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Intyg om överensstämmelse

Sökande:	SolarEdge Technologies Ltd. 1 HaMada Street Herzliya 4673335 Israel
Produkt:	Fotovoltaisk och batteri växelriktare
Modell:	SE3K, SE4K, SE5K, SE6K, SE7K, SE8K, SE9K, SE10K, SE12,5K, SE15K, SE16K, SE17K, SE3K-RWB, SE4K-RWB, SE5K-RWB, SE8.25K-RWB, SE10K-RWB, SE5K-RWS, SE7K- RWS, SE8K-RWS, SE10K-RWS

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

Tillämpliga dokument:

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

Gällande bestämmelser och standarder:

EN 50549-1:2019, SS-EN 50549-1:2019

Fordringar på generatoranläggningar för anslutning i paralleldrif med elnät - Del 1: Anslutning till lågspänningsnät - Generatoranläggningar upp till och med typ B

- 4.4 Normalt driftsområde
- 4.5 Immunitet mot störningar
- 4.6 Aktivt svar på frekvensavvikelse
- 4.7 Kraftsvar på spänningsvariationer och spänningsförändringar
- 4.8 EMC och effektkvalitet
- 4.9 Gränssnittsskydd
- 4.10 Anslutning och börja generera elkraft
- 4.11 Stopp och minskning av aktiv effekt på börvärdet
- 4.12 Fjärranslutet informationsutbyte
- 4.13 Krav på enkel feltolerans för gränssnittsskyddssystemet och gränssnittsomkopplaren

EN 50438:2013, SS-EN 50438:2014

Fordringar för anslutning av smågeneratorer i paralleldrif 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 fränkopplingsanordning mellan en generator och det allmänna lågspänningsnätet

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

Om fastställande av nätföreskrifter med krav för nätanslutning av generatorer.
Typgodkännande för produktionsenheter för användning i anläggningar av typ A och typ B.

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

Rapportnummer:	10TH0222-EN50549-1_4	Certifieringsprogram:	NSOP-0032-DEU-ZE-V01
Certifikatnummer:	U21-0461	Datum för utfärdande:	2021-05-21



*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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Type Approval and declaration of compliance with the requirements of EN 50549-1 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			
	SE3K	SE4K	SE5K	SE6K
Input DC voltage range [V]	680 – 950	680 – 950	680 – 950	680 – 950
Input DC current [A]	5	7	8,5	10
Output AC voltage [V]	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)
Output AC current [A]	5	6,5	8	10
Output power [VA]	3000	4000	5000	6000
	SE7K	SE8K	SE9K	SE10K
Input DC voltage range [V]	680 – 950	680 – 950	680 – 950	680 – 950
Input DC current [A]	12	13,5	15	16,5
Output AC voltage [V]	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)
Output AC current [A]	11,5	13	14,5	16
Output power [VA]	7000	8000	9000	10000
	SE12,5K	SE15K	SE16K	SE17K
Input DC voltage range [V]	680 – 950	680 – 950	680 – 950	680 – 950
Input DC current [A]	21	22	23	23
Output AC voltage [V]	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)
Output AC current [A]	20	23	25,5	26
Output power [VA]	12500	15000	16000	17000
	SE3K-RWB	SE4K-RWB	SE5K-RWB	SE8.25K-RWB
Input DC voltage range [V]	375-450	375-450	375-450	375-450
Input DC current [A]	8,5	11,5	14	22
Output AC voltage [V]	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)
Output AC current [A]	5	6,5	8	13,5
Output power [VA]	3000	4000	5000	8250



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	SE10K-RWB	--	--	--
Input DC voltage range [V]	375-450	--	--	--
Input DC current [A]	28	--	--	--
Output AC voltage [V]	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	--	--	--
Output AC current [A]	16	--	--	--
Output power [VA]	10000	--	--	--

Micro-generator Type Photovoltaic (PV) and Battery Inverter

	SE5K-RWS	SE7K-RWS	SE8K-RWS	SE10K-RWS
Input DC voltage range [V]	680 – 950	680 – 950	680 – 950	680 – 950
Input DC current [A]	8,5	12	13,5	16,5
Output AC voltage [V]	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)	230 / 400 @ 50Hz / 60Hz (3W,N,PE)
Output AC current [A]	8	11,5	13,0	16
Output power [VA]	5000	7000	8000	10000
Battery DC voltage range [V]	40 – 62	40 – 62	40 – 62	40 – 62
Battery DC input current [A]	130	130	130	130
Battery DC input power [W]	5000	5000	5000	5000

