

| TEST REPORT DIN V VDE V 0126-1-1 Automatic disconnecting device between a generator and the public low-voltage grid | |
|--|---|
| Report Reference No. | 210902250SHA-002 |
| Tested by (name + signature) | Billy Chen <i>Billy Chen</i> |
| Approved by (name + signature) | Selif Sui <i>Selif Sui</i> |
| Date of issue | 2021-09-29 |
| Contents | 16 pages |
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| Address | Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China. |
| Testing location / procedure | TL <input checked="" type="checkbox"/> SMT <input type="checkbox"/> TMP <input type="checkbox"/> |
| Testing location / address | Same as above |
| Applicant's name | Dongguan Kaideng Energy Technology Co., Ltd. |
| Address | 4 th floor, Fuyuan business building, no. 1, Lane 13, xin'an maiyuan Road, Chang 'an town, Dongguan City, Guangdong, China. |
| Test specification: | |
| Standard | DIN V VDE V 0126-1-1: 2013 |
| Test procedure | Type test |
| Non-standard test method | N/A |
| Test Report Form/blank test report | |
| Test Report Form No. | VDE 0126-1-1_TTRF V1.0 |
| TRF Originator | Intertek Shanghai |
| Master TRF | 2016-07 |
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| | |
|------------------------------------|------------------------------------|
| Test item description | Utility-Interactive Micro Inverter |
| Trade Mark | KDWVC, CRAFTSTROM |
| Manufacturer..... | Same as applicant |
| Model/Type reference..... | WVC-350W, WVC-300W, Hedy |
| Rating..... | See below Specifications table |

| Specifications table | | | |
|-------------------------------|---|-------------------|-------------|
| Model | KDWVC-350W | KDWVC-300W | Hedy |
| Input: | | | |
| Vmax PV (Vdc) | 60 | 60 | 100 |
| Isc PV (absolute Max.) (A) | 20 | 15 | 7 |
| Number MPP trackers | 1 | 1 | 1 |
| Number input strings | 1 | 1 | 1 |
| Max. PV input current(A) | 14 | 13.6 | 6 |
| MPPT voltage range (Vdc) | 25 to 60 | 25 to 60 | 60 to 100 |
| Output | | | |
| Normal Voltage(V) | <input checked="" type="checkbox"/> 1/N/PE 230Vac <input type="checkbox"/> 3 φ /N/PE 230/400Vac | | |
| Frequency (Hz) | <input checked="" type="checkbox"/> 50 Hz <input type="checkbox"/> 60Hz | | |
| Current (Max. continuous) (A) | 1.52 | 1.3 | 1.3 |
| Power rating (W) | 350 | 300 | 300 |
| Power Rating (VA) | 350 | 300 | 300 |
| Power factor /rated | ≥0.99 | ≥0.99 | ≥0.99 |
| others | | | |
| Protective class | Class I | | |
| Ingress protection (IP) | IP 65 | | |
| Temperature (°C) | -40°C to +50°C | | |
| Inverter Isolation | <input type="checkbox"/> Non-isolated <input checked="" type="checkbox"/> High frequency isolated | | |
| Overvoltage category | OVC III (AC Main), OVC II (PV) | | |
| Weight (kg) | 0.82 | | |
| Dimensions (WxHxD) (mm) | 165 x 176 x 38 | | |

Possible test case verdicts:

- test case does not apply to the test object..... : N/A
- test case does not verify to the test object..... N/E
- test object does meet the requirement : P(Pass)
- test object does not meet the requirement : F(Fail)

Testing..... :

Date of receipt of test item..... : 2021-06-12

Date (s) of performance of tests..... : 2021-06-22 to 2021-08-17

General remarks:

The test results presented in this report relate only to the object (single PV inverter unit) tested. The testing voltage is 230Vac single phase. The information about Generating Plant is not considered and tested.

The inverter is high-frequency isolated and without a power relay at AC output. There is a controller in inverter but is not constructed redundantly protection.

NS protection don't consider in the report. NS protection should be considered after the installation.

Installer and relevant persons shall comply with VDE0126-1-1 and relevant standard and Grid Code in this standard.

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.

Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods.

The test results presented in this report relate only to the item tested. See general product information next for details information.

The test does not include the faults inside the CPU and software evaluation as agreed with Applicant.

