



**BUREAU  
VERITAS**

**TRADUCTION  
POWR GROUP**

# Certificat de conformité

**Demandeur :** Solenso electronic materials Co., LTD.  
4F., NO.56, ZILI 5TH ST., ZHONGLI DIST.,  
TAOYUAN CITY 320  
TAIWAN

**Produit :** Onduleurs Photovoltaïques (PV)

**Modèle :** Sol-H400  
Sol-H350

## Utilisation conforme à la réglementation :

Dispositif de déconnexion automatique avec surveillance du réseau monophasé conformément à la norme EN 50549-1:2019 pour les systèmes photovoltaïques avec couplage parallèle monophasé via un onduleur dans le réseau public. Le dispositif de déconnexion automatique fait partie intégrante de l'onduleur susmentionné.

## Règles et normes appliquées :

### EN 50549-1:2019

Exigences relatives aux centrales électriques destinées à être raccordées en parallèle à des réseaux de distribution - Partie 1: Raccordement à un réseau de distribution BT - Centrales électriques jusqu'au Type B inclus

- 4.4 Plage de fonctionnement normal
- 4.5 Immunité aux perturbations
- 4.6 Réponse active à la déviation de fréquence
- 4.7 Réponse de la puissance aux variations de tension et aux changements de tension
- 4.8 CEM et qualité de l'énergie
- 4.9 Protection de l'interface
- 4.10 Connexion et démarrage de la production d'énergie électrique
- 4.11 Arrêt et réduction de la puissance active sur le point de consigne
- 4.12 Échange d'informations à distance
- 4.13 Exigences relatives à la tolérance de défaillance unique du système de protection de l'interface et du commutateur d'interface

### EN 50438:2013

Exigences relatives au raccordement des microcentrales en parallèle avec les réseaux publics de distribution à basse tension

### DIN V VDE V 0126-1-1:2006 (4.1 Sécurité fonctionnelle)

Dispositif de déconnexion automatique entre un générateur et le réseau public basse tension

Au moment de la délivrance de ce certificat, le concept de sécurité d'un produit représentatif susmentionné correspond aux spécifications de sécurité en vigueur pour l'utilisation spécifiée, conformément à la réglementation.

**Numéro du rapport :** BMH-ESH-P200408503-1  
BMH-ESH-P200408503-2  
BMH-ESH-P200408503-3

**Programme de certification :**  
NSOP-0032-DEU-ZE-V01

**Numéro du certificat :** U21-0106

**Date d'émission:** 2020-02-08

**Organisme de certification**



Thomas Lammel



Organisme de certification Bureau Veritas Consumer Products Services Germany GmbH accréditation selon DIN EN ISO/IEC 17065  
Une représentation partielle du certificat nécessite l'accord écrit de Bureau Veritas Consumer Products Services Germany GmbH.



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# Certificate of compliance

**Applicant:** Solenso electronic materials Co., LTD.  
4F., NO.56, ZILI 5TH ST., ZHONGLI DIST.,  
TAOYUAN CITY 320  
TAIWAN

**Product:** Photovoltaic (PV) inverter

**Model:** Sol-H400  
Sol-H350

## Use in accordance with regulations:

Automatic disconnection device with single-phase mains surveillance in accordance with EN 50549-1:2019 for photovoltaic systems with a single-phase parallel coupling via an inverter in the public mains supply. The automatic disconnection device is an integral part of the aforementioned inverter.

## Applied rules and standards:

### EN 50549-1:2019

Requirements for parallel connection of installations with distribution networks - Part 1: Connection to an LV distribution network - Production of installations up to and including Type B

- 4.4 Normal operating range
- 4.5 Immunity to disturbances
- 4.6 Active response to frequency deviation
- 4.7 Power response to voltage variations and voltage changes
- 4.8 EMC and power quality
- 4.9 Interface protection
- 4.10 Connection and starting to generate electrical power
- 4.11 Ceasing and reduction of active power on set point
- 4.12 Remote information exchange
- 4.13 Requirements regarding single fault tolerance of interface protection system and interface switch

### EN 50438:2013

Requirements for micro-generating plants to be connected in parallel with public low-voltage distribution networks

### DIN V VDE V 0126-1-1:2006 (4.1 Functional safety)

Automatic disconnection device between a generator and the public low-voltage grid

