

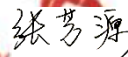








| TEST REPORT IEC 61800-5-1 Adjustable speed electrical power drive systems – Part 5-1: Safety requirements – Electrical, thermal and energy | |
|---|--|
| Report Reference No.....: | INVT.2017.07.10.0001 |
| Date of issue.....: | 2017-07-19 |
| Total number of pages | 39 Pages |
| Testing Laboratory | Shenzhen INVT Electric Co., Ltd |
| Address | No.4 Building, Gaofa Industrial Park Longjing, Nanshan District, 518055 Shenzhen, PEOPLE'S REPUBLIC OF CHINA |
| Test specification: | |
| Standard | <input checked="" type="checkbox"/> EN 61800-5-1:2007 (2 nd Edition) |
| Test procedure | Type test |
| Non-standard test method.....: | N/A |
| Test item description | Servo drive |
| Trade Mark |  |
| Manufacturer | INVT INDUSTRIAL TECHNOLOGY(SHANGHAI)CO.,LTD. Building No.1 188 New junhuan Rd.,Minhang Dist.,Shanghai,China |
| Factory.....: | INVT POWER ELECTRONICS (SUZHOU) CO., LTD. No.1 KunLunShan Road Suzhou Science & Technology Tower Hi-Tech Area Suzhou Jiangsu |
| Model/Type reference.....: | SV-DA200-015-4-S0-J000 SV-DA200-015-4-S7-J000 SV-DA200-015-4-N0 SV-DA200-015-4-N7 SV-DA200-015-4-S0 SV-DA200-015-4-S7 SV-DA200-015-4-K0-I0L0 SV-DA200-015-4-K7-I0L0 SV-DA200-022-4-S0-J000 SV-DA200-022-4-S7-J000 SV-DA200-022-4-N0 SV-DA200-022-4-N7 SV-DA200-022-4-S0 SV-DA200-022-4-S7 SV-DA200-022-4-K0-I0L0 SV-DA200-022-4-K7-I0L0 |
| Ratings | Refer to general product information for details |

| | |
|--|--|
| Testing procedure and testing location: | |
| Testing Laboratory.....: | Shenzhen INVT Electric Co., Ltd. |
| Testing location/ address.....: | 4# Building, Gaofa Scientific Industrial Park, Longjing, Nanshan, Shenzhen, 518055, China |
| Tested by (name + signature) | Weirong Yang  |
| Approved by (name + signature) .: | Fangyuan Zhang  |



| | |
|---|---|
| Summary of testing: | |
| Tests performed (name of test and test clause): The submitted samples were found to comply with the requirements of: - EN 61800-5-1:2007 | Testing location: 4# Building, Gaofa Scientific Industrial Park, Longjing, Nanshan, Shenzhen, 518055, China |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|-------------------|-------------------|-------------|--|--|--------------|---|--|------|-----------|--|--|--|--|--|-------------------|--|------|--|-------------|--|---|--|---|--|-------------------------|--|---------------------|--|----------------|--|------|--|-----------|--|------|--|--|--|---|--|
| Copy of marking plate: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%;"> <tr> <td>伺服驱动器 SERVO DRIVES</td> <td>型号: MODEL:</td> <td>SV-DA200-022-4-S0</td> </tr> <tr> <td>输入 INPUT</td> <td colspan="2">3P AC 380V (-15%~+10%) 47Hz~63Hz 45.4A</td> </tr> <tr> <td>输出 OUTPUT</td> <td colspan="2">3P AC 0V~V_{in} 0~400Hz 66A 22kW</td> </tr> <tr> <td>S/N:</td> <td colspan="2" style="text-align: right;">CE</td> </tr> <tr> <td colspan="3" style="text-align: center;">  上海英威腾工业技术有限公司 INVT Industrial Technology (Shanghai) Co., Ltd. </td> </tr> </table> | 伺服驱动器 SERVO DRIVES | 型号: MODEL: | SV-DA200-022-4-S0 | 输入 INPUT | 3P AC 380V (-15%~+10%) 47Hz~63Hz 45.4A | | 输出 OUTPUT | 3P AC 0V~V _{in} 0~400Hz 66A 22kW | | S/N: | CE | |  上海英威腾工业技术有限公司 INVT Industrial Technology (Shanghai) Co., Ltd. | | | <table border="1" style="width: 100%;"> <tr> <td colspan="2" style="text-align: center;">SV-DA200-022-4-S0</td> </tr> <tr> <td>S/N:</td> <td style="border: 1px solid black; width: 100px; height: 20px;"></td> </tr> <tr> <td colspan="2">Power: 22KW</td> </tr> <tr> <td colspan="2">Input: 3P AC 380V (-15%~+10%) 47Hz~63Hz 45.4A</td> </tr> <tr> <td colspan="2">Output: 3P AC 0V~V_{in} 0~400Hz 66A 22kW</td> </tr> <tr> <td colspan="2">Size: 685mm×395mm×450mm</td> </tr> <tr> <td colspan="2">Gross weight: xx kg</td> </tr> <tr> <td colspan="2">IP level: IP20</td> </tr> <tr> <td colspan="2">ERP:</td> </tr> <tr> <td colspan="2" style="text-align: center;">CE</td> </tr> <tr> <td colspan="2" style="text-align: right;">中国制造</td> </tr> <tr> <td colspan="2" style="text-align: center;">  </td> </tr> <tr> <td colspan="2" style="text-align: right;"> www.invt-tech.com 上海英威腾工业技术有限公司 </td> </tr> </table> | SV-DA200-022-4-S0 | | S/N: | | Power: 22KW | | Input: 3P AC 380V (-15%~+10%) 47Hz~63Hz 45.4A | | Output: 3P AC 0V~V _{in} 0~400Hz 66A 22kW | | Size: 685mm×395mm×450mm | | Gross weight: xx kg | | IP level: IP20 | | ERP: | | CE | | 中国制造 | |  | | www.invt-tech.com 上海英威腾工业技术有限公司 | |
| 伺服驱动器 SERVO DRIVES | 型号: MODEL: | SV-DA200-022-4-S0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 输入 INPUT | 3P AC 380V (-15%~+10%) 47Hz~63Hz 45.4A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 输出 OUTPUT | 3P AC 0V~V _{in} 0~400Hz 66A 22kW | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S/N: | CE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  上海英威腾工业技术有限公司 INVT Industrial Technology (Shanghai) Co., Ltd. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SV-DA200-022-4-S0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S/N: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Power: 22KW | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Input: 3P AC 380V (-15%~+10%) 47Hz~63Hz 45.4A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Output: 3P AC 0V~V _{in} 0~400Hz 66A 22kW | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Size: 685mm×395mm×450mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gross weight: xx kg | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IP level: IP20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ERP: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 中国制造 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| www.invt-tech.com 上海英威腾工业技术有限公司 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Marking of all models are identical except for the designation name, current and power. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Warning on the product for all the models . | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| |
|------------------------------|
| Test item particulars: |
|------------------------------|

Report Reference No.: INVT.2017.07.19.0001

| | |
|---|---|
| Equipment under test | <input type="checkbox"/> PDS <input type="checkbox"/> CDM <input checked="" type="checkbox"/> BDM |
| Intended equipment location | <input type="checkbox"/> stand alone <input checked="" type="checkbox"/> for building-in |
| Mains supply overvoltage category (OVC) | <input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input checked="" type="checkbox"/> OVC III <input type="checkbox"/> OVC IV |
| Reduction of OVC for basic insulation used | <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes, by: |
| Supply earthing systems and system voltage (V) | Supply earthing system <input checked="" type="checkbox"/> TN-S, TN-C, TN-C-S, TT System voltage: (not corner earthed) 230 V <input type="checkbox"/> TN-C (middle point earthed) <input type="checkbox"/> TN-S, TT (corner earthed) <input type="checkbox"/> IT (not corner earthed) <input type="checkbox"/> IT (corner earthed) <input type="checkbox"/> other: |
| OVC for potential free terminals | <input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input checked="" type="checkbox"/> OVC III <input type="checkbox"/> OVC IV |
| Other non-DVC A connections | N/A |
| Class of equipment | <input type="checkbox"/> Class 0 <input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III |
| Pollution degree (PD) | <input type="checkbox"/> PD 1: <input checked="" type="checkbox"/> PD 2: <input type="checkbox"/> PD 3: <input type="checkbox"/> PD 4: |
| IP protection class(es) | IP20 |
| Ambient temperature during operation (°C) with/without derating | 45°C |
| Max. operation altitude (m) | 2000 |
| Altitude of test laboratory (m) | <500 |
| Other particulars | N/A |
| 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 | 2017-06-09 |

Date(s) of performance of tests: From 2017-06-09 to 2014-07-19

Attachment No. 1: 11 pages of photo documentation**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 appended table)” refers to a table appended to the report.
 Throughout this report a point is used as the decimal separator.

General product information:

DA200 series product adopting modular structure, is a function of extensible, feature-rich and powerful servo drive series products.

Input , output and size of each model were listed as following:

| Model No. | Rated Input | Rated Output | Size (mm) |
|------------------------|---|--------------------------------|-------------|
| SV-DA200-015-4-S0-J000 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 31A | 3PH AC 0V~Vin 0~400Hz 50A 15kW | 685*395*450 |
| SV-DA200-015-4-S7-J000 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 31A | 3PH AC 0V~Vin 0~400Hz 50A 15kW | |
| SV-DA200-015-4-N0 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 31A | 3PH AC 0V~Vin 0~400Hz 50A 15kW | |
| SV-DA200-015-4-N7 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 31A | 3PH AC 0V~Vin 0~400Hz 50A 15kW | |
| SV-DA200-015-4-S0 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 31A | 3PH AC 0V~Vin 0~400Hz 50A 15kW | |
| SV-DA200-015-4-S7 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 31A | 3PH AC 0V~Vin 0~400Hz 50A 15kW | |
| SV-DA200-015-4-K0-I0L0 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 31A | 3PH AC 0V~Vin 0~400Hz 50A 15kW | |
| SV-DA200-015-4-K7-I0L0 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 31A | 3PH AC 0V~Vin 0~400Hz 50A 15kW | |
| SV-DA200-022-4-S0-J000 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 45.4A | 3PH AC 0V~Vin 0~400Hz 66A 22kW | |
| SV-DA200-022-4-S7-J000 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 45.4A | 3PH AC 0V~Vin 0~400Hz 66A 22kW | |
| SV-DA200-022-4-N0 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 45.4A | 3PH AC 0V~Vin 0~400Hz 66A 22kW | |
| SV-DA200-022-4-N7 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 45.4A | 3PH AC 0V~Vin 0~400Hz 66A 22kW | |
| SV-DA200-022-4-S0 | 3PH,AC,380V(-15%)~440(+10%) ,47~63Hz, 45.4A | 3PH AC 0V~Vin 0~400Hz 66A 22kW | |
| SV-DA200-022-4-S7 | 3PH,AC,380V(-15%)~ | 3PH AC 0V~Vin 0~400Hz 66A | |

| | | | |
|------------------------|--|-----------------------------------|--|
| | 440(+10%) ,47~63Hz, 45.4A | 22kW | |
| SV-DA200-022-4-K0-I0L0 | 3PH,AC,380V(-15%)~ 440(+10%) ,47~63Hz, 45.4A | 3PH AC 0V~Vin 0~400Hz 66A 22kW | |
| SV-DA200-022-4-K7-I0L0 | 3PH,AC,380V(-15%)~ 440(+10%) ,47~63Hz, 45.4A | 3PH AC 0V~Vin 0~400Hz 66A 22kW | |

- When installing the equipment, all requirements of the mentioned standard must be fulfilled and it should be suitably installed in closed electrical operation area.
- Maximum operating temperature is 45°C.
- The input and output circuits were considered as DVC C circuits and signal circuit was considered as DVC A circuit.
- TN-S, TN-C, TN-C-S and TT (not corner earthed) power systems were evaluated.
- The frequency inverter has no over current protective device. For safety operation, a suitable external circuit breaker must be employed before installation.

