



## Letter of Conformity for Grid Support Interactive Inverter

UL Standard No. 1741-Third Edition Supplement SA And SB

**Certificate:** 80034168

**Master Contract:** 203213

**Project:** 80203034

**Date Issued:** Jun 12, 2024

**Issued To:** Fronius International GmbH  
Guenter Fronius Strasse 1  
Wels-Thalheim, Upper Austria, 4600  
Austria

**Attention:** Josef Feichtinger

*The products listed below have been found to comply with the applicable requirements of UL 1741-3<sup>rd</sup> Edition (Rev. May 19, 2023) Supplement SA8 to SA 15 and SA17 to SA18, SB4.2 and SB4.3- GRID SUPPORT UTILITY INTERACTIVE INVERTERS AND CONVERTERS.*



**Issued by:** *PeterLim*  
Peter Lim

### **PRODUCTS**

CLASS - C531109 - POWER SUPPLIES Distributed Generation Power Systems Equipment  
CLASS - C531189 - POWER SUPPLIES - Distributed Generation Power Systems Equipment - Certified to U.S. Standards

Transformerless Special Purpose Grid Support Interactive Inverter, Primo GEN24 3.8 208-240; Primo GEN24 3.8 208-240 Plus; Primo GEN24 5.0 208-240; Primo GEN24 5.0 208-240 Plus; Primo GEN24 6.0 208-240, Primo GEN24 6.0 208-240 Plus; **Primo GEN24 7.7 208-240; Primo GEN24 7.7 208-240 Plus; Primo GEN24 10.0 208-240 and Primo GEN24 10.0 208-240 Plus permanently connected.**



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For details related to rating and notes, reference should be made to the CSA Certification Record, the Descriptive Report or Annex A Ratings.

### **APPLICABLE REQUIREMENTS**

CSA-C22.2 No.107.1-16 ( <b>reaffirmed 2021</b> ) - *UL Std No. 1741-Third Edition	-	Power Conversion Equipment Inverters, Converters, Controllers and Interconnection System Equipment For Use With Distributed Energy Sources ( <b>Rev. May 19, 2023</b> )
UL Std No. 1741 CRD ( <b>April 01, 2023</b> )  UL 1699B	-	Non-Isolated EPS Interactive PV Inverters Rated Less Than 30kVA. Photovoltaic (PV) DC Arc-Fault Circuit Protection (First Edition Issued <b>April 9-2024</b> )
CSA-C22.2 No.330-23 CSA-C22.3 No.9:20	-	Photovoltaic rapid shutdown systems ( <b>February 2023</b> ) <b>Interconnection of Distributed Energy Resources and Electricity supply system</b>

**\*Note:**

1. In adherence to UL 1741 (Third Edition, dated May 19, 2023), compliance entails meeting the relevant specifications outlined in UL 1741 Supplement SA and SB, in conjunction with the Smart Inverter Requirements (SRDs) as per **California Electric Rule 21. Additionally, the product undergoes verification in accordance with UL 1741 Supplement SB and IEEE 1547.1-2020, aligning with the SRDs specified in IEEE 1547-2018, IEEE 1547a-2020, IEEE 1547:2018 Errata, and the Smart Inverter Requirements set forth by the Hawaiian Electric Code with required URP (SRD-V2.0, dated 11/18/2022). The assessment of the grid support function is conducted in accordance with IEEE 1547.1-2020, and the interoperability is confirmed through verification against the IEEE 2030.5-2018 communication protocol.**
2. **The following products have also been verified for functional safety under Class B for CSA C22.2 No. 0.8 related to the PVRSE and related Inverter Shutdown and Remote Shutdown functions and UL1998 Software Class 1 for all safety functions.**
3. Meeting UL1741 CRDs include compliance with PV combiner and ground fault (or IMI isolation) detection.
4. **Fronius inverter is evaluated to meet the grid support functions according to UL 1741 Supplement SB and IEEE 1547.1-2020 with the SRDs of IEEE 1547-2018 and IEEE 1547a-2020.**
5. **Grid support Utility Interactive inverter, Fronius inverter is evaluated with reactive power priority Volt/Var Mode (Q(V)) Test.**

