



# DECLARATION OF EN50438 FOR IRELAND CONSULTATION PAPER CER/06/190

MATERIALS & SAFETY - R&D

TR18714

page 1 of 3

## APPENDIX 2 Type Test Certification Test Result Sheet

### Micro-generator details

MICRO-GENERATOR Type reference: <i>Fronius Galvo 2.5-1</i>		
Maximum continuous rating:		2500W
Manufacturer:  <i>Fronius International GmbH</i>	Tel: +43-7242-241-0	Address:  <i>Guenter Fronius Str 1 4600 Wels-Thalheim, Austria</i>
	Fax: +43-7242-241-224	
Technical file reference No.:		

### Test house details

Name and address of test house	<i>Fronius R&amp;D Laboratories, Fronius International GmbH, Guenter Fronius Str 1, A-4600 Wels-Thalheim, Austria</i>
Telephone number	+43-7242-241-0
Facsimile number	+43-7242-241-224
E-mail address	<i>pv@fronius.com</i>

## POWER QUALITY

Harmonic current emissions (A)								
Maximum permissible harmonic current as per BS EN 61000-3-2								
Harmonic	2 <sup>nd</sup>	3 <sup>rd</sup>	5 <sup>th</sup>	7 <sup>th</sup>	9 <sup>th</sup>	11 <sup>th</sup>	13 <sup>th</sup>	15 <sup>th</sup> – 39 <sup>th</sup>
Limit	1,08	2,3	1,14	0,77	0,4	0,33	0,21	0,15x(15/n)
Test value (max value of Phase1,2,3)	0,0483	0,2588	0,1688	0,0865	0,1189	0,0429	0,0721	See TR LF_13008



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<b>Voltage Fluctuations and Flicker</b>				
	Starting	Stopping	Running	
Limit*	4%	4%	$P_{st} = 1.0$	$P_{lt} = 0.65$
Test value	NA **	NA**	NA**	NA**

\*Maximum permissible voltage fluctuation (expressed as a percentage of nominal voltage at 100% power) and flicker. As per BS EN 61000-3-11.

\*\* The EUT itself does not produce flicker relevant variations of the line current, startup is made using a ramp function and does therefore not create relevant  $d_{MAX}$  values.

Solar power variations naturally lead to variations of the electric power fed into the grid, however these variations are not significant for  $P_{ST}$  and  $P_{LT}$ .

	<b>Power factor</b>		
Protection Limit	+0.95 lag-0,95 at three voltage levels		
	210 V	230 V	250 V
Test value	0,99	0,99	0,99

## Under / Over frequency tests

	<b>Under Frequency</b>		<b>Over Frequency</b>	
Parameter	Frequency (Hz)	Time (s)	Frequency (Hz)	Time (s)
Protection limit	48 Hz	500 ms	50,5 Hz	500 ms
Actual setting	48,02 Hz	400 ms	50,48 Hz	400 ms
Trip value	48,02 Hz	410 ms	50,50 Hz	400 ms

## Under / Over voltage tests (single stage protection)

	<b>Under Voltage</b>		<b>Over Voltage</b>	
Parameter	Voltage (V)	Time (s)	Voltage (V)	Time (s)
Protection limit	207 V	500 ms	253 V	500 ms
Actual setting	209,07 V	400 ms	250,47 V	400 ms
Trip value	208,03 V	430 ms	252,13 V	430 ms



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TR18714

page 3 of 3

## LoM test

Method used	Frequency shift		
Output power level*	10%	55%	100%
Trip setting clearance time	500 ms	500 ms	500 ms
Trip value clearance time	490 ms	430 ms	330 ms

\*indicative values are shown for minimum, medium and maximum power levels.

## Fault level contribution

Because of electronic current control short circuit current is limited to 12,1A.

## COMMENTS

These tests have been carried out with specifications and parameters set to meet the requirements of CER/06/190. It is hereby declared by the manufacturer that all units shipped to Ireland will have identical parameter settings and that these parameters cannot be changed by a user, installer or by any person other than the manufacturer after the setup has been selected.

The protection settings of the inverter are in compliance with the Irish protection settings stated in EN50438 Annex A for Ireland.