| RIEC 61800-5-1 | | | |
|----------------|---|--|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4 | PROTECTION AGAINST ELECTRIC SHOCK, THERMAL, AND ENERGY HAZARDS | | P |
| 4.1 | General | | P |
| 4.2 | Fault conditions | | P |
| 4.3 | Protection against electric shock | | P |
| 4.3.1 | Decisive voltage classification | | P |
| 4.3.1.1 | Use of decisive voltage class (DVC) : | DVC A and DVC C were used in the product | P |
| 4.3.1.2 | Limits of DVC | | P |
| 4.3.1.3 | Requirements for protection | Protective separation provided between the DVC A and DVC C circuit. And basic insulation between DVC C circuit to the protection earthing. | P |
| 4.3.1.4 | Circuit evaluation | | P |
| 4.3.1.4.1 | General | | P |
| 4.3.1.4.2 | A.C. working voltage | R.M.S value and recurring peak voltage were measured | P |
| 4.3.1.4.3 | D.C. working voltage | | P |
| 4.3.1.4.4 | Pulsating working voltage | | P |
| 4.3.2 | Protective separation..... : | By double or reinforced insulation or by protective boding, protective impedance | P |
| 4.3.3 | Protection against direct contact | | P |
| 4.3.3.1 | General | | P |
| 4.3.3.2 | Protection by means of insulation of live parts | | P |
| 4.3.3.3 | Protection by means of enclosures and barriers | Intended for installation in closed electrical operation area | P |
| 4.3.4 | Protection in case of direct contact | | P |
| 4.3.4.1 | General | | P |
| 4.3.4.2 | Protection using DVC A : | See below | P |
| 4.3.4.3 | Protection by means of protective impedance | By protective resistors | P |

| RIEC 61800-5-1 | | | |
|----------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.3.4.4 | Protection by means of using limited voltage | | N/A |
| 4.3.5 | Protection against indirect contact | | P |
| 4.3.5.1 | General | Comply with the requirements for protective class I | P |
| 4.3.5.2 | Insulation between live parts and accessible conductive parts | | P |
| 4.3.5.3 | Protective bonding circuit | | P |
| 4.3.5.3.1 | General | | P |
| 4.3.5.3.2 | Rating of protective bonding | Comply with 5.2.3.9 | P |
| 4.3.5.3.3 | Protective bonding impedance | | N/A |
| 4.3.5.4 | Protective earthing conductor | Through a dedicated protective bonding conductor | P |
| 4.3.5.5 | Means of connection for the protective earthing conductor | | P |
| 4.3.5.5.1 | General | | P |
| 4.3.5.5.2 | Touch current in case of failure of protective earthing conductor | Test were performed on models SV-DA200-022-4-S0 . Warning marking added on the enclosure. | P |
| 4.3.5.6 | Special features in equipment for protection class II | Class I equipment | N/A |
| 4.3.6 | Insulation | | P |
| 4.3.6.1 | General | | P |
| 4.3.6.1.1 | Influencing factors | | P |
| 4.3.6.1.2 | Pollution degree | 2 | P |
| 4.3.6.1.3 | Oversvoltage Category | OVC III | P |
| 4.3.6.1.4 | Supply earthing systems | TN-S, TN-C, TN-C-S and TT (not corner earthed) | P |
| 4.3.6.1.5 | Insulation voltages | System voltage: 277V Impulse Voltage: 4000V Temporary overvoltage: 2120V(crest value) | P |
| 4.3.6.2 | Insulation to the surroundings | | P |
| 4.3.6.2.1 | General | | P |
| 4.3.6.2.2 | Circuits connected directly to the supply mains ... : | | N/A |
| 4.3.6.2.3 | Circuits not connected directly to the supply mains: | Over voltage category III was used | P |

| RIEC 61800-5-1 | | | |
|----------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.3.6.2.4 | Insulation between circuits | The input and output circuits were considered as DVC C circuits and signal circuit was considered as DVC A circuit. Protective separation was provided between DVC C to DVC A circuit and basic insulation between DVC C circuit to the protection earthing | P |
| 4.3.6.3 | Functional insulation | | P |
| 4.3.6.4 | Clearance distances | (See appended table 4.3.6.4) | P |
| 4.3.6.4.1 | Determination | | P |
| 4.3.6.4.2 | Electric field homogeneity | | P |
| 4.3.6.4.3 | Clearance to conductive enclosures | See 4.3.6.4.1 & 5.2.2.5 | P |
| 4.3.6.5 | Creepage distance | (See appended table 4.3.6.5) | P |
| 4.3.6.5.1 | General | | P |
| 4.3.6.5.2 | Materials | IIIa | P |
| 4.3.6.6 | Coating | | P |
| 4.3.6.7 | PWB spacing for functional insulation | | N/A |
| 4.3.6.8 | Solid insulation | (See appended table 4.3.6.8) | P |
| 4.3.6.8.1 | General | | P |
| 4.3.6.8.2 | Requirements for electrical withstand capability | | P |
| 4.3.6.8.2.1 | Basic or supplementary insulation | (See appended table 4.3.6.8) | P |
| 4.3.6.8.2.2 | Double and reinforced insulation | (See appended table 4.3.6.8) | P |
| 4.3.6.8.2.3 | Functional insulation | | P |
| 4.3.6.8.3 | Thin sheet or tape material | (See appended table 4.3.6.8) | P |
| 4.3.6.8.3.1 | General | | P |
| 4.3.6.8.3.2 | Material thickness not less than 0,2 mm | | P |
| 4.3.6.8.3.3 | Material thickness not less than 0,2 mm | | P |
| 4.3.6.8.3.4 | Compliance | | P |
| 4.3.6.8.4 | Printed wiring boards | | N/A |
| 4.3.6.8.4.1 | General | | P |
| 4.3.6.8.4.2 | Use of coating materials | | N/A |
| 4.3.6.8.5 | Wound components | | P |
| 4.3.6.8.6 | Potting materials | | N/A |
| 4.3.6.9 | Insulation requirements above 30 kHz | Considered | P |

| RIEC 61800-5-1 | | | |
|----------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.3.7 | Enclosures | | P |
| 4.3.7.1 | General | See cl. 4.4.3, cl. 5.2.2.4 and cl.5.2.2.5.3 | P |
| 4.3.7.2 | Cast metal | See cl.5.2.2.5.2 | N/A |
| 4.3.7.3 | Sheet metal | | N/A |
| 4.3.8 | Wiring and connections | | P |
| 4.3.8.1 | General | | P |
| 4.3.8.2 | Routing | The wire was protected by smooth bushing | P |
| 4.3.8.3 | Colour coding | The wires in the colour green with or without one or more yellow stripes were not used other than for protective bonding. | P |
| 4.3.8.4 | Splices and connections | | P |
| 4.3.8.5 | Accessible connections | Non-interchangeable/reversible connector used. Installed in closed electrical operation area | N/A |
| 4.3.8.6 | Interconnections between parts of the PDS | | N/A |
| 4.3.8.7 | Supply connections | | N/A |
| 4.3.8.8 | Terminals | | P |
| 4.3.8.8.1 | Construction requirements | | P |
| 4.3.8.8.2 | Connecting capacity | | P |
| 4.3.8.8.3 | Connection | | P |
| 4.3.8.8.4 | Wire bending space for wires 10 mm ² and greater | No such wire used | N/A |
| 4.3.9 | Output short circuit requirements | (See appended table 5.2.3.6) | P |
| 4.3.10 | Residual current-operated protective (RCD) or monitoring (RCM) device compatibility | No RCD or RCM provided | N/A |
| 4.3.11 | Capacitor Discharge | Discharge to 60V within 5s; except terminals (+)/(-) voltage discharge to 60 V within 5 min. Warning symbol according IEC 60417-5036 was provided and discharge time was also added. | P |
| 4.3.12 | Access conditions for high-voltage PDS | Not high-voltage PDS | N/A |

| RIEC 61800-5-1 | | | |
|----------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|-----------|---|--|-----|
| 4.4 | Protection against thermal hazards | | P |
| 4.4.1 | Minimizing the risk of ignition | (See appended table 1) | P |
| 4.4.2 | Insulation Materials | | P |
| 4.4.2.1 | General | (See appended table 5.2.3.8) | P |
| 4.4.2.2 | Material requirements | See cl. 5.2.5.1, 5.2.5.2 and appended table 1. | P |
| 4.4.3 | Flammability of enclosure materials | | P |
| 4.4.4 | Temperature limits | | P |
| 4.4.4.1 | Internal parts | (See appended table 5.2.3.8) | P |
| 4.4.4.2 | External parts of CDM | (See appended table 5.2.3.8) | P |
| 4.4.5 | Specific requirements for liquid cooled PDS | | N/A |
| 4.4.5.1 | Coolant | | N/A |
| 4.4.5.2 | Design requirements | | N/A |
| 4.4.5.2.1 | Corrosion resistance | | N/A |
| 4.4.5.2.2 | Tubing, joints and seals | | N/A |
| 4.4.5.2.3 | Provision for condensation | | N/A |
| 4.4.5.2.4 | Leakage of coolant | | N/A |
| 4.4.5.2.5 | Loss of coolant | | N/A |
| 4.4.5.2.6 | Conductivity of coolant | | N/A |
| 4.4.5.2.7 | Insulation requirements for coolant loss | | N/A |

| | | | |
|---------|---|--------------|-----|
| 4.5 | Protection against energy hazards | | P |
| 4.5.1 | Electrical energy hazards | Check in PDS | P |
| 4.5.2 | Mechanical energy hazards | | N/A |
| 4.5.2.1 | General | | N/A |
| 4.5.2.2 | Critical torsional speed | | N/A |
| 4.5.2.3 | Transient torque analysis | | N/A |
| 4.5.3 | Acoustic noise emission | | N/A |
| 4.6 | Protection against environmental stresses | | N/A |

| | | | |
|----------|--|------------|----------|
| 5 | TEST REQUIREMENTS | | P |
| 5.1 | General | | P |
| 5.1.1 | Test objectives and classification | Type tests | P |

| RIEC 61800-5-1 | | | |
|----------------|--|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.1.2 | Selection of test samples | The tests were conducted on models: Unless otherwise specified, the models SV-DA200-022-4-S0 were chosen as representative models to perform all the tests. unless otherwise stated. | P |
| 5.1.3 | Sequence of tests | | P |
| 5.1.4 | Earthing Conditions | Neutral to earth | P |
| 5.1.5 | Compliance | | P |
| 5.1.6 | Test Overview | | P |
| 5.2 | Test specifications | | P |
| 5.2.1 | Visual inspections (type test, sample test and routine test) | | P |
| 5.2.2 | Mechanical tests | | P |
| 5.2.2.1 | Clearance and creepage distances (type test) | (See appended table 5.2.2.1) | P |
| 5.2.2.2 | PWB short-circuit test (type test) | (See appended table 5.2.2.2) | P |
| 5.2.2.3 | Non-accessibility test (type test) | | P |
| 5.2.2.4 | Enclosure integrity test (type test) | IP20 | P |
| 5.2.2.5 | Deformation tests | | P |
| 5.2.2.5.1 | General | | P |
| 5.2.2.5.2 | Deflection test (type test) | 250N,5s tested for metal enclosure | P |
| 5.2.2.5.3 | Impact test (type test) | Steel sphere(500g); 1.3m; No damage for display panel | P |
| 5.2.3 | Electrical tests | | P |
| 5.2.3.1 | Impulse voltage test (type test and sample test) | (See appended table 5.2.3.1) | P |
| 5.2.3.2 | A.C. or d.c. voltage test (type and routine test) | (See appended table 5.2.3.2) | P |
| 5.2.3.2.1 | Purpose of test | The test is used to verify that the clearance and solid insulation of components and of assemble PDS/CDM/BDM has adequate dielectric strength to resist overvoltage conditions | P |

