



TEST REPORT



Page 1 of 16 Pages

No.:RZ195200800

Sample Description: SOLAR INVERTER

Model/Specification/Grade: PV18-5548 VHM

Applicant: SHENZHEN MUST ENERGY TECHNOLOGY CO.,LTD

Applicant Address: 5F,Building 11,Rundongsheng Industrial
Park,Longzhu,Xixiang,BaoanDistrict,Shenzhen,Guangdong,China

Date of Receipt: 2019-08-06

Test Period: 2019-08-20 to 2019-08-23

Test Location: Xili Experimental Base

Shenzhen Academy of
Metrology & Quality Inspection
(Stamp)

Approved by: 蔡纯(主任)

Issue Date: 2019-08-30

Signature: 蔡纯

重要声明

Important statement

1. 本院是深圳市人民政府依法设置的产品质量监督检验机构，系社会公益型非营利性技术机构，为各级政府执法部门进行监督管理提供技术支持和接受社会各界的委托检验。

SMQ is a legal non-profit technical institute established by Shenzhen Municipal Government to undertake the quality supervision and inspection of products, and to provide technical support to relevant supervision and administration and also conduct commission test from the society.

2. 本院保证检验的科学性、公正性和准确性，对检验的数据负责，并对委托单位所提供的样品和技术资料保密。

SMQ is committed to assuring the scientificness, impartiality and accuracy of all tests carried out, responsibility for test data gained, and keeping confidential of all test samples and technical documents provided.

3. 抽样按照本院程序文件 CX11-01《抽样程序》和相应产品的检验细则的规定执行。

The sampling should be carried out according to the "sampling procedure" defined in the Procedure Document CX11-01 and relevant testing specifications.

4. 报告无主检、审核、批准人签字，或涂改，或未盖本院“检验检测专用章”及骑缝章无效。未经本院许可，不得部分复印、摘用或篡改本证书/报告内容。

Any report having not been signed by relevant responsible engineer, reviewer or authorized approver, or having been altered without authorization, or having not been stamped by both the "Dedicated Testing/Inspection Stamp" and the sealing stamp is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report/certificate is not permitted without the written authorization of SMQ.

5. 送样委托检验结果仅对来样有效：委托检验的样品信息及委托方信息均由委托方填写，本院不对其真实性及准确性负责。

The test results presented in the report apply only to the tested sample. The product information and the applicant information are provided by the customer and SMQ assumes no responsibility for their validity and accuracy.

6. 未经检验机构同意，样品委托人不得擅自使用检验结果进行不当宣传。

Any use of SMQ test result for advertisement of the tested material or product must be approved in writing by SMQ.

7. 无 CMA 标志的报告，仅供使用方内部参考，不具有对社会的证明作用。含粤字编号的 CAL 标志仅适用于产品标准和判定标准。

The non-CMA report issued by SMQ is only permitted to be used by the client as internal reference use and shall not be used for public demonstration purpose. CAL logo with symbol "Yue" is only relevant to product standards and reference of standards.

8. 对农产品监督抽查检验结果有异议的，可以自收到检验报告之日起五日内，向组织实施农产品质量安全监督抽查的农业行政主管部门或者其上级农业行政主管部门申请复检。对食品监督检验报告有异议的，可以自收到检验报告之日起七个工作日内向实施抽样检验的食品药品监督管理部门或者其上一级食品药品监督管理部门提出复检申请。对其它检验报告有异议的，应于报告发出之日起十五日内向本院提出。

Any objections to the testing results of supervision sampling of agricultural products should apply for retest within 5 days upon receiving the test report to the administrative department of agriculture who organizes and implements agricultural products' supervision sampling or its superior department. Any objections to the testing results of supervision sampling of food should apply for retest within 7 days upon receiving the test report to the administrative department of food and drug who organizes and implements supervision sampling for food or its superior department. Any objections to other inspection report issued by SMQ should be submitted to SMQ within 15 days after the issuance of the test report.

9. 电子版证书/报告更改后将不被追回，委托方有义务将更改后的报告/证书提供给使用原报告/证书的相关方。

SMQ is not responsible for recalling the electronic version of the original report/certificate when any revision is made to them. The applicant assumes the responsibility of providing the revised version to any interested party who uses them.

