



Certificate for the NS protection

Manufacturer / applicant: Fronius International GmbH
Günter Fronius Straße 1
4600 Wels
Austria

Type of grid and plant protection:	Integrated NS protection
Assigned to generation unit type:	Symo20.0-3-M, Symo17.5-3-M, Symo15.0-3-M, Symo12.5-3-M, Symo10.0-3-M

Firmware version: beginning with V1.1.4.0

Connection rule: VDE-AR-N 4105:2018-11 – Power generation systems connected to the low-voltage distribution network
Technical minimum requirements for the connection to and parallel operation with low-voltage distribution networks.

Applicable standards / directives: DIN VDE V 0124-100 (VDE V 0124-100):2020-06 – Grid integration of power generation systems – low voltage
Test requirements for power generation units to be connected and operated parallel with the low-voltage distribution networks

The above mentioned grid and plant protection has been tested and certified according to the test guideline VDE 0124-100. The electrical properties required in the connection rule are satisfied.

- Setting values and disconnect times
- Properly functioning functional chain "NS protection – interface switch"
- Technical requirements of the switching device
- Integrated interface switch that can also be used in conjunction with a central interface protection relay (VDE-AR-N 4105:2018-11 §6.4.1)
- Active detection of unintended islanding
- Single-fault tolerance

The certificate contains the following information:

- Technical specifications of the NS protection and corresponding power generation types
- Setting values of the protection functions
- Trip values of the protection functions

BV project number: 19TH0407-VDE-0124-100:2020_0

Certification program: NSOP-0032-DEU-ZE-V01

Certificate number: U21-0410

Date of issue: 2021-05-18



Certification body

Thomas Lammell

Certification body of Bureau Veritas Consumer Products Services Germany GmbH Accredited according to DIN EN ISO/IEC 17065

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E.7 Requirements for the test report for the NS protection

Extract from test report for NS protection

Nr. 19TH0407-VDE-0124-100:2020_0

“Determination of electrical properties”

NS protection as integrated NS protection

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Firmware version:	beginning with V1.1.4.0
Integrated interface switch:	Type of switching equipment 1: Relay Type of switching equipment 2: Relay
Measurement period:	2019-10-14 - 2020-01-07

Inverter

Protection function	Setting value	Trip value	Disconnection time ^a
Voltage drop protection U <	184,0 V	184,0 V	3017 ms
Voltage drop protection U <<	103,5 V	103,7 V	328 ms
Rise-in-voltage protection U>	253,0 V	—	442 s ^b
Rise-in-voltage protection U>>	287,5 V	288,1 V	119 ms
Frequency decrease protection f<	47,50 Hz	47,50 Hz	121 ms
Frequency increase protection f>	51,50 Hz	51,51 Hz	123 ms

^a proper time of interface switch 5 ms

^b longest disconnection of the rise-in-voltage protection as a moving 10-minute-average, tested according clause 5.7.7 Protection devices and protection settings of VDE 0124-100

The disconnect time (sum of trip time of grid and plant protection and delay time of interface switch) must not exceed 200 ms.

A check of the overall functional chain "NS protection – interface switch" resulted in a successful disconnection.

The above mentioned grid and plant protection with the assigned power generation units has met the requirements for islanding detection with the help of the active method (resonant circuit test).

The above mentioned NS protection meets the requirements for synchronization.