Certificate of compliance

Applicant:	**Fronius International GmbH** **Günter Fronius Straße 1** **4600 Wels-Thalheim** **Austria**	
Product:	**Photovoltaic and battery inverter (Hybrid-Inverter)**	
Model:	**Primo GEN24 8.0**	**Primo GEN24 8.0 Plus**
	Primo GEN24 10.0	**Primo GEN24 10.0 Plus**

The device is designed to work as a generation unit of the type: A

Inverter for single-phase parallel connection to the public grid. The network monitoring and disconnection device is an integral part of the above-mentioned model.

Applied rules and standards:

EN 50549-1:2019/A1:2023
Requirements for parallel connection of installations with distribution networks - Part 1: Connection to an LV distribution network - Production of installations up to and including Type B

4.4 Normal operating range
4.5 Immunity to disturbances
4.6 Active response to frequency deviation
4.7 Power response to voltage variations and voltage changes
4.8 EMC and power quality
4.9 Interface protection
4.10 Connection and starting to generate electrical power
4.11 Ceasing and reduction of active power on set point
4.12 Remote information exchange
4.13 Requirements regarding single fault tolerance of interface protection system and interface switch

EN 50549-10:2022
Requirements for generating plants to be connected in parallel with distribution networks - Part 10: Tests for conformity assessment of generating units

Compliance with the parameters in Annex C of the standard
(see appendix parameter table)

Commission Regulation (EU) 2016/631 of 14 April 2016
Establishing a network code on requirements for grid connection of generators (NC RFG).
Type approval for generation units to use in Type A plants.

At the time of issue of this certificate, the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number: **SGP-24964_15_R2**
Certification Program: **NSOP-0032-DEU-ZE-V10**
Certificate number: **U25-0878**
Date of issue: **2025-09-18**

Certification body

Georg LORITZ
Lab Supervisor Energy Systems

Accreditation

DAkkS Deutsche Akkreditierungsstelle D-ZE-12024-01-00

Type Approval and declaration of compliance with the requirements of EN 50549-1 and Commission Regulation (EU) 2016/631 of 14 April 2016				
Manufacturer	Fronius International GmbH Günter Fronius Straße 1 4600 Wels-Thalheim Austria			
Product type	Photovoltaic and battery inverter (Hybrid-Inverter)			
Static converter model	Primo GEN24 8.0 Primo GEN24 8.0 Plus	Primo GEN24 10.0 Primo GEN24 10.0 Plus	--	--
Input DC (photovoltaic)				
MPP voltage range [V]	260 – 480	260 – 480	--	--
Max. input voltage [V]	65 – 600	65 – 600	--	--
Max. input current per MPPT [A]	22,0 / 22,0	22,0 / 22,0	--	--
Input DC (battery)				
DC voltage range [V]	150 – 455	150 – 455	--	--
Max. DC current per DC input [A]	22,0	22,0	--	--
Output AC				
Rated AC voltage [V]	1~NPE 220 / 230 / 240	1~NPE 220 / 230 / 240	--	--
Rated output current [A]	34,8	43,5	--	--
Max. output current [A]	45,5	45,5	--	--
Nom. converter output (P_{NINV}) [W]	8000	10000	--	--
Rated apparent power [VA]	8000	10000	--	--
Output AC Backup Mode				
P_{sn} (nom. discharge power) [W]	8000	10000	--	--
P_{smax} (max. discharge power) [W]	8000	10000	--	--

Interface protection system and interface switch (Network and system protection "NS-protection")	
Type of protection	Integrated NS-protection
Assigned to generation unit type	Primo GEN24 8.0 / Primo GEN24 8.0 Plus Primo GEN24 10.0 / Primo GEN24 10.0 Plus
Integrated interface switch	Type of switching equipment 1: Relay (Model Song Chuan 510CN-P-2A1-F-C G04) Type of switching equipment 2: Relay (Model Song Chuan 510CN-P-2A1-F-C G04)
	Note: The output is switched off by the inverter bridge and two relay in series in each line and neutral.
Firmware version	1.3x.x-x
	Note: The tests were performed with firmware version 1.33.7-1. Changes in the firmware version on position "x" have no effect on the required electrical properties. "x" could be any number or sign higher than the tested version.

Note

The settings of the product are password protected adjustable.