Firmware version Beginning with DSP1: 1.13 / DSP2: 2.19

Measurement period 2015-09-08, 2015-05-30 to 2016-06-03,2017-01-26, 2017-05-05, 2019-10-13 to 2019-12-10

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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Type Approval and declaration of compliance with the requirements of EN 50549-1 and Commission Regulation (EU) 2016/631 of 14 April 2016 with EIFS:2018:2 for Sweden

Parameter Table:

Clause EN 50549-1	Ref	Parameter	Micro generator setting range	Default settings used	
4.3.2 Interface switch	n.a.	Single fault tolerance for interface switch	yes no	yes	
4.4.2 Operating frequency range (EIFS 2018:2 1§)	A,B	47,0 – 47,5 Hz Duration	0,06 – unlimited	0 s	
	A,B	47,5 – 48,5 Hz Duration	0,06 – unlimited	≥30 min	
	A,B	48,5 – 49,0 Hz Duration	0,06 – unlimited	≥30 min	
	A,B	49,0 – 51,0 Hz Duration	0,06 – unlimited	unlimited	
	A,B	51,0 – 51,5 Hz Duration	0,06 – unlimited	≥30 min	
	A,B	51, 5 – 52 Hz Duration	0,06 – unlimited	0 s	
4.4.3 Minimal requirement for active power delivery at under frequency (EIFS 2018:2 7§)	A,B	Reduction threshold	44 Hz – 60 Hz	Electronic inverter no power reduction take place	
	A,B	Maximum reduction rate	1 – 12 % P _M /Hz	≤ 2 %	
4.4.4 Continuous operating voltage range	n.a.	Upper limit	1,0 U _n – 315V	N/A	
	n.a.	Lower limit	0,0 U _n – 1,0 U _n	N/A	
4.5.2 Rate of change of frequency (ROCOF) immunity (EIFS 2018:2 2§)	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	≥2 Hz/s	
4.5.3.2 Generating plant with non-synchronous generating technology (FRT) (EIFS 2018:2 10§)	B	Maximum power resumption time	not defined	≤1 s	
	B	Voltage-Time-Diagram	see Figure 6, EN 50549-1 * The inverters can stay connected from 0 to 40VAC up to 3 s. For voltage above 40VAC the inverters will stay connected till the NS protection setting (voltage and time are reached).	Time [s] N/A*	U [p.u.] N/A*
4.5.3.3 Generating plant with synchronous generating technology (FRT) (EIFS 2018:2 10§)	B	Maximum power resumption time	not defined	N/A	
	B	Voltage-Time-Diagram	see Figure 7, EN 50549-1	Time [s]	U [p.u.]
				N/A	N/A
				N/A	N/A
				N/A	N/A
				N/A	N/A

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4.5.4 Over-voltage ride through (OVRT) (EIFS 2018:2 18§)	n.a.	Voltage-Time-Diagram	* The inverters can stay connected from 0 to 40VAC up to 3 s. For voltage above 40VAC the inverters will stay connected till the NS protection setting (voltage and time are reached).	Time [s]	U [p.u.]
				N/A*	N/A*
4.6.1 Power response to over frequency (LFM-O) (EIFS 2018:2 3§, 4§, 5§, 6§)	A,B	Threshold frequency f_1	50,0 – 66 Hz	50,5 Hz	
	A,B	Droop	1 % – 12 %	8 %	
	A,B	Power reference	$P_M P_{max}$	P_M	
	n.a.	Intentional delay	0 – 20 min	0 s	
	n.a.	Deactivation threshold f_{stop}	0 – 20 min	deactivated	
	n.a.	Deactivation time t_{stop}	0 – 2 s	-	
	A	Acceptance of staged disconnection	50,0 – 66 Hz	No	
4.6.2 Power response to under frequency	n.a.	Threshold frequency f_1	44 Hz – 60 Hz	N/A	
	n.a.	Droop	1 – 12 %	N/A	
	n.a.	Power reference	$P_M P_{max}$	N/A	
	n.a.	Intentional delay	0 – 2 s	N/A	
4.7.2.2 Capabilities	B	Active factor range overexcited	0,1 – 1	1	
	B	Active factor range underexcited	0,1 – 1	1	
4.7.2.3 Control modes	n.a.	Enabled control mode	Q setp. Q(U) cos φ setp. cos φ (P)	disabled enabled disabled cos φ setp. disabled	
4.7.2.3.2 Set point control modes	n.a.	Q setpoint and excitation	0 – 90 % P_{nom}	0	
	n.a.	cos φ setpoint and excitation	0,1 – 1	1	
4.7.2.3.3 Voltage related control modes	n.a.	Characteristic curve	Q(U) P(U)	disabled Q(U) disabled P(U)	
	n.a.	Time constant	3 s – 60 s	10 s	
	n.a.	Min cos φ	0,0 – 1	0,9	
	n.a.	Lock in power	0 % – 20 %	deactivated	
	n.a.	Lock out power	0 % – 20 %	deactivated	
4.7.2.3.4 Power related control mode	n.a.	Characteristic curve	cos φ (P)	-	
4.7.4.2.2 Zero current mode for converter connected generating technology	n.a.	Enabling	enable disable	disabled	
	n.a.	Static voltage range overvoltage	1,0 U_n – 315V	N/A	
	n.a.	Static voltage range undervoltage	0,2 U_n – 1,0 U_n	N/A	



