

Unit Certificate



FGW TG8 EZE

www.tuv.com
ID 1900000000

No.: 968/GI 2333.01/26

Grid Integration of Distributed Energy Resources

Certificate Holder

NingBo Deye Inverter Technology Co.,
Ltd.
No. 26 South YongJiang Road, Daqi,
Beilun NingBo,
315800 Zhejiang
P. R. China

Subject

**Commercial & Industrial Energy Storage System, including
Power Conversion System:**
SUN-100K-PCS01HP3; SUN-100K-PCS01HP3-B;
SUN-125K-PCS01HP3; SUN-125K-PCS01HP3-B
MPPT: SUN-MPPT-L01-EU-AM8;
STS: SUN-ST5500L

Codes and Standards

VDE-AR-N 4110:2023
VDE-AR-N 4120:2018
FGW TG 3:2023 Revision 26

FGW TG 4:2023 Revision 10
FGW TG 8:2019 Revision 9

Scope and result

The power generating units mentioned above meet the requirements of standards listed above.

The conformity is declared by following documents:

Evaluation Report-No.: 968/GI 2333.01/26, 2026-10-09

Validation Report-No.: 968/GI 2333.00/26, 2026-10-09

Test Report No.: CN25U3MM 001, dated 2025-11-27

The manufacturer has provided proof of certification of the quality management system of his production facility in accordance with ISO 9001 or is subject to production monitoring.

Specific provisions

The deviations and conditions for conformity according to the evaluation report must be observed. The corresponding conditions and deviations are listed on page 4, 5 and 6 of the certificate.

Valid until 2031-10-09

The issue of this certificate is based upon an evaluation in accordance with the Certification Program CERT GI3 V5.0:2021-11 in its actual version, whose results are documented in Report No. 968/GI 2333.01/26 dated 2026-10-09. This certificate is specifically valid for the above mentioned system only. It becomes invalid, if any unapproved changes are implemented without prior assessment/approval by the certification body. Authenticity and validity of this certificate can be verified through the above indicated QR-code or at <https://www.fs-products.com>.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit
Am Grauen Stein, 51105 Köln

Köln, 2026-10-09

Certification Body „Energiesysteme, Renewables, Grid, Safety
& Security for Automation“

Dipl.-Ing. Marco Klose

www.fs-products.com
www.tuv.com



TÜVRheinland®
Precisely Right.

Unit Certificate

Nr.: 968/GI 2333.01/26

Grid Integration of Distributed Energy Resources

Technical data of the PGU:

Power Conversion System (PCS Module)				
Typ:	SUN-100K-PCS01HP3	SUN-125K-PCS01HP3	SUN-100K-PCS01HP3-B	SUN-125K-PCS01HP3-B
Max. apparent power:	110 kVA	125 kVA	110 kVA	125 kVA
Rated active power:	100 kW	125 kW	100 kW	125 kW
Max. active power (P ₆₀₀):	109.98 kW	124.67 kW	109.98 kW	124.67 kW
Rated voltage:	400 V _{AC}			
Nominal frequency:	50/60 Hz			
Firmware-Version:	6011-1008-MS			
MPPT Module				
Type	SUN-MPPT-L01-EU-AM8			
Max. DC input voltage	800 V _{DC}			
DC voltage range	180-750 V _{DC}			
Max. DC input current	8 x 40 A _{DC}			
Firmware-Version	6011-1008-MS			

Unit Certificate

Nr.: 968/GI 2333.01/26

Grid Integration of Distributed Energy Resources

Technical data of the PGU:

STS Module	
Typ:	SUN-STS500L
AC rated input/output voltage	400 V _{AC}
AC rated input/output frequency	50/60 Hz
AC rated input/output current	725 A _{AC}
AC rated input/output power	500 kW
Firmware-Version:	6011-1008-MS

Validated Simulation Model:

Reference name: SUN-100-125K-PCS01HP3(-B)_VDE_V1_Encrypt.pfd

MD5 Checksum: F4155FD0CD21F14633EEBD3AA7D08638

Simulation platform: DIgSILENT PowerFactory 2024 SP4

Unit Certificate

Nr.: 968/GI 2333.01/26

Grid Integration of Distributed Energy Resources

Technical data of the PGU:

Overview of all permitted configuration variants:

