



# Letter of Conformity for Grid Support Interactive Inverter

UL STANDARD No. 1741- THIRD EDITION SUPPLEMENT SA

**Reference Certificate:** 70189564

**Master Contract:** 203213

**Project:** 80158405

**Date Issued:** February 18, 2023

**Issued to:** **Fronius International GmbH**  
**Guenter Fronius Strasse 1**  
**Wels-Thalheim, 4600**  
**AUSTRIA**

*The products listed below have been found to comply with the applicable requirements of UL 1741-Third Edition (Rev. September 28, 2021)  
Supplement SA - GRID SUPPORT UTILITY INTERACTIVE INVERTERS AND CONVERTERS*

**Issued by:** *PeterLim*  
PeterLim

## **PRODUCTS**

Transformerless Special Purpose Grid Support Interactive Inverter, Models Fronius Symo Advanced 10.0-3 208-240, Fronius Symo Advanced 10.0-3 208-240 Lite, Fronius Symo Advanced 12.0-3 208-240, Fronius Symo Advanced 12.0-3 208-240 Lite, Fronius Symo Advanced 15.0-3 480, Fronius Symo Advanced 15.0-3 480 Lite, Fronius Symo Advanced 20.0-3 480, Fronius Symo Advanced 20.0-3 480 Lite, Fronius Symo Advanced 22.7-3 480, Fronius Symo Advanced 22.7-3 480 Lite, Fronius Symo Advanced 24.0-3 480, and Fronius Symo Advanced 24.0-3 480 Lite, permanently connected.

For details related to rating, reference should be made to the CSA Certification Record, the Descriptive Report or Annex A Ratings for Certificate of Conformance.



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## *Supplement to Letter of Conformity for Grid Support Interactive Inverter*

### APPLICABLE REQUIREMENTS

- CSA-C22.2 No.107.1-16 - Power Conversion Equipment
- \*UL Std No. 1741 - 3<sup>rd</sup> Edition - Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Sources (Rev. September 28, 2021)
  - UL CRD - Non-Isolated EPS Interactive PV Inverters Rated Less Than 30kVA
  - UL 1699B - Outline of Investigation for Photovoltaic (PV) DC Arc-Fault Circuit Protection (First Edition 2, AUGUST 22, 2018)
- CSA C22.2 No.290:19 - Photovoltaic combiners and recombiners (2<sup>nd</sup> Edition, July 2019)
- CSA-C22.2 No.330-17 - Photovoltaic rapid shutdown systems (May 2017)
- CSA C22.2 No.292 - 18 - DC Arc Fault Protection for Photovoltaic Applications

#### \*Notes:

- (1) Conformity to UL 1741-3<sup>rd</sup> Edition (Rev. September 28, 2021) includes compliance with applicable requirements of UL1741 Supplement SA - GRID SUPPORT UTILITY INTERACTIVE INVERTERS AND CONVERTERS, PVRSE, California Rule 21(SRDs), Hawaiian Electric Co. Rule 14, Hawaiian Electric Co. SRD-UL-1741-SA-V1.0, IEEE 1547, IEEE 1547a and IEEE 1547.1.
- (2) To fulfill the rapid shutdown requirements of the NEC Article 690.12 and CEC Sec 64-218 Photovoltaic system rapid shutdown with the Fronius Symo Advanced models, the inverter must be mounted within the boundary values given in the NEC and CEC Article. The ac output of the inverter complies with the requirements of following standards to ensure the ac conductors are within the controlled limits of 30Vdc, 15Vac and 8A within the 30s:
  - a. IEC62109-1:2010 §7.3.9
  - b. UL62109-1:2014 §7.3.9
  - c. CAN/CSA C22.2 No. 62109-1:16 §7.3.9
  - d. UL1741 3<sup>rd</sup> Edition (with SA 8 to SA 15 and PVRSE)
  - e. CAN/CSA C22.2 No. 107.1-16
  - g. CAN/CSA C22.2 No. 330-17