In case the generators are used with an external protection device, the protection settings of the inverters are to be adjusted according to the manufacturer's declaration.

The above stated generators are tested according to the requirements in the EN 50549-1 and the Commission Regulation (EU) 2016/631 of 14 April 2016. Any modification that affects the stated tests must be named by the manufacturer/supplier of the product to ensure that the product meets all requirements.

Type Approval and declaration of compliance with the requirements of EN 50549-1 and Commission Regulation (EU) 2016/631 of 14 April 2016					
Parameter Table					
Name of parameter set	**Grid Code Id: 65571 (0X10023), Grid Code Version V 01.00.34.00**				
Specific technical requirement	**EN 50549-10**				
Clause of EN 50549-1	**Parameter**	**Remarks / additional information[b]**	**setting range**	**default settings used**	
4.3.2 Interface switch	Single fault tolerance for interface switch		yes | no	yes	
4.4.2 Operating frequency range	47,0 – 47,5 Hz Duration		0 – 20 s	0 s	
	47,5 – 48,5 Hz Duration		30 – 90 min	≥ 30 min	
	48,5 – 49,0 Hz Duration		30 – 90 min	≥ 30 min	
	49,0 – 51,0 Hz Duration		not configurable	unlimited	
	51,0 – 51,5 Hz Duration		30 – 90 min	≥ 30 min	
	51, 5 – 52 Hz Duration		0 – 15 min	0 s	
4.4.3 Minimal requirement for active power delivery at under frequency	Reduction threshold	Electronic inverter, no power reduction take place	Not configurable	49,5 Hz	
	Maximum reduction rate	≤ 2 % (inverter) ≤ 10 % (generator)	Not configurable	10 % P_M/Hz	
4.4.4 Continuous operating voltage range	Upper limit		Not configurable	110 %	
	Lower limit		Not configurable	85 % Un, 90% Uc	
4.5.2 Rate of change of frequency (ROCOF) immunity	ROCOF withstand capability (defined with a sliding measurement window of 500 ms) non-synchronous generating technology (inverter): synchronous generating technology:		Not configurable yes no	2 Hz/s	
4.5.3.2 Generating plant with non-synchronous generating technology (FRT)	Maximum power resumption time		Not configurable	≤1 s	
	Voltage-Time-Diagram		see Figure 6, EN 50549-1	Time [s]	U [p.u.]
				0,0	0,2
				0,15	0,2
				1,5	0,85
				180	0,85
				180	0,9
4.5.4 Over-voltage ride through (OVRT)	Voltage-Time-Diagram		not configurable	Time [s]	U [p.u.]
				0,0	1,25
				0,1	1,25
				0,1	1,20
				5,0	1,20
				5,0	1,15

				60	1,15
				60	1,10
4.5.5 Phase jump immunity	Phase jump immunity		not configurable	20°	
4.6.1 Power response to over frequency (LFSM-O)	Threshold frequency f_1		50 Hz – 66 Hz	50,2 Hz	
	Droop		0,66 % – 12 %	5 %	
	Power reference		P_M | P_{max}	P_{max}, for synchronous generating technology and EESS P_M for other non-synchronous generating technology	
	Intentional delay		0 – 60 s	0,5 s	
	Deactivation threshold fstop		50,0 Hz – f_1	deactivated	
	Deactivation time t_{stop}		0 – 600 s	30	
	Acceptance of staged disconnection		yes | no	yes	
4.6.2 Power response to under frequency (LFSM-U)	Threshold frequency f_1		50 Hz – 45 Hz	49,8 Hz	
	Droop		1 – 12 %	5%	
	Power reference		P_M | P_{max}	P_{max}	
	Intentional delay		0 – 60 s	0,5 s	
4.7.2.2 Capabilities	Active factor range overexcited		0,9 – 1 / 48 % P_D - 0	0,9 – 1 / 43,6% P_D - 0	
	Active factor range underexcited		0,9 – 1 / 48% P_D – 0	0,9 – 1 / 43,6% P_D - 0	
4.7.2.3 Control modes	Enabled control mode		Q setp. Q(U) Q(P) cos φ setp. cos φ (P)	activated deactivated deactivated deactivated deactivated	
4.7.2.3.2 Set point control modes	Q setpoint and excitation		0 – 48 % P_D, 0 – 33 % P_D	0	
	cos φ setpoint and excitation		1 – 0,9	1	
4.7.2.3.3 Voltage related control modes	Characteristic curve		Q(U) P(U)	deactivated deactivated	
	Time constant		0,01 s – 60 s	10 s	
	Min cos φ		0,0 – 1	0,95	
	Lock in power		0 % – 100 %	deactivated	
	Lock out power		0 % – 100 %	deactivated	
4.7.2.3.4 Power related control mode	Characteristic curve		cos φ (P)	deactivated	