| RIEC 61800-5-1 | | | |
|----------------|--|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.2.3.2.2 | Value and type of test voltage | 3000 VAC for reinforced insulation, 1500 V AC for basic insulation | P |
| 5.2.3.2.3 | Performing the voltage test | | P |
| 5.2.3.2.4 | Duration of the a.c. or d.c. voltage test | 60 s | P |
| 5.2.3.2.5 | Verification of the a.c. or d.c. voltage test | No any electrical breakdown occurs | P |
| 5.2.3.3 | Partial discharge test (type test, sample test) | | N/A |
| 5.2.3.4 | Protective impedence (type test and routine test) : | Resistor connection between the accessible live parts and circuits of DVC C. The test result using the circuit of IEC 60990. | P |
| 5.2.3.5 | Touch current measurement (type test) | Test ware performed on models SV-DA200-022-4-S0 Warning marking added on the enclosure. | P |
| 5.2.3.6 | Short-circuit test and Breakdown of components test (type tests) | (See appended table 5.2.3.6) | P |
| 5.2.3.6.1 | General | | P |
| 5.2.3.6.2 | Test configuration | | P |
| 5.2.3.6.2.1 | Supply voltage and current | Rated supply voltage used | P |
| 5.2.3.6.3 | Short-circuit test | | P |
| 5.2.3.6.3.1 | Load conditions | | P |
| 5.2.3.6.3.2 | Location of short-circuit | | P |
| 5.2.3.6.4 | Breakdown of component test | | P |
| 5.2.3.6.4.1 | Load condition | Normal load conditions | P |
| 5.2.3.6.4.2 | Application of short-circuit or open-circuit | | P |
| 5.2.3.6.5 | Test sequence | | P |
| 5.2.3.6.6 | Pass criteria | | P |
| 5.2.3.7 | Capacitor discharge (type test) | Discharge to 60V within 5s; except terminals (+)/(-) voltage discharge to 60 V within 5 min. Warning symbol according IEC 60417-5036 was provided and discharge time was also added. | P |
| 5.2.3.8 | Temperature rise test (type test) | (See appended table 5.2.3.8) | P |
| 5.2.3.9 | Protective bonding (type test and routine test) | (See appended table 5.2.3.9) | P |

| RIEC 61800-5-1 | | | |
|----------------|--|---------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.2.4 | Abnormal operation tests | (See appended table 5.2.4) | P |
| 5.2.4.1 | General | | P |
| 5.2.4.2 | Test duration | | P |
| 5.2.4.3 | Pass criteria | | P |
| 5.2.4.4 | Loss of phase (type test) | (See appended table 5.2.4) | P |
| 5.2.4.5 | Cooling failure tests (type tests) | | P |
| 5.2.4.5.1 | General | | P |
| 5.2.4.5.2 | Inoperative blower motor (type test) | | P |
| 5.2.4.5.3 | Clogged filter (type test) | | P |
| 5.2.4.5.4 | Loss of coolant | Air cooled equipment | N/A |
| 5.2.5 | Material tests | | P |
| 5.2.5.1 | High current arcing ignition test (type test) | | N/A |
| 5.2.5.2 | Glow-wire test (type test) | | N/A |
| 5.2.5.3 | Hot wire ignition test (type test - alternative to Glow-wire test) | | N/A |
| 5.2.5.4 | Flammability test (type test) | UL recognized material used | N/A |
| 5.2.6 | Environmental tests (type tests) | | P |
| 5.2.6.1 | General | | P |
| 5.2.6.2 | Acceptance criteria | | P |
| 5.2.6.3 | Climatic tests | | P |
| 5.2.6.3.1 | Dry heat test (steady state) | | P |
| 5.2.6.3.2 | Damp heat test (steady state) | | P |
| 5.2.6.4 | Vibration test (type test) | | P |
| 5.2.7 | Hydrostatic pressure test (type test and routine test) : | Not a liquid cooled equipment | N/A |
| 6 | INFORMATION AND MARKING REQUIREMENTS | | P |
| 6.1 | General | | P |
| 6.2 | Information for selection | See appended table 6, part 6.2. | P |
| 6.3 | Information for installing and commissioning | See appended table 6, part 6.3. | P |

| RIEC 61800-5-1 | | | |
|----------------|--|---------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.3.1 | General | | P |
| 6.3.2 | Mechanical considerations | | P |
| 6.3.3 | Environment | | P |
| 6.3.4 | Handling and mounting | | P |
| 6.3.5 | Motor and driven equipment | | P |
| 6.3.5.1 | Motor selection | | P |
| 6.3.5.2 | Motor integrated sensors | | P |
| 6.3.5.3 | Critical torsional speeds | Check in PDS | N/A |
| 6.3.5.4 | Transient torque analysis | Check in PDS | N/A |
| 6.3.6 | Connections | | P |
| 6.3.6.1 | General | | P |
| 6.3.6.2 | Interconnection and wiring diagrams | Provided in the user manual | P |
| 6.3.6.3 | Conductor (cable) selection | Provided in the user manual | P |
| 6.3.6.4 | Terminal capacity and identification | Provided in the user manual | P |
| 6.3.6.5 | Protection requirements | No such accessible part | N/A |
| 6.3.6.6 | Earthing | Provided in the user manual | P |
| 6.3.6.7 | Protective earthing conductor current | Not exceed 3.5mA a.c | N/A |
| 6.3.6.8 | Special requirements | | P |
| 6.3.7 | Overcurrent and short-circuit protection | | P |
| 6.3.8 | Motor overload protection | Provided in the user manual | P |
| 6.3.9 | Commissioning | | N/A |
| 6.4 | Information for use | See appended table 6, part 6.4. | P |
| 6.4.1 | General | | P |
| 6.4.2 | Adjustment | | P |
| 6.4.3 | Labels, signs and signals | Warning for high voltage | P |
| 6.4.3.1 | General | | P |
| 6.4.3.2 | Isolators | No isolator | N/A |
| 6.4.3.3 | Visual and audible signals | For function purpose | N/A |
| 6.4.3.4 | Hot surfaces | No hot surfaces | N/A |
| 6.4.3.5 | Equipment marking | | P |
| 6.5 | Information for maintenance | See appended table 6, part 6.5. | P |

| RIEC 61800-5-1 | | | |
|----------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.5.1 | General | | P |
| 6.5.2 | Capacitor discharge | Cl. 4.3.11 was complied, instruction provided | P |
| 6.5.3 | Auto restart/bypass connection | No auto restart/bypass connection provided | N/A |
| 6.5.4 | PT/CT connection | CT provided, check in PDS | P |
| 6.5.5 | Other hazards | | P |
| Annex A | Examples of protection in case of direct contact | | P |
| Annex B | Examples of overvoltage category reduction | | P |
| Annex C | Measurement of clearance and creepage distances | | P |
| Annex D | Altitude correction for clearances | | N/A |
| Annex E | Clearance and creepage distance determination for frequencies greater than 30 kHz | | P |
| Annex F | Cross sections of round conductors | | P |
| Annex G | Guidelines for RCD compability | | N/A |
| Annex H | Symbols referred to in this part of IEC 61800 | | P |

| | | | | | | | | | | | |
|---|--|------|---------------------------|-----|-----------------------------|-----|-------------------------|-----|---------------------|-----|---|
| 5.2.2.1 | General selection and information of supply earthing systems for clearance distances | | | | | | | | | | - |
| Power systems | TN-S, TN-C, TN-CS, TT (not corner earthed) | | TN-S, TT (corner earthed) | | TN-C (middle point earthed) | | IT (not corner earthed) | | IT (corner earthed) | | |
| Rated voltage (V) | 380 | | Not evaluated | | Not evaluated | | Not evaluated | | Not evaluated | | |
| Max. altitude (m) | 2000 | | - | | - | | - | | - | | |
| System voltage | 220 | | - | | - | | - | | - | | |
| | B/S | D/R | B/S | D/R | B/S | D/R | B/S | D/R | B/S | D/R | |
| Rated Impulse voltage (kV) | 4.0 | 6.0 | - | - | - | - | - | - | - | - | |
| Temporary overvoltage (V) | 1500 | 3000 | - | - | - | - | - | - | - | - | |
| Clearance (mm) | 3.0 | 5.5 | - | - | - | - | - | - | - | - | |
| Test impulse voltage for clearance (kV) | 4.0 | 6.0 | - | - | - | - | - | - | - | - | |
| IT corner earthed, simulated impedance (MΩ).....: | | | | | Not evaluated | | | | | | |
| Supplementary information: | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|--|--|-----|---------------------------|-----------|-----------------------------|-----------|-------------------------|---------------|---------------------|---------------|
| 5.2.2.1 | TABLE: Working voltage measurements for clearance and creepage distances | | | | | | | | | | - |
| Condition # | Between | TN-S, TN-C, TN-CS, TT (not corner earthed) | | TN-S, TT (corner earthed) | | TN-C (middle point earthed) | | IT (not corner earthed) | | IT (corner earthed) | |
| | | peak | rms | peak | rms | peak | rms | peak | rms | peak | rms |
| Transformer SV-DA200-022-4-S0 | | | | | | | | | | | |
| | Transformer Pri. and Sec. | 719 | 478 | Not apply | Not apply | Not apply | Not apply | Not evaluated | Not evaluated | Not evaluated | Not evaluated |

| 5.2.2.1 | TABLE: Clearance and creepage distance measurements (Model: SV-DA200-022-4-S0) | | | | | P |
|--|---|---------------|---------------|----------------|---------------|----------------|
| Clearance (cl) and creepage distance (cr) at/of/between: | U_{peak} (V) | U_{rms} (V) | Req. cl. (mm) | Meas. cl. (mm) | Req. cr. (mm) | Meas. cr. (mm) |
| Model: SV-DA200-022-4-S0 | | | | | | |
| Functional: | | | | | | |
| Different poles of inputs or outputs terminals on terminal block | 400 | 280 | 3.0 | 4.6 | 3.0 | 29.3 |
| Input terminals (+) and (-) (24V power supply board) | 755 | 540 | 3.0 | 8.5 | 5.4 | 8.5 |
| PB and DC- (Brake board) | 755 | 540 | 3.0 | 6.1 | 5.4 | 11.5 |
| Basic/supplementary: | | | | | | |
| Live part and earthing enclosure (24V power supply board) | 390 | 282 | 3.0 | 3.1 | 3.0 | 3.1 |
| Live part and earthing enclosure (Drive PCB) | 390 | 282 | 3.0 | 5.1 | 3.0 | 5.1 |
| Bulk capacitor and earthing enclosure | 390 | 282 | 3.0 | 11.2 | 3.0 | 18.6 |
| Reinforced: | | | | | | |
| TR1 primary winding and secondary terminal (24V power supply board) | 719 | 478 | 5.5 | 13.9 | 9.6 | 13.9 |
| TR1 primary winding and secondary terminal (Drive PCB) | 719 | 478 | 5.5 | 6.1 | 9.6 | 11.2 |
| Optpo-coulier primary and secondary (TRN1) | 390 | 282 | 5.5 | 6.9 | 5.5 | 6.9 |
| Primary circuit and secondary circuit (24V power supply board) | 390 | 282 | 5.5 | 6.9 | 5.5 | 6.9 |
| Primary circuit and secondary circuit (Brake board) | 390 | 282 | 5.5 | 6.9 | 5.5 | 6.9 |
| Primary circuit and secondary circuit (Drive PCB) | 390 | 282 | 5.5 | 8.6 | 5.5 | 8.6 |
| Relay pri. and sec. on power PCB | 390 | 282 | 5.5 | 6.7 | 5.5 | 6.7 |
| Supplementary information: | | | | | | |
| Clearance (cl) and creepage distance (cr) at/of/between: | U_{peak} (V) | U_{rms} (V) | Req. cl. (mm) | Meas. cl. (mm) | Req. cr. (mm) | Meas. cr. (mm) |
| Functional: | | | | | | |

| | | | | | | |
|--|--------|--|-------------------------------------|---|-------------------------------------|--------|
| 4.3.6.8 5.2.3.1 5.2.3.2 5.2.3.3 | TABLE: | Solid insulation, Impulse voltage test, A.C. or d.c. voltage test, Partial discharge test | | | | P |
| Test voltage applied between/at: | | DTI (mm) | Impulse test (kV, circuit) | Electric strength test (V a.c., V d.c.) | Partial discharge test (V) | Result |
| Basic/supplementary: | | | | | | |
| Input /output terminals to earthing terminal | | - | 4.0 | 1500Vac | N/A | P |
| Insulation sheet | | - | 4.0 | 1500Vac | N/A | P |
| Internal wire | | - | 4.0 | 1500Vac | N/A | P |
| Reinforced: | | | | | | |
| Input /output to signal connector | | - | 6.0 | 3000Vac | N/A | P |
| Transformer primary and secondary | | - | 6.0 | 3000Vac | N/A | P |
| Heat shrink tube | | - | 6.0 | 3000Vac | N/A | P |
| 2 layers of insulated tape | | - | 6.0 | 3000Vac | N/A | P |
| Supplementary information: . | | | | | | |

