Product Service

Technical Report No.: 64.290.23.30804.01

Date: 2023-06-25

Client:	Shenzhen Kstar New Energy Company Limited The 9th Floor, R&D Building, Kstar Industrial Park, Guangming Hi-tech Industrial Zone, 518107 Shenzhen, Guangdong Province, PEOPLE'S REPUBLIC OF CHINA
Manufacturer:	Same as Client
Factory:	Shenzhen KSTAR Science & Technology Co., Ltd. Guangming Branch Kstar High Tech Park,Guangming High TechnologyTown, Gongming Street, Baoan District, Shenzhen City, Guangdong Province, PEOPLE'S REPUBLIC OF CHINA
Test object:	Product: Hybrid inverter Model: KAC50DP
Test specification:	C10/11:2021
Purpose of examination:	• Testing and evaluation visual according to the test specification
Test result:	The test results show that the presented product is in compliance with the above listed test specifications.

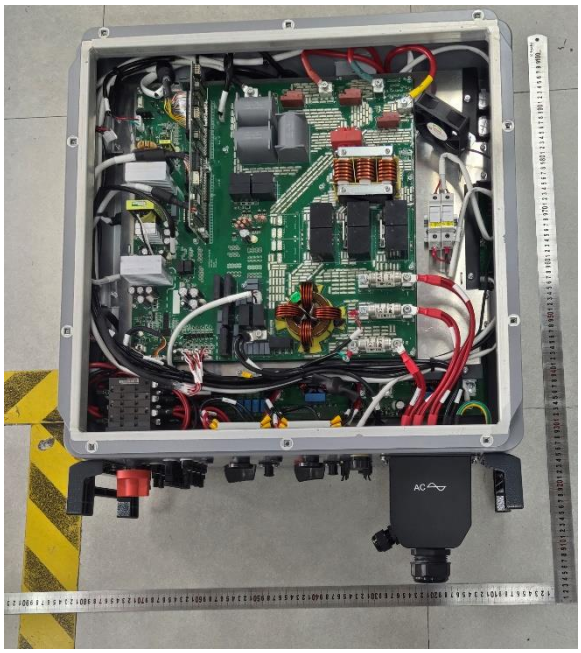
www.tuvsud.com

TÜV®

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group
5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West,Guangzhou, 510656, P.R.China
Telephone: +86 20 38320668

1. Description of the test object

1.1 Picture(s)

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Over view</td><td>Internal view</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Terminal view</td><td>Side view</td></tr>
</table>

1.2 Function

Manufacturer's specification for intended use:

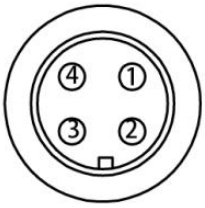
(1) The unit is non-isolated (transformerless) Hybrid Inverter with a maximum power ≤ 250 kVA connected to public grid, for indoor and outdoor use, and defined as type A generator according to Regulation (EU) 2016/631 (NC RfG) and C10/11:2021.

(2) Low voltage electrical installations shall comply with national and local regulation. Only qualified electricians are allowed to install and maintain the converter.

(3) In order to protect the inverter, user and installer, external DC and AC circuit breaker shall be equipped for all source port (battery, AC grid) at the end-use application.

(4) The unit has below reactive power control modes, shall comply with national and local regulation:
   1) Q setpoint mode
   2) Q(U) mode
   3) Cos φ setpoint mode
   4) Cos φ (P)

(5) The inverter use COM port as logic interface. External control command is sent via RS-485 signal and connected with pin 3 and pin4 of COM port.



PIN	Network
1	CAN-H
2	CAN-L
3	RS485-A
4	RS485-B

Figure 6-5 Connection Diagram of COM Port

(6) Firmware Version: REV001, software version: V000B000D001.

(7) The Grid Disconnection Protection System according to C10/21 or C10/23 must be installed externally between the inverter output and grid connection point.

(8) Stand-alone mode is not considered and evaluated in this report, the use of stand-alone mode and electrical installations for unit shall comply with national and local regulation.

1.3 Consideration of the foreseeable use

☐ Not applicable
☒ Covered through the applied standard
☐ Covered by the following comment
☐ Covered by attached risk analysis

