

## Delta RPI H5A\_222 Max Short Circuit Current Declaration

V1.0 13/07/2022

### Declaration:

Delta Electronics Australia hereby confirms that the Delta RPI H5A\_222 has been tested and is shown capable of withstanding a maximum short circuit current of 20A per MPPT. No hardware or firmware change to the inverter is required to utilise to this declaration.

Inverter Model	Previous Max I <sub>sc</sub> PV (per MPPT)	New Max I <sub>sc</sub> PV (per MPPT)
H5A_222	15A	20A

### Industry Predicament

On the 19 of May 2022, AS/NZS 5033:2021 came into effect for all new solar installations nationally. Among many changes, a key modification of this standard was the I<sub>sc</sub> calculation used to select appropriate power conversion equipment. This created an industry issue when pairing high current solar modules with a large portion of existing solar inverters.



Figure 1: H5A\_222

### AS5033:2021

- Clause 4.5.1.1 states “The current rating of the PV input of the PCE (I<sub>sc</sub> PV) shall be at least the current rating of the circuit they will be fitted to according to Clause 4.2.2”
- Clause 4.2.2 references Table 4.2 which references the calculation of I<sub>STRING MAX</sub> in Clause 3.3.3.1(a): “ $I_{string\ max} = 1.25 \times K_I \times I_{sc\ MOD}$ ”


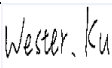

This means, if you use a monofacial PV module ( $K_I=1$ ) with an I<sub>sc</sub> of 12.5A you would need to multiply by 1.25x to attain the maximum string current. The Delta H5A\_222 was listed at a conservative value of 15A per MPPT I<sub>sc</sub> meaning according to the new AS5033:2021, PV modules above 12A I<sub>sc</sub> would not be useable with our inverter.

### Resolution

As per the SEC’s “Solar PV Array Design Resolution” Delta can write a declaration that our H5A\_222 has been tested and shown capable of withstanding the maximum short circuit current of 20A (from the previous 15A). Delta has performed an internal test as well as confirmed the ratings of internal components showing that an I<sub>sc</sub> of 20A is safe and the inverter has been designed to adequately withstand this current in the event of a short circuit.

This declaration can be referred to by installers to justify their design decisions for utilising higher current panels, whilst the I<sub>sc</sub> is changed in the manual. This is declaration expands Delta’s PV panel compatibility options.

Regards,

Name	Position	Signature
Geordie Zaphiris	Senior Field Application Engineer	
Wester Ku	Design Engineering Associate Manager	
David Leal	Country Manager	



## **Delta H5A 222 Short Circuit Current Test Report**

1. Purpose:  
To verify the inverter H5A\_222 will work normally after the reverse input short circuit current test of 20A.
2. Test Instruments:  
DC source : IDRC DSP650-46WS  
Oscilloscope : Lecroy HDO4034  
Voltage probe : Cybertek DP6150A  
Current probe : Cybertek CP8150A
3. Test Condition and site:  
Room Temperature / Delta R.D Lab
4. Setting of the DC Source: 350V / 20A
5. Test Procedure
  - a. Check and confirm the DUT inverter works normally.
  - b. Reverse the polarity of the PV input connection and allow the short circuit current of 20A to pass for 30mins.
  - c. Connect the PV input connection in the correct polarity and verify the DUT inverter works normally.

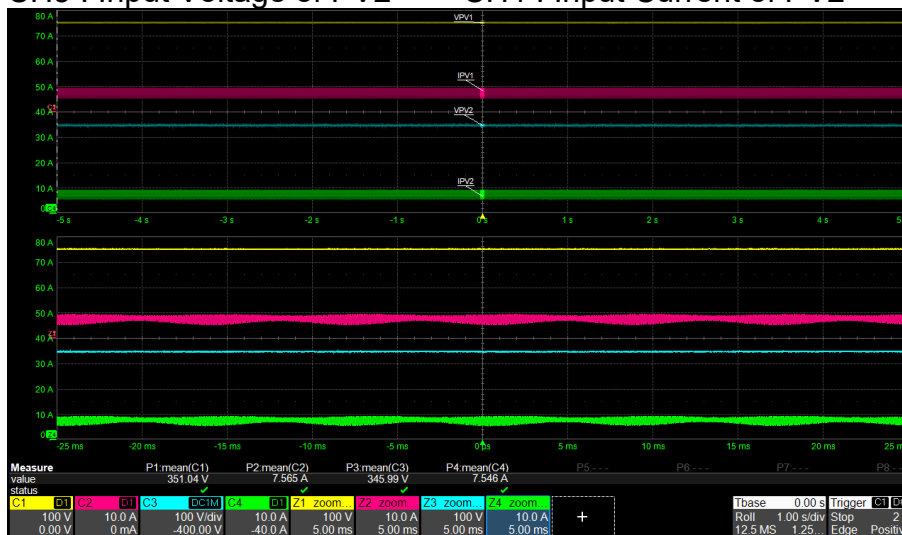
### Test Result

a. Check and confirm the DUT inverter can work normally.

