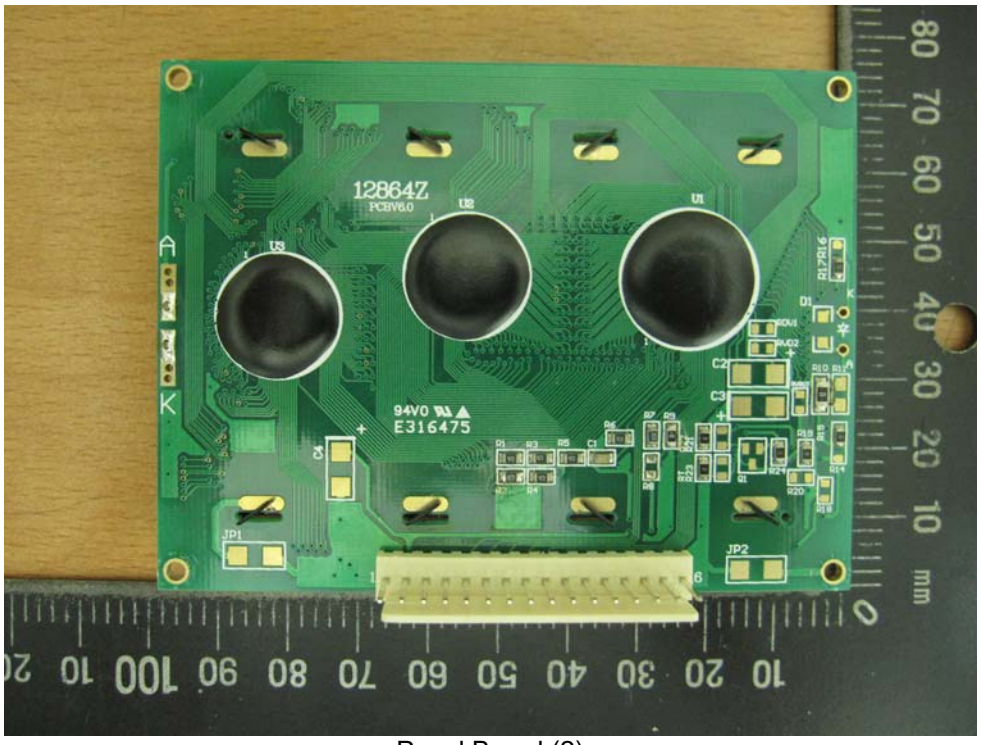

Main Board (1)



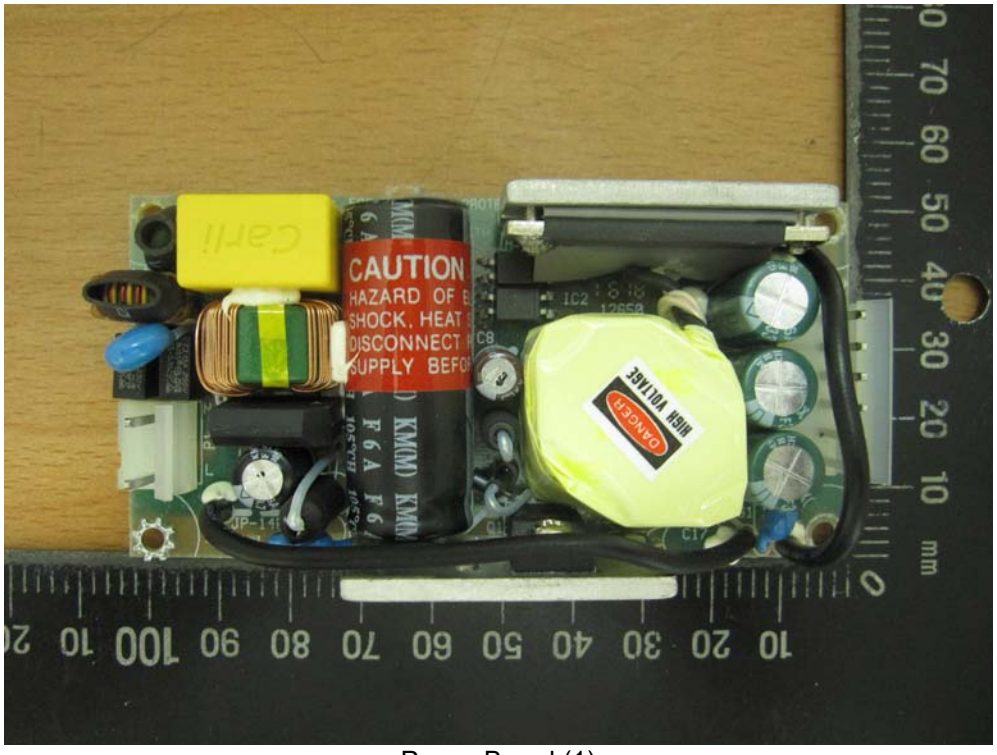
Main Board (2)



