



Manufacturer:	Shenzhen JingFuYuan Tech. Co., LTD.
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Postal code, place:	518055
Country:	China
Test house details:	Shenzhen JingFuYuan Tech. Co., LTD. R&D Department.

Type reference:	Max AC power:	Nominal AC power:	Nominal AC Current:
SUNTREE 17000TL	17000 W	17000 W	3*24.6A

The results of the G59/2 tests are summarized in this certificate. JingFuYuan declares that all devices (with G59 setting) that are shipped to the UK comply with the requirements defined in engineering recommendation G59/2. These settings cannot be changed by an installer, user or by any other person than JingFuYuan. The complete documentation are available at JingFuYuan on demand.

### Test details

- Power quality
- Harmonic current emissions as per BS EN 61000-3-12
- Voltage fluctuations and flicker as per BS EN 61000-3-3
- DC injection / Power factor
- Under / Over frequency switch off
- Under / Over voltage switch off
- Loss of mains test
- Reconnection time

Shenzhen JingFuYuan Tech. Co., LTD.

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## Test results

### Power quality

Harmonic current emissions as per BS EN 61000-3-12									
Minimal Short Circuit Ratio $R_{SCE}$ :								33	
Value of Short Circuit Power $S_{SC}$ corresponding to $R_{SCE}$ :				SUNTREE 17000TL				0.162 MVA	
Description		Harmonic Current % = $100 I_n/I_1$						Harmonic Current	
								Distortion Factors (%)	
Harmonic		3rd	5th	7th	9th	11th	13th	THD	PWHD
Limit BS EN 61000-3-12 Table 2 - 4		21.6	10.7	7.2	3.8	3.1	2	23 (13)	23 (22)
Actual Values:	SUNTREE 17000TL	0.33	2.2	0.53	0.13	1.12	0.71		

Voltage Fluctuations and Flicker				
Harmonic	starting	stopping	Running (at rated power)	
Limit	4 %	4 %	$P_{st} = 1.0$	$P_{it} = 0.65$
Test value	< 1.6%	<1.9%	0.523	0.47

	DC injection			Power factor		
G59/2 Limit	20 mA, tested at three levels			0.95 lag – 0.95 lead at three voltage levels at $P_{rated}$		
Test level	10 %	55 %	100 %	212 V	230 V	248 V
Test value	16.1 mA	17.2mA	18.1 mA	0.9997	0.998	0.998

### Under / Over voltage switch off

Under / Over voltage test						
	G59/2 Limit		Setting		Test Results	
	Voltage	Time	Voltage	Time	Voltage	Time
Under voltage Stage 1	200.1 V	2.1 s	200.1 V	2.2s	200.7 V	2.3s
Under voltage Stage 2	184 V	0.45 s	184 V	0.46 s	184.5 V	0.47 s
Over voltage Stage 1	253 V	0.97 s	253 V	0.92 s	252.3 V	0.95 s
Over voltage Stage 2	264.5 V	0.43 s	264.5 V	0.42 s	263.8V	0.44 s



## Under / Over frequency switch off

Under / Over frequency test						
	G59/2 Limit		Setting		Test Results	
	Frequency	Time	Frequency	Time	Frequency	Time
Under frequency Stage 1	47.5 Hz	20 s	47.5 Hz	20 s	47.51 Hz	19.4 s
Under frequency Stage 2	47 Hz	0.5 s	47 Hz	0.5 s	47.02 Hz	0.41 s
Over frequency Stage 1	51.5 Hz	90 s	51.5 Hz	10 s	51.49 Hz	9.15 s
Over frequency Stage 2	52 Hz	0.5 s	52 Hz	0.5 s	51.99 Hz	0.44 s

## Loss of mains test

Loss of mains test (method used: frequency shift)			
Test level (% of rated power)	10 %	55 %	100 %
G59/2 Limit	2.5 s	2.5 s	2.5 s
Actual setting	0.1s	0.1s	0.1s
Trip values	0.09s	0.09s	0.09s

## Reconnection time measurement

	Under / Over voltage	Under / Over frequency	Loss of mains
Minimum value	180 s	180 s	180 s
Actual setting	180 s	180 s	180 s
Recorded value	180 s	180 s	180 s

## Fault level contribution

As SSEGs (small-scale embedded generators) for PV systems are inverter-connected, they are deemed to auto-matically comply with regulations and no further tests are required.

## Self monitoring – solid state switching

Not applicable as electro-mechanical relays used.