

## Appendix B – Manufacturer’s CLS Product Information

This form is available in a Microsoft Word version from the ENA’s website.

### G100/2 - Form B - Compliance Verification Report for Customer Export or Import Limitation Schemes

This form shall be used by the **Manufacturer** to demonstrate and declare compliance with the requirements of EREC G100. The form can be used in a variety of ways as detailed below:

1. For Fully Type Tested status

The **Manufacturer** can use this form to obtain **Fully Type Tested** status for a **CLS** by registering this completed form with the Energy Networks Association (ENA) Type Test Register.

2. To obtain Type Tested status for a product

The **Manufacturer** can use this form to obtain **Type Tested** status for one or more **Components** which are used in a **CLS** by registering this form with the relevant parts completed with the Energy Networks Association (ENA) Type Test Register.

3. One-off Installation


The **Installer** can use this form to confirm that the **CLS** has been tested to satisfy the requirements of this EREC G100. This form shall be submitted to the **DNO** before commissioning.

A combination of (2) and (3) can be used as required, together with Form C where compliance of the **CLS** is to be demonstrated on site.

Note:

If the **CLS** is **Fully Type Tested** and registered with the Energy Networks Association (ENA) Type Test Register, Form C shall include the **Manufacturer’s** reference number (the Type Test Register system reference), and this form does not need to be submitted.

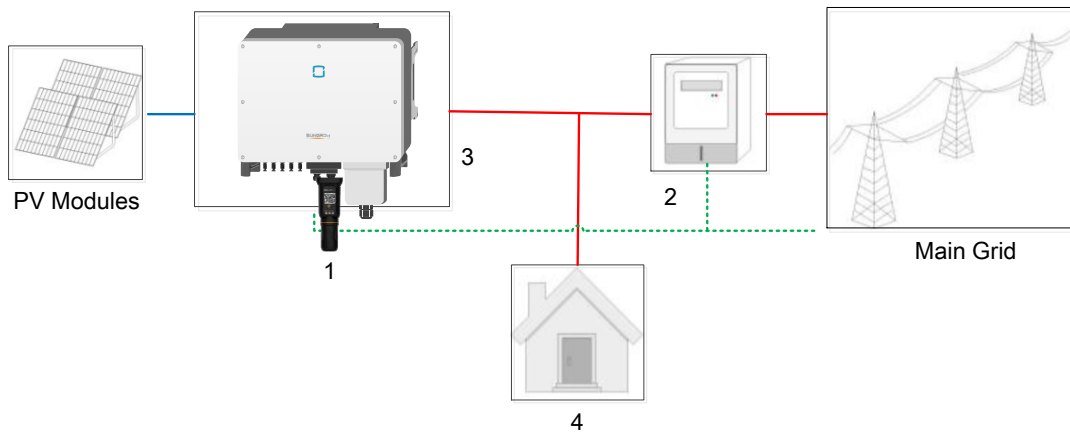
Where the **CLS** is not registered with the ENA Type Test Register or is not **Fully Type Tested** this form (all or in parts as applicable) shall be completed and provided to the **DNO**, to confirm that the **CLS** has been tested to satisfy all or part of the requirements of this EREC G100.

<b>CLS Designation</b>			
<b>Manufacturer name</b>		Sungrow Power Supply Co., Ltd.	
Address		No. 1699 Xiyou Rd., New & High Technology Industrial Development Zone Hefei, Anhui 230088, P. R. China 	
Tel	+86 551 6532 7878	Web site	https://en.sungrowpower.com
E:mail	tong.liu@sungrow-emea.com		
<b>Installer’s name</b>			
Address			
Tel		Web site	
E:mail			

