Certificate | BELGIUM C10/11 100%

The results of tests performed according to reference standard BELGIUM C10/11 100% are summarized in this certificate.
Power-One Italy S.p.a. declares that the units set for BELGIUM C10/11 100% operations are characterized by the following features:

- The internal specification and parameters are set to be compliant with BELGIUM C10/11 100% engineering requirements.
- All units have identical internal parameters setting.
- These parameters cannot be changed without the usage of password protected tool.

SSEG DETAILS (Small-Scale Embedded Generator)

SSEG Type Reference:	PHOTO-VOLTAIC GRID TIED INVERTER
SSEG Model Reference:	PVI-12.5-TL-OUTD PVI-12.5-TL-OUTD-S PVI-12.5-TL-OUTD-FS PVI-10.0-TL-OUTD PVI-10.0-TL-OUTD-S PVI-10.0-TL-OUTD-FS
Maximum export capability (SSEG rating less parasitic load)	12500W (PVI-12.5-TL-OUTD and derived models) 10000W (PVI-10.0-TL-OUTD and derived models)
Nominal Output AC Power	12500W (PVI-12.5-TL-OUTD and derived models) 10000W (PVI-10.0-TL-OUTD and derived models)

MANUFACTURER and TEST HOUSE DETAILS

Name:	Power-one Italy S.p.A. - R.& D. Department
Address:	Via S. Giorgio 642, 52028 Terranuova Bracciolini Arezzo - Italy
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TEST RESULTS SUMMARY

Power Quality:

- Harmonic Current Emission as per EN-61000-3-12
- Voltage Fluctuation and Flickers as per EN-61000-3-3
- DC Injection as per VDE 0126
- Power Factor as per VDE 0126

Protection:

- Under/Over Frequency Tests
- Under/Over Voltage Tests
- Reconnection Times
- Loss of Mains Test

Power-One Italy S.p.a.
Terranuova Bracciolini, March 22, 2013

Robert White
(Director Safety & Environmental Compliance)

BELGIUM C10/11 100% TEST RESULTS DETAILS – TYPE VERIFICATION TEST SHEET

POWER QUALITY

PVI-12.5-TL-OUTD		Value of Short Circuit Power SSC = 0.4125 MVA @ RSCE = 33							
Harmonic Current Emission as per EN-61000-3-12									
Harmonic		3rd [A%]	5rd [A%]	7rd [A%]	9rd [A%]	11rd [A%]	13rd [A%]	THD [A%]	PWHD [A%]
Limit		21.6	10.7	7.2	3.8	3.1	2	13	22
Result	Test value L1	0.664	0.360	0.026	0.075	0.348	0.383	1.326	3.586
	Test value L2	0.088	0.215	0.167	0.089	0.309	0.439	0.986	3.575
	Test value L3	0.549	0.425	0.150	0.104	0.334	0.478	1.230	3.461

PVI-10.0-TL-OUTD		Value of Short Circuit Power SSC = 0.33 MVA @ RSCE = 33							
Harmonic Current Emission as per EN-61000-3-12									
Harmonic		3rd [A%]	5rd [A%]	7rd [A%]	9rd [A%]	11rd [A%]	13rd [A%]	THD [A%]	PWHD [A%]
Limit		21.6	10.7	7.2	3.8	3.1	2	13	22
Result	Test value L1	0.981	0.490	0.095	0.072	0.046	0.149	1.333	2.953
	Test value L2	0.306	0.403	0.280	0.062	0.056	0.197	0.926	3.219
	Test value L3	0.668	0.761	0.275	0.076	0.067	0.149	1.288	3.368

PVI-12.5-TL-OUTD					
Voltage Fluctuation and Flickers as per EN-61000-3-3					
Voltage Disturbance	Pst	Plt	D(t) > 3%	dc (%)	dmax (%)
Limit	1	0.65	0.5	3.3	4
Test Value	0.17	0.15	0.1	1.8	2.18