Input 1		Input 2		Output 1	
Voltage	349.8 V	Voltage	350.1 V	Voltage	229.9 V
Current	7.34 A	Current	7.33 A	Current	21.50 A
Power	2576 W	Power	2577 W	Power	4995 W

CH1 : Input Voltage of PV1  
CH3 : Input Voltage of PV2

CH2 : Input Current of PV1  
CH4 : Input Current of PV2



b. Reverse the polarity of the PV input connection and allow the short circuit current of 20A to pass for 30mins.

DC Source 1

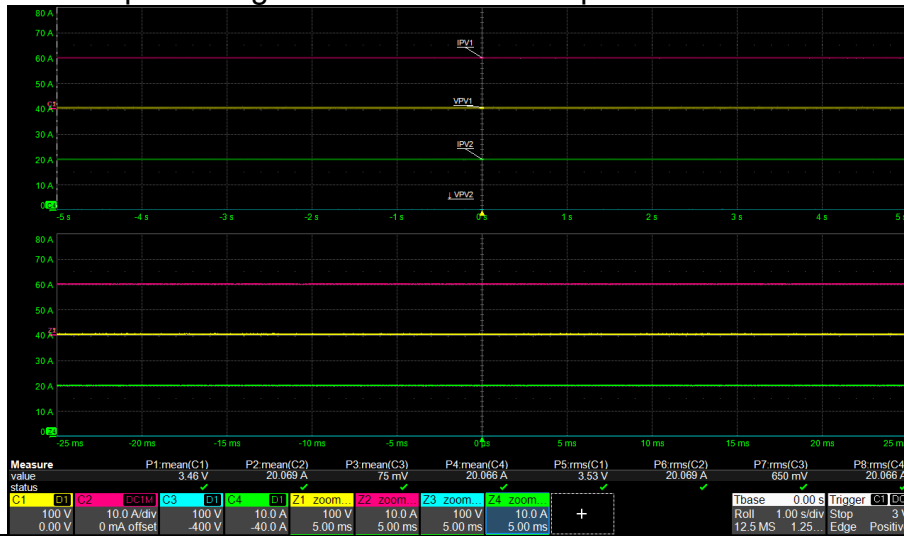


DC Source 2





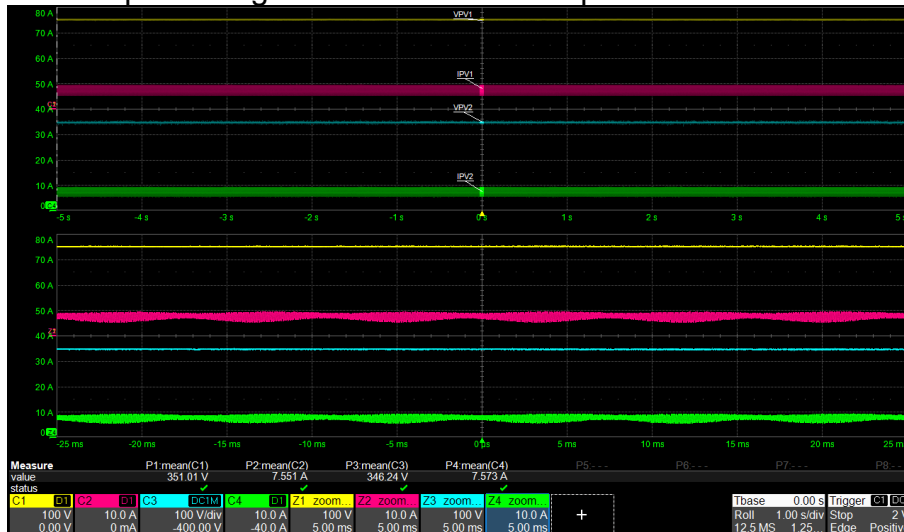
CH1 : Input Voltage of PV1      CH2 : Input Current of PV1  
 CH3 : Input Voltage of PV2      CH4 : Input Current of PV2



c. Check and confirm the DUT inverter can work normally.

Input 1		Input 2		Output 1	
<b>Voltage</b>	<b>349.8 V</b>	<b>Voltage</b>	<b>350.1 V</b>	<b>Voltage</b>	<b>230.0 V</b>
<b>Current</b>	<b>7.34 A</b>	<b>Current</b>	<b>7.33 A</b>	<b>Current</b>	<b>21.49 A</b>
<b>Power</b>	<b>2574 W</b>	<b>Power</b>	<b>2576 W</b>	<b>Power</b>	<b>4996 W</b>

CH1 : Input Voltage of PV1      CH2 : Input Current of PV1  
 CH3 : Input Voltage of PV2      CH4 : Input Current of PV2



6. Conclusion:

Delta H5A\_222 can withstand 20A short circuit current without any hazard or damage.