THE STANDARDS INSTITUTION OF ISRAEL

Electronics & Telematics Laboratory

Test Certificate No. 9412316059

In accordance with Clause 12 of the Standards Law – 1953

Details of order:

Name of customer	:	FRONIUS INTERNATIONAL GMBH
Address	:	Gunter Fronius Strasse 1, 4600-Wels-Thalheim, Austria
Date of order	:	16/06/2014

Description of sample:

Solar Inverter			
Models	:	FRONIUS SYMO 3.0-3-M	FRONIUS SYMO 3.7-3-M
		FRONIUS SYMO 4.5-3-M	FRONIUS SYMO 5.0-3-M
		FRONIUS SYMO 5.5-3-M	FRONIUS SYMO 6.0-3-M
		FRONIUS SYMO 6.7-3-M	FRONIUS SYMO 7.0-3-M
		FRONIUS SYMO 8.0-3-M	FRONIUS SYMO 8.2-3-M
Manufacturer	:	FRONIUS INTERNATIONAL GMBH	
Country of origin	:	Austria	

Sampling details:

Model	:	FRONIUS SYMO 8.2-3-M	
Ratings	:	Input:	150-800 Vdc (1000V max); Idc=2x16A
		Output:	230Vac; Iac=13.5A; 3~NPE 50Hz; 8.2kW

Nature of test:

Review of test reports:

Ref. No.: 2213/0975/1-AS3100-E2, dated 24/02/2014; 2213/0975/1-AS4777.2 and 2213/0975/1-AS4777.3, dated 18/02/2014 issued by SGS TECNOS, S.A..
for the above-specified solar inverter models according to the following standards:
AS 4777.2: 2005 - Grid connection of energy systems via inverters: Inverter requirements;
AS 4777.3: 2005 - Grid connection of energy systems via inverters: Grid protection requirements;
AS 3100: 2009 + A1: 2010 - General requirements for electrical equipment

Performing of basic safety tests according to AS 3100 standard.

This document contains 14 pages and may be used only in full.	**The test results in this report refer only to the item tested.**	This document alone is not sufficient for the release of goods from customs.

Test Conclusions:

Based on the information provided in the aforementioned test reports and the performed tests, the above-specified solar inverter models **comply** with the requirements of the above-specified standards.

Sergey Voytenko
Testing Engineer, Electrical Safety Branch
Electronics and Telematics Laboratory
The Standards Institution of Israel

Date: 22/10/2014

Michael Terman
Head of Electrical Safety Branch
Electronics and Telematics Laboratory
The Standards Institution of Israel

