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Intyg om överensstämmelse

Sökande:	SolarEdge Technologies Ltd. 1 HaMada Street Herzliya 4673335 Israel			
Produkt:	Fotovoltaisk växelriktare (Photovoltaikwechselrichter)			
Modell:	SE30K*	SE33.3K*	SE40K*	SE20K
	SE25K	SE27.6K	SE30K	SE33.3K
Notera:	* 480 V nätspänningsmodeller			

Inverter för trefas parallellanslutning till det allmänna nätet. Nätverksövervaknings- och frångkopplingsanordningen är en integrerad del av ovanstående modell.

Tillämpliga dokument:

Energimarknadsinspektionens föreskrifter om fastställande av generellt tillämpliga krav för nätanslutning av generatorer (EIFS 2018:2)

Gällande bestämmelser och standarder:

EN 50549-2:2019, SS-EN 50549-2:2019

Krav för att generera anläggningar som ska anslutas parallellt med distributionsnät - Del 2: Anslutning till en MV distributionsnätverk - Generera anläggningar till och med typ B

- 4.4 Normalt arbetsområde
- 4.5 Immunitet mot störningar
- 4.6 Aktivt svar på frekvensavvikelse
- 4.7 Effektorespons på spänningsvariationer och spänningsförändringar
- 4.8 EMC och effektkvalitet
- 4.9 Gränssnittsskydd
- 4.10 Anslutning och börja generera elkraft
- 4.11 Avbrytande och minskning av aktiv effekt vid börvärdet
- 4.12 Fjärranslutet informationsutbyte

EN 50438:2013, SS-EN 50438:2014

Fordringar för anslutning av smågeneratorer i parallell drift med det allmänna elnätet kompletterat med ändringar beslutade av SEK TK 8

DIN V VDE V 0126-1-1:2006 (4.1 Funktionell Säkerhet)

Automatisk frångkopplingsanordning mellan en generator och det allmänna lågspänningsnätet

Kommissionens Förordning (EU) 2016/631 av den 14 april 2016

Upprättande av en nätverkskod för krav för nätanslutning av generatorer (NC RFG).
Typgodkännande för produktionsenheter för användning i typ B-anläggningar.

Notera:

Detta certifikat bevisar överensstämmelsen för en genereringsenhet baserad på NC RFG. Vissa krav, såsom frekvenskänsligt läge (FSM), reaktiv effektkapacitet etc. kan dock vara tillämpliga på produktionsanläggningsnivån, vilken bedömning kan falla utanför detta certifikats räckvidd. Följaktligen är det möjligt att bedömningen av överensstämmelse för en genereringsenhet inte täcker alla aspekter av ovanstående standardiseringsdokument, vanligtvis när ett krav snarare utvärderas på anläggningsnivå.

Vid tidpunkten för utfärdandet av detta intyg uppfyller den representativa produkt som anges ovan de angivna reglerna och standarderna.

Rapportnummer:	19TH0534-EN50549-2_2	Certifieringsprogram:	NSOP-0032-DEU-ZE-V01
	19TH0534-FRT_3		
	19TH0534-Power Quality_4		
Certifikatnummer:	U21-0657	Datum för utfärdande:	2021-07-13



Institutet Certifiering för Bureau Veritas Consumer Products Services Germany GmbH ackrediterat enligt DIN EN ISO / IEC 17065

En partiell representation av intyget kräver skriftligt godkännande av Bureau Veritas Consumer Products Services Germany GmbH



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Appendix	
Extract from test report according to EN 50549-2	Nr. 19TH0534-EN50549-2_2 19TH0532-FRT_3 19TH0534-Power Quality_4

Type Approval and declaration of compliance with the requirements of EN 50549-2 and Commission Regulation (EU) 2016/631 of 14 April 2016 with EIFS:2018:2 for Sweden

Manufacturer / applicant	SolarEdge Technologies Ltd. 1 HaMada Street Herzliya 4673335 Israel
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Micro-generator Type	Photovoltaic inverter			
	SE30K	SE33.3K	SE40K	SE20K
Input DC voltage range [V]	680 – 1000	680 – 1000	680 – 1000	680 – 1000
Input DC current [A]	36,25	40,0	48,25	29
Output AC voltage [V]	277 Vac, L-N 480 Vac, L-L	277 Vac, L-N 480 Vac, L-L	277 Vac, L-N 480 Vac, L-L	220/230 Vac, L-N 380/400 Vac, L-L
Output AC current [A]	36,25	40,0	48,25	29
Output power [VA]	30000	33300	40000	20001

