



EQUIPMENT CERTIFICATE

Certificate No.:	Issued:	Valid until:	GCC class
TC-GCC-DNVGL-SE-0124-08835-0	2022-06-09	Unlimited	TC _i

Issued for:

Combined Heat and Power Generation Units XRGI [6-20] with iQ [10-20] Control Panel (PPM Type A)

With specifications and software version as listed in Annex 2

Issued to:

EC POWER A/S

Samsoevej 25, DK-8382 Hinnerup

According to:

DNVGL-SE-0124, 2016-03: Certification of Grid Code Compliance

PTPIREE, 2021-04: Conditions and procedures for using certificates in the process of connecting power generating modules to power networks

32016R0631, 2016-04: Requirements for Generators (NC RfG)

PSE, 2018-12: Requirements of general application resulting from Commission Regulation (EU) 2016/631 of 14 April 2016

detailed in Annex 1

Based on the document:

CR-GCC-DNVGL-SE-0124-08835-A072-0 Network Code Requirements for a PGU of Type A - Poland, Certification Report, dated 2022-06-09

Further assessment information, including scope and conditions, is found in Annex 1. Description of the PV inverters and type tests performed is found in Annex 2 and Annex 3 respectively.

Hamburg, 2022-06-09

For DNV Renewables Certification

Hamburg, 2022-06-09

For DNV Renewables Certification



Bente Vestergaard
Director and Service Line Leader Type
and Component Certification

By DAkkS according DIN EN IEC/ISO 17065
accredited Certification Body for products. The
accreditation is valid for the fields of certification
listed in the certificate.

Artur Zbroński
Project Manager

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Conditions, assessment criteria and scope of assessment

Provided that the conditions listed in section 1 are considered at project level, the CHP generation units as further specified in Annex 2 comply with the requirements within scope of this certification, as specified in section 3.

The customer, as specified on the front page of this certificate, is responsible for the certificate maintenance.

1 Conditions

- Changes of the system design, hardware or the software of the certified PGUs are to be approved by DNV.
- PGU settings must finally be agreed and checked at project level to ensure grid code compliance, based on the requirements of relevant System Operator (SO). For the functionalities within scope of this certification, more information about the settings assessed is found in Control Settings in section 4.2 as well as the corresponding assessment sections 5.1 - 5.4 of the certification report CR-GCC-DNVGL-SE-0124-08835-A072-0.
- The capability of remote control has been shown on unit level but must finally be ensured at project level, considering any further requirements of relevant System Operator (SO) and the full communication network. For the functionalities within scope of this certification, this concerns remote cessation of active power, as further described in section 5.3 of the certification report CR-GCC-DNVGL-SE-0124-08835-A072-0.
- Availability of the qualified personnel with appropriate access level to realize intervention operation and blocking of LFSM-O function must be ensured at project level with relevant System Operator (SO). More information about the capability to execute this functionality is found in section 5.4 of the certification report CR-GCC-DNVGL-SE-0124-08835-A072-0. Should the DSO require more direct method for LFSM-O blocking and intervention operation, implementation of power plant controller should be considered at the plant level.

2 Assessment criteria and normative references for this certificate:

- /A/ Service Specification DNVGL-SE-0124: Certification of Grid Code Compliance, DNV GL, March 2016
- /B/ Conditions and procedures for using certificates in the process of connecting power generating modules to power networks, Warunki i procedury wykorzystania certyfikatów w procesie przyłączenia modułów wytwarzania energii do sieci elektroenergetycznych, version 1.2, PTPIREE, dated 2021-04-28, (in the following: PTPIREE 2021-04)
- /C/ Requirements of general application resulting from Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators (NC RfG) – as approved by the decision of the President of the Energy Regulatory Office DRE.WOSE.7128.550.2.2018.ZJ dated January 2nd 2019, Wymogi ogólnego stosowania wynikające z Rozporządzenia Komisji (UE) 2016/631 z dnia 14 kwietnia 2016 r. ustanawiającego kodeks sieci dotyczący wymogów w zakresie przyłączenia jednostek wytwórczych do sieci (NC RfG), PSE S.A., dated 2018-12-18 zatwierdzone Decyzją Prezesa Urzędu Regulacji Energetyki DRE.WOSE.7128.550.2.2018.ZJ z dnia 2 stycznia 2019 r, (in the following: PSE 2018-12)
- /D/ Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators, published in the Official Journal of the European Union L112/1, The European Commission, 27/04/2016. Document 32016R0631, (in the following: NC RfG)

3 Scope of assessment and results

The following functionalities have been assessed based on the rules for the use of equipment certificates for Power Park Modules (PPMs), as specified in chapter 7 and 9 of the PTPIREE 2021-04 /B/. The functions denoted "Not Applicable" in the table of chapter 7 has not been included.

Capability	NC RfG /D/	PSE 2018-12 /C/	Type A	Assessment result (*)
Frequency range	13.1 (a)	13.1 (a)(i)	x	Compliant
Rate of Change of Frequency (RoCoF) withstand capability, df/dt	13.1 (b)	13.1 (b)	x	Compliant
Remote cessation of active power	13.6	13.6	x	Compliant
Limited Frequency Sensitive Mode – Over Frequency (LFSM-O)	13.2	13.2 (a), (b), (f)	x	Compliant

(*) Please note also the corresponding conditions for compliance, as stated in section 1

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Schematic description and technical data of the generating units

1 Schematic description of the generating unit

The EC Power CHP generating unit series XRGI [6-20] with iQ [10-20] Control Panel, consisting of: XRGI 6 with iQ10 Control Panel, XRGI 9 with iQ10 Control Panel, XRGI 15 with iQ15 Control Panel, XRGI 20 with iQ20 Control Panel generate three-phase alternating current (AC) through CHP technology utilising asynchronous generators.