| | | | | | | | |
|--|--------|---------------------------|-----------------------|--------------------------|-----|--------|------|
| 5.2.3.5 | TABLE: | Touch current measurement | | | | P | |
| Location (Model SV-DA200-022-4-S0) | | Single / Three phase | Test configuration | Measured current (mA) | | Result | |
| | | | | a.c | d.c | Pass | Fail |
| Input /output to earthing terminal | | Three phase | Let go | 1.25 | - | P | |
| Input /output to signal connector | | Three phase | Let go | 0.12 | - | P | |
| Warning marking added on the enclosure for the other models. Measurements have been carried out according to figures 11 of IEC 60990. | | | | | | | |

| 5.2.3.8 | TABLE: Temperature rise test (Model SV-DA200-022-4-S0) | | | P | |
|---|---|------------------------------------|------|--------|------|
| | Supply voltage (V) | 323 | | — | |
| | Derating (%) | -15% | | — | |
| | Rated maximum ambient temperature (°C) | 45.0 | | — | |
| | Ambient T _{min} (°C) | 25.4 | | — | |
| | Ambient T _{max} (°C) | 27.2 | | — | |
| Part / Location | Measured | Max. Limit * | | Result | |
| Load: External inductor | | | | | |
| Part / Location | Temp (°C) | Adjust to T _{ma} (°C) | (°C) | Pass | Fail |
| Input Terminal Block (S phase) | 28.9 | 46.7 | 125 | P | |
| Input Terminal Block (V phase) | 29.6 | 47.4 | 125 | P | |
| Phase 'S' Rectifier Body | 52.9 | 70.7 | 150 | P | |
| Insulation Barrier close to terminal of phase 'S' Rectifier | 44.0 | 61.8 | 125 | P | |
| Phase 'V' IGBT Body | 35.5 | 53.3 | 80 | P | |
| Bus Capacitor body | 33.3 | 51.1 | 85 | P | |
| Contacting surrounding air | 30.0 | 47.8 | 85 | P | |
| Insulation Barrier Between copper | 37.7 | 55.5 | 125 | P | |
| Voltage decreasing IGBT body | 38.9 | 56.7 | 80 | P | |
| Phase 'V' Hall Sensor Body | 32.8 | 50.6 | 80 | P | |
| Fan Power board:Capacitor (C8) | 48.8 | 66.6 | 80 | P | |
| Fan Power board:Transformer (TR1) | 82.2 | 100.0 | 125 | P | |
| Fan Power Board:Transistor (Q1) | 56.3 | 74.1 | 130 | P | |
| Fan Power Board:Diode (D1) Body | 55.8 | 73.6 | 130 | P | |
| Fan Power Board:Optical Isolator | 56.8 | 74.6 | 100 | P | |
| Drive board:Transformer (TR1) Coil | 45.2 | 63.0 | 125 | P | |
| Drive board:Capacitor (C1) | 40.8 | 58.6 | 80 | P | |
| Drive board:Optical Isolator (U1) Body | 42.3 | 60.1 | 100 | P | |
| Drive board:Connector (CN4) | 25.2 | 43.0 | 125 | P | |
| Drive board:Optical Isolator (PC1) | 44.1 | 61.9 | 100 | P | |
| Control board:Relay (K1) | 38.2 | 56.0 | 85 | P | |
| Rear of Metal case:Close to IGBT | 25.5 | 43.3 | 55 | P | |
| Rear of Metal case:Close to Bus | 25.5 | 43.3 | 55 | P | |
| Ambient: t1: 25.4 °C ; t2: 27.2 °C | | <i>temperature curves see page</i> | | | |

| 5.2.3.8 | TABLE: Temperature rise test (Model SV-DA200-022-4-S0) | | | P | |
|---|---|------------------------------------|------|--------|------|
| | Supply voltage (V) | 484 | | — | |
| | Derating (%) | +10% | | — | |
| | Rated maximum ambient temperature (°C) | 45.0 | | — | |
| | Ambient T _{min} (°C) | 25.8 | | — | |
| | Ambient T _{max} (°C) | 26.9 | | — | |
| Part / Location | Measured | Max. Limit * | | Result | |
| Load: External inductor | | | | | |
| Part / Location | Temp (°C) | Adjust to T _{ma} (°C) | (°C) | Pass | Fail |
| Input Terminal Block (S phase) | 27.4 | 45.5 | 125 | P | |
| Input Terminal Block (V phase) | 28.3 | 46.4 | 125 | P | |
| Phase 'S' Rectifier Body | 53.5 | 71.6 | 150 | P | |
| Insulation Barrier close to terminal of phase 'S' Rectifier | 44.5 | 62.6 | 125 | P | |
| | 34.0 | 52.1 | | | |
| Phase 'V' IGBT Body | 32.0 | 50.1 | 80 | P | |
| Bus Capacitor body | 30.6 | 48.7 | 85 | P | |
| Contacting surrounding air | 38.2 | 56.3 | 85 | P | |
| Insulation Barrier Between copper | 37.4 | 55.5 | 125 | P | |
| Voltage decreasing IGBT body | 31.5 | 49.6 | 80 | P | |
| Phase 'V' Hall Sensor Body | 39.4 | 57.5 | 80 | P | |
| Fan Power board:Capacitor (C8) | 42.7 | 60.8 | 80 | P | |
| Fan Power board:Transformer (TR1) | 54.8 | 72.9 | 125 | P | |
| Fan Power Board:Transistor (Q1) | 54.5 | 72.6 | 130 | P | |
| Fan Power Board:Diode (D1) Body | 57.4 | 75.5 | 130 | P | |
| Fan Power Board:Optical Isolator | 45.7 | 63.8 | 100 | P | |
| Drive board:Transformer (TR1) Coil | 39.3 | 57.4 | 125 | P | |
| Drive board:Capacitor (C1) | 41.0 | 59.1 | 80 | P | |
| Drive board:Optical Isolator (U1) Body | 25.8 | 43.9 | 100 | P | |
| Drive board:Connector (CN4) | 44.6 | 62.7 | 125 | P | |
| Drive board:Optical Isolator (PC1) | 36.7 | 54.8 | 100 | P | |
| Control board:Relay (K1) | 27.2 | 45.3 | 85 | P | |
| Rear of Metal case:Close to IGBT | 29.1 | 47.2 | 55 | P | |
| Rear of Metal case:Close to Bus | 27.4 | 45.5 | 55 | P | |
| Ambient: t1: 25.8 °C ; t2: 26.9°C | | <i>temperature curves see page</i> | | | |

| 5.2.2.2 5.2.3.6 5.2.4 | TABLE: PWB short-circuit test, Short-circuit test and breakdown of component test, Abnormal operation tests | | | P |
|---|---|--------------------|--|--|
| | Ambient temperature (°C) | | 25°C 68RH | — |
| | Mains fuse during test (A) | | A suitable external circuit breaker must be employed before installation | — |
| Component No. | Fault | Supply voltage (V) | Test time | Observation |
| Model SV-DA200-022-4-S0 | | | | |
| Output U-V | Short circuit | 440 | 10min | Unit show Er01-0 immediately. Recoverable after remove fault condition. No damage, no hazard |
| Output U-W | Short circuit | 440 | 10min | Unit show Er01-0 immediately. Recoverable after remove fault condition. No damage, no hazard |
| Output V-W | Short circuit | 440 | 10min | Unit show Er01-0 immediately. Recoverable after remove fault condition. No damage, no hazard |
| Loss phase | Loss T | 440 | 10min | Unit operated as normal.No damage,no hazard |
| Loss phase | Loss S | 440 | 10min | Unit operated as normal.No damage,no hazard |
| Loss phase | Loss R | 440 | 10min | Unit operated as normal.No damage,no hazard |
| Half filter | clogged | 440 | 60min | Unit operated as normal. No damage, no hazard |
| All filter | clogged | 440 | 60min | Unit shut down during test. No damage, no hazard |
| All blower motors | Inoperative | 440 | 60min | Unit shut down during test. No damage, no hazard |
| Drive PCB | | | | |
| TR1 Pin(9-10) | Short circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| C1 | Short circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| PC1 pin(3-4) | Short circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| PC1 pin3 | Short circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| Q1 Pin D-G | Short circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |

| | | | | |
|------------------------|---------------|-----|-------|--|
| Q1 Pin S-G | Short circuit | 440 | 60min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| Q1 Pin S-D | Short circuit | 440 | 60min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| 24V power supply board | | | | |
| TR1 Pin(5-6) | Short circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| Q1 Pin D-G | Short circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| Q1 Pin S-G | Short circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| Q1 Pin S-D | Short circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| C8 | Short circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| PC1 pin(3-4) | Short circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |
| PC1 pin3 | Open circuit | 440 | 10min | After short, unit shut down immediately. Recoverable after remove fault condition. No damage, no hazard. |

| | | | | | | |
|---|--|--|-----------------|-------------|---------------|--------|
| 5.2.3.9 | TABLE: Protective bonding(SV-DA200-022-4-S0) | | | | P | |
| | Test current (A) | | | 10A | — | |
| Points of application | | | Resistance (mΩ) | Voltage (V) | Test time (s) | Result |
| Metal enclosure | | | Max.11 | - | 60 | Pass |
| Fan screws | | | Max.13 | | 60 | Pass |
| Supplementary information: limit is 20 mΩ | | | | | | |

| | | | | | | |
|--|-------------------------------|-----------------------|----------------|------|--------|-----|
| 5.2.5 | TABLE: Material tests | | | | | N/A |
| Part | Manufacturer of material/part | Type of material/part | Thickness (mm) | Test | Result | |
| — | — | — | — | — | — | |
| Supplementary information: UL Recognized material used | | | | | | |

| | | | | | | |
|-----------------|--|------------|----------------|---------------------------|-----------------------|---|
| 1 | TABLE: List of materials and components separately evaluated | | | | | P |
| Object/part No. | Manufacturer/trademark | Type/model | Technical data | Standard (Edition / year) | Mark(s) of conformity | |

| SV-DA200-022-4-S0 | | | | | |
|--------------------------|--|--------------------|--------------------|--------------|----|
| Insulation Barrier | E I DUPONT DE NEMOURS & CO INC | 410 | V-0,220° C | UL 746C | UL |
| | SABIC INNOVATIVE PLASTICS US L L C | FR1 | VTM-0,125° C | UL 746C | UL |
| | ITW ELECTRONICS COMPONENTS/ PRODUCTS (SHANGHAI) CO LTD | FORMEX GK-10 | VTM-0,115° C | UL 746C | UL |
| IGBT | Infineon Technologies AG | FF | 200A;1200V | UL1577 | UL |
| (Alt.) | SEMIKRON | SKM | 200A;1200V | UL1577 | UL |
| (Alt.) | FUJI | 2MBI200VH-120 | 200A;1200V | UL1557 | UL |
| (Alt.) | STARPOWER SEMICONDUCTOR LTD | GD200HFT120 C2S_G8 | 1200V, 200A, | UL1557 | UL |
| (Alt) | MITSUBISHI ELECTRIC CORP | CM200DY-24T | 1200V;200A ,175°C | UL1577 | UL |
| (Alt) | MACMIC SCIENCE & TECHNOLOGY CO LTD | MMG200D120 B6TN | 1200V;200A , 175°C | UL1577 | UL |
| Single-tube IGBT | MACMIC SCIENCE & TECHNOLOGY CO LTD | MMG100J120U Z | 100A;1200V | UL1577 | UL |
| Rectifier bridge | SILING | MDC100B-16 | 1600V, 100A | UL1577 | UL |
| (Alt.) | SEMIKRON | SKKD | 1600V, 100A | UL1577 | UL |
| (Alt) | SILING | MDC100-16 | 1600V, 100A | UL1577 | UL |
| (Alt.) | SILING | MDC100B-18 | 1800V, 100A | UL1577 | UL |
| (Alt) | CHANGZHOU RUIHUA POWER ELECTRONIC DEVICES CO LTD | MDC110-18 | 1800V, 100A | UL1577 | UL |
| (Alt) | MacMic Science & Technology Co.,Ltd | MMD110A180B | 1800V, 100A | UL1577 | UL |
| Contactator | Tianshui 213 Electrical Apparatus Co.,Ltd. | GSZ2-200S | DC24V/400 A | UL 60947-4-1 | UL |