投诉电话： 0755-86009898-31206（西丽 Xili） 0755-26941613（龙珠 Longzhu）

Complaint hotline : 0755-27528392（龙华 Longhua）



TEST REPORT

No.: RZ195200800

Page 2 of 16 Pages

Sample Information:

Sample Description: SOLAR INVERTER

Trade Mark: MUST

Model/Specification/Grade: PV18-5548 VHM

Serial/Batch No. of Sample: -----

Manufactured Date: -----

Manufacturer: MUST (GUANGDONG) ENERGY TECHNOLOGY CO.,LTD

Manufacturer Address: 5FL,Building8,No.115,zhangcha 1st road,South China power innovation Science Park,Foshancity,Guangdong,China

Sample Quantity: 1PC

Sample Description before Testing: Normal

Client Information:

Applicant: SHENZHEN MUST ENERGY TECHNOLOGY CO.,LTD

Applicant Address: 5F,Building 11,Rundongsheng Industrial Park,Longzhu,Xixiang,BaoanDistrict,Shenzhen,Guangdong,China

Applicant Telephone: 0755-29108002

Applicant Post Code: -----

Test Information:

Date of Receipt: 2019-08-06

Applicant No.: 7385737

Environment Condition: (25.1-26.8) °C (50-60) %RH


Sampling Method: Delivered by Applicant


Judgment Basis: IEC 61683:1999 Photovoltaic systems - Power conditioners - Procedure for measuring efficiency

Test Standard: IEC 61683:1999 Photovoltaic systems - Power conditioners - Procedure for measuring efficiency

Test Conclusion:

See the report for details.

Tested by: 陈官路 

Checked by: 李菊欢 

TEST REPORT

No.: RZ195200800

Page 3 of 16 Pages

General product information:

The equipment is single phase stand-alone type inverter and a charge controller. It can be connected to the PV module, generator or AC mains to charge the battery, and convert DC from batteries to AC for load use. The following illustration shows basic application of this equipment.

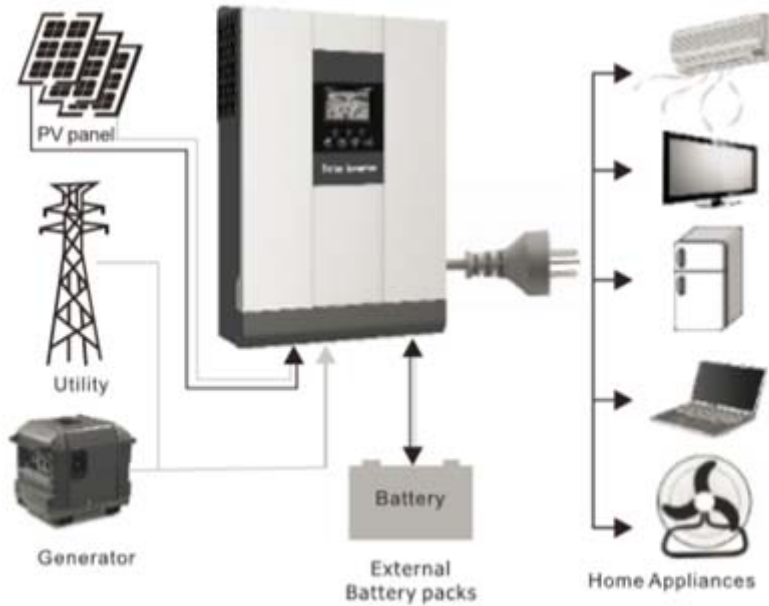


Figure 1 Hybrid Power System

Ratings:

Model	PV18-5548 VHM
Input voltage (V)	48V d.c.
Input current (A)	125A
Rated output Voltage (V)	230Va.c
Rated output Current (A)	23.9A
Rated output Frequency (Hz)	50/60Hz
Rated output Power (W)	5500W
Out Voltage waveform	Pure Sine Wave
Weight (kg)	9.96
Size (mm) (W×D×H)	330*468*119