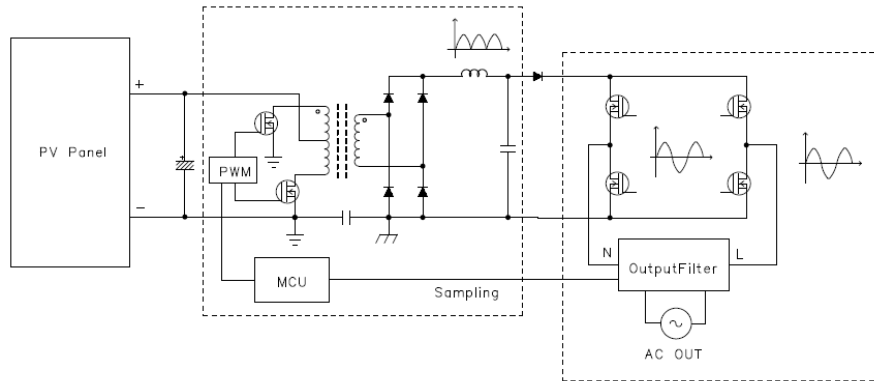
All the tests are performed on single unit.

General product information:

The Solar inverter converts DC power into AC power.

The unit is providing EMC filtering at the output toward mains. The unit provided galvanic insulation from input to output (high frequency transformer isolation). The interface switch is not provided in the solar inverter, the external NS protection device shall be provided at the end use.

Block diagram:



The model KDWVC-300W is identical to model KDWVC-350W except the power de-rating by software; the model Hedy is identical to model KDWVC-300W except the input voltage range.

The testing performed on typical model KDWVC-350W, is valid for model KDWVC-300W and Hedy.

The software version used for the testing is:

300W and Hedy Firmware version: WVC300R3-55-100-433-c3

350W Firmware version: WVC350R3-55-100-433-c3

Abbreviations used in the report:

PGU: Power Generation unit.

PGS: Power Generation System

In: Rated current of power generation unit.

Copy of marking plate:

91,00 mm

KDWVC
Micro Solar Inverter

Model: KDWVC-350

Automatic adaptation of AC voltage worldwide
Forward excitation full complement high frequency modulation grid-connected mode
High precision voltage sensing micro-grid mode
Real-time collection of IOT multi-point collection data
Smartphone APP Monitoring System
Automatic adaptation of the world's AC frequency
No professional installation and maintenance required
Built-in high-precision electricity meter
Dual engine maximum power point tracking (MPPT)

Product Parameters

| | |
|--------------------------------------|----------------|
| MPPT range DC: | 25Vdc-60Vdc |
| Maximum input short circuit current: | 23A |
| Range of operating dc input voltage: | 22V-60V |
| Range of operating dc input current: | 0A-14A |
| Max DC Current/Voltage/Watts: | 14A/60V/350W |
| AC output: | 230V |
| Oper. freq. Hz: | 50 |
| Output power factor: | 0.99 min |
| AC max. cont. output current: | 1.52 A |
| AC max. cont. output power: | 330W |
| Max. units per branch: | 10 |
| Waterproof: | IP65 |
| Operation ambient temperature: | -25°C to +50°C |

WARNING
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference.
2. This device must accept any interference received, including that interference that may cause undesired operation.

CAUTION
Risk of electric shock. Normally grounded conductors may be energized and exposed when a grounded fault is indicated.
Do not remove cover or user serviceable parts inside. Refer servicing to qualified service personnel.
Both AC and DC voltage sources are terminated inside this equipment. Each circuit must be individually disconnected before servicing.
When the photovoltaic array is exposed to light, it supplies a DC voltage to this equipment.
To be connected only to a designated branch circuit.
Maximum branch circuit over current protection: 35A

59,00 mm

91,00 mm

KDWVC
Micro Solar Inverter

Model: KDWVC-300

Automatic adaptation of AC voltage worldwide.
Forward excitation full complement high frequency modulation grid-connected mode.
High precision voltage sensing micro-grid mode.
Real-time collection of IOT multi-point collection data
Smartphone APP Monitoring System
Automatic adaptation of the world's AC frequency
No professional installation and maintenance required
Built-in high-precision electricity meter
Dual engine maximum power point tracking (MPPT)

Product Parameters

| | |
|--------------------------------------|----------------|
| MPPT range DC: | 25Vdc-60Vdc |
| Maximum input short circuit current: | 13A |
| Range of operating dc input voltage: | 22V-60V |
| Range of operating dc input current: | 0A-9.5A |
| Max DC Current/Voltage/Watts: | 13.5A/60V/300W |
| AC output: | 230V |
| Oper. freq. Hz: | 50 |
| Output power factor: | 0.99 min |
| AC max. cont. output current: | 1.3A |
| AC max. cont. output power: | 300W |
| Max. units per branch: | 10 |
| Waterproof: | IP65 |
| Operation ambient temperature: | -25°C to +50°C |

WARNING
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference.
2. This device must accept any interference received, including that interference that may cause undesired operation.