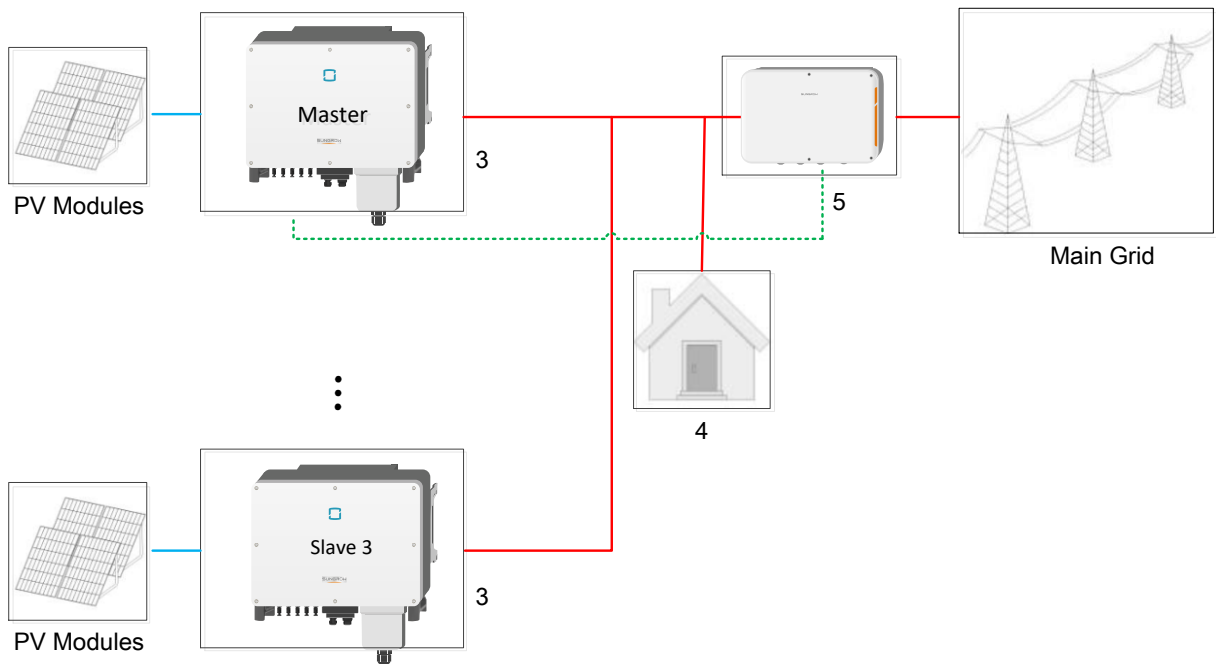
<b>Export/Import capabilities</b>			
Export	<b>Y / N</b>	Import	<b>Y / N</b>
<b>Description of Operation</b>			
<p>EREC G100 section <b>Error! Reference source not found.</b> requires a description of the <b>CLS</b>, and schematic diagram, to be provided to the <b>Customer</b>. Please provide that description and the diagram here.</p>			
<p>Sungrow end-to-end smart energy management solution is based on centralized concept (Master-slave), where the G100-2 CLS logic is implemented on the master inverter. The master inverter is responsible for communicating with the generation and the Sungrow CLS collects the current at the grid through the meter and then feeds it back to the inverter, which carries out Export/Import limitation control after judging.</p> <p><u>Sungrow CLS Controls &amp; Settings description:</u></p> <p>Sungrow systems meet EREC G100 version 2 policy requirements through the following high-level control &amp; settings:</p> <ol style="list-style-type: none"> <li><b>Sungrow Energy Meter (monitoring PoC with the grid):</b> Sungrow electricity meters will ensure real-time monitoring of current flow at the main PoC (Point of Connection), ensuring that the Sungrow CLS captures all potential input/output current. For multiple parallel systems, these values are aggregated according to DNO requirements to ensure that necessary import and export restrictions are properly managed.</li> <li><b>Sungrow Control Response Times:</b> The Sungrow CLS response time is compliant with the G100 2nd amendment time harmonization requirement fixes and will tether the applicable import/export elements to ensure no excursion into State 2 is greater than 15 seconds.</li> <li><b>Sungrow State 1, 2 &amp; 3:</b> Sungrow's solution meets the requirements (timing and allowable number of excursions) for state 1, 2 and 3 requirements, as detailed in the G100 2nd amendment policy.</li> <li><b>Sungrow Interrogation &amp; Data:</b> Sungrow's solution captures all control, power and current data which is presented in real-time via an remote online platform (Sungrow iSolarCloud system) both on site and off site which enables multi-tier extensive data interrogation (by either installer or manufacturer).</li> </ol>			






Customer connection scheme

Single Inverter in the system



Multiple inverters in parallel system



No.	Product type	Icon	Product number
1	Smart devices		Winet-S, Wient-S2, EyeS4-EU Logger1000A-EU, Logger1000B COM100D-EU, COM100E
2	Meter		DTSU666 DTSU666-20 DTSD1352-C 10(80)A DTSD1352-C/1(6)A UMG 604-PRO Energy Meter 610
3	Inverter		SG25CX-P2 SG30CX-P2 SG33CX-P2 SG36CX-P2 SG40CX-P2 SG50CX-P2 SG125CX-P2
4	Commercial load		
5	Smart Communication Box		COM100E, COM100D-EU, Logger1000A-EU, Logger1000B

## Communications Media

Document the provisions made for the use of various communication media, and both the inherent characteristics and the design steps made to ensure security and reliability.

