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Verklaring van geen bezwaar

Aanvrager: SolarEdge Technologies Ltd.
1 HaMada Street
Herzliya 4673335
Israel

Product: Fotovoltaïsche en batterij-omvormer

Model: 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

Omvormer voor driefasige parallelle aansluiting op het openbare net. Het netbewakings- en scheidingsapparaat maakt integraal deel uit van bovengenoemd model.

Toepasselijke documenten:

Besluit van de Autoriteit Consument en Markt van 21 april 2016, kenmerk ACM/DE/2016/202151, houdende de vaststelling van de voorwaarden als bedoeld in artikel 31 van de Elektriciteitswet 1998 (Netcode elektriciteit)

Controlebasis:

EN 50549-1:2019, NEN-EN 50549-1:2019

Vereisten voor het parallel schakelen van installaties met distributienetwerken - Deel 1: Aansluiting op een LV-distributienetwerk - Productie van installaties tot en met Type B

- 4.4 Normaal werkbereik
- 4.5 Immuniteit voor storingen
- 4.6 Actieve reactie op frequentieafwijking
- 4.7 Krachtreactie op spanningsvariaties en spanningsveranderingen
- 4.8 EMC en vermogenskwaliteit
- 4.9 Interfacebescherming
- 4.10 Aansluiting en starten met het opwekken van elektrische stroom
- 4.11 Stoppen en verminderen van actief vermogen op instelpunt
- 4.12 Informatie-uitwisseling op afstand
- 4.13 Vereisten met betrekking tot tolerantie voor één fout van interfacebeveiligingssysteem en interfaceschakelaar

EN 50438:2013, NEN-EN 50438:2013

Eisen voor het aansluiten van microgeneratoren op het openbare laagspanningsnet

DIN V VDE V 0126-1-1:2006-02 (4.1 Functionele Veiligheid)

Automatisch schakelstation tussen een netparallele zelfopwekinstallatie en het openbare laagspanningsnet

Verordening (EU) 2016/631 Van De Commissie van 14 april 2016

Tot vaststelling van een netcode betreffende eisen voor de aansluiting van elektriciteitsproducenten op het net. Typegoedkeuring voor productie-eenheden voor gebruik in installaties van type A en type B.

Een representatief testpatroon van het hoger vermelde product voldoet aan de op het moment van de uitreiking van dit attest geldende veiligheid technische eisen van de vermelde controlegrondbeginselen voor een reglementair voorgeschreven gebruik.

Rapportnummer: 10TH0222-EN50549-1_4 **Certificatie-programma:** NSOP-0032-DEU-ZE-V01
Certificaatnummer: U21-0460 **Datum:** 2021-05-21

Certificatie-instelling



Thomas Lammel



Certificatie-instelling Bureau Veritas Consumer Products Services Germany GmbH geaccrediteerd volgens DIN EN ISO/IEC 17065

Een gedeeltelijke weergave van het certificaat vereist de schriftelijke goedkeuring van Bureau Veritas Consumer Products Services Germany GmbH

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Annex to the EN 50549-1 certificate of compliance No. U21-0460

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Type Approval and declaration of compliance with the requirements of EN 50549-1, Commission Regulation (EU) 2016/631 of 14 April 2016 and "Netcode elektriciteit" for Netherlands

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, Commission Regulation (EU) 2016/631 of 14 April 2016 and "Netcode elektriciteit" for Netherlands