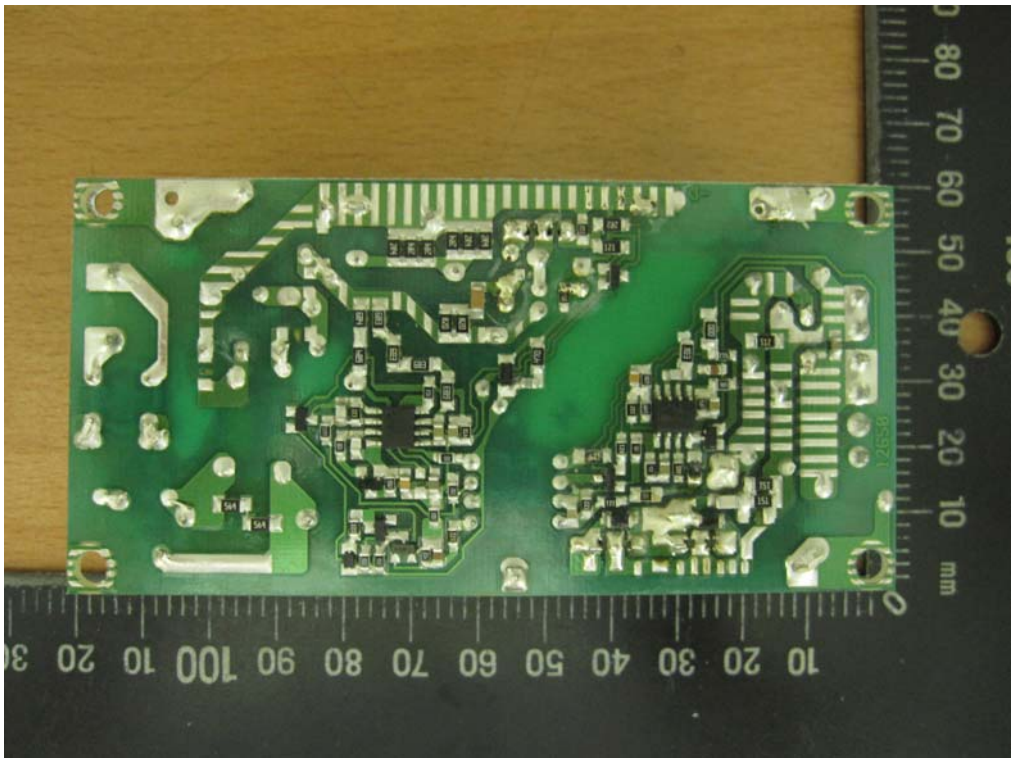
Panel Board (1)