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Device	Device Manufacturer/Type	Software Version (release date)	Device Checksum
ReCerbo (U2 on ReCerbo)	ST Microelectronics / STM32F437IIH6	V0.3.17.2 (2018-05-17)	59608D6B64 68C25428AD C33049D2D4 5CB65C5F2A
PS1 – Roach (U4 on ROACH)	ST Microelectronics / STM32F405ZGT6	V0.28.2.0 (2018-05-07)	0x037eae0e
PS1 – Roach (U4 on ROACH)	ST Microelectronics / STM32F405ZGT6	V0.28.4.0 (2018-09-12)	0xF001AE72
PS2 – Guard (U7 on SYMFILxxAV)	ST Microelectronics / STM32F765ZGT7	V0.11.7.3 (2019-06-19)	0xCF29E58F

Tests were performed on Models Fronius Symo Advanced 12.0-3 208-240 and Fronius Symo Advanced 24.0-3 480 (representative of series), at Fronius International GmbH, Guenter Fronius Strasse 1, Wels-Thalheim, 4600 Austria under the CSA SMTC program, witnessed by CSA certifier

The above models are identical to the existing certified and CEC listed Symo Series (refer to project Certificate No. 2760387 and Project No. 70163421) except model name has been added with the word “Advance”, firmware has been updated and minor changes to the decorative cover and added alternative components. In addition, the filter board has been altered from six layers layout to four, add PLC transformer and revised AFCI detection to include ring and ball to meet future requirements. The following tests were performed under the requirements of UL 1741-3<sup>rd</sup> with SUPPLEMENT SA - GRID SUPPORT UTILITY INTERACTIVE INVERTERS AND CONVERTERS (in Jun and September 2017) with acceptable results.

General Overview of UL 1741 Evaluation with Supplementary SA -Grid Support Utility Interactive		
UL1741 – SA	Applicable Requirement/Topic	Comment
UL1741 - SA8	Anti-islanding Protection - Unintentional Islanding with Grid Support Functions Enabled	PASS
UL1741 - SA9 (Electric Rule No. 21 Table Hh.1)	L/HVRT Low and High Voltage Ride-Through	PASS
UL1741 - SA10 (Electric Rule No. 21 Table Hh.2)	L/HFRT Low and High Frequency Ride-Through	PASS
UL1741 - SA11 Electric (Rule No. 21 Hh.2k)	RR – Normal Ramp Rate and SS – Soft-Start Ramp	PASS
UL1741 - SA12 (Electric Rule No. 21 Hh.2i)	SPF – Specified Power Factor	PASS



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General Overview of UL 1741 Evaluation with Supplementary SA -Grid Support Utility Interactive		
UL1741 – SA	Applicable Requirement/Topic	Comment
UL1741 - SA13 (Electric Rule No. 21 Hh.2J)	Volt/VAr Mode (Q(V))	PASS
UL1741 - SA14 (Electric Rule No. 21 Hh.2.I)	Frequency-Watt (FW) – Optional	PASS
UL1741 - SA15 (Electric Rule No. 21 Hh.2.m)	Volt-Watt (VW) – Optional	PASS

UL 1741 3 <sup>rd</sup> Edition makes reference to IEEE 1547 and IEEE1547.1; Reference Documents (RD) are integral to UL 1741		
(RD Cl. 5.5.2)	Surge Withstand on External signal and control Circuits.	PASS
(RD Cl. 5.1, 5.2, 5.3)	Utility Voltage and Freq. Variation Test Conducted with acceptable results.	PASS
(RD Cl. 5.1.3.1, 5.5.1.2)	Radiated Immunity Test	PASS
(RD Cl. 5.7)	Anti-Islanding Test	PASS
(RD Cl. 5.11)	Harmonic Distortion	PASS
UL1741 - SA9	L/HVRT Low and High Voltage Ride-Through	PASS
UL1741 - SA10	L/HFRT Low and High Frequency Ride-Through	PASS
UL1741 - SA12	SPF – Specified Power Factor	PASS
UL1741 - SA13	Volt/VAr Mode (Q(V))	PASS
UL1741 - SA14	Frequency-Watt (FW) – Optional	PASS
UL1741 - SA15	Volt-Watt (VW) – Optional	PASS

