Fronius
SHIFTING THE LIMITS

Wels, April 21st 2016

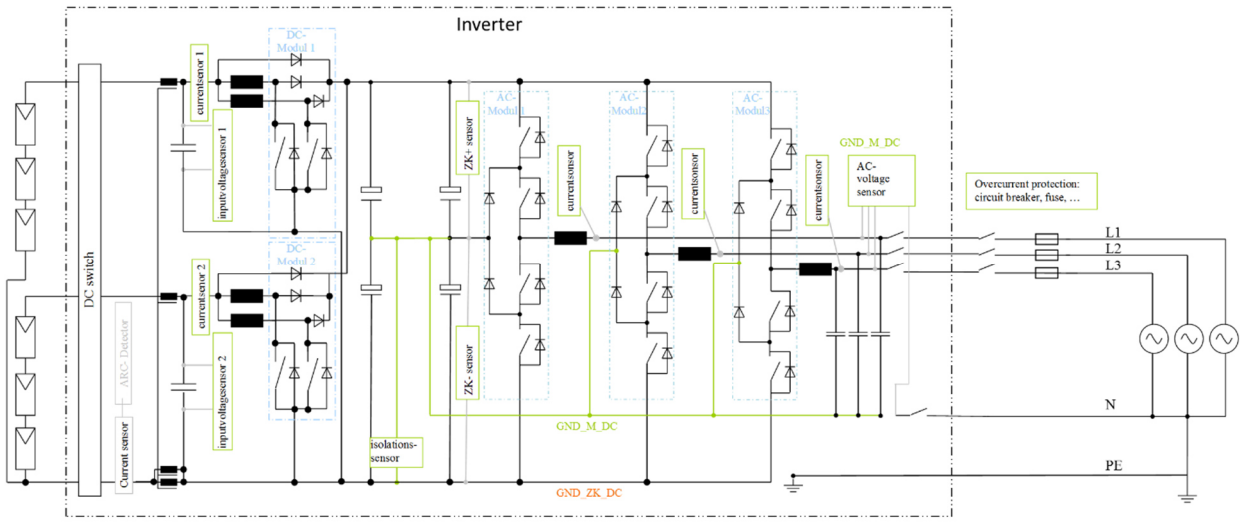
FRONIUS SYMO & ECO: IN-BUILT DC ISOLATOR AND DC EARTH FAULT CHARACTERISTICS

Fronius International GmbH

hereby confirms that the Fronius Symo and Eco inverter operates as a “pure” 3-phase inverter, and does not use the Neutral for power injection. The entire DC to AC conversion is built symmetrically around L1, L2 & L3, therefore the power path has no direct connection to Neutral and thus to Earth. The Neutral conductor is only used for measurement purposes.

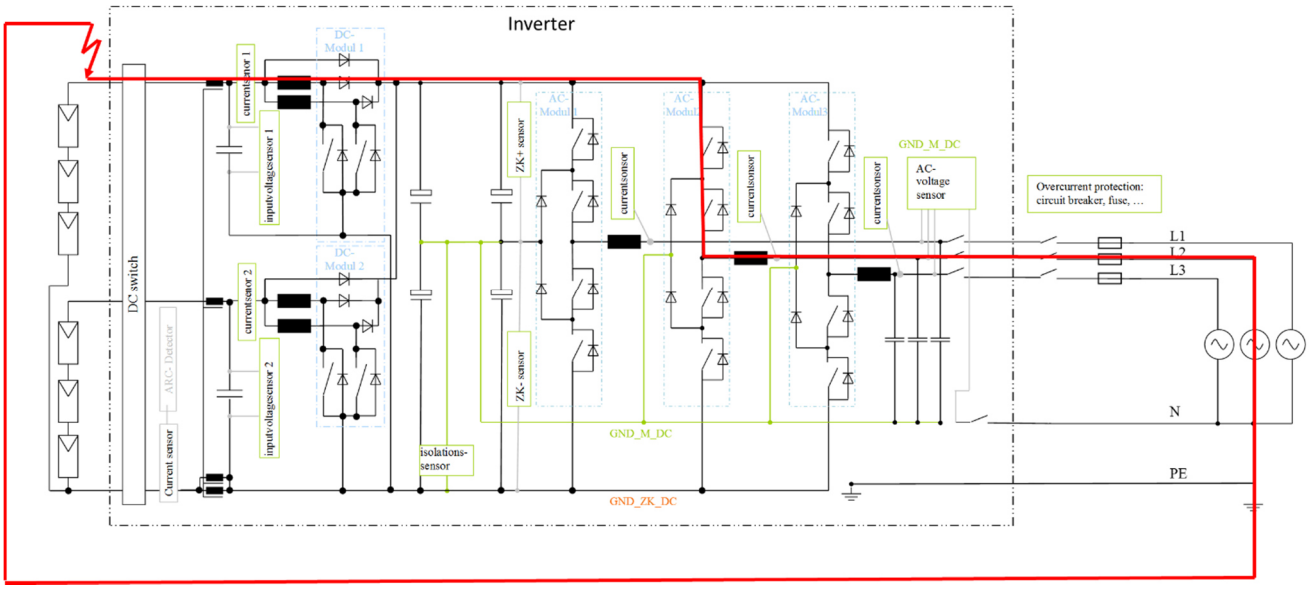
Due to this fact, there is no connection between the Neutral conductor and the DC+ or DC- in the inverter at any time. (See Figure 1)

Figure 1:



This demonstrates that in the case of a DC earth fault, there will be no fault current return path via the Neutral. With this topology, the only other theoretically possible Earth fault path can be through one or more of the AC phases due to the Earth reference on the Neutral side of the grid transformer. An example is shown in Figure 2. However this earth fault path is driven by the unlimited AC source (grid) and thus will trip the mandatory AS/NZS 3000 external AC overcurrent protection device. As soon as any of the AC overcurrent protection devices trip, the Earth fault current will also cease leaving the DC switch to be operated without current, or in the case of a short circuit within the inverter, with DC+ and DC- pole in series.

Figure 2:



Due to its inverter topology and above described DC earth fault path, the Fronius Symo and Eco will not be required to break the full array current or voltage across 1 pole in a DC Earth fault scenario and therefore the inverter's in-built isolator 2-pole in series rating should be used.

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