



**BUREAU
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Certificate of compliance

Applicant: Huawei Technologies Co., Ltd.
Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian,
Longgang District, Shenzhen, 518129
P.R. China

Product: SOLAR INVERTER

Model: SUN2000-200KTL-H2, SUN2000-215KTL-H0

Use in accordance with regulations:

Automatic disconnection device with three-phase mains surveillance in accordance with EN 50549-2:2019 for photovoltaic systems with a three-phase parallel coupling via an inverter in the public mains supply. The automatic disconnection device is an integral part of the aforementioned inverter.

Firmware version: V300R001

Connection rule: EN 50549-2:2019:

Requirements for generating plants to be connected in parallel with distribution networks - Part 2:

Connection to a MV distribution network - Generating plants up to and including Type B

The power generating units, stated in the certificate, were tested and certified according to the technical guidelines referenced to the grid connection regulation. The electrical characteristics fulfil the requirements of the grid connection regulation:

- 4.4 Normal operating range
- 4.5 Immunity to disturbances
- 4.6 Active response to frequency deviation
- 4.7 Power response to voltage changes
- 4.8 EMC and power quality
- 4.9 Interface protection
- 4.10 Connection and starting to generate electrical power
- 4.11 Ceasing and reduction of active power on set point

At the time of issue of this certificate, the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number: 20TH0456_EN50549-2_0

Certification scheme: NSOP-0032-DEU-ZE-V01

Certificate number: U20-0931

Date of issue: 2020-11-23

Certification body



Thomas Lammel



Certification body of Bureau Veritas Consumer Products Services Germany GmbH accredited according to DIN EN ISO/IEC 17065
A partial representation of the certificate requires the written approval of Bureau Veritas Consumer Products Services Germany GmbH

Extract from test report according to EN 50549-2

No. 20TH0456_EN50549-2_0

Type Approval and declaration of compliance with the requirements of EN 50549-2

Manufacturer / applicant:	Huawei Technologies Co., Ltd. Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129 P.R. China
Product description:	Grid-tied photovoltaic inverter

Unit / Type:	SUN2000-200KTL-H2	SUN2000-215KTL-H0
Input DC voltage range [V]..... :	500-1500	
Full load MPP DC voltage range [V] . :	930-1300	
Input DC current [A] :	max. 9 x 30 A	
Nominal output AC voltage [V]..... :	800, 3~ + PE; 50 Hz	
Max. output AC current [A] :	155,2	
Nominal active output power [kW]... :	185	200
Max. apparent output power [kVA]... :	215	
Firmware version :	V300R001	

Description of the structure of the power generation unit:
 The input and output are protected by Varistors to Earth. The unit is providing EMC filtering at the output toward mains. The unit does not provide galvanic separation from input to output (transformerless). The output is switched off redundant by the high power switching bridge and a two relays. This assures that the opening of the output circuit will also operate in case of one error.

Parameter Table

General parameter settings (rated values or reference values)			
Name	Description	Unit	Value default
Pn	Rated active power	KW	SUN2000-200KTL-H2:185 SUN2000-215KTL-H0:200
Smax	Max apparent power	KVA	SUN2000-200KTL-H2:215 SUN2000-215KTL-H0:215
Un	Rated voltage	V	800
In	Rated current	A	SUN2000-200KTL-H2: 133.5A SUN2000-215KTL-H0: 144.4A
Fn	Rated frequency	Hz	50

Clause(s) / subclause(s) of this EN	Ref	Parameter	Typical value range	Value default	
4.4.2 Operating frequency range	A,B	47,0 – 47,5 Hz Duration	0 – 20 s	0,5s	
	A,B	47,5 – 48,5 Hz Duration	30 – 90 min	unlimited	
	A,B	48,5 – 49,0 Hz Duration	30 – 90 min	unlimited	
	A,B	49,0 – 51,0 Hz Duration	not configurable	unlimited	
	A,B	51,0 – 51,5 Hz Duration	30 – 90 min	unlimited	
	A,B	51, 5 – 52 Hz Duration	0 – 15 min	0,5 s	
4.4.3 Minimal requirement for active power delivery at underfrequency	A,B	Reduction threshold	49 Hz – 49,5 Hz	No reduction	
	A,B	Maximum reduction rate	2 – 10 % PM/Hz	No reduction	
4.4.4 Continuous operating voltage range	n.a.	Upper limit	not configurable	110% Un	
	n.a.	Lower limit	not configurable	85% Un	
4.5.2 Rate of change of frequency (ROCOF) immunity	A,B	ROCOF withstand capability (defined with a sliding measurement window of 500 ms)	not defined	-	
		non-synchronous generating technology:		2 Hz/s	
		synchronous generating technology:		N/A	
4.5.3.2 Generating plant with non-synchronous generating technology	B	Maximum power resumption time	not defined	1 s	
	B	Voltage-Time-Diagram	see Figure 6	Time [s]	U [p.u.]
				0,0	0,05
				0,25	0,05