The communication mediums of the CLS can be Wired or Wireless and are registered by the CLS. During the commissioning process, the device is registered as a generation/nongeneration device. The G100-2 logic is also implemented in each of the CLS devices.

1. Sungrow's solution CLS Internal Communications: All the parts within the Solution:  
The CLS system uses a combination of the:
  - a. Hard-wired serial Modbus RTU
  - b. Hard-wired wired communication (LAN)
  - c. Hard-wired serial dedicated protocol (over RS485)
  - d. Standardized wireless communication (Wi-Fi/LTE/Bluetooth)

Communication AIDS: Winet-S, Winet-S2, Loogger 1000B, and COM100E. Communication media are Wi-Fi and Ethernet. Based on Wired RS485 and inverter for transmission, the communication mode is Modbus Protocol, which is a safe and reliable protocol.

Among them, the auxiliary communication media are EyeS4-EU, Logger1000A-EU, and COM100D-EU, in addition to the WiFi mentioned above and Ethernet communications, can also spread data through wireless 4G signal.

2. Sungrow's solution 'Local Network Connection' communications: All devices in the system that constitute the full Sungrow's solution CLS system are inter-connected by 'local hard-wired' and dedicated communications cables. No 3rd party equipment is connected to this network, ensuring that we create a ring-fenced solution.
3. Sungrow's Remote communications: Sungrow's solution CLS systems can either communicate remotely via homeowner local router (WLAN) or via LTE(4G) mobile router installed within the Inverters.

## Cyber Security

Confirm that the **Manufacturer** or **Installer** of the **CLS** has provided a statement describing how the **CLS** has been designed to comply with cyber security requirements, as detailed in section **Error! Reference source not found.**

We Sungrow Power Supply Co., Ltd. declare that G100 certified products,  
And the variant models to be included in the certification,  
Are in compliance with Cyber security requirements in accordance with the standards:

- ENA Engineering Recommendation G99 Issue 1 Amendment 8 2021
- ETSI EN 303 645;
- PAS 1879 "Energy smart appliances – Demand side response operation – Code of practice";

Please also refer to the documents provided

*Manufacturer's declaration in accordance with the requirements of*

*G98-Amd. 7 (2022-10) standard Sec.s 9.7.1, 9.7.2, and G99-Amd. 9 (2022-10) standard Sec.s 9.1.7, 9.1.8 regarding "Cyber Security"*

## Power Quality Requirements

Where the **CLS** includes the power electronics that controls generation or loads (as opposed to the power electronics being included in **Devices** that are subject to their own power quality compliance requirements) please submit the harmonic and disturbance information here as required by EREC G5 and EREC P28.

Not applicable to our system as it is not a stand-alone device, and it works as a system.

## Fail Safe

**CLS** internal failure: please submit here the description of the internal **Fail Safe** design and operation. Please also document how it has been demonstrated, including the non-volatile recording of times and numbers of state 2 operations, and confirm the overall response of the **CLS** to this internal.

### Sungrow G100 Fail Safe Compliance

Sungrow G100 CLS was designed with a fail-safe mechanism according to G100 section 4.5. Therefore, the Sungrow system design ensures that it will limit the imported/exported current at the site to the DNO's agreed limit(s).

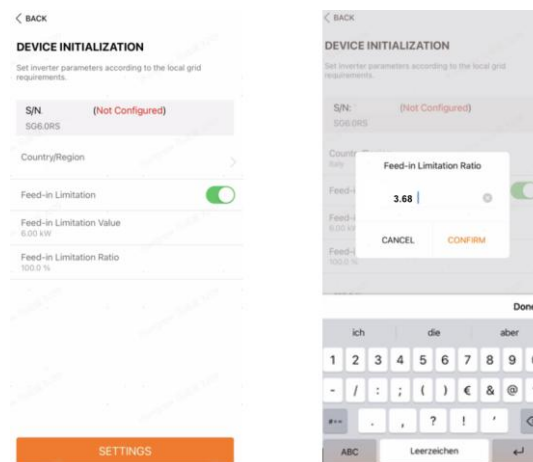
All the devices in the Sungrow system are either wired or wireless and are registered by the CLS. At the commissioning process the device is registered as a generation/non generation device.

