



**BUREAU
VERITAS**

Certificat de conformité

Demandeur:	SolarEdge Technologies Ltd. 1 HaMada Street Herzliya 4673335 Israël			
Produit:	Onduleurs Photovoltaïques			
Modèle:	SE50K	SE55K	SE66.6K	SE82.8K
	SE90K	SE100K	SE66.6K*	SE80K*
	SE100K*	SE120K*	SE50K**	SE55K**
	SE66.6K**	SE82.8K**	SE90K**	SE100K**
Noter:	* Modèles de tension de ligne 480V ** Modèles de Connexion de tension delta			

Onduleur pour connexion parallèle triphasée au réseau public. Le dispositif de surveillance et de déconnexion du réseau fait partie intégrante du modèle susmentionné.

Réglementations et normes appliquées:

EN 50549-1:2019-02, NBN EN 50549-1:2019-02

Exigences relatives aux centrales électriques destinées à être raccordées en parallèle à des réseaux de distribution - Partie 1: Raccordement à un réseau de distribution BT - Centrales électriques jusqu'au Type B inclus

- 4.4 Plage de fonctionnement normale
- 4.5 Immunité aux perturbations
- 4.6 Réponse active à l'écart de fréquence
- 4.7 Réponse de puissance aux variations de tension et aux changements de tension
- 4.8 CEM et qualité de l'alimentation
- 4.9 Protection d'interface
- 4.10 Connexion et démarrage de la production d'énergie électrique
- 4.11 Arrêt et réduction de la puissance active au point de consigne
- 4.12 Échange d'informations à distance
- 4.13 Exigences concernant la tolérance de panne unique du système de protection d'interface et du commutateur d'interface

C10/11:2019-09

Prescriptions techniques spécifiques de raccordement d'installations de production décentralisée fonctionnant en parallèle sur le réseau de distribution

DIN V VDE V 0126-1-1:2006 (4.1 Sécurité fonctionnelle)

Dispositif de déconnexion automatique entre un générateur et le réseau public à basse tension

Règlement (UE) 2016/631 De La Commission du 14 avril 2016

Etablissant un code de réseau sur les exigences applicables au raccordement au réseau des installations de production d'électricité. Homologation de type pour les unités de production à utiliser dans les installations de type A et de type B.

Au moment de la délivrance de ce certificat, le produit représentatif énuméré ci-dessus correspond aux règles et normes énoncées.

Numéro de rapport:	20TH0532-EN50549-1_6	Programme de certification:	NSOP-0032-DEU-ZE-V01
	20TH0532-FRT_0		
	20TH0532-Power Quality_0		
Numéro de certificat:	U21-0470	Délivré le:	2021-05-25

Organisme de certification



Thomas Lammel

Organisme de certification Bureau Veritas Consumer Products Services Germany GmbH accrédité par DIN EN ISO/IEC 17065

Une représentation partielle du certificat nécessite l'autorisation écrite de Bureau Veritas Consumer Products Services Germany GmbH



Annex to the EN 50549-1 / C10/11 certificate of compliance No. U21-0470

**BUREAU
VERITAS**

Appendix	
Extract from test report according to EN 50549-1	Nr. 20TH0532-EN50549-1_6 20TH0532-FRT_0 20TH0532-Power Quality_0

Type Approval and declaration of compliance with the requirements of EN 50549-1, Commission Regulation (EU) 2016/631 of 14 April 2016 and C10/11 for Belgium

Manufacturer / applicant	SolarEdge Technologies Ltd. 1 HaMada Street Herzliya 4673335 Israel
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Micro-generator Type	Photovoltaic inverter			
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	SE50K	SE55K	SE66.6K	SE82.8K
Input DC voltage range [V]	680 - 1000	680 - 1000	680 - 1000	680 - 1000
Input DC current [A]	2 x 36,25	2 x 40	2 x 48,25	3 x 40
Output AC voltage [V]	220 / 380 230 / 400	220 / 380 230 / 400	220 / 380 230 / 400	220 / 380 230 / 400
Output AC current [A]	72,5	80	96,5	120
Output power [VA]	50000	55000	66600	82800

	SE90K	SE90K	SE100K	SE66.6K*
Input DC voltage range [V]	680 - 1000	680 - 1000	680 - 1000	680 - 1000
Input DC current [A]	3 x 43,5	3 x 43,5	3 x 48,25	2 x 40
Output AC voltage [V]	220 / 380 230 / 400	220 / 380 230 / 400	220 / 380 230 / 400	277 / 480
Output AC current [A]	130,5	130,5	145	80
Output power [VA]	89970	90000	100000	66600

	SE80K*	SE100K*	SE120K*	--
Input DC voltage range [V]	680 - 1000	680 - 1000	680 - 1000	--
Input DC current [A]	2 x 48,25	3 x 40	3 x 48,5	--
Output AC voltage [V]	277 / 480	277 / 480	277 / 480	--
Output AC current [A]	96,5	120	145	--
Output power [VA]	80000	100000	120000	--

	SE50K**	SE55K**	SE66.6K**	SE82.8K**
Input DC voltage range [V]	370 - 600	370 - 600	370 - 600	370 - 600
Input DC current [A]	2 x 36,25	2 x 40	2 x 48,25	3 x 40
Output AC voltage [V]	230 / 400	230 / 400	230 / 400	230 / 400
Output AC current [A]	72,5	80	96,5	120
Output power [VA]	29000	32000	38500	48000



Appendix	
Extract from test report according to EN 50549-1	Nr. 20TH0532-EN50549-1_6 20TH0532-FRT_0 20TH0532-Power Quality_0

	SE90K**	SE100K**	--	--
Input DC voltage range [V]	370 - 600	370 - 600	--	--
Input DC current [A]	3 x 43,5	3 x 48,25	--	--
Output AC voltage [V]	230 / 400	230 / 400	--	--
Output AC current [A]	130,5	145	--	--
Output power [VA]	51900	57600	--	--

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, 2021-05-20
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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.