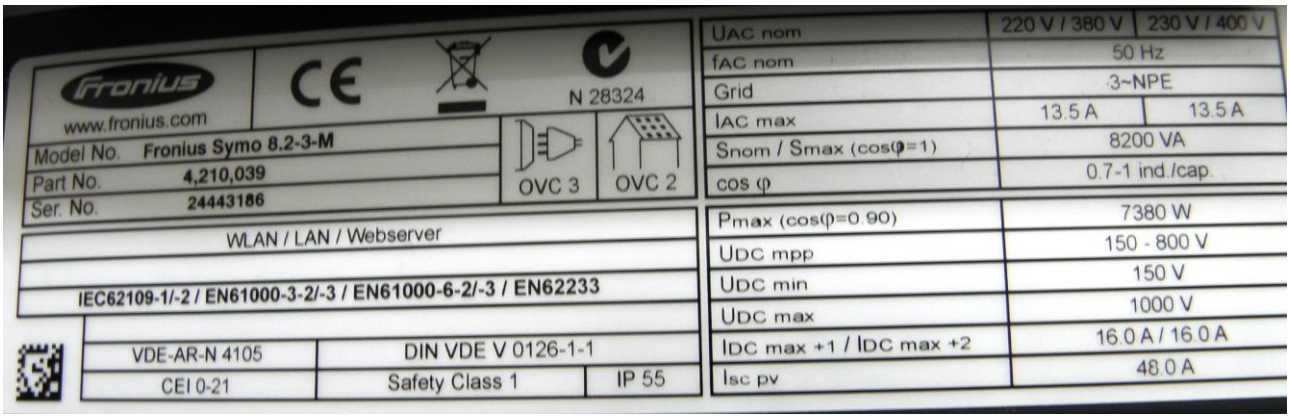
Date: 22/10/2014

This document does not permit marking the product with SII Mark

EVALUATION REPORT

Report Reference No. ..... :	9412316059
Performed by (name + signature) .... :	SERGEY VOYTENKO .....
Approved by (name + signature) ..... :	MICHAEL TERMAN .....
Date of performance of evaluation.... :	15 -16/07/2014
Date of issue ..... :	22/10/2014
Testing Laboratory..... :	The Standards Institution of Israel Electronics and Telematics Laboratory, Electrical Safety Branch
Address ..... :	42 Chaim Levanon St., Tel Aviv 69977, Israel
Applicant's name ..... :	FRONIUS INTERNATIONAL GMBH
Address ..... :	Gunter Fronius Strasse 1, 4600-Wels-Thalheim, Austria
Manufacturer's site ..... :	FRONIUS INTERNATIONAL GMBH
Location..... :	Gunter Fronius Strasse 1, 4600-Wels-Thalheim, Austria
Test item description..... :	Photovoltaic inverter for grid connection
Trademark..... :	Fronius
Model/Type reference ..... :	FRONIUS SYMO 3.0-3-M / FRONIUS SYMO 3.7-3-M FRONIUS SYMO 4.5-3-M / FRONIUS SYMO 5.0-3-M FRONIUS SYMO 5.5-3-M / FRONIUS SYMO 6.0-3-M FRONIUS SYMO 6.7-3-M / FRONIUS SYMO 7.0-3-M FRONIUS SYMO 8.0-3-M / FRONIUS SYMO 8.2-3-M
Ratings ..... :	See table Electrical Ratings on page 2

Copy of marking plate:



ELECTRICAL RATINGS

Model Number	Input Voltage (MMP)	Input Current	IP Rating	Output Current	Output Power
SYMO 3.0-3-M	150-800 V d.c.	2 x 16 A	IP65	4.4 A (Max. 13.5 A)	3000 W
SYMO 3.7-3-M	150-800 V d.c.	2 x 16 A	IP65	5.4 A (Max. 13.5 A)	3700 W
SYMO 4.5-3-M	150-800 V d.c.	2 x 16 A	IP65	6.5 A (Max. 13.5 A)	4500 W
SYMO 5.0-3-M	163-800 V d.c.	2 x 16 A	IP65	7.3 A (Max. 13.5 A)	5000 W
SYMO 5.5-3-M	179-800 V d.c.	2 x 16 A	IP65	8 A (Max. 13.5 A)	5500 W
SYMO 6.0-3-M	195-800 V d.c.	2 x 16 A	IP65	8.7 A (Max. 13.5 A)	6000 W
SYMO 6.7-3-M	218-800 V d.c.	2 x 16 A	IP65	9.7 A (Max. 13.5 A)	6700 W
SYMO 7.0-3-M	228-800 V d.c.	2 x 16 A	IP65	10.2 A (Max. 13.5 A)	7000 W
SYMO 8.0-3-M	260-800 V d.c.	2 x 16 A	IP65	11.6 A (Max. 13.5 A)	8000 W
SYMO 8.2-3-M	267-800 V d.c.	2 x 16 A	IP65	11.9 A (Max. 13.5 A)	8200 W

Possible test case verdicts:

- test case does not apply to the test object.....: N/A (Not Applicable)
- test object does meet the requirement.....: P (Pass)
- test object does not meet the requirement.....: F (Fail)

Final conclusion:

A sample of the solar inverter SYMO 8.2-3-M was evaluated and found identical to the unit of the same model name, covered by the following test reports:
Ref. No.: 2213/0975/1-AS3100-E2, dated 24/02/2014;
Ref. No.: 2213/0975/1-AS4777.2, dated 18/02/2014;
Ref. No.: 2213/0975/1-AS4777.3, dated 18/02/2014
issued by SGS TECNOS, S.A..
The test reports were found complying with the quality requirements for test reports.