CAUTION
Risk of electric shock. Normally grounded conductors may be energized and exposed when a grounded fault is indicated.
Do not remove cover or user serviceable parts inside. Refer servicing to qualified service personnel.
Both AC and DC voltage sources are terminated inside this equipment. Each circuit must be individually disconnected before servicing.
When the photovoltaic array is exposed to light, it supplies a DC voltage to this equipment.
To be connected only to a designated branch circuit.
Maximum branch circuit over current protection: 35A

59,00 mm

CRAFTSTROM
Interactive Micro Inverter

Model: Hedy

MPPT range DC: 80Vdc-100Vdc
Maximum input short circuit current: 7A
Range of operating dc input voltage: 50V-100V
Range of operating dc input current: 0A-6.5A
Max DC Current/Voltage/Watts: 6A/100Vdc/300W
AC output: 230V
Oper. freq. Hz: 50
Output power factor: 0.99 min
AC max. cont. output current: 1.3 A
AC max. cont. output power: 300W
Max. units per branch: 5
Waterproof: IP65
Operation ambient temperature: -20°C to +50°C

CAUTION ⚠️

- Risk of electric shock.
- Do not remove cover. You may not service this device.
- Equipment may only be opened by qualified service technicians.
- Both AC and DC Voltage sources are terminated inside the equipment. Each circuit must be individually disconnected before servicing.
- When the photovoltaic array is exposed to light and plugged into the inverter, it supplies a DC voltage.
- To be connected to designated circuit with a max. current protection of 15A.

ACHTUNG! ⚠️

- Stromschlag Gefahr
- Abdeckung nicht entfernen. Sie dürfen dieses Gerät nicht warten.
- Das Gerät darf nur von qualifizierten Service-Technikern geöffnet werden.
- Sowohl Wechsel- als auch Gleichstromspannungsquellen sind innerhalb des Geräts abgeschirmen. Jeder Stromkreis muss vor der Wartung einzeln abgeschaltet werden.
- Wenn der Photovoltaikarray Licht ausgesetzt und an den Wechselstrom angeschlossen ist, liefert es eine Gleichstromspannung.
- Muss an einen eigenen Stromkreis mit einer maximalen Stromstärke von 15 A angeschlossen werden.

ATTENTION! ⚠️

- Risque de choc électrique.
- Ne pas retirer le boîtier. Vous ne pouvez pas réparer cet appareil.
- L'appareil ne peut être réparé que par un technicien qualifié.
- Les sources de tension CA et CC sont terminées à l'intérieur. Chaque circuit doit être déconnecté individuellement avant entretien.
- Lorsque le champ photovoltaïque est exposé à la lumière et branché sur l'inverseur à fournie une tension continue.
- À connecter au circuit désigné avec un courant de protection maximum de 15A.

