



**BUREAU
VERITAS**

Certificate of conformity NS protection

Manufacturer / applicant: Hoymiles Converter Technology Co., Ltd.
No. 18 Kangjing Road,
HangZhou, Zhejiang Province,
P.R. China

Type of grid and plant protection:	Integrated NS protection
Assigned to generation unit type:	MI-500 MI-600 MI-700

Firmware version: V00.02.32

Connection rule: **VDE-AR-N 4105:2011-08 – 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): 2012-07 – 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
- Active detection of stand-alone power systems
- Single-fault tolerance

The certificate contains the following information:

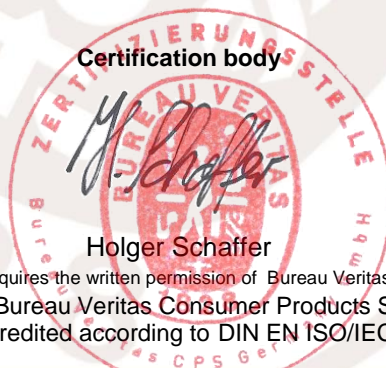
- Technical specifications of the NS protection and corresponding power generation types
- Setting values of the protection functions
- Trip values of the protection functions

BV project number: **BMH-19JA0333FCSHP**

Certificate number: **U19-0071**

Date of issue: **2019-01-25**

Certification body



Holger Schaffer



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

F.4 Requirements for the test report for the NS protection

Extract from test report for NS protection
"Determination of electrical properties"

Nr. BMH-19JA0333FCSHP

NS protection as integrated NS protection

Manufacturer / applicant:	Hoymiles Converter Technology Co., Ltd. No. 18 Kangjing Road, HangZhou, Zhejiang Province, P.R. China
Type of grid and plant protection:	Integrated NS protection
Assigned to generation unit type:	MI-500 MI-600 MI-700
Firmware version:	V00.02.32
Integrated interface switch:	Type of switching equipment 1: HF-Transformer Type of switching equipment 2: Relay
Measurement period:	2018-11-29 to 2019-01-04

Protection function	Setting value	Trip value	Disconnection time ^a
Voltage drop protection U <	184,0 V	182,2 V	154,53 ms
Rise-in-voltage protection U >	253,0 V	---	489 s ^b
Rise-in-voltage protection U >>	264,5 V	263,5 V	155,07 ms
Frequency decrease protection f <	47,50 Hz	47,5 Hz	160,4 ms
Frequency increase protection f >	51,50 Hz	51,5 Hz	156,67 ms

^a proper time of interface switch 6 ms

^b longest disconnection of the rise-in-voltage protection as a moving 10-minute-average, tested according clause 5.4.5.3.3 measurement a) 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 passive method (three-phase voltage monitoring) / active method (resonant circuit test).

The above mentioned NS protection meets the requirements for synchronization.