TEST REPORT

No.: RZ195200800

Page 4 of 16 Pages

Copy of marking plate


SOLAR INVERTER








Model Name: PV18-5548 VHM
 Operating Temperature Range: -10°C~50°C
 Protection Class: Class I

Inverter Mode:
 Rated Power: 5500VA/5500W
 DC Input: 48VDC, 125A
 AC Output: 230VAC, 50/60Hz, 23.9A, 1φ
 Output Power Factor: 1.0

AC Charger Mode:
 AC Input: 230VAC, 50/60Hz, 35A, 1 φ
 DC Output: 54VDC, 60A

Solar Charger Mode:
 Rated Current: 80A
 System Voltage: 48VDC
 MPPT Voltage Range: 60~130VDC
 Max.Solar Voltage(VOC): 145VDC
Max.Charge Current: 140A


 VPV185548201712060001
 S/N.: VPV185548201712060001

Possible test case verdicts:

- | | |
|--|----------|
| - test case does not apply to the test object | N/A |
| - test object does meet the requirement | Pass (P) |
| - test object was not evaluated for the requirement..... | N/E |
| - test object does not meet the requirement | Fail (F) |



TEST REPORT

No.: RZ195200800

Page 5 of 16 Pages

Clause	Requirement-Test	Result-Remark	Verdict
4	Efficiency measurement conditions		P
	Efficiency is measured under the conditions in the following clauses.	Refer to Table 1.	P
	Specific conditions may be excluded by mutual agreement when those conditions are outside the manufacturer's allowable operating range.		N/A
4.1	DC power source for testing		P
	For power conditioners operating with fixed input voltage, the d.c. power source is a storage battery or constant voltage power source to maintain the input voltage	Constant voltage power source used to maintain the input voltage.	P
	For power conditioners that employ maximum power point tracking (MPPT) and shunt-type power conditioners, either a photovoltaic array or a photovoltaic array simulator is utilized.		N/A
4.2	Temperature		P
	All measurements are to be made at an ambient temperature of $25\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.	$(25.1-26.8)^{\circ}\text{C}$	P
	Other ambient temperatures may be allowed by mutual agreement. However, the temperature used must be clearly stated in all documentation.		N/A
4.3	Output voltage and frequency		P
	The output voltage and frequency are maintained at the manufacturer's stated nominal values.	230Vac, 50/60Hz	P
4.4	Input voltage		P
	Measurements performed in each of the following tests are repeated at three power conditioner input voltages:		P
	a) manufacturer's minimum rated input voltage;		N/A
	b) the inverter's nominal voltage or the average of its rated input range;		P
	c) 90 % of the inverter's maximum input voltage.		N/A



TEST REPORT

No.: RZ195200800

Page 6 of 16 Pages

Clause	Requirement-Test	Result-Remark	Verdict
	In the case where a power conditioner is to be connected with a battery at its input terminals, only the nominal or rated input voltage may be applied.		P
4.5	Ripple and distortion		P
	Record input voltage and current ripple for each measurement. Also record output voltage and current distortion (if a.c.) or ripple (if d.c.). Ensure that these measurements remain within the manufacturer's specified values.		P
4.6	Resistive loads/utility grid		P
	At unity power factor, or at the intrinsic power factor of grid-connected inverters without power factor adjustment, measure the efficiency for power levels of 10 %, 25 %, 50 %, 75 %, 100 % and 120 % of the inverter's rating. Stand-alone inverters are also measured at a power level of 5 % of rated. The power conditioner test is conducted with a specified resistive and reactive grid impedance.	Refer to Table 1.	P
4.7	Reactive loads		N/A
	For stand-alone inverters, measure the efficiency with a load which provides a power factor equal to the manufacturer's specified minimum level (or 0,25, whichever is greater) and at power levels of 25 %, 50 % and 100 % of rated VA.		N/A
	Repeat for power factors of 0,5 and 0,75 (do not go below the manufacturer's specified minimum PF) and power levels of 25 %, 50 %, and 100 % of rated VA.		N/A
4.8	Resistive plus non-linear loads		N/A
	For stand-alone inverters, measure the efficiency with a fixed non-linear load (total harmonic distortion (THD) = $(80 \pm 5) \%$) equal to $(25 \pm 5) \%$ of the inverter's rated VA plus sufficient resistive load in parallel to achieve a total load of 25 %, 50 % and 100 % of rated VA.		N/A
	Repeat the measurements with a fixed non-linear load equivalent to $(50 \pm 5) \%$ of the inverter's rated VA plus sufficient resistive load in parallel to achieve a total load of 50% and 100% of rated VA.		N/A
	The type of non-linear load must be clearly stated in all documentation.		N/A