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

**Report number:** BMH-ESH-P200408503-1  
BMH-ESH-P200408503-2  
BMH-ESH-P200408503-3

**Certification Program:** NSOP-0032-DEU-ZE-V01

**Certificate number:** U21-0106

**Date of issue:** 2020-02-08

**Certification body**



Thomas Lammel



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

A partial representation of the certificate requires the written approval of Bureau Veritas Consumer Products Services Germany GmbH



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Annex to the EN 50549-1 certificate of compliance No. U21-0106

**Appendix**

Extract from test report according to EN 50549-1

Nr. BMH-ESH-P200408503-1  
BMH-ESH-P200408503-2  
BMH-ESH-P200408503-3

**Type Approval and declaration of compliance with the requirements of EN 50549-1.**

<b>Manufacturer / applicant:</b>	Solenso electronic materials Co., LTD. 4F., NO.56, ZILI 5TH ST., ZHONGLI DIST., TAOYUAN CITY 320 TAIWAN
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<b>Micro-generator Type</b>	Photovoltaic inverter			
	Sol-H400	Sol-H350	--	--
<b>MPP DC voltage range [V]</b>	34-48	33-48	--	--
<b>Input DC voltage range [V]</b>	max. 60	max. 60	--	--
<b>Input DC current [A]</b>	12,5	11,5	--	--
<b>Output AC voltage [V]</b>	220/230/240	220/230/240	--	--
<b>Output AC current [A]</b>	2	1,75	--	--
<b>Output power [VA]</b>	400	350	--	--

<b>Firmware version</b>	V01.01.00
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<b>Measurement period:</b>	2020-04-08 to 2020-04-20 BMH-ESH-P200408503-1 2020-04-08 to 2020-05-12 BMH-ESH-P200408503-2 2020-04-08 to 2020-05-19 BMH-ESH-P200408503-3
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**Description of the structure of the power generation unit:**

The power generation unit is equipped with a PV and line-side EMC filter. The power generation unit has galvanic isolation between DC input and AC output (HF/LF transformer). Output switch-off is performed with single-fault tolerance based on one relays in each line and neutral. This enables a safe disconnection of the power generation unit from the network in case of error.



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## Annex to the EN 50549-1 certificate of compliance No. U21-0106

### Appendix

Extract from test report according to EN 50549-1

Nr. BMH-ESH-P200408503-1  
BMH-ESH-P200408503-2  
BMH-ESH-P200408503-3

#### Setting of the interface protection:

Parameter	Max. disconnection time	Min. operate time	Trip value
Over voltage (stage 1) <sup>a</sup>	3s	-	230V +10% (253V)
Over voltage (stage 2)	0,2s	0,1s	230V +15% (264,5V)
Under voltage	1,5s	1,2s	230V -15% (195,5V)
Over frequency	0,5s	0,3s	50Hz +4% (52Hz)
Under frequency	0,5s	0,3s	50Hz -5% (47,5Hz)
Reconnection settings for voltage (normal operational startup)	$0,85V_n (195,5V) \leq V \leq 1,10V_n (253V)$		
Reconnection settings for frequency (normal operational startup)	$49,5Hz \leq f \leq 50,2Hz$		
Reconnection time (normal operational startup)	$\geq 60s$		
Reconnection settings for voltage (automatic reconnection after tripping)	$0,85V_n (195,5V) \leq V \leq 1,10V_n (253V)$		
Reconnection settings for frequency (automatic reconnection after tripping)	$49,5Hz \leq f \leq 50,2Hz$		
Reconnection time (automatic reconnection after tripping)	$\geq 60s$		
Active power gradient after reconnection	10% $P_{E_{max}}$ / per minute		
Active power delivery at under frequency	electronic inverter, no active power reduction		
Power response to over frequency (frequency / droop s)	50,2Hz / 5%		
Permanent DC-injection	0,5% of rated inverter output current or 20mA		
Rate of change of frequency (ROCOF)	2Hz/s		
Loss of mains according EN 62116 (LoM)	2,0s		

#### Note:

<sup>a</sup> Over voltage – stage1: 10 min-mean-value corresponding to EN 50160.

Default interface setting according to EN 50438:2013 are used.

The settings of the interface protection are password protected adjustable.

In case the above stated generators are used with an external protection device, the protection settings of the inverters are to be adjusted according to the manufacturer's declaration.

The above stated generators are tested according to the requirements in the EN 50549-1:2019. Any modification that affects the stated tests must be named by the manufacturer/supplier of the product to ensure that the product meets all requirements of the EN 50549-1:2019.