| VDE-0126-1-1:2013 | | | |
|-------------------|--|--|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 4 | REQUIREMENTS. | | P |
| | These requirements apply to integrated or separate (independent) disconnecting devices unless otherwise noted. | | P |
| | The disconnection device has to cut off the power generating system on the ac side from the grid by two switches in series when: <ul style="list-style-type: none"> the voltage and/or the frequency of the grid is deviating, direct current (DC) is fed into the Grid. unintentional islanding operation occurs, intentional islanding operation using grid backup systems (emergency supplies). | The external central NS protection used; it shall be considered after the installation. | N/E |
| 4.1 | Functional safety The safety must be assured under all operating conditions complying with the defined functions 4.3 to 4.6 and – if applicable – 4.8 of the disconnection device. The disconnection device can be an independent unit or an integrated part of the power generating unit and must switch off in case of a fault and indicate the fault status | The external central NS protection used; it shall be considered after the installation. | N/E |
| 4.1.1 | Single fault safety. | | N/E |
| | The disconnection device must comply with the single fault tolerance requirements of VDE-AR-N 4105:2011-08, A.6 | The external central NS protection used; it shall be considered after the installation. | N/E |
| 4.1.2 | Interface Switch | | N/E |
| | The interface switch must, in case it is integrated into a PV-inverter, comply with the requirements of DIN EN 62109-2(VDE 0126-14-2):2012-04, 4.4.4.15.2 and in all other cases with the requirements according to VDE-AR-N 4105:2011-08, 6.4. | The external central NS protection used; it shall be considered after the installation. | N/E |
| 4.2 | Connection conditions | | P |
| | The connection, the reconnection after a grid-fault and the reconnection after short interruption shall be carried out according to VDE-AR-N 4105:2011-08, 8.3.1 | See appended table | P |
| 4.3 | Monitoring the voltage | | P |
| 4.3.1 | voltage drop $U_{<}$ | | P |
| | The disconnection because of a voltage drop shall be carried out according to VDE-AR-N 4105:2011-08, 6.5.1 and 6.5.2 | See appended table | P |
| 4.3.2 | rise-in-voltage $U_{>>}$ | | P |
| | The disconnection because of a rise-in-voltage shall be carried out according to VDE-AR-N 4105:2011-08, 6.5.1 and 6.5.2 | See appended table | P |
| 4.3.3 | slow rise-in-voltage $U_{>}$ | | N/E |
| | The disconnection because of a slow rise-in-voltage (10-minute-average) shall be carried out according to VDE-AR-N 4105:2011-08, 6.5.1 and 6.5.2 | No such function, the external central NS protection used; it shall be considered after the installation | N/E |

| VDE-0126-1-1:2013 | | | |
|-------------------|---|--|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 4.4 | Monitoring the frequency | | P |
| | The disconnection because of a frequency decrease or a frequency increase shall be carried out according to VDE-AR-N 4105:2011-08, 6.5.1 and 6.5.2 | | P |
| 4.5 | Monitoring the dc current | | P |
| | A feed in of d.c current into the low-voltage grid due to defective equipment must lead to a switch off within 0.2 seconds. For this purpose the fault itself or a measurement of the dc component of the current exceeding 1 A can be used as disconnection criteria. | See appended table | P |
| 4.6 | Detection of islanding operation | | N/E |
| | The disconnection because of a detection of unintended islanding operation shall be carried out according to VDE-AR-N 4105:2011-08, 6.5.1 and 6.5.3 | No such function, the external central NS protection used; it shall be considered after the installation | N/E |
| 4.7 | Markings | | N/E |
| | A generating system equipped with an automatic disconnecting device shall be marked with the information "VDE 0126-1-1" which is visible from the outside. This can be done by | | N/E |
| | <ul style="list-style-type: none"> — the marking plate or — showing it on a display of the disconnection device or — a separate marking | The marking shall be shown on central NS protection device. | N/E |
| 4.8 | Requirements for disconnection devices integrated into PV-inverters | | N/E |
| | The requirements of the DIN EN 62109-2 (VDE 0126-14-2):2012-04, 4.8 regarding the residual current detection and the insulation detection of the PV-generator shall be complied with. | The external central NS protection used; it shall be considered after the installation. | N/E |
| | | The PV is grounded, isolated type PV inverter. | N/A |
| 5 | General Requirements | | P |
| | Limits according to DIN EN 61000-6-3 (VDE 0839-6-3) regarding radio interferences must be complied with. For disturbance-free operation disturbance limits according to DIN EN 61000-6-2 (VDE 0839-6-2) shall be complied with. | See EMC report | P |
| 6 | Type Testing | | P |
| 6.0 | General | | P |
| | The following tests are valid for integrated and separated disconnecting devices unless otherwise noted. A separate disconnection device must be tested together with a suitable supply. It has to be ensured that the turn-off signal is caused by the disconnection device and not by the supply. | | P |
| 6.1 | Functional safety | | P |
| | The testing of the single fault tolerance and the error detection with following disconnection according to 4.1 is carried out according to DIN VDE V 0124-100 (VDE V 0124-100):2012-07, 5.4.5.2. | The external central NS protection used; it shall be considered after the installation. | N/E |
| 6.2 | Connection conditions | | P |