TEST REPORT

No.: RZ195200800

Page 7 of 16 Pages

Clause	Requirement-Test	Result-Remark	Verdict
4.9	Complex loads		N/A
	When a non-linear plus a sufficient reactive load condition is specified for stand-alone inverters, measure the efficiency with a fixed non-linear load (THD = (80 ± 5) %) equal to (50 ± 5) % of the inverter's rated VA plus a sufficient reactive load (PF = 0,5) in parallel to achieve a total load of 50 % and 100 % of rated VA.		N/A
	The type of complex load is clearly stated in all documentation.		N/A

5	Efficiency calculations		P
5.1	Rated output efficiency		P
	Rated output efficiency shall be calculated from measured data as follows: $\eta_R = (P_o / P_i) \times 100$	Refer to Table 1.	P
5.2	Partial output efficiency		P
	Partial output efficiency shall be calculated from measured data as follows: $\eta_{par} = (P_{op} / P_{ip}) \times 100$	Refer to Table 1.	P
5.3	Energy efficiency		P
	Energy efficiency shall be calculated from measured data as follows: $\eta_E = (W_o / W_i) \times 100$	Refer to Table 1.	P
5.4	Efficiency tolerances		P
	When an efficiency value has been guaranteed, the tolerance of this value shall be within the value at rated conditions indicated in the table 2.	The peak efficiency state in the user's manual is 90%, and the measured peak η_E is above 93%	P

6	Conditions of loading for output ports		P
6.1	Test circuit		P
	Figure 1 shows recommended test circuits for power conditioners which have a single-phase a.c. output or d.c. output. It can as well as be regared as a single-phase representation of a test set-up for multiphase power conditioners.		P



TEST REPORT

No.: RZ195200800

Page 8 of 16 Pages

Clause	Requirement-Test	Result-Remark	Verdict
	Figure 1a is applied to standard-alone power and ultity-interactive power conditionners respectively.		P
	The proposed test circuits in figure 1 are not mandatory, but together with the test descriptions, are intended to establish a base for mutual agreement between user and manufacturer.		P
	The type of power source shall be indicated on all tests and shall adhere to the requirements of 4.1		P
6.2	Measurement procedure		P
	a) Efficiency is calculated with equation (1) or (2) using measured P_i , P_o or P_{ip} , P_{op} . DC input power P_i , P_{ip} can be measured by wattmeter W1, or determined by multiplying the d.c. voltmeter V1 and d.c. ammeter A1 readings. Output power P_o , P_{op} is measured with wattmeter W2.		P
	b) DC input voltage, which is measured by d.c. voltmeter V1, shall be varied in the defined range where the output current, which is measured with a.c. ammeter A2, is varied from low output to the rated output.		P
	c) An average indicating instrument shall be used for the d.c. voltmeter and d.c. ammeter. A true r.m.s. type of indicating instrument shall be used for the a.c. voltmeter and a.c. ammeter. The d.c. wattmeter W1 shall be a d.c. measuring type. The wattmeter W2 shall be an a.c. or d.c. measuring type according to the output.		P
	d) Power factor (PF in per cent) can be measured by a power factor meter PF, or calculated from the readings of V2, A2, W2 and as follows: $PF = (W2 / (V2 \times A2)) \times 100$		P
	e) Each meter may be an analogue type or a digital type. The measurement accruacy shall be better than 5 % of the full-scale value for each power measured. Digital power instruments for W1 and W2 are also recommended.		P