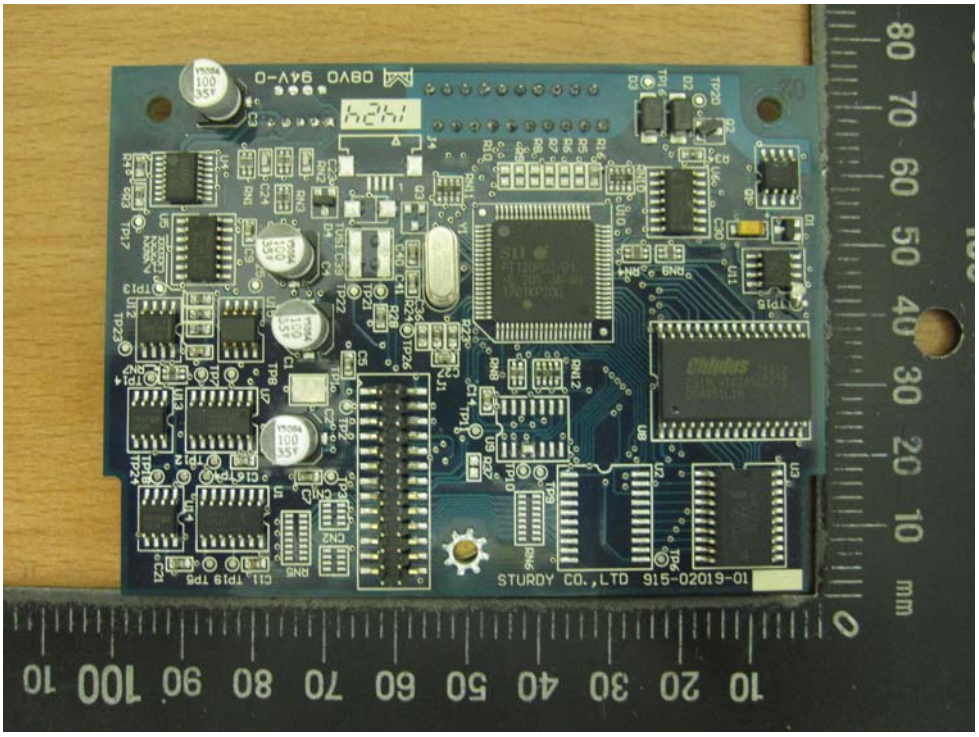

Panel Board (2)



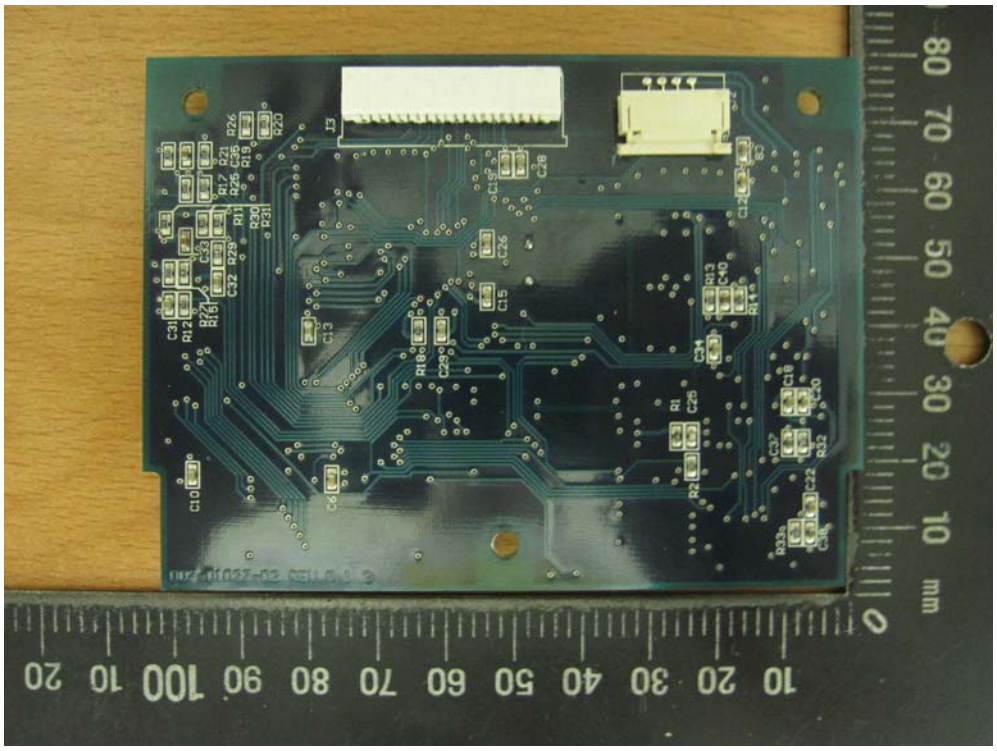

Power Board (1)



Power Board (2)

