1. Appendix B: Type Certification Test Result Sheet

Micro-generator details

MICRO-GENERATOR Type reference: IQ7PLUS-72-2-INT, IQ7PLUS-72-5-INT, IQ7PLUS-72-B-INT, IQ7PLUS-72-ACM-INT		
Maximum continuous rating: 290 VA		
Manufacturer: **Enphase Energy** ENPHASE.	Tel: +1 707 763 4784 Fax:	Address: 1420 North McDowell Boulevard, Petaluma, CA 94954, USA.
Technical file reference No. P2018072502		

Test house or laboratory details

Name and address of test house or laboratory:	**EnTEST Laboratories** 1 Treffers Road, Wigram, Christchurch, New Zealand 8042
Telephone number	+64 3 345 5334
Facsimile number	
E-mail address	dkeis@enphaseenergy.com

Test details

Date of test	July 2018
Name of test Engineer	Daniel Keis
Signature of test Engineer	
Test location if different from above	

Power quality

Harmonic current emission								
	Maximum permissible harmonic current as per EN 61000-3-2 Class A							
Harmonic	2nd	3rd	5th	7th	9th	11th	13th	15th = n = 39th
Limit	1,08	2,3	1,14	0,77	0,4	0,33	0,21	0,15 [a] (15/n)
Test value	0.0064	0.0026	0.0326	0.0002	0.0003	0.0008	0.0008	≤0.001
[a] 50 % or some other declared value close to the mid point between minimum and maximum.								

Voltage fluctuations and flicker				
	Maximum permissible voltage fluctuation (expressed as a percentage of nominal voltage at 100 % power) and flicker as per EN 61000-3-3			
	Starting	Stopping	Running	
Limit	3,3 %	3,3 %	P_{st}= 1,0	P_{lt}= 0,65
Test value	0.33 %	0.33 %	0.12	0.12

	DC injection			Power factor		
Protection limit	20 mA, tested at three power levels			+ 0,95 – 0,95 at three voltage levels		
	Min.	Medium [a]	Max.	210 V	230 V	250 V
Test value	0.4 mA	0.38 mA	2.08 mA	1.00	1.00	1.00
[a] 50 % or some other declared value close to the mid point between minimum and maximum.						

	Under frequency		Over frequency	
Parameter	Frequency [Hz]	Time [s]	Frequency [Hz]	Time [s]
Protection limit (from table 1)	48	0.5	50.5	0.5
Actual setting (as applied to interface protection)	48	0.5	50.5	0.5
Trip value (test result)	48.02	0.19	50.48	0.2

Under / Over voltage tests (single stage protection)

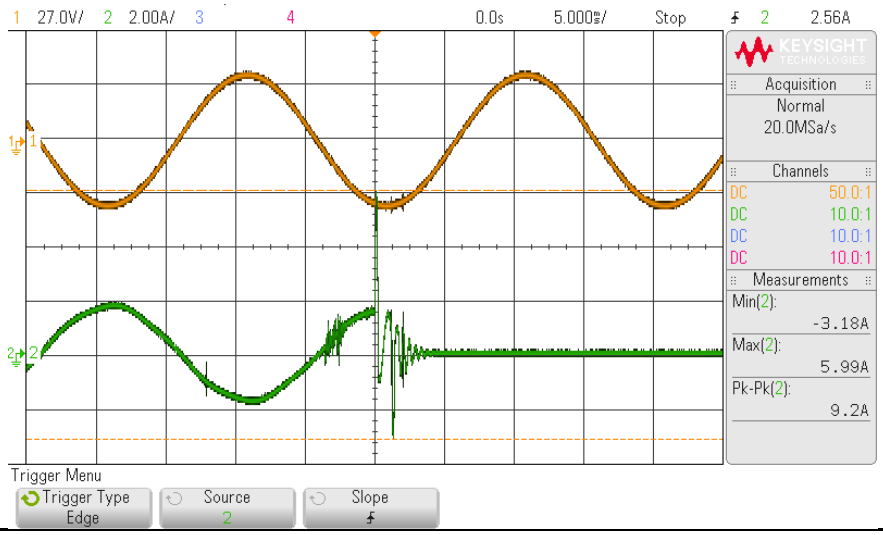
	Under voltage		Over voltage	
Parameter	Voltage [V]	Time [s]	Voltage [V]	Time [s]
Protection limit (from table 1)	207	0.5	253	0.5
Actual setting (as applied to interface protection)	207	0.5	253	0.5
Trip value (test result)	206.7	0.46	252.5	0.46

LoM test

Method used	BS EN 62116		
Output power level [a]	Min.33%	Medium 66%	Max. 100%
Trip setting clearance time (s)	0.5	0.5	0.5
Trip value clearance time (s)	0.182	0.2	0.115

[a] Indicative values are shown for minimum, medium and maximum power levels.

Fault level contribution

Short-circuit current at micro-generator terminals
Short-circuit applied to micro-generator at normal running condition 0 – 2,0 s plot   

Parameter	**Symbol**	**Value 1**	**Value 2**	**Value 3**	**Value 4**	**Value 5**
Peak short-circuit current	i_p	9.2 A	7.3 A	5.5 A	6.5 A	5.3 A
Initial value of aperiodic component	A	5.99 A	3.66 A	3.02 A	2.69 A	3.42 A
Initial symmetrical short-circuit current	I_k	3.18 A	3.66 A	2.45 A	3.82 A	1.89 A
Decaying (aperiodic) component of short -circuit current	i_{DC}	0	0	0	0	0
Reactance/Resistance ratio of source	X/R	2.5	2.5	2.5	2.5	2.5

Signed: D. K Position/Title: Test Engineer

Date: 26 July 2018