| | | | | | |
|----------------------------|--|-------------------|---|--------------|-----------------------|
| (Alt) | Nanjing QuanNing Electrical Appliance Co.,Ltd. | QNZ-200A | DC24V/400 A | UL 60947-4-1 | UL |
| HALL | LEM | HAS200-S | 200A/4V,80 °C | UL 61010-1 | UL |
| (Alt) | Avadi | HCK10-200S | 200A/4V,80 °C | / | Test with appliance |
| Fan | DELTA | 3110KL05WB8 9B01 | 0.5A,24V | UL507 | UL |
| (Alt) | NIDEC | R8025Y24BPC B1I-7 | 0.53A,24V | UL507 | UL |
| (Alt) | NIDEC | AFB1224SHE-BX63 | 0.41A,24V | UL507 | UL |
| (Alt) | PELKO Motors | D12E-24PS11 | 0.5A,24V | UL507 | UL |
| (Alt) | DELTA | TA450DC-B34978-16 | 0.5A,24V | UL507 | UL |
| (Alt) | Shenzhen Huaxia Hengtai Electronic | DA12038B24U A | 24VDC,1.0A | UL507 | UL |
| (Alt) | Adda Corporation | AD0924HB-F91DS | 24VDC,0.4A | UL507 | UL |
| Terminal Blocks | SHENZHEN SUCCEED ELECTRONICS TECHNOLOGY CO LTD | TD100 | 600 V, 130 A (FW: 2, 22-1 AWG, 25.5 lb.in, CU, UG: C) | UL486A-486B | UL |
| Lightning protection board | | | | | |
| PCB | HUIZHOU GLORYSKY ELECTRONICS CO LTD | GS-D | 130°C, V-0 | UL94,UL796 | UL |
| Varistor(RV1,RV2,RV3,RV4) | CENTRA SCIENCE CORP | CNR-20D621K | 385V,1.0W | UL1449 | UL E316325 |
| (Alt) | BRIGHTKING (SHENZHEN) CO LTD | 621KD20 | 385V,1.0W | UL1449 | UL E327997 |
| (Alt) | EPCOS (ZHUHAI FTZ) CO LTD | S20K385 | 385V,1.0W | UL1449 | UL E321126 |
| (Alt) | SHAANXI HUAXING ELECTRONIC GROUP CO LTD | MYG20G20K62 1 | 385V,1.0W | UL1449 | UL E329651 |
| Y2 Cap (C9,C10) | Xiamen Faratronic Co.,Ltd | MKP63 | 0.1µF, 300VAC, 105 °C Y2 | EN 61800-5-1 | Tested with appliance |
| (Alt) | EPCOS | B3202# | 0.1µF, 300VAC, 105 °C Y2 | EN61800-5-1 | Test with appliance |
| Y2 Cap (C4,C13) | XIAMEN FARATRONIC CO LTD | C43 | 300Vac;0.22 uF 105 °C Y2 | UL 60384-14 | UL |

| | | | | | |
|------------------------------------|--|--------------|--------------------------------------|-------------|-----------------------|
| X2 Cap (C1,C2,C3) | XIAMEN FARATRONIC CO LTD | C42 | 275Vac;1.0 Uf 110 °C X2 | UL 60384-14 | UL |
| (Alt) | SHENZHEN SUCCEED ELECTRONICS TECHNOLOGY CO | C42 | 275Vac;1.0 Uf 110 °C X2 | UL 60384-14 | UL |
| 24V power supply board | | | | | |
| PCB | HUIZHOU GLORYSKY ELECTRONICS CO LTD | GS-D | 130°C, V-0 | UL94,UL796 | UL |
| Y2 Cap (C5,C6,C7,C8,C11,C12) | FENGHUA (HOLDING) CO LTD ZHENGHUA CERAMIC | CT7-Y2 | rated 250 Vac, 125° C4.7 nF | UL 60384-14 | UL E219015 |
| (Alt) | SHAANXI HUAXING ELECTRONIC DEVELOPMENT CO | CT7Y2 | rated 250 Vac, 125° C 4.7 nF | UL 60384-14 | UL E217400 |
| (Alt) | MURATA MFG CO LTD | KH | rated minimum 250 Vac, 125° C 4.7 nF | UL 60384-14 | UL E37921 |
| (Alt) | TDK CORPORATION | CS | rated 300 Vac, 125° C ,4.7 nF | UL 60384-14 | UL E37861 |
| (Alt) | VISHAY ELECTRONIC GMBH | VY2 | rated 300 Vac, 125° C ,4.7 nF | UL 60384-14 | UL E183844 |
| Opto coupler(TRN1,TRN2, TRN3,TRN4) | LITE-ON TECHNOLOGY CORP | PC817X3NIP0F | 5000Vac | UL1577 | UL |
| Transformer (TR1) | INVT ELECTRIC Co., Ltd. | PA1112T1 | / | EN61800-5-1 | Tested with appliance |
| -Bobbin | CHANG CHUN PLASTICS CO LTD | PQ3230 | 150°C, V-0 | UL94,UL746 | UL |
| - wire | SHEN ZHEN CITY CHENGWEI INDUSTRY CO.,LTD. | 2UEW | 130°C, V-0 | UL1446 | UL |
| | PACIFIC ELECTRIC WIRE&CABLE(S HENZHENCO., LTD. | 2UEW | 130°C, V-0 | UL1446 | UL |
| | TAI-I ELECTIC WIRE&CABLE.C O.LTD | 2UEW | 130°C, V-0 | UL1446 | UL |

| | | | | | |
|-------------------|--|--------------------|--|-------------|-----------------------|
| - Triple wire | GREAT LEOFLON INDUSTRIAL CO LTD | TRW-B | 130°C, V-0 | UL1446 | UL |
| | TOTOKU ELECTRIC CO LTD | TIW-2 | 130°C, V-0 | UL1446 | UL |
| | da hjin Technologies Co., Ltd. | TLW-B | 130°C, V-0 | UL1446 | UL |
| | FURUKAWA ELECTRIC CO.,LTD | TEX-E | 130°C, V-0 | UL1446 | UL |
| - tape | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO., LTD | CT280B | 130°C, V-0 | UL510 | UL |
| | P LEO & CO (B C) LTD | 1P801 | 130°C, V-0 | UL510 | UL |
| -Tube | CHANGYUAN ELECTRONICS (SHENZHEN) CO LTD | CB-TT-S | 200°C/600V | UL224 | UL |
| | GREAT HOLDING INDUSTRIAL CO LTD | TFS | 200°C/600V | UL224 | UL |
| | P LEO & CO (B C) LTD | 2T-TFS | 200°C/600V | UL224 | UL |
| - VARNISH | HANG CHEUNG PETROCHEMICAL LTD | 8562 | 155°C | UL1446 | UL |
| | WU JIANG TAIHU INSULATING MATERIAL CO LTD | ET-90(a) T-4260(a) | 155°C 130°C | UL1446 | UL |
| Fuse (F1) | HOLLYLAND CO LTD | 6FF | 1000V,1A | EN61800-5-1 | Tested with appliance |
| Brake board | | | | | |
| PCB | HUIZHOU GLORYSKY ELECTRONICS CO LTD | GS-D | 130°C, V-0 | UL94,UL796 | UL |
| Opto coupler(PC1) | AVAGO TECHNOLOGIES PTE LTD | ACPL-T350 | Rated 100°C, Isolation voltage: 3750/ 5000 V | UL1577 | UL |
| | SHARP CORP ELECTRONIC COMPONENTS AND DEVICES DIV | PC925L | Rated 100°C, Isolation voltage: 5000 V | UL1577 | UL |

| | | | | | |
|-------------------|---|------------|---|--------|----|
| | AVAGO TECHNOLOGIE S PTE LTD | HCPL-3120 | Rated 100° C, Isolation voltage: 3750/ 5000 V | UL1577 | UL |
| | TOSHIBA CORP, SEMICONDUCTOR CO DISCRETE SEMICONDUCTOR DIV | TLP350H | Rated 125° C, Isolation voltage: 3750 V | UL1577 | UL |
| | FAIRCHILD SEMICONDUCTOR CORP | FOD3150ASD | Rated 110° C, Isolation voltage: 5000 V | UL1577 | UL |
| | LITE-ON TECHNOLOGY CORP | LTV-3120 | Rated 110° C, Isolation voltage: 5300 V | UL1577 | UL |
| | VISHAY INFRARED COMPONENTS INC | VO3120 | Rated 115° C, Isolation voltage: 5300 V | UL1577 | UL |
| | CT MICROELECTRONICS FAR EAST LTD | CT350 | Rated 100° C, Isolation voltage: 5000 V | UL1577 | UL |
| | TOSHIBA CORP | TLP350 | Rated 125° C, Isolation voltage: 3750 V | UL1577 | UL |
| Opto coupler(PC2) | SHARP CORP ELECTRONIC COMPONENTS AND DEVICES DIV | PC123 | Rated 110° C, Isolation voltage: 5000 V | UL1577 | UL |
| | LITE-ON TECHNOLOGY CORP | LTV-816 | Rated 115° C, Isolation voltage: 5300 V | UL1577 | UL |
| | AVAGO TECHNOLOGIE S PTE LTD | HCPL-817 | Rated 110° C, Isolation voltage: 5000 V | UL1577 | UL |
| | FAIRCHILD SEMICONDUCTOR CORP | FOD817CSD | Rated 110° C, Isolation voltage: 5000 V | UL1577 | UL |
| | VISHAY INFRARED COMPONENTS INC | VO617A | Rated 115° C, Isolation voltage: 5300 V | UL1577 | UL |

| | | | | | |
|---------------------------|---|----------------|--|------------|----|
| | CT MICROELECTR ONICS FAR EAST LTD | CT817C | Rated 110° C, Isolation voltage: 5000 V | UL1577 | UL |
| | EVERLIGHT | EL816 | Rated 125° C, Isolation voltage: 5000V | UL1577 | UL |
| Connector CN3 | SHENZHEN SHINNING ELECTRONIC CO LTD | 1344-041 | DSR all, minimum 105°C | UL 94 | UL |
| (Alt) | CVILUX CORP | CI5204P1V00 | DSR all, minimum 105° C | UL 94 | UL |
| Connector CN2 | SHENZHEN SHINNING ELECTRONIC CO LTD | 1344-031-110-2 | 250V,7A, 3P, V-0 | UL 94 | UL |
| (Alt) | CVILUX CORP | CI5203P1V00 | DSR all, minimum 105° C | UL 94 | UL |
| Brake driver board | | | | | |
| PCB | HUIZHOU GLORYSKY ELECTRONICS CO LTD | GS-M2 | 130°C, V-0 | UL94,UL796 | UL |
| Opto coupler(U1) | AVAGO TECHNOLOGIE S PTE LTD | QCPL-329J | 5000Vac | UL1577 | UL |
| (Alt) | FAIRCHILD SEMICONDUCT OR CORP | FOD8333R2V | 5000Vac | UL1577 | UL |
| Varistor(RV1,RV2,RV 3) | CENTRA SCIENCE CORP | CNR-14D391K | 990V, 85°C | UL1449 | UL |
| (Alt) | BRIGHTKING (SHENZHEN) CO LTD | 391KD14 | 1500V, 85°C | UL1449 | UL |
| (Alt) | EPCOS (ZHUHAI FTZ) CO LTD | S14K250 | 1200V, 85°C | UL1449 | UL |
| Y cap. (C80-C83) | FENGHUA (HOLDING) CO LTD ZHENGHUA CERAMIC | CT7-Y2 | rated 250 Vac, 125° C 4.7 nF | UL60384-14 | UL |
| (Alt) | SHAANXI HUAXING ELECTRONIC DEVELOPMENT CO | CT7Y2 | rated 250 Vac, 125° C 4.7 nF | UL60384-14 | UL |
| (Alt) | MURATA MFG CO LTD | KH | rated minimum 250 Vac, 125° C 4.7 nF | UL60384-14 | UL |