In addition, the product has successfully passed the following tests:

Clearance/creepage measurements;
Electric strength test;
Insulation resistance test;
Earthing test

Refer to Appendix 2 for test results.

Testing and evaluation were performed on model FRONIUS SYMO 8.2-3-M which was considered representative of other models covered by this test report:

FRONIUS SYMO 3.0-3-M	FRONIUS SYMO 3.7-3-M
FRONIUS SYMO 4.5-3-M	FRONIUS SYMO 5.0-3-M
FRONIUS SYMO 5.5-3-M	FRONIUS SYMO 6.0-3-M
FRONIUS SYMO 6.7-3-M	FRONIUS SYMO 7.0-3-M
FRONIUS SYMO 8.0-3-M	

The product contains an integral leakage current monitoring device.

The customer performs adjustment of overvoltage/undervoltage, overfrequency/underfrequency protection according to the requirements of Israel Standard SI AS 4777 Part 3.

Clause	Requirement + Test	Result - Remark	Verdict

1.	**Evaluation of test reports:**		**P**
1.1	Test report provided by the Applicant for evaluation:	Ref. No.: 2213/0975/1-AS3100-E2, dated 24/02/2014; Ref. No.: 2213/0975/1-AS4777.2, dated 18/02/2014; Ref. No.: 2213/0975/1-AS4777.3, dated 18/02/2014 issued by SGS TECNOS, S.A.	—
1.2	Suitability of the standards	The report has been issued according to the suitable standards: AS 4777.2:2005, AS 4777.3:2005; AS 3100:2009 + A1:2010	P
1.3	Laboratory accreditation	SGS TECNOS, S.A. is accredited by ENAC for AS4777 and AS3100 standards (Accreditation Certificate No.: 5/LE011).	P
1.4	Signatures	The report is duly signed.	P
1.5	Verdicts	All clauses of the reports contain appropriate verdicts. No "Fail" verdicts are found in the report.	P
1.6	Tables with test results	All applicable tables with test results are duly filled and a list of test equipment is attached.	P
1.7	Photo and related technical documentation	The reports contain sufficient photo and related technical documentation for the tested units.	P

2.	**Identification and evaluation of the actual sample:**		**P**
2.1	Identification of the product (model, manufacturer, electrical ratings)	The actual markings (model, manufacturer, electrical ratings) on the product provided for evaluation (see page 1 of this report) are identical to the information provided in the aforementioned test reports.	P
2.2	Identification of the internal boards	Marking of the internal board is identical to the marking specified in the aforementioned test reports.	P
2.3	Construction	The actual product provided for evaluation is identical in construction to the unit tested and evaluated in the aforementioned test reports.	P

Clause	Requirement + Test	Result - Remark	Verdict
3.	**Testing of the actual sample:**		**P**
3.1	Verification of safety critical components	Safety critical components in the actual product were verified and found identical to the components specified in the table "Critical components" of the test report 2213/0975/1-AS3100-E2	P
3.2	Tests	See test results in Appendix 2	P
	Clearance and creepage distances		P
	Electric strength test		P
	Insulation resistance test		P
	Earthing test		P

APPENDIX 1
PHOTO DOCUMENTATION

Fig.1

General View

Fig.2

Internal View

APPENDIX 2
TEST RESULTS

AS 3100 4.1	TABLE: Clearances		P
	Overvoltage category..... :	II	—

	Type of insulation:					
Working voltage (V):	Min. cl (mm)	Basic	Functional	Supplementary	Reinforced	Verdict / Remark
Up to 325	6.0*	--	--	7.98	--	Recerbo card: Relay (AC-SELV)
Up to 325	2.5*	3.88	--	--	--	Symofil card: AC-PE
Up to 1000	--	--	--	11.16	--	Symofil card: DC-SELV
Up to 1000	--	17.02	--	--	--	Symofil card: DC-PE
Up to 325	2.5*	15.18	--	--	--	Symop card: AC-PE
Up to 1000	--	--	--	7.93	--	Symop card: DC-SELV
Up to 1000	--	4.9	--	--	--	Symop card: DC-PE
Up to 325	2.5*	5.03	--	--	--	Terminal connections: AC-PE
Up to 1000	--	11.41	--	--	--	Terminal connections: DC-PE

*) specified for protected for deposition of dirt;
**) in accordance with IEC60950-1, Table 2K.