**If a fault is detected, CLS will automatically enter to state 2 from state 1, but if the number of times it enters state 2 is more than 3 times within 24 hours, next time, the SLC will directly enter state 3.**

**AND also, if the time interval between CLS entering to state 2 twice is less than 10 minutes, CLS will directly enter state 3 next time.**

4	Fail Safe Tests	P
Component	Test	Enter state 3 within 15s Yes/No
1.Connection Point Component (CT)	Remove power supply to transducer	Yes
2.Components controlling generation/storage Devices(DSP)	Remove power supply to DSP	Yes
3.Communication controller(RS485)	Remove power supply to communication controller	Yes
4.Communication between Meter and Inverter	Remove/interrupt communication between Meter and Inverter	Yes
5.CLS system	Relay detect disabled,voltage measurement disabled,current measurement disabled	CLS can report the corresponding fault and enters state 3within 15s.

The setting for (Master) inverter is as below.



Communication and power supply failures between **Components** and **Devices**. Please document here compliance with EREC G100 section **Error! Reference source not found..**

Component/Device number/description	Communication failure test	Power supply failure test
Meter: DTSU666 DTSU666-20 DTSD1352-C 10(80)A DTSD1352-C/1(6)A UMG 604-PRO Energy Meter 610	PASS	PASS
Inverter: SG25CX-P2 SG30CX-P2 SG33CX-P2 SG36CX-P2 SG40CX-P2 SG50CX-P2 SG125CX-P2	PASS	PASS
Smart communication devices: Winet-S,Wient-S2,EyeS4-EU, Logger1000A-EU, Logger1000B COM100E COM100D-EU	PASS	PASS
No battery connect	-	-

<b>Operational Tests</b>						
In accordance with EREC G100 section <b>Error! Reference source not found.</b> undertake the tests A to D to confirm correct operation in state 1 and state 2, that transition into state 3 occurs as required, and that behaviour in state 3 is also as required.						
<b>Test A (Test on DTSU666&amp; DTSD1352-C series with SG50CX-P2)</b>						
Nominal Export Limit (for type tests this will be at maximum, minimum and one intermediate setting) in Amp:						72.46A
Nominal Import Limit (for type tests this will be at maximum, minimum and one intermediate setting) in Amp:						72.46A
<p><b>Sungrow:</b> According to the G100 file requirements: Test A:</p> <p>We following the testing process below:</p> <ol style="list-style-type: none"> <li>Initially apply an injection of 100% of nominal voltage and inject current to mimic a current flow equivalent to of 95% of the limit setting;</li> <li>Step up the current to give a current flow equivalent to 105% of the limit (for Test 1), Check that change in level is registered appropriately by the CLS. Check that the CLS is in state 2;</li> <li>Check that the current from generation and exporting storage devices reduces to a value at least 5% below the export limit setting within the specified reaction time.;</li> <li>Within 58s reduce the injected current back to 95% of the limit. Check that the CLS has returned to state 1 normally;</li> <li>Repeat the above for step increases from 95% to 110% of the set limit and from 95% to 120% of the set limit as detailed below.</li> </ol>						
No	Starting level	Step value	CLS registers change in level?	CLS and/or Component and/or Device initiates correct response of $\geq 5\%$ ?	Duration of step in test	Correct state 1/ state 2 operation
1	<b>68.75</b> (Export)	<b>75.98</b> (Export)	Yes	Yes	58s	<b>state 1-2-1</b>
2	<b>68.72</b> (Export)	<b>79.77</b> (Export)	Yes	Yes	58s	<b>state 1-2-1</b>
3	<b>68.75</b> (Export)	<b>87.18</b> (Export)	Yes	Yes	58s	<b>state 1-2-1</b>
4	<b>68.75</b> (Import)	<b>75.93</b> (Import)	Yes	Yes	58s	<b>state 1-2-1</b>
5	<b>68.72</b> (Import)	<b>79.88</b> (Import)	Yes	Yes	58s	<b>state 1-2-1</b>
6	<b>68.75</b> (Import)	<b>87.23</b> (Import)	Yes	Yes	58s	<b>state 1-2-1</b>
<b>Test B</b>						
Nominal Export Limit:						72.46A
Nominal Import Limit						72.46A

**Sungrow:** According to the G100 file requirements: Test B: repeat test 1 and 4 only of the above (but the CX-P2 series does not have import current, so the data here is omitted, so retest "test1")

We following the testing process below:

1. Initially apply an injection of 100% of nominal voltage and inject current to mimic a current flow equivalent to 95% of the limit setting;
2. Step up the current to give a current flow equivalent to 105% of the limit (for Test I), Check that change in level is registered appropriately by the CLS. Check that the CLS is in state 2;
3. After 62s (or 182s where appropriate) check that the CLS has moved into state 3; reduce the injected current back to 95% of the limit;
4. Confirm that all Devices have assumed an operating state (including being tripped off) as required by state 3.
5. Confirm that Devices remain in state 3 operating mode (or off) until the CLS is reset.