BUREAU
VERITAS

Annex to the EN 50549-1 / C10/11 certificate of compliance No. U21-0470

Appendix	
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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 (C10/11 D.4.1)	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 (C10/11 D.4.2)	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 (C10/11 D.4.3)	n.a.	Upper limit	1,0 U _n – 335V	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 (C10/11 D.5.1)	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) (C10/11 D.5.2)	B	Maximum power resumption time	not defined	≤1 s	
	B	Voltage-Time-Diagram	see Figure 6, EN 50549-1 C10/11 Figure 11 *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).	Time [s]	U [p.u.]
				N/A*	N/A*



Appendix

Extract from test report according to EN 50549-1 Nr. 20TH0532-EN50549-1_6
20TH0532-FRT_0
20TH0532-Power Quality_0

4.5.3.3 Generating plant with synchronous generating technology (FRT) (C10/11 D.5.2)	B	Maximum power resumption time	not defined	N/A	
	B	Voltage-Time-Diagram	see Figure 7, EN 50549-1 C10/11 Figure 12	Time [s]	U [p.u.]
				N/A	N/A
				N/A	N/A
				N/A	N/A
				N/A	N/A
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).	Time [s]	U [p.u.]
4.6.1 Power response to over frequency (LFSM-O) (C10/11 D.6.1)	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	
	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 (C10/11 D.6.2)	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 (C10/11 D.7.1)	B	Active factor range overexcited	0,1 – 1	0,9	
	B	Active factor range underexcited	0,1 – 1	0,9	
4.7.2.3 Control modes (C10/11 D.7.1)	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 (C10/11 D.7.1)	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 (C10/11 D.7.1 / D.7.2)	n.a.	Characteristic curve	Q(U) 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	



BUREAU
VERITAS

Annex to the EN 50549-1 / C10/11 certificate of compliance No. U21-0470

Appendix

Extract from test report according to EN 50549-1

Nr. 20TH0532-EN50549-1_6

20TH0532-FRT_0

20TH0532-Power Quality_0

4.7.2.3.4 Power related control mode	n.a.	Characteristic curve	$\cos \varphi (P)$	-
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	$1,0 U_n - 335V$	N/A
	n.a.	Static voltage range undervoltage	$0,2 U_n - 1,0 U_n$	N/A
4.9.2 Requirements on voltage and frequency protection (C10/11 C.1 / C2)	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	0,2 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	$1,0 U_n - 335V$	$1,15 U_n$
	B	Overvoltage operate time stage 1	0,04 s – 20 min	0,2 s
	B	Overvoltage threshold stage 2	$1,0 U_n - 335V$	N/A
	B	Overvoltage operate time stage 2	0,04 s – 20 min	N/A
	B	Overvoltage threshold 10 min mean protection ^a	$1,0 U_n - 315V$	$1,1 U_n$
	B	Overvoltage operate time 10 min mean protection ^a	3 s	10 min (update every 3s)
	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	0,2 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	0,2 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	2s	
4.10.2 Automatic reconnection after tripping (C10/11 D.8)	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	$0,0 U_n - 1,0 U_n$	$0,85 U_n$
	B	Upper voltage	$1,0 U_n - 335 V$	$1,10 U_n$
	B	Observation time	1 s – 20min	60 s
	B	Active power increase gradient	1 % – 10000 %/min	10 % /min



BUREAU
VERITAS

Annex to the EN 50549-1 / C10/11 certificate of compliance No. U21-0470

Appendix	
Extract from test report according to EN 50549-1	Nr. 20TH0532-EN50549-1_6 20TH0532-FRT_0 20TH0532-Power Quality_0

4.10.3 Starting to generate electrical power (C10/11 D.8)	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	0,85 U _n
	A,B	Upper voltage	1,0 U _n – 335 V	1,10 U _n
	A,B	Observation time	0s – 20min	60 s
	A,B	Active power increase gradient	1% – 10000 %/min	10 % /min
4.11.1 Ceasing active power (C10/11 D.9.1)	A,B	Remote operation of the logic interface	yes no	Yes (RS485, DI)
4.11.2 Reduction of active power on set point (C10/11 D.9.2)	B	Remote operation NOTE: If yes further definition is provided by the DSO	yes no	Yes (RS485, DI)
4.12 Remote information exchange (C10/11 D.10)	B	Remote information exchange required NOTE: If yes further definition is provided by the DSO	yes no	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, Commission Regulation (EU) 2016/631 of 14 April 2016 and C10/11 for Belgium. 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.