***) clearance requirements for primary circuits and between primary and secondary circuits in accordance with IEC60950-1, Table 2K, interpolated for actual working voltage.

Date of test: 15/07/2014
Performed by: Sergey Voytenko

AS 3100 4.1	TABLE: Creepage					P
	Overvoltage category ... :		II			—
	Type of insulation:					
Working voltage (V):	Min. cr (mm)	Basic	Functional	Supplementary	Reinforced	Verdict / Remark
Up to 325	6.0*	--	--	7.98	--	Recerbo card: Relay (AC-SELV)
Up to 325	2.5*	3.88	--	--	--	Symofil card: AC-PE
Up to 1000	--	--	--	11.16	--	Symofil card: DC-SELV
Up to 1000	--	17.02	--	--	--	Symofil card: DC-PE
Up to 325	2.5*	15.18	--	--	--	Symop card: AC-PE
Up to 1000	--	--	--	7.93	--	Symop card: DC-SELV
Up to 1000	--	4.9	--	--	--	Symop card: DC-PE
Up to 325	2.5*	7.80	--	--	--	Terminal connections: AC-PE
Up to 1000	--	18.70	--	--	--	Terminal connections: DC-PE

*) specified for protected for deposition of dirt;

**) creepage requirements in accordance with IEC60950-1 Table 2N column "Printed boards" are interpolated for 250V.

***) creepage requirements for primary circuits and between primary and secondary circuits in accordance with IEC60950-1, Table 2N, Printed board , Pollution degree I (IP65), interpolated for 950Vdc. Values are increased to clearance limit.

Date of test: 15/07/2014
Performed by: Sergey Voytenko

AS3100 5.3	TABLE: Earthing facilities		P
	Test current (1.5*I rated or 25A)	16A*1.5A = 24A < 25A	25A
Test current applied between:		Resistance, Ω	Verdict
Earthing terminal to rear enclosure (grille)		0.007	P
Earthing terminal to front cover		0.010	P

Date of test: 16/07/2014
Performed by: Sergey Voytenko

AS 3100 8.3	TABLE: Insulation resistance		P
Between:		Resistance required, MΩ	Resistance measured, MΩ
AC to GND (with elements connected to earth)		1.0	49.0
DC to GND (with elements connected to earth)		1.0	2.37
AC to SELV (with elements connected to earth)		1.0	49.5
DC to SELV (with elements connected to earth)		1.0	2.64
Date of test: 16/07/2014 Performed by: Sergey Voytenko			

AS 3100 8.4	TABLE: Electric strength		P
Test voltage applied between:		Test voltage V r.m.s.	Breakdown (Yes/No)
DC to PE		3110 Vdc(BI)	No
AC to PE		1500Vac (BI)	No
DC to SELV (USB port)		3750 Vdc (RI)	No
AC to SELV (USB port)		3750 Vdc (RI)	No
Note:			
Date of test: 16/07/2014 Performed by: Sergey Voytenko			

Test instruments						
SII Ref. No.	Instrument Type	Manufacturer	Model	Calibration Date		SII Location
				Last	Due	
6501330	Digital Caliper	SIGNET	75430	10/13	10/14	Electr. Safety Branch
5971	AC/DC Withstand Voltage Tester	Associated Research	3670 (S/N 9331305)	12/13	12/14	Electr. Safety Branch
5972	Ground Bond Tester	Associated Research	3140 (S/N 9500194)	12/13	12/14	Electr. Safety Branch
6501243	Humidity/Baro/Temperature Data Recorder	Lutron	MHB-382SD S/N Q655831	11/13	11/14	Electr. Safety Branch