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 (Netcode elektriciteit Article 3.13)	A,B	47,0 – 47,5 Hz Duration	0,06 – unlimited	unlimited	
	A,B	47,5 – 48,5 Hz Duration	0,06 – unlimited	unlimited	
	A,B	48,5 – 49,0 Hz Duration	0,06 – unlimited	unlimited	
	A,B	49,0 – 51,0 Hz Duration	0,06 – unlimited	unlimited	
	A,B	51,0 – 51,5 Hz Duration	0,06 – unlimited	unlimited	
	A,B	51, 5 – 52 Hz Duration	0,06 – unlimited	unlimited	
4.4.3 Minimal requirement for active power delivery at under frequency (Netcode elektriciteit Article 3.13)	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	≤ 1 %	
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	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	≥2,5 Hz/s	
4.5.3.2 Generating plant with non-synchronous generating technology (FRT) (Netcode elektriciteit Article 3.17)	B	Maximum power resumption time	not defined	≤ 0,1 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) (Netcode elektriciteit Article 3.17)	B	Maximum power resumption time	not defined	≤ 0,1 s	
	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) (Netcode elektriciteit Article 3.17)	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 (LFSM-O) (Netcode elektriciteit Article 3.13)	A,B	Threshold frequency f_1	50,0 – 66 Hz	50,2 Hz	
	A,B	Droop	1 % – 12 %	5 %	
	A,B	Power reference	P_M P_{max}	P_M	
		P(f) soft start	0 – 20 min	10min	
		P(f) reset time	0 – 20 min	30 s	
	n.a.	Intentional delay	0 – 2 s	0 s	
	n.a.	Deactivation threshold f_{stop}	50,0 Hz – 66 Hz	deactivated	
	n.a.	Deactivation time t_{stop}	0 – 20 min	N/A	
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	1,0	
	B	Active factor range underexcited	0,1 – 1	1,0	
4.7.2.3 Control modes	n.a.	Enabled control mode	Q setp. Q(U) cos φ setp. cos φ (P)	disabled disabled enabled cos φ setp. disabled	
4.7.2.3.2 Set point control modes	n.a.	Q setpoint and excitation	0 – 90 % P_{nom}	N/A	
	n.a.	cos φ setpoint and excitation	0,1-1,0	1,0	
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	3 s	
	n.a.	Min cos φ	0,0 – 1	disabled	
	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)	disabled	
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	1,15 U_n	
	n.a.	Static voltage range undervoltage	0,2 U_n – 1,0 U_n	0,85 U_n	



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4.9.2 Requirements on voltage and frequency protection (Netcode elektriciteit Article 3.8, 3.14)	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	0,80 U_n
	B	Undervoltage operate time stage 1	0,04 s – 20 min	1,950 s
	B	Undervoltage threshold stage 2	0,0 U_n – 1 U_n	0,70 U_n
	B	Undervoltage operate time stage 2	0,04 s – 20 min	0,2 s
	B	Overvoltage threshold stage 1	1,0 U_n – 315V	1,10 U_n
	B	Overvoltage operate time stage 1	0,04 s – 20 min	2 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	N/A
	B	Overvoltage operate time 10 min mean protection ^a	3 s	N/A
	B	Underfrequency threshold stage 1	44,0 Hz – 60,0 Hz	47,5 Hz
	B	Underfrequency operate time stage 1	0,06 s – 20 min	1,900 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	51,5 Hz
	B	Overfrequency operate time stage 1	0,06 s – 20 min	1,900 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 (Netcode elektriciteit Article 3.13, 3.17)	B	Lower frequency	44,0 Hz – 60,0 Hz	49,9 Hz
	B	Upper frequency	50,0 Hz – 66,0 Hz	50,1 Hz
	B	Lower voltage	0,0 U_n – 1,0 U_n	0,90 U_n
	B	Upper voltage	1,0 U_n – 315 V	1,10 U_n
	B	Observation time	1 s – 20 min	60 s
	B	Active power increase gradient	1 % – 10000 %/min	≤10 %/min
4.10.3 Starting to generate electrical power (Netcode elektriciteit Article 3.13, 3.17)	A,B	Lower frequency	44,0 Hz – 60,0 Hz	49,9 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	0,90 U_n
	A,B	Upper voltage	1,0 U_n – 315 V	1,10 U_n
	A,B	Observation time	0s – 20 min	60 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 Commission Regulation (EU) 2016/631 of 14 April 2016. 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.