



Letter of Conformity for Grid Support Interactive Inverter

UL STANDARD No. 1741-THIRD EDITION SUPPLEMENT SA

Reference Certificate: 2779302

Master Contract: 203213

Project: 80158409

Date Issued: 2023-02-16

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: Thian (Peter) Lim
Thian (Peter) Lim

Transformerless Special Purpose Grid Support Interactive Inverter, Models Fronius Primo 3.8-1 208-240, Fronius Primo 3.8-1 208-240 Lite, Fronius Primo 5.0-1 208-240, Fronius Primo 5.0-1 208-240 Lite, Fronius Primo 6.0-1 208-240, Fronius Primo 6.0-1 208-240 Lite, Fronius Primo 7.6-1 208-240, Fronius Primo 7.6-1 208-240 Lite, Fronius Primo 8.2-1 208-240 and Fronius Primo 8.2-1 208-240 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.

APPLICABLE REQUIREMENTS

*UL Std No. 1741- Third Edition - Inverters, Converters, Controllers and Interconnection System Equipment For Use With Distributed Energy Sources (Rev. September 28, 2021)

*Note: Conformity to UL 1741-Third Edition (Rev. September 28, 2021) includes compliance with applicable requirements of UL1741 Supplement SA 8 to SA 15 - GRID SUPPORT UTILITY INTERACTIVE INVERTERS AND CONVERTERS, California Rule 21(SRDs), Hawaiian Electric Co. Rule 14, Hawaiian Electric Co. SRD-UL-1741-SA-V1.0, IEEE 1547:2003, IEEE 1547a and IEEE 1547.1:2005



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Supplement to Letter of Conformity for Grid Support Interactive Inverter

Tests were performed on model Fronius Primo 8.2-1 208-240 (representative of series), at Fronius International GmbH, Guenter Fronius Strasse 1, Wels-Thalheim, 4600 Austria under the CSA SMTC program.

The following tests were performed under the requirements of UL 1741-3rd Edition with SUPPLEMENT SA - GRID SUPPORT UTILITY INTERACTIVE INVERTERS AND CONVERTERS (September 28th, 2021) with acceptable results.

Product Tested	Fronius Primo 8.2-1 208-240 (representative of series)		
Utility interactive evaluations were conducted with the following firmware:			
Device	Device Manufacturer/Type	Software Version (release date)	Device Checksum
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ReCerbo (U2 on ReCerbo)	ST Microelectronics / STM32F437IIH6 (U2)	V0.2.19.2 (2014-10-25)	0xD73424F9C7 0x4758452B59 0x7E779F12F7 0x75A58279ED
		V0.2.25.1 (2015-03-16)	0x4A76A01550 0x1C33B7522B 0x1EB44F70D8 0x999E86AB1F
		V0.3.7.0 (2015-07-17)	0x033D2FB7BE 0x3E4429E74E 0x4B9B77DB18 0x25A1F7162B
		V0.3.8.2 (2015-10-09)	0xDAEC969571 0xB126D12202 0x800383CC19 0x6A0D971C36
		V0.3.14.7 (2017-05-11)	0x043E90A76F 0xA377597C27 0x9E962AC18E 0xE480FA2AC4
		V0.3.14.9 (2020-06-18)	0xE3492C0519 0xAE4F1889BC 0x7AC2223564 0xDBD515D7FA
		V0.3.25.0 (2020-11-30)	0x42C2680BD0 0xDA43B99DD2 0xEE36096821 0xEF8FE850F1



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PS1 – Roach (U4 on ROACH02)	ST Mircoelectronics / STM32F405ZG (U4) <u>Alternative:</u> ST Microelectronics / STM32F407XX(U4)	v0.13.20.3 (2014-11-06) v0.15.16.3 (2015-03-27) v0.17.6.3 (2015-05-29) v0.18.6.3 (2015-08-04) v0.18.10.3 (2015-09-23) V0.26.9.0 (2017-06-20) V0.26.9.10 (2017-07-14) V1.5.1.1 (2021-02-11)	0xf487166b 0x5a36050c 0x7d00a95b 0xc6687c3a 0xdfd5e6d8 0x25eb5a7 0x24655cca 0xffc6b806
PS2 – Guard (U7 on PRIMOFIL8)	ST Mircoelectronics / STM32F415VG (U7)	V0.3.10.4 (2014-10-28) V0.4.12.4 (2014-12-29) V0.6.12.4 (2015-08-04) V 0.6.26.4 (2015-10-09) V0.10.2.10 (2017-06-28) V0.10.7.0 (2017-09-05) V0.10.9.0 (2017-11-10) V0.11.8.1 (2021-03-09)	0x5f048395 0x355cd8e9 0x4397c9f3 0xeca75edd 0xff8d87d3 0x998c8938 0xab23f31a 0xea584008