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4.9.2 Requirements on voltage and frequency protection	n.a	Threshold for protection as dedicated device [in A or kW, kVA]	All activated	N/A
	B	Undervoltage threshold stage 1	$0,0 U_n - 1 U_n$	$0,85 U_n$
	B	Undervoltage operate time stage 1	0,04 s – 20 min	0,18 s
	B	Undervoltage threshold stage 2	$0,0 U_n - 1 U_n$	N/A
	B	Undervoltage operate time stage 2	0,04 s – 20 min	N/A
	B	Overvoltage threshold stage 1	$1,0 U_n - 315V$	$1,15 U_n$
	B	Overvoltage operate time stage 1	0,04 s – 20 min	0,18 s
	B	Overvoltage threshold stage 2	$1,0 U_n - 315V$	N/A
	B	Overvoltage operate time stage 2	0,04 s – 20 min	N/A
	B	Overvoltage threshold 10 min mean protection ^a	$1,0 U_n - 315V$	$1,11 U_n$
	B	Overvoltage operate time 10 min mean protection ^a	3 s	60 s mean value (update every 3 s)
	B	Underfrequency threshold stage 1	44,0 Hz – 60,0 Hz	47,0 Hz
	B	Underfrequency operate time stage 1	0,06 s – 20 min	0,4 s
	B	Underfrequency threshold stage 2	44,0 Hz – 60,0 Hz	N/A
	B	Underfrequency operate time stage 2	0,06 s – 20 min	N/A
	B	Overfrequency threshold stage 1	50,0 Hz – 66,0 Hz	52,0 Hz
	B	Overfrequency operate time stage 1	0,06 s – 20 min	0,4 s
	B	Overfrequency threshold stage 2	50,0 Hz – 66,0 Hz	N/A
	B	Overfrequency operate time stage 2	0,06 s – 20 min	N/A
	B	Loss of mains according EN 62116 (LoM)	0-100 s	2,5 Hz/s (0,5s)
4.10.2 Automatic reconnection after tripping (EIFS 2018:2 8§, 9§)	B	Lower frequency	44,0 Hz – 60,0 Hz	47,5 Hz
	B	Upper frequency	50,0 Hz – 66,0 Hz	50,1 Hz
	B	Lower voltage	$0,0 U_n - 1,0 U_n$	$0,85 U_n$
	B	Upper voltage	$1,0 U_n - 315 V$	$1,10 U_n$
	B	Observation time	1 s – 20min	180 s
	B	Active power increase gradient	1 % – 10000 %/min	10 %/min
4.10.3 Starting to generate electrical power	A,B	Lower frequency	44,0 Hz – 60,0 Hz	47,5 Hz
	A,B	Upper frequency	50,0 Hz – 66,0 Hz	50,1 Hz
	A,B	Lower voltage	$0,0 U_n - 1,0 U_n$	$0,85 U_n$
	A,B	Upper voltage	$1,0 U_n - 315 V$	$1,10 U_n$
	A,B	Observation time	0s – 20min	180 s
	A,B	Active power increase gradient	1% – 10000 %/min	10 %/min
4.11.1 Ceasing active power	A,B	Remote operation of the logic interface	yes no	Yes (RS485, DI)
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	Yes (RS485, DI)
4.12 Remote information exchange	B	Remote information exchange required NOTE: If yes further definition is provided by the DSO	yes no	No



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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.