| | | | | | |
|------------------------|--|-------------|--|-------------|-----------------------|
| (Alt) | TDK CORPORATION | CS | rated 300 Vac, 125° C, 4.7 nF | UL60384-14 | UL |
| (Alt) | VISHAY ELECTRONIC GMBH | VY2 | rated 300 Vac, 125° C, 4.7 nF | UL60384-14 | UL |
| Opto coupler | SHARP CORP ELECTRONIC COMPONENTS AND DEVICES DIV | PC123 | Rated 110° C, Isolation voltage: 5000 V | UL1577 | UL |
| (Alt) | LITE-ON TECHNOLOGY CORP | LTV-816 | Rated 115° C, Isolation voltage: 5300 V | UL1577 | UL |
| (Alt) | AVAGO TECHNOLOGIE S PTE LTD | HCPL-817 | Rated 115° C, Isolation voltage: 5300 V | UL1577 | UL |
| (Alt) | FAIRCHILD SEMICONDUCTOR CORP | FOD817CSD | Rated 110° C, Isolation voltage: 5000 V | UL1577 | UL |
| (Alt) | VISHAY INFRARED COMPONENTS INC | VO617A | Rated 115° C, Isolation voltage: 5300 V | UL1577 | UL |
| (Alt) | CT MICROELECTRONICS FAR EAST LTD | CT817C | Rated 110° C, Isolation voltage: 5000 V | UL1577 | UL |
| (Alt) | EVERLIGHT | EL816 | Rated 125° C, Isolation voltage: 5000V | UL1577 | UL |
| Rectifier bridge (DB2) | PAN JIT ELECTRONICS (WUXI) CO LTD | DI1010S | 1000V, 1A, 150°C | UL1012 | UL |
| Transformer TR1 | SHENZHEN BOULDER ELECTRONIC CO.,LTD | GD300-30GT1 | 80uH MAX | EN61800-5-1 | Tested with appliance |
| Bobbin | CHANG CHUN PLASTICS CO LTD. | T375J | V-0, HAI=0, HWI=1, CTI PLC=3, 150° C, Min. 0.75 mm | UL94,UL764 | UL |

| | | | | | |
|--------------------|--|-------------------|--|-------------|------------|
| (Alt) | CHANG CHUN PLASTICS CO LTD | T375HF | V-0, HAI=0, HWI=1, CTI PLC=3, 150° C, Min. 0.75 mm | UL94,UL764 | UL |
| Triple wire | FURUKAWA ELECTRIC CO.,LTD | TEX-E Φ0.40 130°C | TEX-E | UL1446 | UL |
| (Alt) | da hjin Technologies Co., Ltd. | TLW-B 130°C | TLW-B 130°C | UL1446 | UL |
| (Alt) | COSMOLINK CO LTD | TIW-M 130°C | TIW-M 130°C | UL1446 | UL |
| (Alt) | GREAT LEOFLON INDUSTRIAL CO LTD | TRW-B 130°C | TRW-B 130°C | UL1446 | UL |
| Insulation Tape | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | CT or CT-280B | 130° C | UL510 | UL |
| (Alt) | P LEO & CO LTD | 1P801 | 130° C | UL510 | UL |
| Margin Tape | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | WF | 130° C | UL510 | UL |
| Tube | various | various | 600 V, 200° C | UL224 | UL |
| Relay K2 | XIAMEN HONGFA ELECTROACOUSTIC CO LTD | JQX-115F | Coil: 24V DC, Contactor 250VAC, 8A | EN 61810-1 | VDE |
| (Alt) | OMRON CORP | G2RL-2 | 250Vac,16A | EN61810-1 | VDE 119650 |
| 15KW series | | | | | |
| Y cap.(C2,C4,C6) | TDK CORPORATION | CS | 250VAC;10 nF | UL60384-14 | UL |
| (Alt) | MURATA MFG CO LTD | KH | 250VAC;10 nF | UL60384-14 | UL |
| Single-tube IGBT | INFINEON TECHNOLOGIES AG | IGW60T120 | 60A;1200V | UL1577 | UL |
| Terminal Blocks | SHENZHEN SUCCEED ELECTRONICS TECHNOLOGY CO LTD | TB2000 | 80A;600V | UL486A-486B | UL |
| Fan | DELTA ELECTRONICS INC | FFB0924SHE | 24V,0.4A | UL507 | UL |

| | | | | | |
|---------------------------------|---|--------------------|-----------------------|------------|----|
| (Alt) | ADDA CORP | AD0924HB | 24V,0.4A | UL507 | UL |
| (Alt) | DONGGUAN PROTECHNIC ELECTRIC CO LTD | MGA9224HB | 24V,0.4A | UL507 | UL |
| HALL | LEM SWITZERLAND S A | HAS100-S | 100A/4V,80 °C | UL 61010-1 | UL |
| Three-phase rectifier bridge | CHANGZHOU RUIHUA POWER ELECTRONIC DEVICES CO LTD | MDS200-16 | 1600V;200A ; 150°C | UL1577 | UL |
| (Alt) | YANGZHOU SILING ELECTRONICS CO LTD | MDS200-16 | 1600V;200A ; 150°C | UL1577 | UL |
| IGBT | STARPOWER SEMICONDUCT OR LTD | GD150FFL120 C6S | 1200V;150A ; 175°C | UL1577 | UL |
| (Alt) | INFINEON TECHNOLOGIE S AG | FS150R12KT4 | 1200V;150A ; 175°C | UL1577 | UL |
| (Alt) | MITSUBISHI ELECTRIC CORP | CM150TX- 24S1 | 1200V;150A ; 175°C | UL1577 | UL |

| | | | | | | |
|----------------------------------|---|---------|---------|--------------|------|-------------|
| 6 | TABLE: Information and marking requirements | | | | | P |
| | | Product | Package | Installation | User | Maintenance |
| 6.2 | Information for selection | | | | | |
| | - Name or trademark of the manufacturer, supplier or importer | OK | OK | OK | OK | OK |
| | - Catalogue number or equivalent | OK | OK | OK | OK | OK |
| | - Voltage rating | OK | - | OK | - | OK |
| | - Current rating | OK | - | OK | - | OK |
| | - Power rating | OK | - | OK | - | OK |
| | - Frequency | OK | - | OK | - | OK |
| | - Number of phases | OK | - | OK | - | OK |
| | - Reference to standards | - | - | OK | - | - |
| | - Date code or serial number | OK | - | - | - | - |
| | - Reference to instructions | - | - | OK | OK | OK |
| 6.3 | Information for installation and comissioning | | | | | |
| 6.3.2: Mechanical considerations | | - | OK | OK | - | OK |
| - Dimensions (SI units) | | - | - | OK | - | OK |
| - Mass (SI units) | | - | OK | OK | - | OK |

| | | | | | |
|--|-----|----|-----|-----|-----|
| - Mounting details (SI units) | - | - | OK | - | OK |
| 6.3.3: Environment (operation, transport, storage) | - | - | OK | - | OK |
| - Temperature | - | - | OK | - | OK |
| - Humidity | - | - | OK | - | OK |
| - Altitude | - | - | OK | - | OK |
| - Pollution | - | - | OK | - | OK |
| - Ultra violet light | - | - | OK | - | OK |
| - Type of electrical supply system | - | - | OK | - | - |
| - Field supply requirements (if any) | - | - | OK | - | - |
| - IP rating | OK | - | OK | - | OK |
| 6.3.4: Handling and mounting | - | OK | OK | - | OK |
| - Packing and unpacking | - | OK | OK | - | OK |
| - Moving | - | OK | OK | - | OK |
| - Lifting | - | OK | OK | - | OK |
| - Strength and rigidity of mounting surface | - | OK | OK | - | OK |
| - Fastening | - | OK | OK | - | OK |
| - Coolant type and design pressure for liquid cooled product | - | - | OK | - | OK |
| - Provision of adequate access for operation, adjustment and maintenance | - | OK | OK | - | OK |
| - Warning if mounting surface exceeds 90 °C : | - | - | N/A | - | - |
| 6.3.5.1: Motor selection | - | - | N/A | N/A | N/A |
| 6.3.5.2: Motor integrated sensors | - | - | N/A | N/A | N/A |
| 6.3.5.3: Critical torsional speeds | - | - | N/A | N/A | N/A |
| 6.3.5.4: Transient torque analysis | - | - | N/A | N/A | N/A |
| 6.3.6.2: Interconnection and wiring diagrams .. | - | - | OK | - | OK |
| 6.3.6.3: Conductor (cable) selection | - | - | OK | - | OK |
| 6.3.6.4: Terminal capacity and identification .. | OK | - | OK | - | OK |
| 6.3.6.5: Protection requirements | - | - | OK | OK | OK |
| - Protective class | OK | - | OK | OK | OK |
| - Interface details | - | - | OK | - | OK |
| - Terminals with protective separation | - | - | OK | OK | OK |
| 6.3.6.6: Earthing | - | - | OK | - | OK |
| - Symbol IEC 60417-5019, PE or green-yellow | OK | - | - | - | - |
| - Symbol IEC 6417-5172 for Class II | N/A | - | - | - | - |
| 6.3.6.7: Protective earthing conductor current : | - | - | OK | - | OK |
| - Symbol ISO 7000-0434 and instruction | OK | - | OK | - | OK |
| - RCD compability | - | - | N/A | - | N/A |

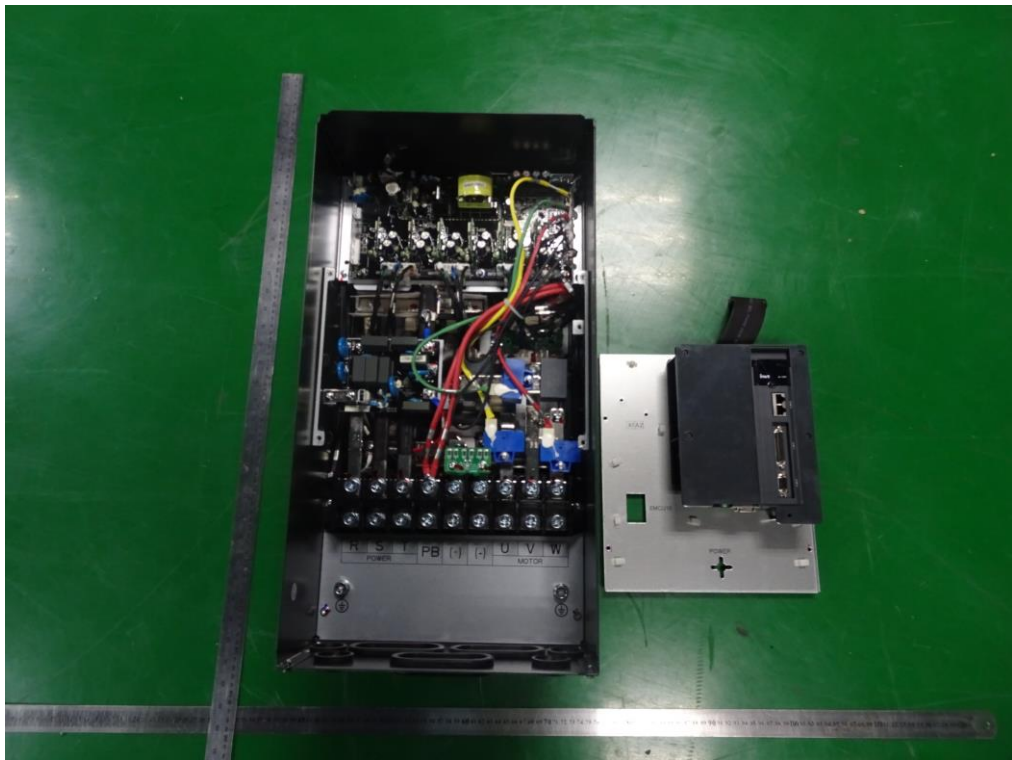
| | | | | | |
|---|-----------------------------|---|----|-----|----|
| 6.3.6.8: Special requirements | - | - | OK | - | OK |
| 6.3.7: Supply overcurrent or short-circuit protection | - | - | OK | - | OK |
| 6.3.8: Motor overload protection | - | - | OK | - | OK |
| 6.3.9: Commissioning | - | - | OK | - | - |
| 6.4 | Information for use | | | | |
| 6.4.1: General | - | - | OK | OK | OK |
| 6.4.2: Adjustment | OK | - | OK | OK | OK |
| 6.4.3: Labels, signs, and signals | OK | - | OK | OK | OK |
| 6.4.3.1: General | OK | - | OK | OK | OK |
| 6.4.3.2: Isolators | OK | - | - | - | - |
| 6.4.3.3: Visual and audible signals | OK | - | - | OK | - |
| 6.4.3.4: Hot surfaces, symbol IEC 60417-5041 | N/A | - | - | N/A | - |
| 6.4.3.5: Equipment marking | OK | - | OK | OK | OK |
| 6.5 | Information for maintenance | | | | |
| 6.5.1: General..... | - | - | - | OK | OK |
| - Maintenance procedures and schedules | - | - | - | - | OK |
| - Maintenance schedules | - | - | - | OK | OK |
| - Safety precautions | - | - | - | - | OK |
| - Location of live parts accessible during maintenance | - | - | - | - | OK |
| - Adjustment procedures | - | - | OK | OK | OK |
| - Repair and replacement procedures | - | - | - | - | OK |
| - Special tools list | - | - | - | OK | OK |
| 6.5.2: Capacitor discharge | OK | - | OK | - | OK |
| 6.5.3: Auto restart/bypass | - | - | OK | OK | OK |
| 6.5.4: Potential Transformer (PT) / Current Transformer (CT) connection | OK | - | OK | - | OK |
| 6.5.5: Other hazards | OK | - | - | - | OK |
| Supplementary information: | | | | | |