Clause(s) / subclause(s) of this EN	Ref	Parameter	Typical value range	Value default	
				3	0,85
				180	0,85
				180	0,90
4.5.3.3 Generating plant with synchronous generating technology	B	Maximum power resumption time	not defined	N/A	
	B	Voltage-Time-Diagram	see Figure 7 (N/A)	Time [s]	U [p.u.]
				-	-
				-	-
				-	-
				-	-
				-	-
4.5.4 Over-voltage ride through (OVRT)	n.a.	Voltage-Time-Diagram	not configurable	Time [s]	Time [s]
				0,0	1,25
				0,1	1,25
				0,1	1,20
				5,0	1,20
				5,0	1,15
				60	1,15
60	1,10				
4.6.1 Power response to overfrequency	A,B	Threshold frequency f1	50,2 Hz – 52 Hz	50,2 Hz	
	A,B	Droop	2 % – 12 %	5 %	
	A,B	Power reference	PM Pmax	PM for other non-synchronous generating technology	
	n.a.	Intentional delay	0 – 2 s	0s	
	n.a.	Deactivation threshold fstop	50,0 Hz – f1	deactivated	
	n.a.	Deactivation time tstop	0 – 600 s	-	
	A	Acceptance of staged disconnection	yes no	yes	
4.6.2 Power response to underfrequency	n.a.	Threshold frequency f1	49,8 Hz – 46 Hz	49,5 Hz	
	n.a.	Droop	2 – 12 %	5 %	
	n.a.	Power reference	PM Pmax	Pmax	
	n.a.	Intentional delay	0 – 2 s	0 s	
4.7.2.2 Capabilities	B	Reactive power range overexcited	0,9-1	0,9(0,8-1 adj. by manufacture)	

Clause(s) / subclause(s) of this EN	Ref	Parameter	Typical value range	Value default
	B	Reactive power range underexcited	0,9-1	0,9(0,8-1 adj. by manufacture)
4.7.2.3 Control modes	n.a.	Enabled control mode	Q setp. Q(U) Q(P) cos φ setp. cos φ (P)	Q setpoint
4.7.2.3.2 Setpoint control modes	n.a.	Q setpoint and excitation	0 – 60 % S _{max}	0 (0-60%S _{max} adj. by manufacturer)
	n.a.	cos φ setpoint and excitation	1 – 0,9	1 (1-0.8 adj. by manufacturer)
4.7.2.3.3 Voltage related control modes	n.a.	Characteristic curve	-	-
	n.a.	Time constant	3 s – 60 s	10 s (1-120s adj. by manufacturer)
	n.a.	Min cos φ	0,0 – 1	0,9 (low to 0.8 by manufacturer)
	n.a.	Lock in power	0 % – 20 %	20%
	n.a.	Lock out power	0 % – 20 %	5%
4.7.2.3.4 Power related control mode	n.a.	Characteristic curve	-	-
4.7.4.2.1 Voltage support during faults and voltage steps - General	B.	Enabling	enable disable	enable
	B.	Static voltage range overvoltage	100 % Un – 120 % Un	110 % Un
	B.	Static voltage range undervoltage	20 % Un – 100 % Un	90 % Un
	B.	Insensitivity range of ΔU50per	0 % – 15 %	5 %
	B.	Gradient k1	0 – 6	2
	B.	Gradient k2	0 – 6	2
4.7.4.2.1.2 Optional Modes	n.a.	Active power priority	enable disable	disabled
	n.a.	Reactive current limitation [% rated current]	0 %–100 %	disabled
	n.a.	Zero current threshold	20 % U _c – 100 % U _c	70%
4.7.4.2.2 Zero current mode for converter connected generating technology	n.a.	Enabling	enable disable	disabled
	n.a.	Static voltage range undervoltage	20 % Un – 100 % Un	70 % Un
4.9.3 Requirements on voltage and	B	Undervoltage threshold stage 1	0,15 Un – 1 Un	0,8 Un