1.4 Technical Data

Model:	KAC50DP
PV input parameter	
Maximum input voltage	1000 Vd.c.
MPPT voltage range	350~800 Vd.c.
MPPT voltage range (full load)	667~750 Vd.c.
Maximum input current	3*36 Ad.c.
PV I_{SC}	3*40 Ad.c.
Battery input/output parameter	
Battery type	Lithium-ion
Input voltage range	350~750 Vd.c.
Maximum input/output voltage	750 Vd.c.
Maximum charging current	2*55 Ad.c.
Maximum charging power	55000 W
Maximum discharging current	2*55 Ad.c.
Maximum discharging power	55000 W
Grid parameter	
Rated input/output voltage	230/400 Va.c., 3/N/PE
Rated input/output frequency	50 Hz
Maximum input current	80 Aa.c.
Maximum input active power	50000 W
Maximum input apparent power	55000 VA
Maximum input active power from grid to battery	50000 W
Rated output current	72 Aa.c.
Maximum continuous output current	80 Aa.c.
Rated output active power	50000 W
Maximum output active power	50000 W
Maximum output apparent power	55000 VA
Maximum output active power from battery to grid (without PV input)	50000 W
Power factor	0.9 inductive(under-excited) to 0.9 capacitive(over-excited)

1.5 Label

KSTAR

Hybrid Inverter

Model:	KAC50DP
PV input parameters	
Maximum input voltage	1000 V d.c.
MPPT voltage range	350 V d.c. ~ 800 V d.c.
MPPT voltage range (full load)	667 V d.c. ~ 750 V d.c.
Maximum continuous PV input current	36/36/36 A d.c.
Maximum PV short circuit current	40/40/40 A d.c.
Maximum continuous PV input power	75 kW
Battery input/output parameters	
Battery type	Lithium-ion battery
Rated voltage	512 V d.c.
Battery voltage range	350 V d.c. ~ 750 V d.c.
Rated charging power	50 kW
Maximum charging current	55/55 A d.c.
Rated discharging power	50 kW
Maximum discharging current	55/55 A d.c.
AC input parameters	
Rated input voltage	230/400 V a.c., 3/N/PE
Rated input frequency	50 / 60 Hz
Maximum continuous input current	80 Aa.c.
Maximum input active power	50 kW
Maximum input apparent power	55 kVA
AC output parameters	
Rated output voltage	230/400 V a.c., 3/N/PE
Rated output frequency	50 / 60 Hz
Maximum continuous output current	80 Aa.c.
Maximum continuous output active power	50 kW
Maximum continuous output apparent power	55 kVA
Power factor	0.9 leading to 0.9 lagging
General	
Operating temperature range	-25 °C ~ 60 °C (Derating above 45 °C)
Protection class	I
Ingress protection	IP65
Operating altitude range	≤3000m
Production serial number	

Shenzhen Kstar New Energy Company Limited

Made in China

2. Order

2.1 Date of Purchase Order, Customer's Reference

2023-05-05

2.2 Test Sample(s)

- Reception date(s): 2023-05-05
- Location(s) of reception: TÜV SÜD Testing Center, D1 building, No. 63 Chuangqi Road, Shilou Town, Panyu District, Guangzhou 511447, P.R. China
- Condition of test sample(s): Intact

2.3 Testing

- Testing date(s): 2023-05-05 to 2023-06-25
- Location(s) of testing: TÜV SÜD Testing Center, D1 building, No. 63 Chuangqi Road, Shilou Town, Panyu District, Guangzhou 511447, China

2.4 Points of Non-Compliance or Exceptions of the Test Procedure

- None

3. Test Results

- "Decision rule according to IEC Guide 115:2021, clause 4.4.3, 4.5.1 was applied."

3.1 Positive Test Results

Test specification(s)	Report no. / Rev. No.	Date	Remark
Grid Code compliance	64.290.23.30804.01	2023-06-25	--

www.tuvsud.com

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group
5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West,Guangzhou, 510656, P.R.China
Telephone: +86 20 38320668

3.2 Points of Non-Compliance according to the test specification

- None

4. Test History

- None

5. Remarks

5.1 General

The user manual has been examined according to the minimum requirements described in the product standard. The manufacturer is responsible for the accuracy of further particulars as well as of the composition and layout.

5.2 Factory surveillance cycle

Your production facility is currently on the following surveillance cycle.

☐ Annual (12 month)

☐ Bi-Annual (6 month)

☐ Quarterly (3 month)

☒ None

6. Documentation

- None

7. Summary

The test specifications are met.

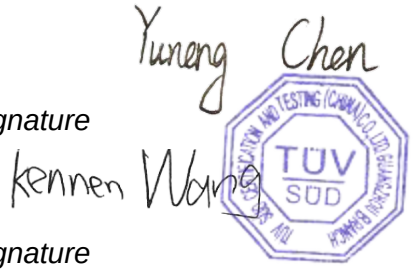
www.tuvsud.com

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group
5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West,Guangzhou, 510656, P.R.China
Telephone: +86 20 38320668

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
TÜV SÜD Group

Tested by: Yuneng Chen
(Project Handler)
printed name, function & signature

Approved by: Kennen Wang
(Designated Reviewer)
printed name, function & signature



www.tuvsud.com

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group
5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West,Guangzhou, 510656, P.R.China
Telephone: +86 20 38320668