

Wels, September 07th 2021

MEDIUM VOLTAGE REQUIREMENTS JORDAN

Fronius International GmbH

confirms that the following inverters

- / **Fronius Symo 10.0-3 – 20.0-3**
- / **Fronius Eco 25.0-3 – 27.0-3**
- / **Fronius Tauro Eco**

fulfill the inverter-specific requirements of the document “Intermittent Renewable Resources (Wind and PV) Distribution Connection Code (DCC) At Medium Voltage (MV); (IRR-DCC-MV; Version 1; May 24, 2015)”.

In order to fulfill all requirements of “Intermittent Renewable Resources (Wind and PV) Distribution Connection Code (DCC) At Medium Voltage (MV); (IRR-DCC-MV; Version 1; May 24, 2015)”, a PV-system connected to the MV-grid will need additional technical equipment.

For more information, the following table shows a detailed analysis of the compliance of the above mentioned inverters with requirements for the connection to medium voltage in Jordan defined in the document “Intermittent Renewable Resources (Wind and PV) Distribution Connection Code (DCC) At Medium Voltage (MV); (IRR-DCC-MV; Version 1; May 24, 2015)”.

Code Description	Section	Compliance
Frequency Tolerance requirement	IRR-DCC-MV 4.1	Complies if configured correctly
Frequency Relaying Requirement	IRR-DCC-MV 4.2	Not applicable, requirement at PCC. (Inverter fulfills G99)
Active Power Requirement	IRR-DCC-MV 4.3	Complies
Governor – Primary Frequency Response (PFR)	IRR-DCC-MV 4.4	Integrated control complies with requirement of Fig 4-2 if configured correctly. For compliance of all options external park control is necessary.
Voltage Tolerance Requirement at PCC	IRR-DCC-MV 5.1	Inverter complies if configured correctly. Trip limits are defined for a protection at PCC, so not applicable for inverter.
Voltage Relaying Requirement	IRR-DCC-MV 5.2	Not applicable, requirement at PCC. (Inverter fulfills G99)
Voltage Step Limit	IRR-DCC-MV 5.3.1	Evaluation of voltage flicker at PCC are not done (cannot be done) by Fronius.
Flicker Standards	IRR-DCC-MV 5.3.2	Fronius inverters comply with Flicker standards IEC 61000-3-3 resp. IEC 61000-3-11. The assessment of the flicker values at the MV level is not provided by Fronius.
Fault and Zero Voltage Ride through Requirement	IRR-DCC-MV 5.4	Complies with ride through time profile according Figure 5-1. During the fault the inverter provides active power in proportion to retained voltage. Reactive current supply can be configured as well. In



		that case, reactive current is promised over active current.
Voltage Regulation (AVR)	IRR-DCC-MV 5.5	Volt/Var control at inverter terminals is integrated. Other kind of voltage regulation can be implemented with external park controller
Reactive Power Requirement	IRR-DCC-MV 5.6	Complies if correctly configured.
Power Transformer	IRR-DCC-MV 5.7	No inverter topic.
Power Factor	IRR-DCC-MV 6	Inverter complies with power factor control at inverter terminals. For exact control at PCC, external park controller is required.
Harmonics	IRR-DCC-MV 7	Fronius inverter comply with IEC 61000-3-2 resp. 61000-3-12. The assessment of voltage harmonics at PCC level is not delivered by Fronius. Values for harmonics and interharmonics can be supplied by request.
Phase Imbalance and Negative Sequence Handling	IRR-DCC-MV 8	Fronius inverters are configured to deliver pure symmetrical current with no negative sequence current.
Ramp Rate	IRR-DCC-MV 9	Ramp Rates for startup and control commands are implemented. Ramp rates for normal operation are planned to be implemented. (Ramp Up Limitation x%/sec.)
Islanding Requirements	IRR-DCC-MV 10.1	Active Anti-Islanding is implemented Passive Anti-Islanding is implemented
Anti Islanding Relay or Transfer Scheme	IRR-DCC-MV 10.2	Requirements at PCC are out of scope of the inverter. But RoCoF protection is implemented in the inverter as well.
System Impact Studies	IRR-DCC-MV 11	Impact study is not provided by Fronius.

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