	SE25K	SE27.6K	SE30K	SE30K
Input DC voltage range [V]	680 – 1000	680 – 1000	680 – 1000	680 – 1000
Input DC current [A]	36,25	40,0	43,5	43,5
Output AC voltage [V]	220/230 Vac, L-N 380/400 Vac, L-L	220/230 Vac, L-N 380/400 Vac, L-L	220/230 Vac, L-N 380/400 Vac, L-L	220/230 Vac, L-N 380/400 Vac, L-L
Output AC current [A]	36,25	40	43,5	43,5
Output power [VA]	25000	27600	29990	30000

	SE33.3K	--	--	--
Input DC voltage range [V]	680 – 1000	--	--	--
Input DC current [A]	48,25	--	--	--
Output AC voltage [V]	220/230 Vac, L-N 380/400 Vac, L-L	--	--	--
Output AC current [A]	48,25	--	--	--
Output power [VA]	33300	--	--	--

Firmware version	Beginning with DSP1:1.20 / DSP2: 2.20
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Measurement period	2019-11-29 – 2020-05-29, 2020-06-01 – 2020-07-31
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Description of the structure of the power generation unit:
 The power generation unit is equipped with a PV and line-side EMC filter. The power generation unit has no galvanic isolation between DC input and AC output. Output switch-off is performed with single-fault tolerance based on two series-connected relays in each line and neutral. This enables a safe disconnection of the power generation unit from the network in case of error.



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Parameter Table:			
Clause EN 50549-2	Ref	Parameter	Micro generator setting range
4.3.2 Interface switch	n.a.	Single fault tolerance for interface switch	yes no
4.4.2 Operating frequency range	A,B	47,0 – 47,5 Hz Duration	0,06 – unlimited
	A,B	47,5 – 48,5 Hz Duration	0,06 – unlimited
	A,B	48,5 – 49,0 Hz Duration	0,06 – unlimited
	A,B	49,0 – 51,0 Hz Duration	0,06 – unlimited
	A,B	51,0 – 51,5 Hz Duration	0,06 – unlimited
	A,B	51, 5 – 52 Hz Duration	0,06 – unlimited
4.4.3 Minimal requirement for active power delivery at under frequency	A,B	Reduction threshold	44 Hz – 60 Hz
	A,B	Maximum reduction rate	1 – 12 % P _M /Hz
4.4.4 Continuous operating voltage range	n.a.	Upper limit	1,0 U _n – 335V
	n.a.	Lower limit	0,0 U _n – 1,0 U _n
4.5.2 Rate of change of frequency (ROCOF) immunity	A,B	ROCOF withstand capability (defined with a sliding measurement window of 500 ms) non-synchronous generating technology: synchronous generating technology:	0-100 Hz/s
4.5.3.2 Generating plant with non- synchronous generating technology (FRT)	B	Maximum power resumption time	not defined
	B	Voltage-Time-Diagram	see Figure 6, EN 50549-1 *The inverters have a DC to DC converter, so there are no limits. The inverters will stay connected till the NS protection setting (voltage and time are reached).
4.5.3.3 Generating plant with synchronous generating technology (FRT)	B	Maximum power resumption time	not defined
	B	Voltage-Time-Diagram	see Figure 7, EN 50549-1



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4.5.4 Over-voltage ride through (OVRT)	n.a.	Voltage-Time-Diagram	*The inverters have a DC to DC converter, so there are no limits. The inverters will stay connected till the NS protection setting (voltage and time are reached).
4.6.1 Power response to over frequency (LFSM-O)	A,B	Threshold frequency f_1	50,0 – 66 Hz
	A,B	Droop	1 % – 12 %
	A,B	Power reference	P_M P_{max}
		P(f) soft start	0 – 20 min
		P(f) reset time	0 – 20 min
	n.a.	Intentional delay	0 – 2 s
	n.a.	Deactivation threshold f_{stop}	50,0 - 66Hz
	n.a.	Deactivation time t_{stop}	0 – 20 min
	A	Acceptance of staged disconnection	yes no
4.6.2 Power response to under frequency	n.a.	Threshold frequency f_1	44 Hz – 60 Hz
	n.a.	Droop	1 – 12 %
	n.a.	Power reference	P_M P_{max}
	n.a.	Intentional delay	0 – 2 s
4.7.2.2 Capabilities	B	Active factor range overexcited	0,1 – 1
	B	Active factor range underexcited	0,1 – 1
4.7.2.3 Control modes	n.a.	Enabled control mode	Q setp. Q(U) cos φ setp. cos φ (P)
4.7.2.3.2 Set point control modes	n.a.	Q setpoint and excitation	0 – 90 % P_{nom}
	n.a.	cos φ setpoint and excitation	0,1-1



