



Wels, January 25<sup>th</sup> 2016

## PROTECTION BY RESIDUAL CURRENT MONITORING REGARDING FRONIUS SYMO HYBRID

During the feed-in operation of the Fronius Symo Hybrid the integrated Residual Current Monitoring Unit (RCMU) is responsible for the detection of a positive ground fault as well as for a negative one. The RCMU measures the total (both AC and DC components) root mean square (RMS) current to ground and comply with the requirements in IEC 62109-2.

IEC 62109-2 states that transformerless (non-isolated) inverters shall provide residual current monitoring for both continuous excessive residual current and excessive sudden changes in residual current, according to the following limits:

### Continuous residual current

- / If the continuous residual exceeds 300mA the inverter shall disconnect from the mains within 0.3 seconds. That's the limit for inverters with rated output power  $\leq 30\text{kVA}$  (Fronius Symo Hybrid)

### Sudden changes in residual current

- / If a sudden change in residual current is detected the inverter shall disconnect from the mains within the limit specified in Table 1:

Sudden change in residual current	Maximum disconnection time from the mains
30 mA	300 ms
60 mA	150 ms
150 mA	40 ms

Table 1: time limits for sudden changes in residual current for transformerless inverters

From that follows that the Fronius Symo Hybrid will disconnect the neutral from the DC side of the inverter under the first fault condition. All Fronius transformerless inverters switch off and break the neutral connection if an earth fault occurs in accordance with VDE 0126-1-1 and IEC 62109-2.

**Fronius International GmbH**  
Solar Energy Division  
Froniusplatz 1  
A-4600 Wels

DI Thomas Mühlberger  
Head of Solution Management