**Additional Notes:**

- 1) Conformity to UL 1741-Third Edition includes compliance with applicable requirements of UL1741 PVRSE and Supplement SA8 to SA15, SA17, SA18 - GRID SUPPORT UTILITY INTERACTIVE INVERTERS AND CONVERTERS, California Rule 21(SRDs), IEEE 1547-2003, IEEE1547a-2014, IEEE 1547.1-2005 and IEEE 1547.1a-2015. Meeting UL1741 CRD includes compliance with PV combiner.



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- 2) To fulfill the rapid shutdown requirements of the NEC Article 690.12 and CEC Sec 64- 218 Photovoltaic system rapid shutdown with the Primo GEN24 series models, the inverter can be used together with a suitable rapid shutdown device, or the inverter must be mounted within the boundary values given in the NEC and CEC Article. **The PV input** of the inverter complies with the requirements of following standards to ensure the **PV conductors** are within the controlled limits of 30Vdc, 15Vac and 8A within the 30s:
  - a. UL1741 3rd Edition
  - b. CAN/CSA C22.2 No. 330-23
- 3) The integrated combiner unit is also evaluated to reference standards covering UL1741 CRD and CSA-C22.2 No.290:19 (2nd Edition) for Photovoltaic combiners and recombiners. **The evaluation includes reference standard C62.41-1991 for Surge Voltages in Low Voltage AC Power Circuits.**

Edition 1: (Project 80034168)

Tests were performed on representative model Primo GEN24 6.0 208-240 Plus, at Fronius International GmbH, Guenter Fronius Strasse 1, Wels-Thalheim, 4600 Austria under the CSA SMTC program approved by CSA certifier with acceptable results.

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Utility interactive evaluations were conducted with the following firmware: Software Version	Control Devises	Models:
		Primo GEN24 3.8 208-240 and Primo GEN24 3.8 208-240 Plus Primo GEN24 5.0 208-240 and Primo GEN24 5.0 208-240 Plus Primo GEN24 6.0 208-240 and Primo GEN24 6.0 208-240 Plus
ZEUS	ST Microelectronics / STM32F765NGH7 (U20)	V2.10.2 (release date 24/01/2020)
KRONOS	ST Microelectronics / STM32F765NGH7 (U1)	V2.16.2 (release date 24/01/2020)
Check-Sum ZEUS	ST Microelectronics / STM32F765NGH7 (U20)	0x57a62a64 (release date 24/01/2020)
Check-Sum KRONOS	ST Microelectronics / STM32F765NGH7 (U1)	0xbab5e48f (release date 24/01/2020)



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The following tests were performed with the requirements of UL 1741-2nd Edition as per the SUPPLEMENT - GRID SUPPORT UTILITY INTERACTIVE INVERTERS AND CONVERTERS (Rev. February 15, 2018) with acceptable results.

UL1741 – SA	Applicable Requirement/Topic	Comment
UL1741 - SA8	Anti-islanding Protection - Unintentional Islanding with Grid Support Functions Enabled	PASS
UL1741 - SA9	L/HVRT Low and High Voltage Ride-Through	PASS
UL1741 - SA10	L/HFRT Low and High Frequency Ride-Through	PASS
UL1741 - SA11	RR – Normal Ramp Rate and SS – Soft-Start Ramp Rate	PASS
UL1741 - SA12	SPF – Specified Power Factor	PASS
UL1741 - SA13	Volt/VAr Mode (Q(V))	PASS
UL1741 - SA14	Frequency-Watt (FW)	PASS
UL1741 - SA15	Volt-Watt (VW)	PASS

Edition:2: (Project 80179059)

Update report 80034168 to amend applicable standard from UL1741 2<sup>nd</sup> edition to UL1741 3<sup>rd</sup> Edition and evaluate additional alternate components. Also change manufacturer Silicon Lab to Skyworks Solutions Inc. for opto coupler(U13) – same specifications. Added missing critical component list for PWB PILOT2 (4,071,817). Construction review was conducted for the UL 1741 3<sup>rd</sup> edition standard. Also, corrected the typo errors for max array short and backfeed current in the specification. The alternate T9 has the identical construction and UL approved EIS, also the alternate enclosure materials met the original construction and material properties requirements.