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4.7.2.3.3 Voltage related control modes	n.a.	Characteristic curve	Q(U) P(U)
	n.a.	Time constant	3 s – 60 s
	n.a.	Min cos φ	0,0 – 1
	n.a.	Lock in power	0 % – 20 %
	n.a.	Lock out power	0 % – 20 %
4.7.2.3.4 Power related control mode	n.a.	Characteristic curve	cos φ (P)
4.7.4.2.1 Voltage support during faults and voltage steps – general	B	Enabling	enable disable
	B	Static voltage range overvoltage	1,0 U _n – 335V
	B	Static voltage range undervoltage	0,0 U _n – 1,0 U _n
	B	Intensivity range $\Delta 50$ per	0 % - 25%
	B	Gradient K1	0 – 10
	B	Gradient K2	0 – 10
4.7.4.2.1.2 Optional Modes	n.a.	Active power priority	enable disable
	n.a.	Reactive current limitation [% rated current]	0 % - 100 %
	n.a.	Zero current threshold	0,2 U _n – 1,0 U _n
4.7.4.2.2 Zero current mode for converter connected generating technology	n.a.	Enabling	enable disable
	n.a.	Static voltage range overvoltage	1,0 U _n – 335V
	n.a.	Static voltage range undervoltage	0,0 U _n – 1,0 U _n
4.9.2 Requirements on voltage and frequency protection	n.a.	Threshold for protection as dedicated device [in A or kW, kVA]	All activated
	B	Undervoltage threshold stage 1	0,0 U _n – 1 U _n
	B	Undervoltage operate time stage 1	0,04 s – 20 min
	B	Undervoltage threshold stage 2	0,0 U _n – 1 U _n
	B	Undervoltage operate time stage 2	0,04 s – 20 min
	B	Overvoltage threshold stage 1	1,0 U _n – 335V
	B	Overvoltage operate time stage 1	0,04 s – 20 min
	B	Overvoltage threshold stage 2	1,0 U _n – 335V
	B	Overvoltage operate time stage 2	0,04 s – 20 min
	B	Overvoltage threshold 10 min mean protection ^a	1,0 U _n – 335V
	B	Overvoltage operate time 10 min mean protection ^a	3 s
	B	Underfrequency threshold stage 1	44,0 Hz – 60,0 Hz
	B	Underfrequency operate time stage 1	0,06 s – 20 min
	B	Underfrequency threshold stage 2	44,0 Hz – 60,0 Hz
	B	Underfrequency operate time stage 2	0,06 s – 20 min
	B	Overfrequency threshold stage 1	50,0 Hz – 66,0 Hz
	B	Overfrequency operate time stage 1	0,06 s – 20min
	B	Overfrequency threshold stage 2	50,0 Hz – 66,0 Hz
B	Overfrequency operate time stage 2	0,06 s – 20 min	



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	B	Positive sequence under-voltage protection threshold	N/A
	B	Positive sequence under-voltage protection operation time	N/A
	B	Negative sequence over-voltage protection threshold	N/A
	B	Negative sequence over-voltage protection operation time	N/A
	B	Zero Sequence over voltage protection threshold	N/A
	B	Zero Sequence over voltage protection operation time	N/A
4.10.2 Automatic reconnection after tripping	B	Lower frequency	44,0 Hz – 60,0 Hz
	B	Upper frequency	50,0 Hz – 66,0 Hz
	B	Lower voltage	0,0 U _n – 1,0 U _n
	B	Upper voltage	1,0 U _n – 335 V
	B	Observation time	1 s – 20min
	B	Active power increase gradient	1 % – 10000 %/min
4.10.3 Starting to generate electrical power	A,B	Lower frequency	44,0 Hz – 60,0 Hz
	A,B	Upper frequency	50,0 Hz – 66,0 Hz
	A,B	Lower voltage	0,0 U _n – 1,0 U _n
	A,B	Upper voltage	1,0 U _n – 335 V
	A,B	Observation time	0s – 20min
	A,B	Active power increase gradient	1% – 10000 %/min
4.11.1 Ceasing active power	A,B	Remote operation of the logic interface	yes no
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
4.12 Remote information exchange	B	Remote information exchange required NOTE: If yes further definition is provided by the DSO	yes no

Note:

^a Over voltage – stage1: 10 min-mean-value corresponding to EN 50160.

The settings of the interface protection are password protected adjustable in the stated range above.

In case the above stated generators are used with an external protection device, the protection settings of the inverters are to be adjusted according to the manufacturer's declaration.

The above stated generators are tested according to the requirements in the EN 50549-1:2019 and Commission Regulation (EU) 2016/631 of 14 April 2016 with EIFS:2018:2 for Sweden. Any modification that affects the stated tests must be named by the manufacturer/supplier of the product to ensure that the product meets all requirements.