**General Overview of UL 1741 Evaluations:
 UL 1741 3rd Edition**

With SUPPLEMENT SA - GRID SUPPORT UTILITY INTERACTIVE INVERTERS AND CONVERTERS

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 Rate	PASS
UL1741 - SA12 (Electric Rule No. 21 Hh.2i)	SPF – Specified Power Factor	PASS
UL1741 - SA13 (Electric Rule No. 21 Hh.2J)	Volt/VAr Mode (Q(V)	PASS
UL1741 - SA14 (Electric Rule No. 21 Hh.2.l)	Frequency-Watt (FW) – Optional	PASS
UL1741 - SA15 (Electric Rule No. 21 Hh.2.m)	Volt-Watt (VW) – Optional	PASS

Grid Support Interactive Inverters certified with Reactive Power Priority

Inverter Manufacturer Company Name	New Model numbers to be listed with CEC list[Nominal Voltage]	Question #1 (Y/N)	Question #2 (Y/N)	Question #3 (Y/N)
Fronius International GmbH	Fronius Primo 3.8-1 208-240		Y	Y
Fronius International GmbH	Fronius Primo 3.8-1 208-240 Lite		Y	Y
Fronius International GmbH	Fronius Primo 5.0-1 208-240		Y	Y



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Fronius International GmbH	Fronius Primo 5.0-1 208-240 Lite		Y	Y
Fronius International GmbH	Fronius Primo 6.0-1 208-240		Y	Y
Fronius International GmbH	Fronius Primo 6.0-1 208-240 Lite		Y	Y
Fronius International GmbH	Fronius Primo 7.6-1 208-240		Y	Y
Fronius International GmbH	Fronius Primo 7.6-1 208-240 Lite		Y	Y
Fronius International GmbH	Fronius Primo 8.2-1 208-240		Y	Y
Fronius International GmbH	Fronius Primo 8.2-1 208-240 Lite		Y	Y



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Product Certification History

Project	Date	Description
80158409	2023-02-14	Update report 2779302 to include alternate Fuse holder, DC and AC Surge Suppressor, and opto isolator with identical or better rated specifications. PRIMOFIL8 PWB updated to version V0.6 with a minor change in the one trace layout that does not affect spacing requirements. Due to the nature of changes as state above, no further testing is deemed necessary.
80139528	2022-09-03	Update to report 2779302 to include Lite versions models. The only difference is that the Lite Models do not include WILMA card. WILMA Card is an optional WLAN communication feature to enable data management and it is power by an SELV limited power device. This card has no impact on product safety and grid tie integration. Therefore, since the lite models' version are respectively identical to their certified corresponding Primo model series, no further testing is deemed necessary.
80106346	2022-03-28	Update report 2779302 to include software bugfixes and some alternative components.
80048719	2020-07-28	Update report 2779302 to include new RECEBRO Firmware revision number for the increase in initial programing initialization timing slot from 80ms to 125 ms to accommodate hardware tolerances. The change on this parameter has no impact on grid tie and factory testing except factory programing's initialization timing. Therefore, no further testing is deemed necessary.
80045326	2020-06-15	Update report 2779302 to include an alternate MCUs which is identical to the original model STM32F405 except alternate Micro STM32F407 has two additional features (I.e. Ethernet + camera interface which are not deployed). Since firmware version remains the same and the hardware functional features including form and fit are compatible, no further testing is deemed necessary.
70163419	2017-12-22	Update report 2779302 to evaluate firmware changes that address software bugs associated with PS2 filter stage issues.
70152937	2017-09-22	Update report 2779302 to include change in Firmware Numbering to facilitate set-up for existing UL1741 SA certified models.
70130870	2017-07-07	Update Primo Series Report 2779302 to include new UL1741 SA.