
CERTIFICATE G83/2

Product Model: Growatt 1000S/Growatt 1500S

Nominal AC Power: 1000W/1600W

MAX. AC Power: 1000W/1650W

Manufacturer: Shenzhen Growatt New Energy Technology Co., Ltd.

Address: 1st East & 3rd Floor, Jiayu Industrial Zone, Xibianling, Shangwu Village, Shiyan, Baoan District, Shenzhen, P.R. China

Test Lab: Growatt R&D Test Lab

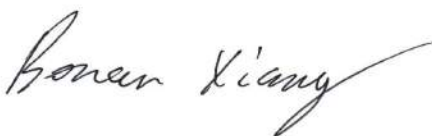
The results of the G83/2 tests are summarized in this certificate. Growatt declares hereby that all units shipped to the UK are within the specification and parameter set by the G83/2 engineering recommendation.

Test Details:

- Under / Over voltage switch off
- Under / Over frequency switch off
- Loss of mains test
- Power quality: Harmonic current emissions as per BS EN 61000-3-2
- Power quality: Power factor
- Power quality: Voltage fluctuations and flicker as per BS EN 61000-3-3
- Power quality: DC injection
- Reconnection times

Growatt New Energy Technology CO., LTD

The General Engineer



TEST I: UNDER/OVER AC VOLTAGE TEST						
Parameter	G83/2 Limit		Setting		Test results	
	Voltage	Time	Voltage	Time	Voltage	Time
Under Voltage Stage 1	200.1 V	2.5 s	200.0V	2.55 s	198.3 V	2.52 s
Under Voltage Stage 2	184 V	0.5 s	184.5V	0.55 s	183.3 V	0.57 s
Ovder Voltage Stage 1	262.2 V	1.0 s	262.0V	1.05 s	262.1 V	1.05 s
Ovder Voltage Stage 2	273.7 V	0.5 s	273.0V	0.55 s	273.8 V	0.53 s

TEST II: UNDER/OVER FREQUENCY TEST						
Parameter	G83/2 Limit		Setting		Test results	
	Frequency	Time	Frequency	Time	Frequency	Time
Under Frequency Stage 1	47.5Hz	20 s	47.51Hz	20.1 s	47.51Hz	20.2 s
Under Frequency Stage 2	47 Hz	0.5 s	47.01Hz	0.55 s	47.01 Hz	0.56 s
Ovder Frequency Stage 1	51.5 Hz	90 s	51.49 Hz	90.2 s	51.49 Hz	90.3 s
Ovder Frequency Stage 2	52 Hz	0.5 s	51.99 Hz	0.55 s	51.99 Hz	0.56 s

TEST III: LOSS OF MAINS PROTECTION				
Parameter	10% of power	55% of power	100% of power	Note
G83/2 Limit,sec	0.5	0.5	0.5	
Trip setting,sec	0.4	0.4	0.4	
Trip value,sec	0.36	0.32	0.30	

TEST IV: POWER QUALITY TEST-HARMONICS									
Parameter		2nd	3rd	5th	7th	9th	11th	13th	15th....39th
G83/2Limit(A)		1.08	2.3	1.14	0.77	0.4	0.33	0.21	0.15x(15/n)
Test value	Growatt1000S	0.503	1.022	0.582	0.298	0.218	0.182	0.052	<limit BS EN 61000-3-2
	Growatt1500S	0.518	1.028	0.563	0.285	0.226	0.173	0.051	

TEST V: POWER QUALITY TEST-POWER FACTOR				
Parameter	212V	230V	250V	Note
G83/2 Limit	0.95lag-0.95lead	0.95lag-0.95lead	0.95lag-0.95lead	
Measured	>0.99	>0.99	>0.99	@full load

TEST VI: POWER QUALITY TEST- VOLTAGE FLICKER					
Parameter	Starting	Stopping	Running		Note
Limit	4%	4%	$P_{st} = 1.0$	$P_{it} = 0.65$	
Test Value	<1.12%	<1.12%	0.28	0.18	

TEST VII: POWER QUALITY TEST- DC INJECTION				
Test level	10% power	55% power	100% power	Note
Test value	<<20mA	<<20mA	<<20mA	

TEST VIII: RECONNECTION TIMES				
Test level (% of rated power)	Under/Over Voltage	Under/Over Frequency	Loss of mains	Note
G83/2 Limit	20 s	20 s	20 s	
Actual setting	60 s	60 s	60 s	
Recorded values	60 s	60 s	60 s	