TEST REPORT

No.: RZ195200800

Page 9 of 16 Pages

Clause	Requirement-Test	Result-Remark	Verdict
	f) An MPPT dynamically adjusts the input voltage so as to maximize the output power. In principle, the monitoring equipment shall sample all of the electrical parameters, such as input voltage and current, output power and current, within the update period of the MPPT. If the MPPT and input source (PV array or PV array simulator) interact in such a way that the input voltage varies by less than 5 %, then averaging of readings is acceptable. The averaging period shall be 30 s or longer.		N/A

7	Loss measurement		P
7.1	No-load loss		P
	No-load loss shall be measured as follows.		P
	If the power conditioner is a stand-alone type, the reading of d.c. input voltage, output voltage and frequency is given with meters V1, V2 and F respectively in figure 1a, and shall be adjusted to the rated values.		P
	The no-load loss is thus the indicated value of d.c. input wattmeter, W1, when the load is disconnected from the power conditioner.	Refer to Table 1.	P
	If the power conditioner is a utility-interactive type, the reading of d.c. input voltmeter V1, a.c. output voltmeter V2 and frequency meter F in figure 1b shall be adjusted to meet the specified voltages and frequency.		N/A
	No-load loss is thus the indicated value of d.c. input wattmeter, W1, when a.c. wattmeter, W2, indicates a zero value. For the measurement, allow the power conditioner time to transfer to its no-load operating state, if applicable.		N/A
7.2	Standby loss		N/A
	Standby loss shall be measured as follows.		N/A
	If the power conditioner is a utility-interactive type, standby loss is defined as the consumption of utility power when the power conditioner is not operating but is under standby condition. Standby loss is indicated with a.c. wattmeter, W2 in figure 1b at the rated a.c. output voltage.		N/A



TEST REPORT

No.: RZ195200800

Page 10 of 16 Pages

Clause	Requirement-Test	Result-Remark	Verdict
	If the power conditioner is a stand-alone type, standby loss is defined as the consumption from the d.c. source when the power conditioner is not operating but is under standby condition. Standby loss is indicated with d.c. wattmeter, W1 in figure 1a (without a.c. or d.c. output voltage).		N/A

Annex A	Power conditioner description		P
	A power conditioner is defined in IEC 61277.		P
	Some types of photovoltaic system configurations relate to their purpose and size. Figure A.1 shows the generic system configuration proposed in IEC 61277. In figure A.1, the power conditioner (PC) is inside the dotted line. The power conditioner may consist of one or more of the following: d.c. conditioner, d.c./d.c. interface, inverter, a.c./a.c. interface, a.c. utility interface, and a part of master control and monitoring (MCM) subsystem. The power flows are indicated by the arrows. When a PV system has a d.c. storage subsystem, it is assumed that the storage is connected to the input of the power conditioner in parallel with the array (see figures A.2 and A.3).	The equipment is single phase stand-alone type inverter and a charge controller. It can be connected to the PV module, generator or AC mains to charge the battery, and convert DC from batteries to AC for load use.	P
	Under normal conditions, the power conditioner a.c. output voltage and frequency are constant value when the system is connected to the utility grid (in a utility-interactive type) or to the a.c. loads (in a stand-alone type). However, when a.c. loads consist of pumps or blowers with variable speed induction motors, the a.c. voltage and frequency may be variable.	The a.c. output voltage and frequency are constant value.	P
	In this standard, systems with a constant a.c. output voltage and frequency as well as systems with a d.c. output are discussed. Figures A.2 and A.3 show the configuration of the PV system and the power conditioner described in this standard.	With a constant a.c. output voltage and frequency	P

