SWEDENERGY
ENERGIFÖRETAGEN SVERIGE

## Registration for approval of an inverter for a type A power-generating facility – Registration for "Rikta Rätt"

The Registration concerns an inverter for a type A power-generating facility which must meet all requirements of Commission Regulation (EU) 2016/631 establishing a network code on requirements for grid connection of generators, as well as the related Swedish regulation EIFS 2018:2 establishing generally applicable requirements for grid connection of generators and required protection settings based on the standard SS-EN 50549-1 and the manual ALP published by Swedenergy (Energiföretagen Sverige).

A type A power-generating facility is a facility with a maximum continuous capacity of between 0.8 kW and 1500 kW.

**The attached pages with questions must be completed and signed by a responsible person at the applying company.**

### Applying company

| | | | |
|---|---|---|---|
| Company | Sungrow Power Supply Co., Ltd. | | |
| Contact person | Elsa Cubillas | Telephone number | +491734968527 |
| Address | No. 1699 Xiyou Rd., New and High Technology Industrial Development Zone, Hefei 230088 P.R. China | | |
| E-mail | e.cubillas@sungrow-emea.com | | |

### Details of the inverter

| | | | | |
|---|---|---|---|---|
| Manufacturer/Make of inverter | Sungrow | | | |
| Type designation/Model number | SG33CX-P2 | | | |
| Firmware (version number) | LCD_EMERALD-S_V11_V01_A; MDSP_EMERALD-S_V11_V01_A | | | |
| Connection | ☐ Singlephase | ☒ Threephase | Power factor (cos ϕ) | +/- 0.8 |
| Can be combined with battery storage | ☐ | The inverter can be used for backup power (island operation) | | ☐ |

### Protection settings

| The inverter can be configured with the settings below | ☒ | |
|---|---|---|
| Protection settings | Recommended value<br>Time | Level |
| Overvoltage (step 2) | 60 s | 253,0 V |
| Overvoltage (step 1) | 0,2 s | 264,5 V |
| Undervoltage | 0,2 s | 195,5 V |
| Overfrequency | 0,5 s | >51,5 Hz |
| Underfrequency | 0,5 s | <47,5 Hz |
| Protection from unwanted island operation | 0,5 s | 2,5 Hz/s[1] |

[1] Frequency derivate

### Information about flicker and harmonics emissions

| The inverter meets the requirements below | | | ☒ **Obs**erve that flicker values must be provided |
|---|---|---|---|
| Electricity quality data | | Value | |
| Flicker values | Pst | 1.00 | ≤ 16 A Calculated according to SS-EN 61000-3-3 |
| | Plt | 0.65 | 16 – 75 A Calculated according to SS-EN 61000-3-11<br>> 75 A Calculated according to SS-EN 61400-21 |
| Harmonics max 16 A | Meets SS-EN 61000-3-2 | | |
| Harmonics 16-75 A | Meets SS-EN 61000-3-12 | | |
| Harmonics > 75 A | Interharmonics and individual current harmonics must be reported separately in Appenix 1 | | |

### Requirement regarding logic interface according to EU Commission Regulation 2016/631 article 13.6

☒ The inverter is equipped with a logic interface that allows remote control

### CE-marking

☒ The inverter is CE-marked

**Frequency response**

*The following configuration requirements for frequency response settings are taken from the Swedish Energy Market Inspectorate's regulation EIFS 2018:2, Commission Regulation (EU) 2016/631 (RFG) and the applicable Swedish standard SS-EN 50549-1. All requirements are mandatory unless otherwise stated.*

| ☒ **The inverter meets the following requirements** | |
|---|---|
| | **Reference** |
| The inverter meets the requirement to remain connected within the following frequency ranges:<br>• Not less than 30 minutes for frequency 47,5 – 49,0 Hz<br>• Unlimited for frequency range 49,0 – 51,0 Hz<br>• Not less than 30 minutes for frequency range 51,0 – 51,5 Hz | EIFS 2018:2 chapter 3 (1) |
| The inverter meets the requirement to remain connected to the network and operate with a rate of change of frequency up to 2.0 Hz/s | EIFS 2018:2 chapter 3 (2) |
| The inverter meets the requirement to reduce its active power output when the frequency exceeds 50.5 Hz | EIFS 2018:2 chapter 3 (3) |
| The droop[2] setting is 8% | EIFS 2018:2 chapter 3 (4) |
| Active power output from the inverter is reduced by a maximum of 3.0 per cent per Hz at frequencies below 49.0 Hz | EIFS 2018:2 chapter 3 (7) |
| The inverter is automatically reconnected only within the frequency range 47.5 - 50.1 Hz:<br>• Connection occurs only if the network frequency has been within this range continuously for at least 3 minutes | EIFS 2018:2 chapter 3 (8) |
| The inverter meets the requirement concerning the increase of active power output during automatic connection as follows:<br>• < 49.9 Hz - rate of increase of active power output unlimited<br>• 49.9-50.1 Hz - rate of increase of active power output is limited to 10 per cent of nominal power output per minute<br>• > 50.1 Hz - there is no increase of active power output | EIFS 2018:2 chapter 3 (9) |
| State the lowest active power output (in kW) to which the inverter can be down- regulated in case of overfrequency: 20.62 kW | EIFS 2018:2 chapter 3 (5) |

Hereby it is certified that the above information is correct and that technical documentation that support the stated information, values and settings can be presented upon request.

Date, City, Country

10th Oct 2022 ,Munich Germany

Lucas Liu

Signature

LiuTong liutong@sungrowpower.com

Name

[1] The value of the rate of change of frequency must be measured at the grid connection point and calculated over a period of 0.5 s.

[2] Droop means the ratio of a change of frequency to the change in power output, expressed in percentage terms. The change of frequency is expressed as a ratio between the actual frequency and the nominal frequency. The power output is expressed as a ratio between the nominal power and the power output in case of overfrequency in the network. For regulation of the power output based on overfrequency, the droop is calculated according to the installed power of the plant. According to section 6 of the EIFS 2018:2.