| VDE-0126-1-1:2013 | | | |
|-------------------|--|--|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | The testing of the connection and the reconnection is carried out according to DIN VDE V 0124-100 (VDE V 0124):2012-07, 5.5.1 and 5.5.2. | See appended table | P |
| 6.3 | Monitoring the voltage | | P |
| | The testing of the voltage monitoring is carried out according to DIN VDE V 0124-100 (VDE V 0124-100):2012-07, 5.4.5.3. | See appended table | P |
| 6.4 | Monitoring the frequency | | P |
| | The testing of the frequency monitoring is carried out according to DIN VDE V 0124-100 (VDE V 0124-100):2012-07, 5.4.5.4. | See appended table | P |
| 6.5 | Monitoring the dc current | | P |
| | a) The measuring device at the switching point (e.g. current transformer or resistance) is fed with direct current of 1 A. The cut-off must be carried out within 0.2 seconds. b) By means of a fault simulation it is measured if a defective system operation with a d.c. fault current of more than 1 A leads to cut-off within 0.2 seconds. | See appended table | P |
| 6.6 | Detection of islanding operation | | N/E |
| | The testing of the disconnection due to unintended islanding operation is carried out according to DIN VDE V 0124-100 (VDE V 0124-100):2012-07, 5.4.6 | No such function, the external central NS protection used; it shall be considered after the installation | N/E |
| 7 | Routine Test | | NA |
| 8 | Construction Specification | | NA |
| | Initial tests and re-examination in addition to the routine tests may be omitted. If the disconnection device is a separate unit it must not be used in a TN-C power system. In this case a TN-C-S power system must be created. | | NA |

Appendix table

| 6.2 | TABLE: Connection conditions and synchronization (Reconnection) | | | P |
|-------------------------|---|----------------|--------------|----------------|
| Condition | Measurement | | Limitation | |
| | Reconnection | Delay time [s] | Reconnection | Delay time [s] |
| $f < 47.45\text{Hz}$ | No | -- | No | ≥ 60 |
| $f \geq 47.55\text{Hz}$ | Yes | 108.5 | Yes | ≥ 60 |
| $f > 50.1\text{Hz}$ | No | -- | No | ≥ 60 |
| $f \leq 50.00\text{Hz}$ | Yes | 90.4 | Yes | ≥ 60 |
| $U < 0.84U_n$ | No | -- | No | ≥ 60 |
| $U \geq 0.86U_n$ | Yes | 111.3 | Yes | ≥ 60 |
| $U > 1.11U_n$ | No | -- | No | ≥ 60 |
| $U \leq 1.09U_n$ | Yes | 111.3 | Yes | ≥ 60 |

Note(s):

| 6.3 | TABLE: line to neutral voltage monitoring | | | | P | |
|----------------------------|---|---------------------|----|----|-------------------------------|--------------------------------|
| Rated voltage U_n : 230V | | | | | | |
| No. | Set value [V] | Threshold value [V] | | | Limitation VDE 4105 | Remark |
| | | L1 | L2 | L3 | | |
| 1 | 184 | 182 | -- | -- | $80\%U_n \pm 1\%$ | Decreasing value ramp of 0.1V. |
| 2 | | 183 | -- | -- | | |
| 3 | | 184 | -- | -- | | |
| 1 | 264.5 | 264 | -- | -- | $110\%U_n - 115\%U_n \pm 1\%$ | Increasing value ramp of 0.1V. |
| 2 | | 264 | -- | -- | | |
| 3 | | 264 | -- | -- | | |

| UV / OV | Trip time [ms] | | | |
|--------------|----------------|----|----|---------------------|
| | Measurement | | | Limitation VDE 4105 |
| | L1 | L2 | L3 | |
| Un to 77%Un | 94 | -- | -- | 200 |
| | 99 | -- | -- | 200 |
| | 122 | -- | -- | 200 |
| Un to 118%Un | 111 | -- | -- | 200 |
| | 55 | -- | -- | 200 |
| | 65 | -- | -- | 200 |

Rated: 230Vac, 50Hz.