Annex B	Power efficiency and conversion factor		P
---------	--	--	---



TEST REPORT

No.: RZ195200800

Page 11 of 16 Pages

Clause	Requirement-Test	Result-Remark	Verdict
	<p>There are two types of efficiencies shown in IEC 60146-2; one is a power efficiency, the other is a conversion factor. Power efficiency is defined as the ratio of active output power and active input power. Conversion factor is the ratio between output and input fundamental power levels. The formulae for these two parameters:</p> $\eta_P = (P_{aAC} / P_{aDC}) \times 100 \quad (\%)$ $\eta_C = (P_{fAC} / P_{fDC}) \times 100 \quad (\%)$		P
	<p>Active power Pa is calculated as</p> $P_a = \frac{1}{T} \int_0^T v(t)i(t)dt \quad \text{or} \quad = \frac{1}{T} \int_0^T p(t)dt$		P
	<p>The difference between the above two efficiencies is due to the evaluation of the harmonic components. IEC 60146 unifies them into power efficiency. Their differences depend on their voltage and current waveforms as shown in table B.1 and are only meaningful in case 5. Considering the purpose of IEC standards and the illustration in table B.1, the power efficiency is used as the efficiency of power conditioners.</p>		P
	<p>As shown in table B.1, case 1 or case 4, the difference between C and P is only 0.1% when the d.c. voltage and current ripple are 10 %pp, or when a.c. 5th r.m.s. voltage content is 2 % and the 5th current content is 5 %. This means that the conversion factor is practically the same as the power efficiency. It shall, however, be noted that in the case of a square wave, as in case 5, the power efficiency shall be used because the difference is large, i. e., $\eta_C / \eta_P = 0,81$.</p>		P
	<p>The integration time (duration of one cycle) T shall be 30 s or more and the resultant mean power efficiency value shall be used as the efficiency of the power conditioner.</p>		P

Annex C	Weighted-average energy efficiency		N/A
	<p>The energy of a power conditioner depends on both the irradiance profile and the load profile. The energy efficiency of a power conditioner shall be calculated by the ratio of the output to the input energy actually measured over a certain period (such as a month or a year).</p>		N/A



TEST REPORT

No.: RZ195200800

Page 12 of 16 Pages

Clause	Requirement-Test	Result-Remark	Verdict
	For reference, a method of estimating the energy efficiency using a weighted-average energy efficiency is described.		N/A
	The weighted-average energy efficiency, η_{WT} , is calculated as the sum of the products of each power level efficiency and related weighting coefficient.		N/A
	When the system is a utility-interactive type without a storage subsystem, the weighting coefficients depend on a regional irradiance duration curve.		N/A
	When the system is a stand-alone type with a storage subsystem, the weighting coefficients depend on the load duration curve.		N/A
	Clauses C.1 and C.2 show the calculation procedures for η_{WT} for utility-interactive systems and stand-alone systems.		N/A
C.1	η_{WT} of power conditioner for utility-interactive PV systems		N/A
	Utility-interactive PV systems, which have no storage and for which reverse-power flow is accepted, are described. In this case, d.c. power generated by the PV array is supplied direct into the power conditioner (PC). Almost all of the input power to the PC is converted to a.c. power. A part of it is dissipated as the PC loss.		N/A
	<p>The weighted-average energy efficiency, WT, is an index to evaluate annual energy efficiency in which a weighting coefficient, K_i, is used for each input power level. Here, the irradiance is divided into several discrete levels. By using a duration time T_i, d.c. input power level, P_{i1}, output power level, P_{O1}, and PC efficiency, i, for each level i, WT is defined as follows:</p> $f_{iWT} = \frac{\sum P_{O1} \cdot T_i}{\sum P_{i1} \cdot T_i} = \frac{P_{11} \cdot f_{11} \cdot T_1 + \dots + P_{1n} \cdot f_{1n} \cdot T_n}{P_{11} \cdot T_1 + \dots + P_{1n} \cdot T_n}$ $= K_1 \cdot f_{11} + K_2 \cdot f_{12} + \dots + K_n \cdot f_{1n}$		N/A