Clause(s) / subclause(s) of this EN	Ref	Parameter	Typical value range	Value default
frequency protection – inverter self-protection	B	Undervoltage operate time stage 1	0,05 s – 7200 s	5 s
	B	Undervoltage threshold stage 2	0,15 Un – 1 Un	0,5 Un
	B	Undervoltage operate time stage 2	0,05 s – 7200 s	2 s
	B	Overvoltage threshold stage 1	1,0 Un – 1,25 Un	1,15 Un
	B	Overvoltage operate time stage 1	0,05 s – 7200 s	61 s
	B	Overvoltage threshold stage 2	1,0 Un – 1,25 Un	1,25 Un
	B	Overvoltage operate time stage 2	0,05 s – 7200 s	0,2 s
	B	Overvoltage threshold 10 min mean protection	1,0 Un – 1,25 Un	1,10 Un
	B	Overvoltage threshold 10 min mean protection time	0,05 s – 7200 s	0,2s
	B	Underfrequency threshold stage 1	40,0 Hz– 50,0 Hz	47,5 Hz
	B	Underfrequency operate time stage 1	0,05 s – 7200 s	0,5 s
	B	Underfrequency threshold stage 2	40,0 Hz – 50,0 Hz	47 Hz
	B	Underfrequency operate time stage 2	0,05 s – 7200 s	0,2 s
	B	Overfrequency threshold stage 1	50,0 Hz – 60,0 Hz	51,5 Hz
	B	Overfrequency operate time stage 1	0,05 s – 7200 s	0,5 s
	B	Overfrequency threshold stage 2	50,0 Hz – 60,0 Hz	52 Hz
	B	Overfrequency operate time stage 2	0,05 s – 7200 s	0,2s
	B	Positive sequence under-voltage protection threshold	20 % – 100 %	N/A
	B	Positive sequence under-voltage protection operate time	0,2 s – 100 s	N/A

Clause(s) / subclause(s) of this EN	Ref	Parameter	Typical value range	Value default
	B	Negative sequence over-voltage protection threshold	1 % – 100 %	N/A
	B	Negative sequence over-voltage protection operate time	0,2 s – 100 s	N/A
	B	Zero sequence over-voltage protection threshold	0 % – 100 %	N/A
	B	Zero sequence over-voltage protection operate time	0,2 s – 100 s	N/A
4.10.2 Automatic reconnection after tripping	B	Lower frequency	40,0 Hz – 50,0 Hz	49,5 Hz
	B	Upper frequency	50,0 Hz – 60,0 Hz	50,2 Hz
	B	Lower voltage	45% Un – 100 % Un	90 % Un
	B	Upper voltage	100 % Un – 136 % Un	110 % Un
	B	Observation time	0 s – 7200 s	60 s
4.10.3 Starting to generate electrical power	B	Active power increase gradient	3.33 % – 6000 %/min	10 %Pn /min
	A,B	Lower frequency	40,0 Hz – 50,0 Hz	49,5 Hz
	A,B	Upper frequency	50,0 Hz – 60,0 Hz	50,1 Hz
	A,B	Lower voltage	45 % – 100 % Un	90 % Un
	A,B	Upper voltage	100 % – 136 % Un	110 % Un
4.11.1 Ceasing active power	A,B	Observation time	10 s – 600 s	60 s
	A,B	Active power increase gradient	6 % – 3000 %/min	300 %Pn /min
4.11.2 Reduction of active power on set point	A,B	Remote operation of the logic interface	yes no	Can be achieved by PGU. (Logic interface shall be specified by DNO)
4.11.2 Reduction of active power on set point	B	Remote operation NOTE: If yes further definition is provided by the DSO	yes no	Can be achieved by PGU. (Definition shall be specified by DNO)
4.12 Remote information exchange	B	Remote information exchange required NOTE: If yes further definition is provided by the DSO	yes no	No