Grid Support Interactive Inverters certified with Reactive Power Priority		
Question #	Description	Direction for NRTL
1	Is the product capable of providing the required reactive power for the volt/var curve function at all active power levels without derating active power? (Y or N) (Active Power = 20 – 100%)	A "Yes" response meets the intent of the Resolution and Question #2 and #3 do not need to be answered
2	Was the volt/var curve tested with reactive power priority enabled? (Y or N)	"Yes" response meets the requirements of the Resolution and Question #1 does not need to be answered
3	Was the volt/var curve tested with active power priority enabled? (Y, N, or N/A)	An "N/A" response indicates active power priority is not an option for the inverter. A "Yes" indicates that the inverter must be programmed with the correct profile in the final installation



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<b>Fronius New Grid Support Interactive Inverters certified with Reactive Power Priority</b>				
<b>Inverter Manufacturer</b>	<b>New Model numbers to be listed with CEC list[Nominal Voltage]</b>	<b>Question #1 (Y/N)</b>	<b>Question #2 (Y/N)</b>	<b>Question #3 (Y/N)</b>
Fronius International GmbH	Fronius Symo Advanced 10.0-3 208-240[208]		Y	Y
	Fronius Symo Advanced 10.0-3 208-240[220]		Y	Y
	Fronius Symo Advanced 10.0-3 208-240[240]		Y	Y
Fronius International GmbH	Fronius Symo Advanced 10.0-3 208-240		Y	Y
	Fronius Symo Advanced 10.0-3 208-240		Y	Y
	Fronius Symo Advanced 10.0-3 208-240		Y	Y
Fronius International GmbH	Fronius Symo Advanced 12.0-3 208-240[208]		Y	Y
	Fronius Symo Advanced 12.0-3 208-240[220]		Y	Y
	Fronius Symo Advanced 12.0-3 208-240[240]		Y	Y
Fronius International GmbH	Fronius Symo Advanced 12.0-3 208-240		Y	Y
	Fronius Symo Advanced 12.0-3 208-240		Y	Y
	Fronius Symo Advanced 12.0-3 208-240		Y	Y
Fronius International GmbH	Fronius Symo Advanced 15.0-3 480[440]		Y	Y
	Fronius Symo Advanced 15.0-3 480[480]		Y	Y
Fronius International GmbH	Fronius Symo Advanced 15.0-3 480 Lite[440]		Y	Y
	Fronius Symo Advanced 15.0-3 480Lite[480]		Y	Y
Fronius International GmbH	Fronius Symo Advanced 20.0-3 480[440]		Y	Y
	Fronius Symo Advanced 20.0-3 480[480]		Y	Y
Fronius International GmbH	Fronius Symo Advanced 20.0-3 480 Lite[440]		Y	Y
	Fronius Symo Advanced 20.0-3 480 Lite[480]		Y	Y
Fronius International GmbH	Fronius Symo Advanced 22.7-3 480[440]		Y	Y
	Fronius Symo Advanced 22.7-3 480[480]		Y	Y
Fronius International GmbH	Fronius Symo Advanced 22.7-3 480 Lite[440]		Y	Y
	Fronius Symo Advanced 22.7-3 480 Lite[480]		Y	Y
Fronius International GmbH	Fronius Symo Advanced 24.0-3 480[440]		Y	Y
	Fronius Symo Advanced 24.0-3 480[480]		Y	Y
Fronius International GmbH	Fronius Symo Advanced 24.0-3 480 Lite[440]		Y	Y
	Fronius Symo Advanced 24.0-3 480 Lite[480]		Y	Y



*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**

<b>Project</b>	<b>Date</b>	<b>Description</b>
80158405	2023-02-18	Update report 70189564 to include alternate Fuse holder, DC and AC Surge Suppressor, Line to ground cap, opto isolator, PTC and Current sensor with similar form fit and function or better. Due to the nature of the changes as state above, no further testing is deemed necessary.
80106342	2022-02-02	Update report 70189564 to include alternative components and PCB board revisions.
70189564	2018-08-01	New model name Symo Advance Series, models are identical to CSA certified and CEC listed Symo Series (See Certificate No. 2760387 and Project No. 70156295). Additional SA and IEEE 1547.1 tests were repeated base on the firmware changes to meet the future arc flash requirements.