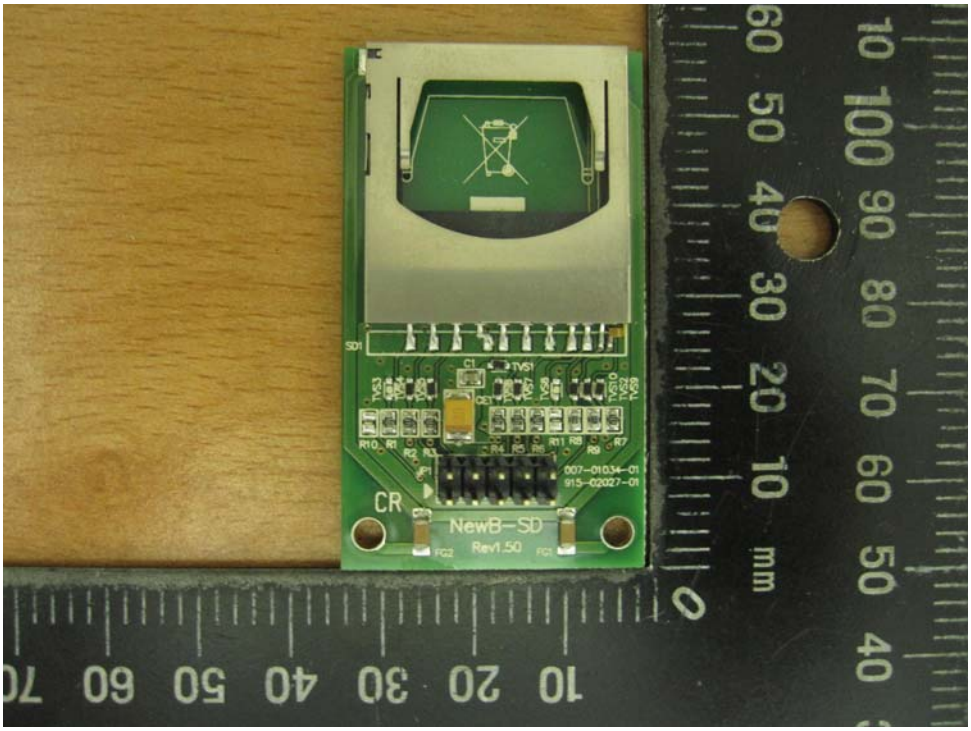



Printer Board (1)

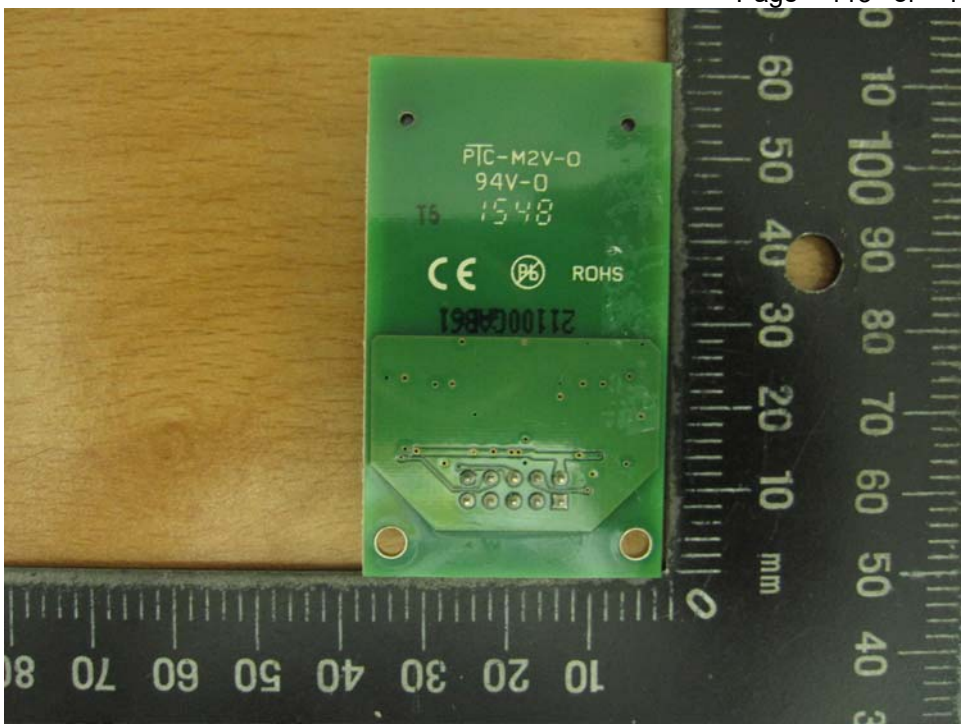


Printer Board (2)


SA-260MB motors




SD Card Board (1)




SD Card Board (2)