TEST REPORT

No.: RZ195200800

Page 13 of 16 Pages

Clause	Requirement-Test	Result-Remark	Verdict
	<p>If the irradiance duration curve is given as shown in figure C.1, equation (C.1) can be rewritten as follows:</p> $\eta_{WT} = \frac{1T_1}{T_{WT}} \eta_{1/4} + \frac{2T_2}{T_{WT}} \eta_{2/4} + \frac{3T_3}{T_{WT}} \eta_{3/4} + \frac{4T_4}{T_{WT}} \eta_{4/4} \geq \eta_{ER}$ $T_{WT} = 1T_1 + 2T_2 + 3T_3 + 4T_4$		N/A
C.2	η_{WT} of power conditioner for stand-alone PV systems		N/A
	In stand-alone PV systems with a storage subsystem, power generated from the PV array is stored and stabilized by the batteries. DC power is converted into regulated d.c. power or constant-voltage and constant-frequency a.c. power by a power conditioner (PC) and supplied to the load. In this case, some fraction of the generated power is dissipated as a loss in the batteries and power conditioner.		N/A
	The calculation of the weighted-average energy efficiency, WT , for stand-alone PV systems requires weighting coefficients for respective load levels.		N/A
	<p>By using a load duration time T_i, d.c. input power P_{Ii}, a.c. output power P_{Oi} and PC efficiency for respective load level i, WT is defined as follows:</p> $\eta_{WT} = \frac{\sum P_{Oi} \cdot T_i}{\sum P_{Ii} \cdot T_i} = \frac{\sum P_{O1} \cdot T_1 + \dots + P_{On} \cdot T_n}{P_{I0} \cdot T_0 + P_{O1} \cdot T_1 / \eta_{i1} + P_{On} \cdot T_n / \eta_{in}}$ $= \frac{1}{K_0 + K_1 / \eta_{i1} + \dots + K_n / \eta_{in}}$		N/A

Annex D	Derivation of efficiency tolerance in table 2		N/A
---------	---	--	-----



TEST REPORT

No.: RZ195200800

Page 14 of 16 Pages

Table 1		Efficiency measurement							P
Model		PV18-5548 VHM							
Ambient temperature		(25.1-26.8)°C							
Output rated power		5500W							
Input rated voltage		48V							
No-load loss power		63.60 W							
Total load, % of rated VA		5%	10%	25%	50%	75%	100%	120%	
Stand alone inverter with battery supply									
Voltage	Pac/Pac,r [%]:	4.99%	10.02%	25.01%	49.97%	74.97%	100.45%	--	
Vnorminal	Output efficiency								
	Vac[V]	228.46	228.36	228.16	227.96	227.78	228.05	---	
	Iac[A]	1.20	2.41	6.03	12.06	18.10	24.23	--	
	Pop [W]	274.74	550.98	1375.36	2748.30	4123.60	5525.01	--	
	PF	1.00	1.00	1.00	1.00	1.00	1.00	--	
	Vdc[V]	48.27	48.25	48.17	48.22	48.29	49.61	--	
	Idc[A]	7.02	12.81	30.63	61.46	93.77	123.07	--	
	Pip [W]	338.74	617.94	1472.26	2949.22	4498.83	6061.66	--	
	η_{par} [%]	81.11	89.16	93.42	93.19	91.66	91.15	--	
	Uthd[%]	0.80	1.34	0.71	0.60	0.85	0.96	--	
Ithd[%]	1.88	1.61	0.87	0.71	0.93	1.01	--		



TEST REPORT

No.: RZ195200800

Page 15 of 16 Pages

Table 1		Efficiency measurement						P
Vnorm inal	Power efficiency							
	PaAC[W]	276.60	554.66	1384.63	2766.71	4151.26	5562.04	--
	PaDC[W]	338.84	618.24	1475.48	2964.09	4527.97	6105.59	--
	η_P [%]	81.63	89.72	93.84	93.34	91.68	91.10	--
	Conversion factor							
	PfAC[W]	274.72	550.86	1375.39	2748.14	4123.23	5524.51	--
	PfDC[W]	338.84	618.24	1475.48	2964.09	4527.97	6105.59	--
	η_C [%]	81.08	89.10	93.22	92.71	91.06	90.48	--
	Energy efficiency							
	Wo [Wh] (5min.)	23.05	46.22	115.39	230.56	345.94	463.50	--
	Wi [Wh] (5min.)	28.42	51.84	123.52	247.42	377.42	508.52	--
	$\eta_E = (W_o / W_i) \times 100\%$	81.11	89.16	93.42	93.19	91.66	91.15	--
	Note: η_R is the rated output efficiency. η_{par} is the partial output efficiency. η_E is the energy efficiency. The inverter can not overload to 120%.							



TEST REPORT

No.: RZ195200800

Page 16 of 16 Pages



The front of the sample



The back of the sample

--End of test report--