They run at 400 V (phase to phase) rated output voltage with a rated active power output of 6 kW to 20 kW (corresponding Max. apparent power of 6.32 kVA to 21.05 kVA). The different output power variants are achieved through using generators and engines with different ratings. Different variants use different heat distributors accordingly to their rated power. Furthermore, the variants utilise different control system units. The capacitor used for power factor adjustment is selected at project level, depending on actual power and requested power factor at the connection point.

XRGI 15 with iQ15 Control Panel uses Zanardi generator and “Gas Safety” speed controller, while XRGI 6 with iQ10 Control Panel, XRGI 9 with iQ10 Control Panel and XRGI 20 with iQ20 Control Panel use Emod generators and “ECU” speed controller.

There are no further differences in the hardware or firmware used. It has been concluded that the presented differences do not impact the electrical behaviour in scope of the certification.

The electrical data of the generating unit is summarized in the following section.

2 Technical data of main components

According to the documents provided by the manufacturer, the following components are used.

2.1 General Specifications

PGU Variant	XRGI 6 with iQ10 Control Panel	XRGI 9 with iQ10 Control Panel	XRGI 15 with iQ15 Control Panel	XRGI 20 with iQ20 Control Panel
No. of phases	3	3	3	3
Rated apparent power	6.32 kVA	9.47 kVA	15.26 kVA	21.05 kVA
Maximum active power	6.0 kW	9.0 kW	14.5 kW	20.0 kW
Rated active power	6.0 kW	9.0 kW	14.5 kW	20.0 kW
Rated AC-voltage	400 V	400 V	400 V	400 V
Rated frequency	50 Hz	50 Hz	50 Hz	50 Hz

2.2 Generator Specifications

PGU Variant	XRGI 6 with iQ10 Control Panel	XRGI 9 with iQ10 Control Panel	XRGI 15 with iQ15 Control Panel	XRGI 20 with iQ20 Control Panel
Manufacturer	Emod	Emod	Zanardi	Emod
Model no.	WKASYG 200/4-100	WKASYG 200/4-100	AS 200/4	WKASYG 225/4-16/20
Max. rated power Sr max	12.8 kVA	12.8 kVA	18.9 kVA	25.6 kVA

2.3 Engine Specifications

PGU Variant	XRGI 6 with iQ10 Control Panel	XRGI 9 with iQ10 Control Panel	XRGI 15 with iQ15 Control Panel	XRGI 20 with iQ20 Control Panel
Manufacturer	Toyota	Toyota	Toyota	Toyota
Type	1KS	1KS	4Y	4Y
Mechanical power P (kW)	6.5 kW	9.9 kW	16.2 kW	21.5 kW

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2.4 Speed Controller Specifications

PGU Variant	XRGI 6 with iQ10 Control Panel	XRGI 9 with iQ10 Control Panel	XRGI 15 with iQ15 Control Panel	XRGI 20 with iQ20 Control Panel
Manufacturer	EC Power	EC Power	EC Power	EC Power
Type	ECU	ECU	Gas Safety	ECU

2.5 Controller Specifications

PGU Variant	XRGI 6 with iQ10 Control Panel	XRGI 9 with iQ10 Control Panel	XRGI 15 with iQ15 Control Panel	XRGI 20 with iQ20 Control Panel
Manufacturer	EC Power	EC Power	EC Power	EC Power
Type	iQ10 Central Control	iQ10 Central Control	iQ15 Central Control	iQ20 Central Control
HW version	4.01	4.01	4.01	4.01
SW version	1.16.8 or higher	1.16.8 or higher	1.16.8 or higher	1.16.8 or higher
Frequency Response SW Module:	1.0.1	1.0.1	1.0.1	1.0.1

2.6 Unit transformer

The transformer is not part of the generating unit and consequently has not been part of the assessment.

2.7 Grid Protection

The protection is not part of certification scope

2.8 Control settings

The control interface allows for the selection of different parameter sets via the “Grid Code” field, which provide default settings based on specific grid codes and national requirements. For this certification report the parameter set called “RFG 2016/631 (PL)” in the display interface, was assessed for the functionalities within scope of this certification.

It should be noted that compliance can be achieved also with other parameter sets and control settings, but that changes to control settings will affect the PGU control behaviour which can thus affect compliance. It should be noted the final settings must be agreed on project level in agreement with relevant system operator.

Protection settings has not been part of the assessment. Since these could intervene with and affect the compliance of the assessed functionalities, this must be further assessed at project level.

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Type tests

1 Type tests

Tests were performed 2022-03-22 in the EC Power A/S Test Site, Hinnerup in Denmark, based on a customized test plan. All tests were performed under ISO-17025 accreditation and they were performed on the XRGI 15 with iQ15 Control Panel and XRGI 20 with iQ20S Control Panel power generation units.

The results used for assessment are documented in the measurement report(s) as specified below:

Test report(s)	Document number	Content
/1/	165/22/01781/ER, Rev.02	TEST REPORT: XRGI 15 with iQ15 Control Panel
/2/	165/22/01782/ER, Rev.02	TEST REPORT: XRGI 20 with iQ20S Control Panel

Scope	Reference
Frequency range	4.2 of /1/ and 4.2 of /2/
Rate of Change of Frequency (RoCoF) withstand capability, df/dt	4.3 of /1/ and 4.3 of /2/
Remote cessation of active power	4.4 of /1/ and 4.4 of /2/
Limited Frequency Sensitive Mode – over frequency (LFSM-O)	4.5 of /1/ and 4.5 of /2/

The tests results have been assessed against the requirements of PSE 2018-12 /C/ and NC RfG /D/. Further details are described in the corresponding certification report CR-GCC-DNVGL-SE-0124-08835-A072-0.