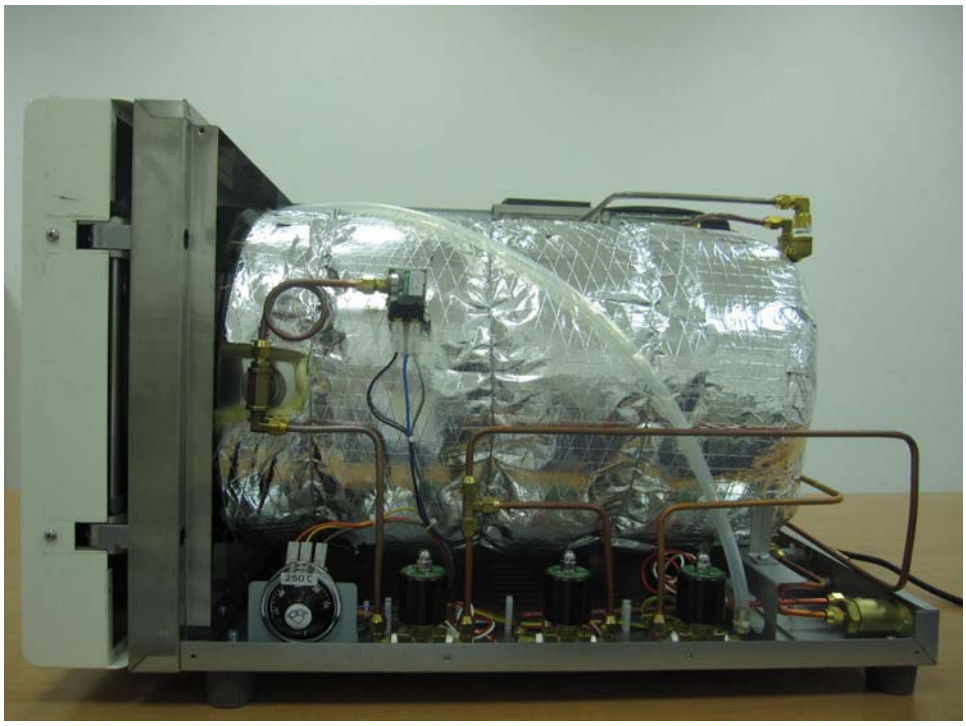
SA-260MB-G with Pump 82110110

SA-300 MB Overall View ( Front and Side )

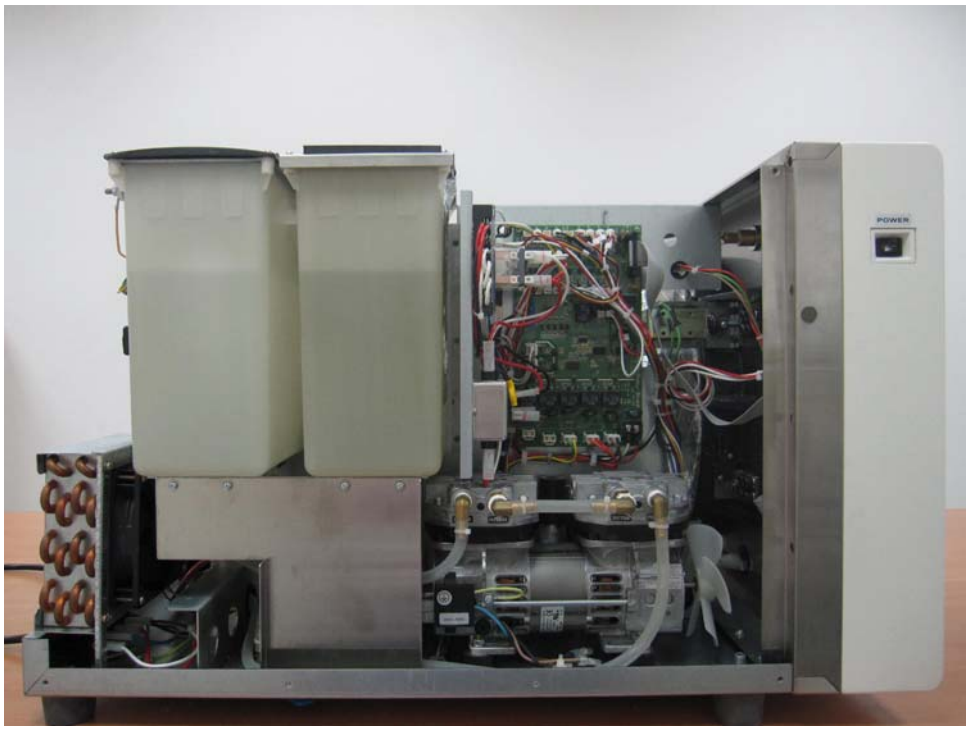

SA-300 MB Overall View ( Back and Bottom )

SA-300MB ( behind the door )


SA-300MB ( internal - back)



SA-300MB ( internal - right )




SA-300MB ( internal - left )