Photographs of samples

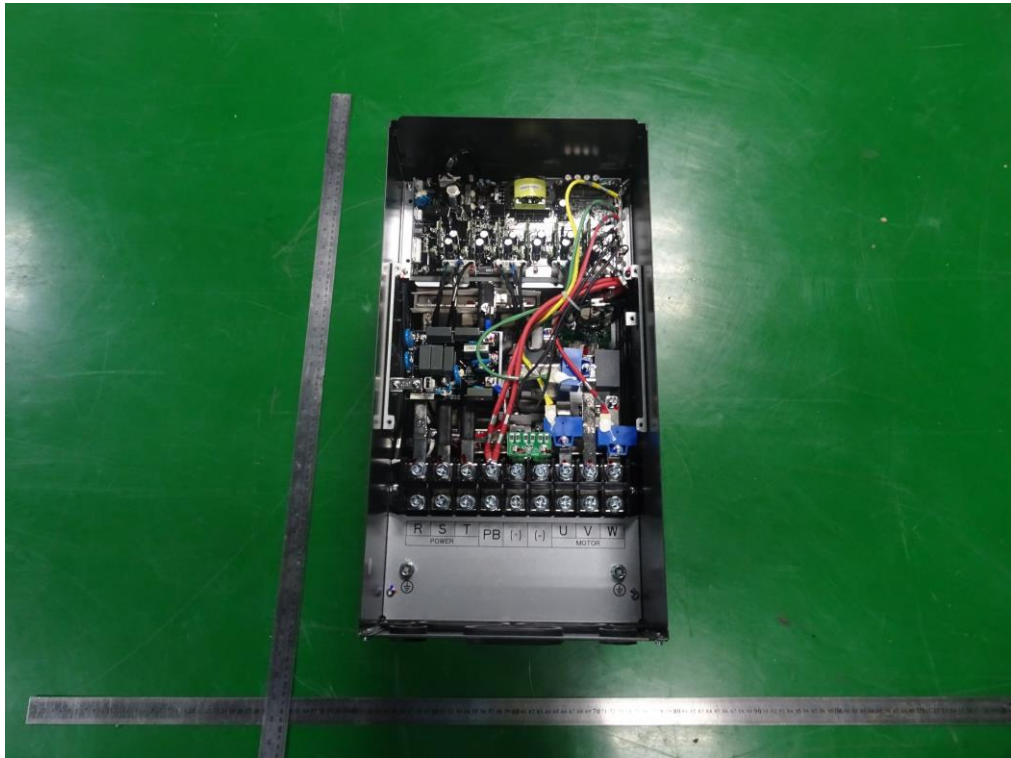
(Model No.: **SV-DA200-022-4-S0**)