No additional testing is deemed necessary based on the differences as compared to UL1741 2<sup>nd</sup> edition against the third edition (refer to checklist attached). All alternate components added are within the specifications of the original outlined and meeting form, fit and functions.

**Edition: 3 (Project 80203034)**

Tests were performed on models Primo GEN24 7.7 208-240, Primo GEN24 10.0 208-240 and Primo GEN24 6.0 208-240, at Fronius International GmbH, Guenter Fronius Strasse 1, Wels-Thalheim, 4600 Austria under the CSA SMTc program approved by CSA certifier with acceptable results.

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**Utility interactive evaluations were conducted with the following firmware:**

Software Version	Control Devises	Primo GEN24 3.8 208-240	Primo GEN24 5.0 208-240	Primo GEN24 6.0 208-240	Primo GEN24 7.7 208-240	Primo GEN24 10.0 208-240
		Primo GEN24 3.8 208-240 Plus	Primo GEN24 5.0 208-240 Plus	Primo GEN24 6.0 208-240 Plus	Primo GEN24 7.7 208-240 Plus	Primo GEN24 10.0 208-240 Plus
ZEUS	ST Microelectronics / STM32F765NGH7 (U20)	<b>V2.10.2 (release date 24/01/2020)</b> <b>V2.28.5 (release date 23/02/2024)</b>			<b>V2.28.5 (release date 23/02/2024)</b>	
KRONOS	ST Microelectronics / STM32F765NGH7 (U1)	<b>V2.16.2 (release date 24/01/2020)</b> <b>V2.36.6 (release date 23/02/2024)</b>			<b>V2.36.6 (release date 23/02/2024)</b>	
Check-Sum ZEUS	ST Microelectronics / STM32F765NGH7 (U20)	<b>0x57a62a64 (release date 24/01/2020)</b> <b>0xe5b98a5d (release date 23/02/2024)</b>			<b>0xe5b98a5d (release date 23/02/2024)</b>	
Check-Sum KRONOS	ST Microelectronics / STM32F765NGH7 (U1)	<b>0xbab5e48f (release date 24/01/2020)</b> <b>0x95013193 (release date 23/02/2024)</b>			<b>0x95013193 (release date 23/02/2024)</b>	

<b>Grid Tied Requirements</b>		
<b>UL1741 SUPPLEMENT SB – GRID SUPPORT UTILITY-INTERACTIVE INVERTERS AND CONVERTERS BASED UPON IEEE, 1547-2018 and IEEE 1547.1-2020</b>		
<b>SB4.2</b>	<b>Grid support utility interconnection performance</b>	<b>Meeting Requirements</b>
<b>SB4.2A</b>	<b>Performance Categories.</b>	<b>Cat III B. Meeting Requirements</b>
<b>SB4.3</b>	<b>Additional requirements for testing according to IEEE 1547.1-2020.</b>	<b>Meeting Requirements</b>



## *Supplement to Certificate of Compliance*

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*The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.*

### **Product Certification History**

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<b>Project</b>	<b>Date</b>	<b>Description</b>
80203034	2024-06-12	<b>Update report 80034168 (80179059) to include UL1741 SB testing and additional two new models Series for Fronius models Primo GEN24 7.7 208-240, Primo GEN24 7.7 208-240 Plus and Fronius Primo GEN24 10.0 208-240 and Primo GEN24 10.0 208-240 Plus.</b>
80179059	2023-10-17	Update report 80034168 to revise applicable standard from UL1741 2nd edition to UL1741 3rd Edition and evaluate additional alternate components.
80034168	2020-05-21	Original model certification new model Primo GEN24 (C/US) Product CLASS 5311- 09 and CLASS 5311 89. -Include CEC efficiency attestation.