| 6.3 | TABLE: over voltage protection as sliding 10-min-average value | | | | | N/E |
|-----|--|----------------------|--------------------|--------------------|------------------|-----|
| | Rated voltage Un: 230V | | | | | |
| No. | U _{start} [V] | U _{end} [V] | Limitation T [min] | Trigger time [min] | Recover time [s] | |
| 1 | -- | -- | -- | -- | -- | |
| 2 | -- | -- | -- | -- | -- | |
| 3 | -- | -- | -- | -- | -- | |

| 6.3 | TABLE: Frequency monitoring test | | | | | P |
|---------------------------------------|----------------------------------|------------|----------------|------------|---|---|
| Rating frequency: 50Hz, speed: 1 Hz/s | | | | | | |
| UF/OF | Trip value [Hz] | | Trip time [ms] | | | |
| No. | Measurement | Limitation | Measurement | Limitation | Remark | |
| 1 | 47.5 | 47.5 | 60 | 200 | 48.0Hz -> 47.0Hz Delayed time:500ms is considered. | |
| 2 | 51.5 | 51.5 | 101 | 200 | 51.0Hz -> 52.0Hz Delayed time:500ms is considered. | |

| | | | |
|--|------------------------|--|------------------------|
| 6.4 | Monitoring the current | | |
| | | Limits | Disconnection time(ms) |
| | DC current 1A | DC current >1A, disconnection time within 0.2s | 21 |
| Note: By means of fed with direct current of 1A Limit : DC current:1A . Disconnection time 0.2s | | | |

| 4.3.6 | TABLE: Islanding Protection | | | | | N/E |
|-----------------------|-----------------------------|---------------------|---------------------|----------------|----------------|-----------------|
| Power 100% | | | | | | |
| Conditions | P _w [w] | Q _L [VA] | Q _C [VA] | Q _f | Trip time [ms] | Limitation [ms] |
| R: 100% L / C: 95% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 96% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 97% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 98% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |

| | L3: | L3: | L3: | | | |
|------------------------|--------------------|---------------------|---------------------|----------------|----------------|-----------------|
| R: 100% L / C: 99% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 100% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 101% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 102% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 103% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 104% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 105% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| Power 66% | | | | | | |
| Conditions | P _w [w] | Q _L [VA] | Q _c [VA] | Q _f | Trip time [ms] | Limitation [ms] |
| R: 100% L / C: 95% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 96% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 97% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 98% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 99% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |

| R: 100% L / C: 100% | L1: | L1: | L1: | | | 5000 |
|------------------------|--------------------|---------------------|---------------------|----------------|----------------|-----------------|
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 101% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 102% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 103% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 104% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 105% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| Power 33% | | | | | | |
| Conditions | P _w [w] | Q _L [VA] | Q _c [VA] | Q _f | Trip time [ms] | Limitation [ms] |
| R: 100% L / C: 95% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 96% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 97% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 98% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 99% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 100% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% | L1: | L1: | L1: | | | |

| | | | | | | |
|------------------------|-----|-----|-----|--|--|------|
| L / C: 101% | L2: | L2: | L2: | | | 5000 |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 102% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 103% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 104% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| R: 100% L / C: 105% | L1: | L1: | L1: | | | 5000 |
| | L2: | L2: | L2: | | | |
| | L3: | L3: | L3: | | | |
| Remark: | | | | | | |

| 4.8 | TABLE: Insulation resistance measurement | | | | | P |
|--|--|---------------|---------------|---------------|-------------------|---|
| Conditions | Measurement [I.F. / N.O.] | | | | | Identification |
| | PV / DC Supply Voltage [Vdc] | | | | | |
| | V_{mpp} lowest | $1/4 V_{mpp}$ | $1/2 V_{mpp}$ | $3/4 V_{mpp}$ | V_{mpp} highest | |
| PV+ to PE:limit-10% [kΩ] | I.F | I.F | I.F | I.F | I.F | I.F.: Isolation Fault N.O.: Normal Operation |
| PV- to PE: limit-10% [kΩ] | I.F | I.F | I.F | I.F | I.F | |
| PV+ to PE:limit+10% [kΩ] | N.O. | N.O. | N.O. | N.O. | N.O | |
| PV- to PE:limit+10% [kΩ] | N.O. | N.O. | N.O. | N.O. | N.O | |
| <p>Note:</p> <p>Array Insulation Resistance Threshold Value $R = 3.33$ [kΩ] (Should be larger than $R = V_{MAX PV} / 30mA.$)</p> <p>The accuracy of resistance measurement $\Delta R = 0.3$ [kΩ] (the value declared by manufacturer)</p> | | | | | | |

Appendix -Photos of the product

Overview



Overview -



Internal view-

