CERTIFICATE G83/1

Engineering Recommendation

Issuing company	:	Mastervolt B.V.
Address	:	Snijdersbergweg 93
Postal code, place	:	1105 AN Amsterdam
Country	:	The Netherlands

Electrical apparatus	:	Photovoltaic Inverter with HF-transformer
Trademark	:	MASTERVOLT

Type designation	Rated power	Max. Export capability
Sunmaster XS4300 IP44	3300W	3465W
Sunmaster XS3200 IP44	2500W	2625W
Sunmaster XS2000 IP44	1500W	1575W

Test details

Power quality
Harmonic current emissions as per BS EN 61000-3-2 A
Voltage Fluctuations and Flicker as per BS EN 61000-3-3 A
Power Factor
DC injection under normal operation and protection function
Under / Over Frequency switch off
Under / Over Voltage switch off
Loss Of Mains Test
Reconnection Time

Mastervolt declares that Sunmaster XS IP44 models with country setting [UK] as indicated on the LCD display are compliant with the specifications set by the G83/1 engineering recommendation, issued by Electricity Assosiation Services, London.

Mastervolt R&D department
Amsterdam, 29-10-2010

Ing. D.R. Bassie.

Test results XS4300-XS3200-XS200

1. POWER QUALITY

Harmonic current emissions as per BS EN 61000-3-2-Class A								
Harmonic	2^{nd}	3^{rd}	5^{th}	7^{th}	9^{th}	11^{th}	13^{th}	15^{th}... 39^{th}
Limit (Amp.)	1.08	2.3	1.14	0.77	0.4	0.33	0.21	0.15 x (15/n)
Test value	0.05	0.22	0.16	0.14	0.10	0.09	0.09	0.87
% of fund.	0.32	1.53	1.10	0.98	0.72	0.63	0.63	6.09

Voltage fluctuations and Flicker as per BS EN 61000-3-3 Class A				
Harmonic	Starting	Stopping	Running	
Limit	4%	4%	P_{st} = 1.0	P_{lt} = 0.65
Test value	Max 2%	Max 2%	Max 0.582 in 10 min.	Max 0.582 in 2 hrs.

	DC injection			Power Factor		
G83/1 limit	20mA, tested at three levels			0.95 lag - 0.95 lead at three voltage levels at P_{rated}		
Test level	10%	50%	100%	212V	230V	248V
Test value	<5mA	<7mA	<8mA	0.998	0.997	0.996

	DC injection protection	
Parameter	DC inj [mA]	Time[s]
Actual setting	+/- 75 mA	1s
Test value	+/- 75mA	570ms

2. UNDER / OVER FREQUENCY SWITCH OFF

	Under Frequency Switch Off						Over Frequency Switch Off					
Parameter	Frequency [Hz]			Time [s]			Frequency [Hz]			Time [s]		
G83/1 limit	47 Hz			0.5s			50.5 Hz			0.5s		
Output power	10%	50%	100%	10%	50%	100%	10%	50%	100%	10%	50%	100%
Actual setting	47.10 Hz	47.10 Hz	47.10 Hz	0.5s	0.5s	0.5s	50.40 Hz	50.40 Hz	50.40 Hz	0.5s	0.5s	0.5s
Trip value	47.11 Hz	47.11 Hz	47.11 Hz	482ms	484ms	489ms	50.41 Hz	50.41 Hz	50.41 Hz	496ms	496ms	486ms

3. UNDER / OVER VOLTAGE SWITCH OFF

	Under Voltage Switch Off						Over Voltage Switch Off					
Parameter	Voltage [V]			Time [s]			Voltage [V]			Time [s]		
G83/1 limit	207V			1.5s			264V			1.5s		
Output power	10%	50%	100%	10%	50%	100%	10%	50%	100%	10%	50%	100%
Actual setting	209V	209V	209V	1.5s	1.5s	1.5s	262V	262V	262V	1.5s	1.5s	1.5s
Trip value	208.7V	208.4V	208.3V	1.49s	1.48s	1.48s	263.6V	263.0V	262.8V	1.46s	1.48s	1.48s

4. LOSS OF MAINS TEST

Method used	Frequency shift		
Output power level	10% P_{rated}	50% P_{rated}	100% P_{rated}
G83/1 limit	0.5s	0.5s	0.5s
Trip setting	0.5s	0.5s	0.5s
Trip value	266.9ms	295ms	313ms

5. RECONNECTION TIME MEASUREMENT

Reconnection time	Under / over Voltage	Under / over Frequency	Loss of Mains
Minimum value	180s	180s	180s
Actual setting	180s	180s	180s
Recorded value	>180s	>180s	>180s

6. FAULT LEVEL CONTRIBUTION

As Photovoltaic SSEGs are inverter connected, they are deemed to automatically comply with regulations and no further tests are required

7. SELF MONITORING - SOLID STATE SWITCHING

Not applicable as electro-mechanical relays are used.