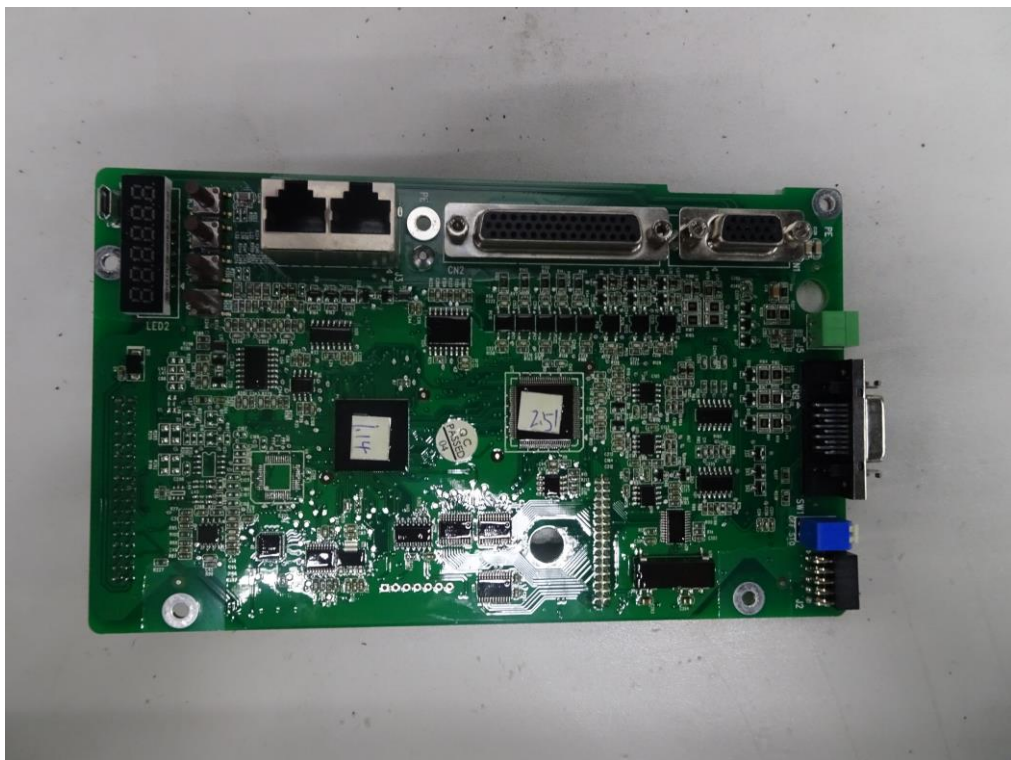
General view



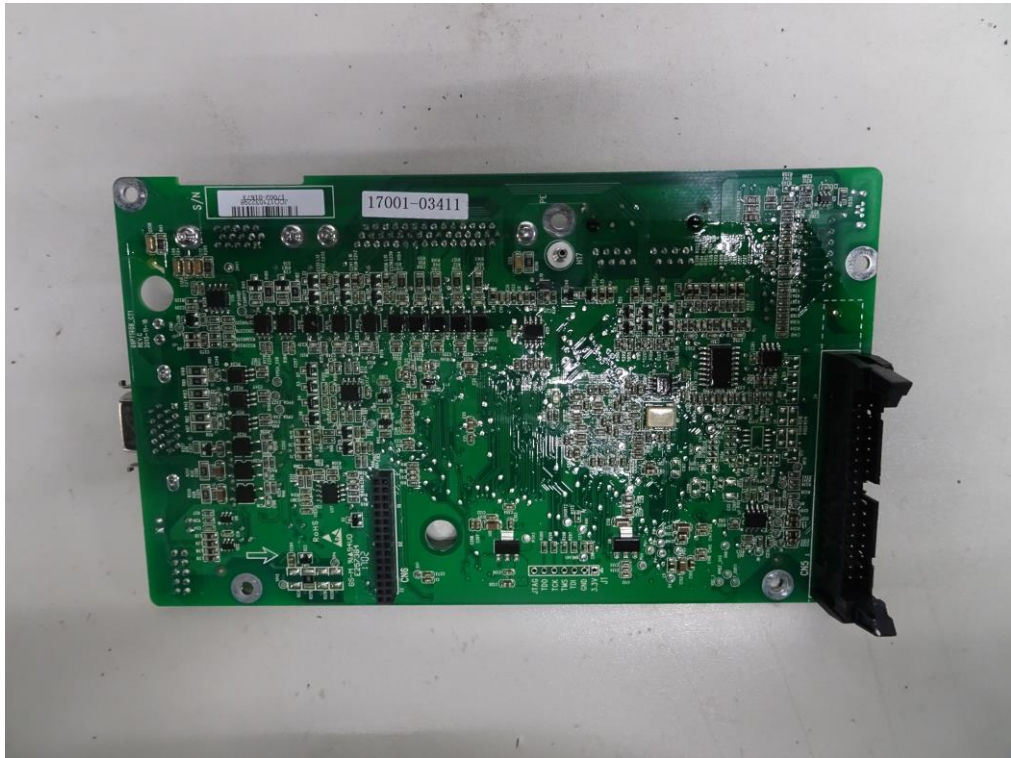
Internal view



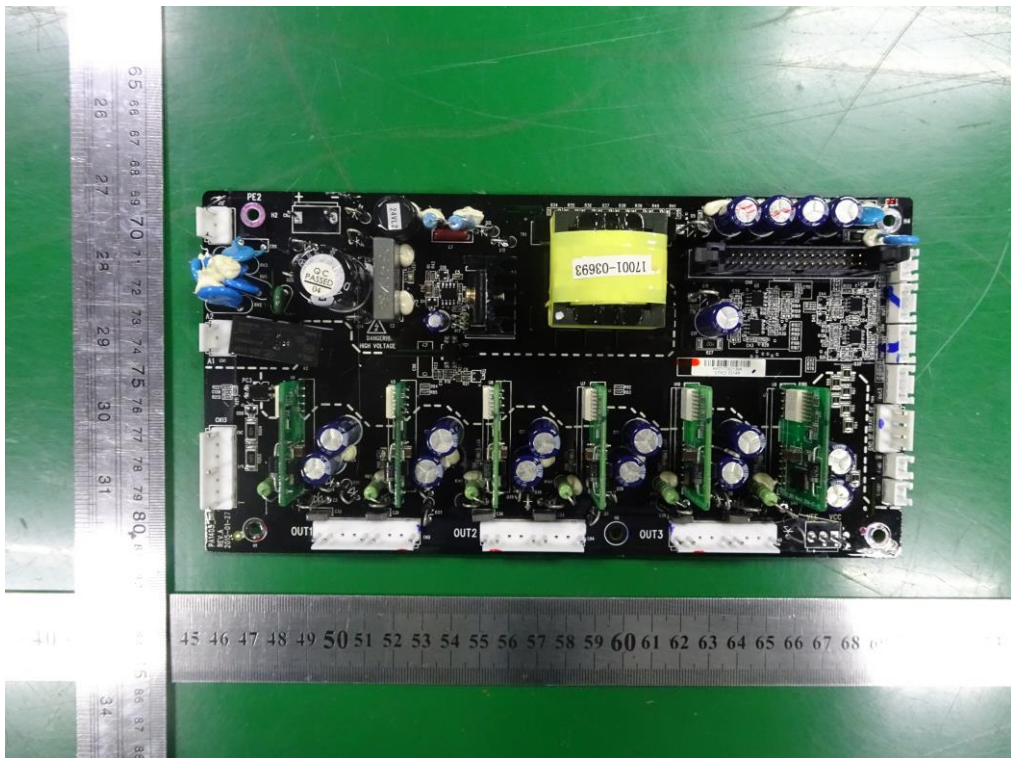
Internal view



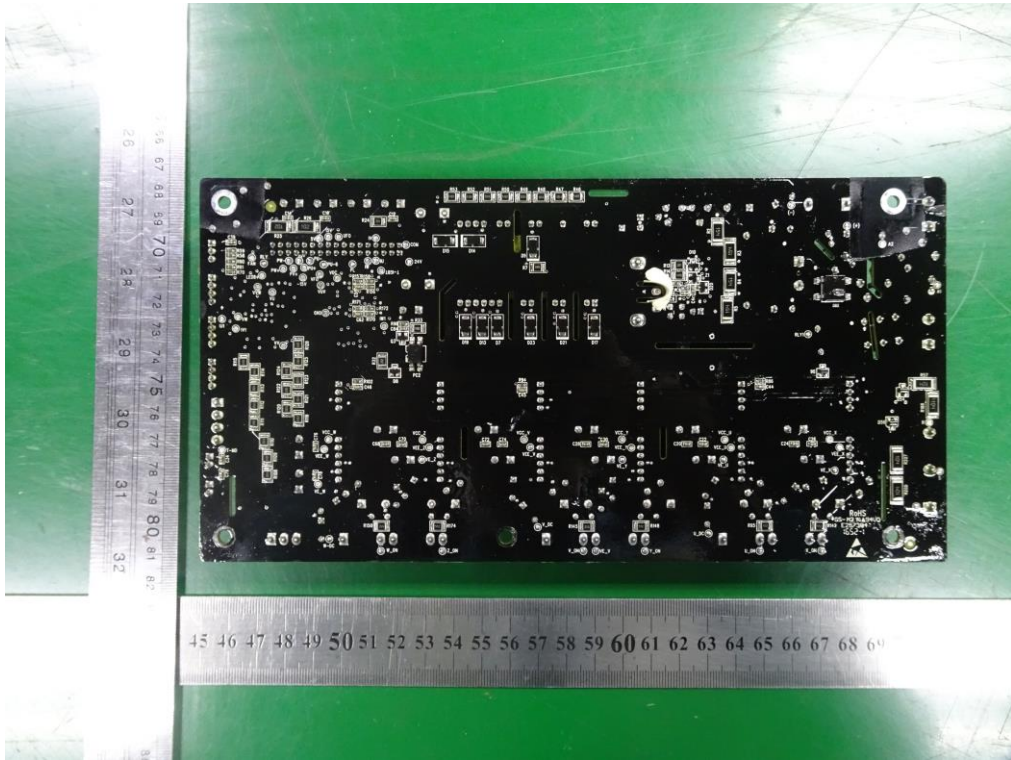
Control panel PCB components side



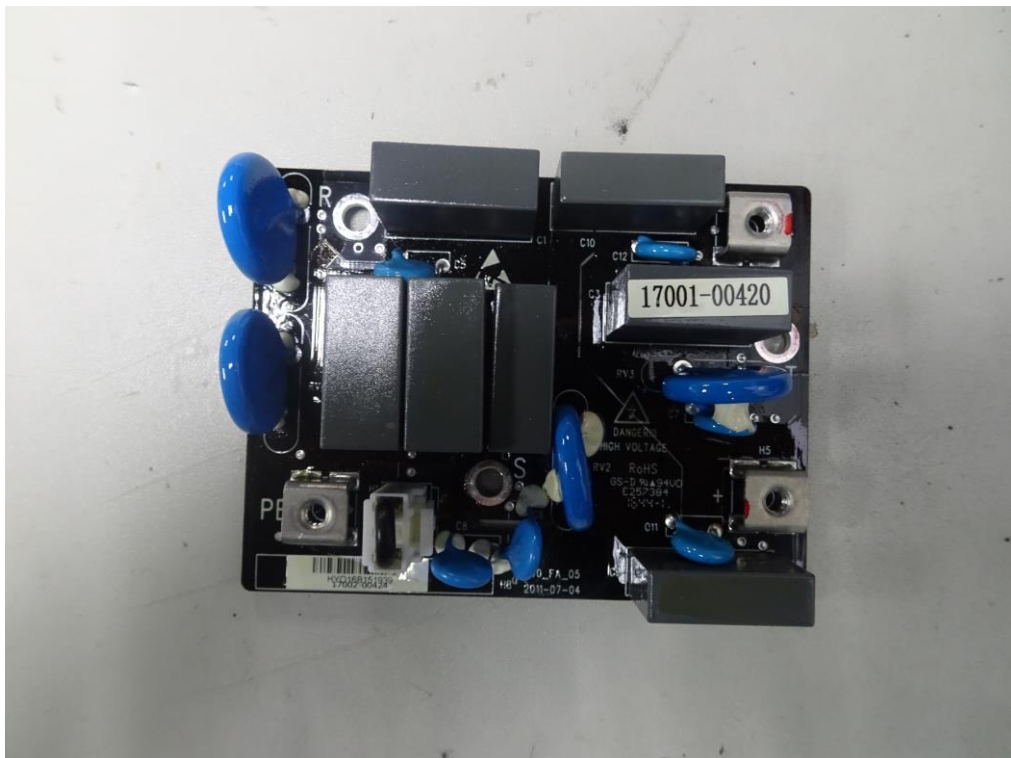
Control panel PCB track side



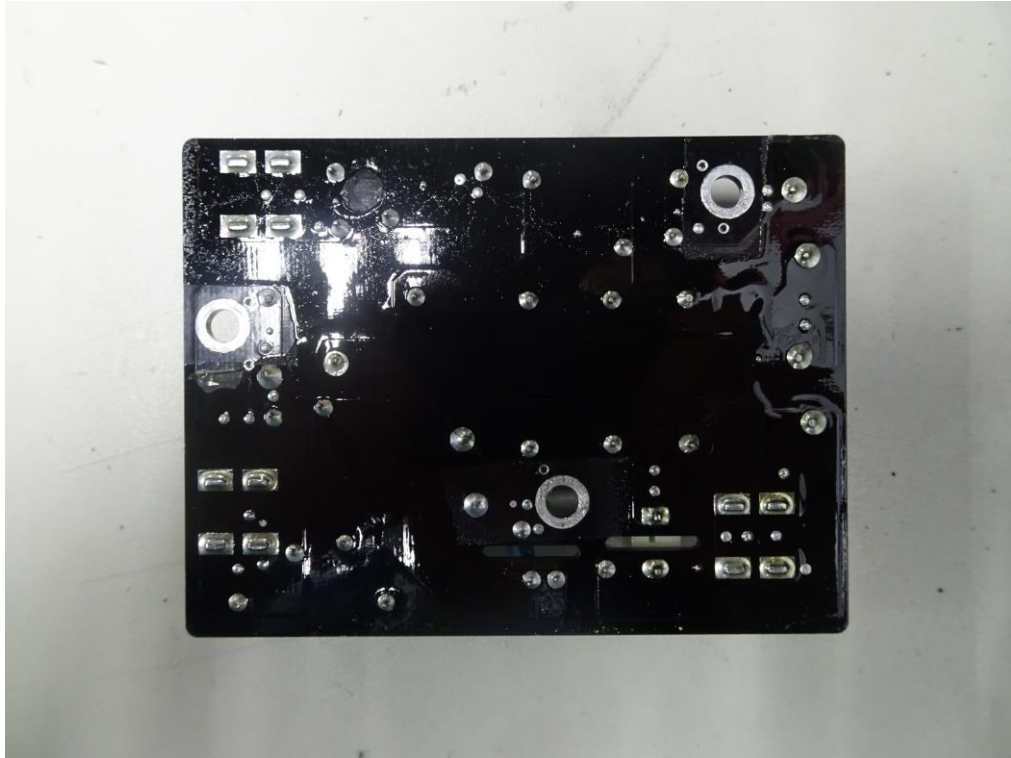
Drive PCB components side



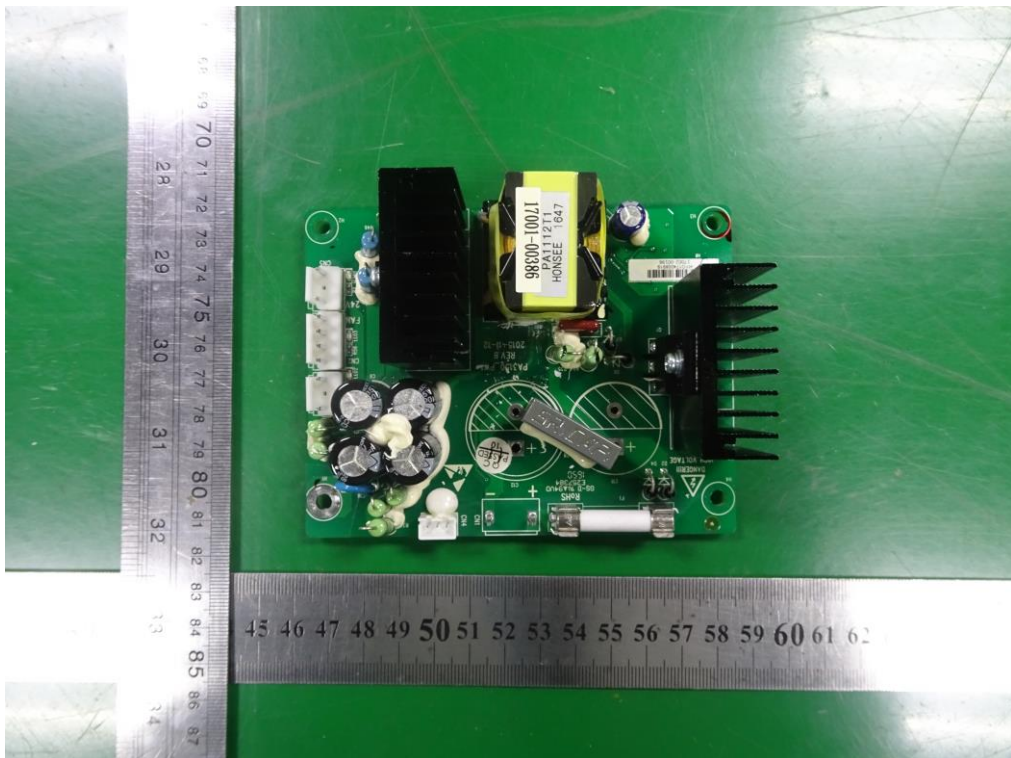
Drive PCB track side



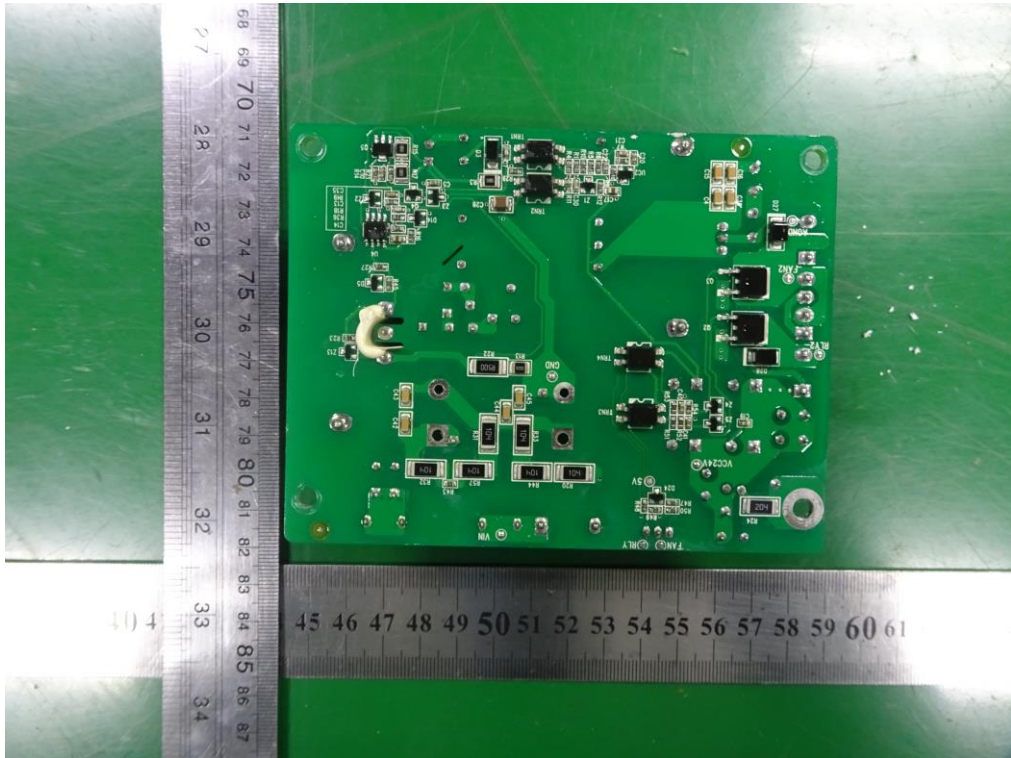
EMI PCB components side



EMI PCB track side



Fan power supply board components side



Fan power supply board track side

-END OF REPORT-