No	Starting level	Step value	CLS registers change in level?	CLS and/or Component and/or Device initiates correct response of $\geq 5\%$	Duration of step in test	Correct state 3 operation
7	<b>68.78</b> (Export)	<b>76.19</b> (Export)	Yes	Yes	62 s	<b>state 1-2-3</b>
8	<b>68.78</b> (Import)	<b>76.19</b> (Import)	Yes	Yes	62 s	<b>state 1-2-3</b>

### Test A (Test on DTSU666 & DTSD1352-C series with SG125CX-P2)

Nominal Export Limit (for type tests this will be at maximum, minimum and one intermediate setting) in Amp:	181.16A
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Nominal Import Limit (for type tests this will be at maximum, minimum and one intermediate setting) in Amp:	181.16A
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Sungrow: For specific test methods, please refer to the process of 50CX-P2(Page 7 Test A description)

No	Starting level	Step value	CLS registers change in level?	CLS and/or Component and/or Device initiates correct response of $\geq 5\%$ ?	Duration of step in test	Correct state 1/ state 2 operation
1	<b>172.91</b> (Export)	<b>191.18</b> (Export)	Yes	Yes	58 s	<b>state 1-2-1</b>
2	<b>171.94</b> (Export)	<b>197.70</b> (Export)	Yes	Yes	58 s	<b>state 1-2-1</b>
3	<b>171.99</b> (Export)	<b>217.82</b> (Export)	Yes	Yes	58 s	<b>state 1-2-1</b>
4	<b>172.91</b> (Import)	<b>191.32</b> (Import)	Yes	Yes	58 s	<b>state 1-2-1</b>
5	<b>171.94</b> (Import)	<b>197.88</b> (Import)	Yes	Yes	58 s	<b>state 1-2-1</b>
6	<b>171.99</b> (Import)	<b>217.96</b> (Import)	Yes	Yes	58 s	<b>state 1-2-1</b>

Test B						
Nominal Export Limit:						181.16A
Nominal Import Limit						181.16A
For specific test methods, please refer to the process of 50CX-P2						
No	Starting level	Step value	CLS registers change in level?	CLS and/or Component and/or Device initiates correct response of $\geq 5\%$ ?	Duration of step in test	Correct state 3 operation
7	172.07(Export)	190.98(Export)	Yes	Yes	62.0s	state 1-2-3
8	172.07(Import)	190.04(Import)	Yes	Yes	62.0s	state 1-2-3
State 3 Reset						
<p>These tests are to demonstrate compliance with section EREC G100 <b>Error! Reference source not found..</b></p> <p>Please document how the reset from state 3 to state 1 has been demonstrated. Please include how the reset is achieved.</p> <p>Please confirm that for <b>CLSs</b> to be installed in <b>Domestic installations</b> three (3) resets causes lockout or that for non-domestic installations lockout can only be reset after four hours. Please explain how lockout is reset.</p>						
<ol style="list-style-type: none"> <li>1. System state is "State 3 - Lock-Out";</li> <li>2. <b>Because the SG125CX-P2 model is defined as a non-domestic(<math>\geq 100A</math>) type, the system will remain and lock in state3 for 4 hours, and this state cannot be released through operations during this period.</b>  <b>For SG25-50CX-P2, is defined as a domestic(<math>\leq 100A</math>) type.If this criterion is breached the CLS will remain locked in state 3 pending further investigation and resolution of the issues causing the CLS to be locked out in state 3. Sungrow can be accessed (offline) through iSolarCloud APP locally (WiFi or Bluetooth) to check parameters, and can be restored manually after everything is normal.</b></li> <li>3. After the lockout period an electrician can sent to troubleshoot the problem, CLS can be restored to state 1.</li> <li>4. CLS changes system state to "State 1 - Normal Operation" and sends commands to Load &amp; Generation devices.</li> <li>5. CLS Clears all G.100 related events from its memory due to investigations.</li> <li>6. Devices receive the command and enter their Normal Operational Mode.</li> <li>7. CLS logs the state change.And meantime send this event to "iSolarCloud".</li> <li>8. CLS sends and alert to a User Interface that the system is in "State 1 - Normal Operation".</li> </ol>						