PVI-10.0-TL-OUTD					
Voltage Fluctuation and Flickers as per EN-61000-3-3					
Voltage Disturbance	Pst	Plt	D(t) > 3%	dc (%)	dmax (%)
Limit	1	0.65	0.5	3.3	4
Test Value	0.17	0.15	0.1	1.8	2.18

PVI-12.5-TL-OUTD							
VDE 0126 Limit 0.5% of 20A	DC injection [mA] 100mA, tested at three power levels				Power Factor 0.95 lag - 0.95 lead at three voltage levels		
Test Level		10%	50%	100%	190 Vac	230 Vac	260 Vac
Test Value	L1	-10.0	12.0	23.5	0.99	0.99	0.99
	L2	-21.0	-20.0	-32.0			
	L3	25.0	19.0	11.5			

PVI-10.0-TL-OUTD							
VDE 0126 Limit 0.5% of 16.5A	DC injection [mA] 82.5mA, tested at three power levels				Power Factor 0.95 lag - 0.95 lead at three voltage levels		
Test Level		10%	50%	100%	190 Vac	230 Vac	260 Vac
Test Value	L1	-10.6	-8.2	-27.2	0.99	0.99	0.99
	L2	5.7	8.6	11.8			
	L3	7.5	1.6	11.7			

PROTECTION

PVI-12.5-TL-OUTD and PVI-10.0-TL-OUTD

UNDER FREQUENCY TEST						
Fnom=50Hz	BELGIUM C10/11 100% Limit		Settings		Results	
Under Frequency <	Frequency [Hz]	Time [s]	Frequency [Hz]	Time [s]	Frequency [Hz]	Time [s]
	47.50	0.20	47.50	0.12	47.47	0.08

OVER FREQUENCY TEST						
Fnom=50Hz	BELGIUM C10/11 100% Limit		Settings		Results	
Over Frequency >	Frequency [Hz]	Time [s]	Frequency [Hz]	Time [s]	Frequency [Hz]	Time [s]
	51.50	0.20	51.50	0.12	51.51	0.09

UNDER VOLTAGE TEST						
Vφ-n nom =230V	BELGIUM C10/11 100% Limit		Settings		Results	
Under Voltage <	Voltage [V]	Time [s]	Voltage [V]	Time [s]	Voltage [V]	Time [s]
L1-N	184.0	0.20	184.0	0.16	184.3	0.19
L2-N					184.2	0.19
L3-N					184.3	0.19
L1-L2-L3	318.7	0.20	318.7	0.16	317.8	0.19

OVER VOLTAGE TEST						
Vφ-n nom =230V	BELGIUM C10/11 100% Limit		Settings		Results	
Over Voltage > 10min	Voltage [V]	Time [s]	Voltage [V]	Time [s]	Voltage [V]	Time [s]
Lx-N	253.0	<600	253.0	<600	254.5	<580
Over Voltage >>	Voltage [V]	Time [s]	Voltage [V]	Time [s]	Voltage [V]	Time [s]
L1-N	264.5	0.20	264.5	0.16	264.0	0.18
L2-N					264.1	0.18
L3-N					264.2	0.18
L1-L2-L3	458.1	0.20	458.1	0.16	457.2	0.18

RECONNECTION TIMES			
	Under/Over voltage	Under/Over Frequency	Loss of Main
Minimum Value Limit [s]	60	60	60
Actual setting [s]	60	60	60
Recorded value [s]	64	67	63

LOSS OF MAIN TESTS			
Method used	Rate Of Change Of Frequency and Active Power Variation		
Output power Level	10%Prated	55%Prated	100%Prated
BELGIUM C10/11 100% Limit [s]	5	5	5
Trip setting [s]	5	5	5
Trip value [s]	<4	<4	<4

SSEG Short Circuit Current Contribution Test

RMS Value over 1 Period (Cycle)	15.46	[Aac]
Peak Current	247.0	[A]

SELF MONITORING – SOLID STATE SWITCHING

Not applicable because electro-mechanical relays are used

SSEG ACCURACY

Voltage reading accuracy = +/- 1%

Frequency reading accuracy = +/- 0.05Hz

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