4.7.4.2.2 Zero current mode for converter connected generating technology	Enabling		enable | disable	disabled
	Static voltage range overvoltage		100 % U_n – 200 % U_n	120 % U_n
	Static voltage range undervoltage		0 % U_n – 100 % U_n	50 % U_n
4.9.3 Requirements on voltage and frequency protection	Threshold for protection as dedicated device [in A or kW, kVA]		Note: Rated current of internal safety device!	Internal safety device 16 A – 250kVA
	Undervoltage threshold stage 1		0 U_n – 1,0 U_n	0,8 U_n
	Undervoltage operate time stage 1		0 s – 1000 s	3 s
	Undervoltage threshold stage 2		0 U_n – 1,0 U_n	0,45 U_n
	Undervoltage operate time stage 2		0 s – 1000 s	0,3 s
	Overvoltage threshold stage 1		1,0 U_n – 1,352 U_n	1,15 U_n
	Overvoltage operate time stage 1		0 s – 1000 s	1 s
	Overvoltage threshold stage 2		1,0 U_n – 1,352 U_n	1,12 U_n
	Overvoltage operate time stage 2		0 s – 1000 s	0,1 s
	Overvoltage threshold 10 min mean protection[a]		1,0 U_n – 1,352 U_n	1,1 U_n
	Overvoltage operate time 10 min mean protection[a]		0,0 – 3,0 s	10 min (update every 3s)
	Underfrequency threshold stage 1		45,0 Hz – 50,0 Hz	47,5 Hz
	Underfrequency operate time stage 1		0,1 s – 1000 s	0,1 s
	Underfrequency threshold stage 2		45,0 Hz – 50,0 Hz	47,5 Hz
	Underfrequency operate time stage 2		0 s – 1000 s	0,1 s
	Overfrequency threshold stage 1		50,0 Hz – 66,0 Hz	51,5 Hz
	Overfrequency operate time stage 1		0 s – 1000 s	0,1 s
	Overfrequency threshold stage 2		50,0 Hz – 66,0 Hz	51,5 Hz
	Overfrequency operate time stage 2		0 s – 1000 s	0,1 s
	Loss of mains according EN 62116 (LoM)		0 – 6000 s	ROCOF 2,5 Hz/s (0,5 s) aktive 2 s (5 s)
	Lower frequency		45,0 Hz – 50,0 Hz	49,5 Hz
	Upper frequency		50,0 Hz – 66,0 Hz	50,2 Hz

4.10.2 Automatic reconnection after tripping	Lower voltage		0 % U_n – 100 % U_n	85 % U_n
	Upper voltage		100 % U_n – 135,2 % U_n	110 % U_n
	Observation time		1 s – 900 s	60 s
	Active power increase gradient		0,06 % – 6000 %/min	10 % /min
4.10.3 Starting to generate electrical power	Lower frequency		47,0 Hz – 50,0 Hz	49,5 Hz
	Upper frequency		50,0 Hz – 66,0 Hz	50,1 Hz
	Lower voltage		0 % U_n – 100 % U_n	85 % U_n
	Upper voltage		100 % U_n – 135,22 % U_n	110 % U_n
	Observation time		1 s – 900 s	60 s
	Active power increase gradient		0,06 % – 6000 %/min	disabled
4.11.1 Ceasing active power	Remote operation of the logic interface	available activation option	yes | no	digital input, Fronius Solar API (JSON), sunspec
4.11.2 Reduction of active power on set point	Remote operation NOTE: If yes further definition is provided by the DSO	available activation option	yes | no	digital input, Fronius Solar API (JSON), sunspec
4.12 Remote information exchange	Remote information exchange required NOTE: If yes further definition is provided by the DSO	available communication standards	yes | no	Fronius Solar API (JSON), sunspec