



**BUREAU  
VERITAS**

# Certificate of conformity NS protection

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

<b>Type of grid and plant protection:</b>	integrated NS protection
<b>Assigned to generation unit type:</b>	MI-1000 MI-1000T MI-1200 MI-1200T

**Firmware version:** V00.01.32

**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
- Passive / 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:** ZEM-18AP0895FCSHP-1

**Certificate number:** U18-0501

**Date of issue:** 2018-09-06

Certification body



Holger Schaffer

(A partial representation of the certificate requires the written permission of Bureau Veritas Consumer Products Services Germany GmbH)

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



Deutsche  
Akkreditierungsstelle  
D-ZE-12024-01-00

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

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

Nr. ZEM-18AP0895FCSHP-1

**NS protection as integrated NS protection**

<b>Manufacturer / applicant:</b>	Hoymiles Converter Technology Co., Ltd. No. 18 Kangjing Road, HangZhou, Zhejiang Province P.R. China
<b>Type of grid and plant protection:</b>	integrated NS protection
<b>Assigned to generation unit type:</b>	MI-1000 MI-1000T MI-1200 MI-1200T
<b>Firmware version:</b>	V00.01.32
<b>Integrated interface switch:</b>	Type of switching equipment 1: HF-transformer Type of switching equipment 2: Relay
<b>Measurement period:</b>	2018-04-28 to 2018-08-27

Protection function	Setting value	Trip value	Disconnection time <sup>a</sup>
Voltage drop protection U <	184,0 V	184,1 V	140,4 ms
Rise-in-voltage protection U>	253,0 V	253,0 V	498,0 s <sup>b</sup>
Rise-in-voltage protection U>>	264,5 V	265,2 V	142,0 ms
Frequency decrease protection f<	47,50 Hz	47,50 Hz	161,6 ms
Frequency increase protection f>	51,50 Hz	51,50 Hz	157,6 ms

<sup>a</sup> proper time of interface switch xx ms

<sup>b</sup> 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.