6	Appropriate operating & maintenance manuals must be available for the end-user as part of the main contract of sale in order to optimise the achievement of any potential efficiency improvements.

Table 1: Micro-generation Interface settings for Republic of Ireland

All type-testing must be carried out with these settings on board. Full details are outlined in the Arrangements for Micro Generation Consultation Paper issued by the Commission for Regulation if Utilities (CRU) CER/06/190

Parameter	Trip setting	Clearance time
Over voltage	230 V + 10 %	0,5 s
Under voltage	230 V – 10 %	0,5 s
Over frequency	50 Hz + 1 %	0,5 s
Under frequency	50 Hz - 4 %	0,5 s
An explicit Loss of Mains functionality must be included. Established methods such as, but not limited to, Rate of Change of Frequency, Vector Shift or Source Impedance Measurement may be used. Where Source Impedance is measured, this must be achieved by purely passive means. Any implementation which involves the injection of pulses onto the DSO network, shall not be permitted.		
ROCOF [where used]	0,4 Hz/s	0,5 s
Vector Shift [where used]	6 degrees	0,5 s

TABLE 1: PROTECTION SETTINGS FOR EN 50549 POST JANUARY 28TH, 2022.

Parameter		Trip setting	Clearance time	Confirm Settings Applied (Y/N)
Over Voltage				
Pre I.S EN 50549-1 Single Stage Voltage Setting		269 V / 468 V	0.7 s	
I.S. EN 50549-1 Two Stage Voltage Settings	Stage 1	269 V / 468 V	70 s	
	Stage 2	281 V / 488 V	0.7 s	
Under voltage		191 V / 332 V	0.7 s	
Over frequency*		52 Hz	0.5 s	
Under frequency*		47 Hz	0.5 s	
An explicit Loss of Mains functionality shall be included. Established methods such as, but not limited to, Rate of Change of Frequency, or Source Impedance Measurement may be used. Where Source Impedance is measured, this shall be achieved by purely passive means. Any implementation which involves the injection of pulses onto the DSO network, shall not be permitted.				
ROCOF (**)		1.0 Hz/s	0.6 s	
Vector Shift		Not permitted		

(*) For relays that have a setting step of 0.1Hz then the frequency should be set to 52.1Hz and 46.9Hz receptively.

(**) reset interval should be set to >0.6 seconds to detect step changes

Important Note:

- **No deviations from the protection settings in the above Table shall be allowed without permission in writing from ESB Networks.**
- **If a deviation exists, please provide correspondence from ESB Networks confirming acceptance of this deviation to networkservicesbureau@esb.ie**

Details of the Generator interface protection settings installed are as per those applicable in the Conditions Governing the Connection and Operation of Micro-Generation (DTIS-230206-BRL) current at date of application, and the actual settings installed on the Micro-Generator are as listed above.