Configuration	PCS	PCS + MPPT	PCS + STS	PCS + MPPT + STS
Module included	SUN-100K-PCS01HP3	SUN-100K-PCS01HP3 + SUN-MPPT-L01-EU-AM8	SUN-100K-PCS01HP3 + SUN-ST500L	SUN-100K-PCS01HP3 + SUN-MPPT-L01-EU-AM8 + SUN-ST500L
	SUN-125K-PCS01HP3	SUN-125K-PCS01HP3 + SUN-MPPT-L01-EU-AM8	SUN-125K-PCS01HP3 + SUN-ST500L	SUN-125K-PCS01HP3 + SUN-MPPT-L01-EU-AM8 + SUN-ST500L
	SUN-100K-PCS01HP3-B	SUN-100K-PCS01HP3-B + SUN-MPPT-L01-EU-AM8	SUN-100K-PCS01HP3-B + SUN-ST500L	SUN-100K-PCS01HP3-B + SUN-MPPT-L01-EU-AM8 + SUN-ST500L
	SUN-125K-PCS01HP3-B	SUN-125K-PCS01HP3-B + SUN-MPPT-L01-EU-AM8	SUN-125K-PCS01HP3-B + SUN-ST500L	SUN-125K-PCS01HP3-B + SUN-MPPT-L01-EU-AM8 + SUN-ST500L
Firmware-Version	6011-1008-MS			

Unit Certificate

Nr.: 968/GI 2333.01/26

Grid Integration of Distributed Energy Resources

The following deviations and restrictions apply:

☐ None

☒ The following:

Proof	Deviation / Restriction
Grid perturbations – switching operations	--
Grid perturbations – asymmetries	--
Grid perturbations – flicker	--
Grid perturbations – Harmonics, inter-harmonics and supraharmonics	--
Quasi-static operation	--
Pole angle and grid oscillations	--
Reactive power supply	--
Method for reactive power supply	▪ To meet the requirements according to VDE-AR-N 4120, an external PGS controller with valid component certificate is required. This has to be implemented on PGS level and evaluated during system certification. ▪ Q(U) control: A voltage deadband cannot be set through parameters available on the LCD screen. If required, this has to be implemented by changing underlying code in the software. ▪ Q(P) control: The PGU control only supports six reference points for Q(P) control. If more reference points are needed, the Q(P) control must be implemented on PGS level (e.g. by PGS controller).

Unit Certificate

Nr.: 968/GI 2333.01/26

Grid Integration of Distributed Energy Resources

Active power – general and grid security management	Separate interfaces for setpoint specifications regarding active power (e.g. grid operator, direct marketer) and the active power prioritization according chapter 8.1 of VDE-AR-N 4110 and VDE-AR-N 4120 (e.g. in case of under-frequency) must be implemented at PGS level (e.g. by PGS-controller) and be evaluated as part of system certification.
Active power output dependent on grid frequency	--
Connecting – limit values for connection without prior protection tripping	--
Connecting – limit values for connection with prior protection tripping	No information is available in the manufacturer declaration about the PGU reconnection following external signal when applying the grid code VDE-AR-N 4120 . The requirement should be therefore considered and evaluated as part of system certification.
Connecting – Active power gradient	--
FRT – dynamic grid support	The PGU enters FRT mode if a sudden voltage change > 5% Un. The function is always activated by default. Specific requirements have to be considered and evaluated as part of system certification.
FRT – Contribution to short-circuit current	--
Protection technology and settings – readability of the protection settings	--
Protection technology and settings – Test terminal block	If required, this has to be installed separately.
Protection technology and settings – Setting range	--
Protection technology and settings – Accuracy	--
Protection technology and settings – Independence of protection functions	--

Unit Certificate

Nr.: 968/GI 2333.01/26

Grid Integration of Distributed Energy Resources

Protection technology and settings – auxiliary power supply	--
Protection technology and settings – section switch	--
Simulation model (validation)	▪ The validated simulation model of the PGUs specified shall be used in the certified version. ▪ The reference-voltage functionality for Q(U)-control is available in the PGU, however, no dedicated reference-voltage input or control logic is implemented in the dynamic model. For power plant simulations requiring a different reference-voltage setting at PGU level, the Q(U) characteristic shall be adapted accordingly to represent the required operating point.

Note 1: According to the manufacturer's declaration and the user manual, the Commercial & Industrial Energy Storage System also provides off-grid mode. Off-grid operation was not observed and is not part of the certification.

Note 2: In this report, only grid-connected mode will be evaluated. The grid side relays of the STS switches remain connected, while the generator and load relays stay in open mode.

Unit Certificate

Nr.: 968/GI 2333.01/26

Grid Integration of Distributed Energy Resources

Schematic overview of the PGU:

SUN-100K-PCS01HP3 & SUN-125K-PCS01HP3 & SUN-100K-PCS01HP3-B & SUN-125K-PCS01HP3-B

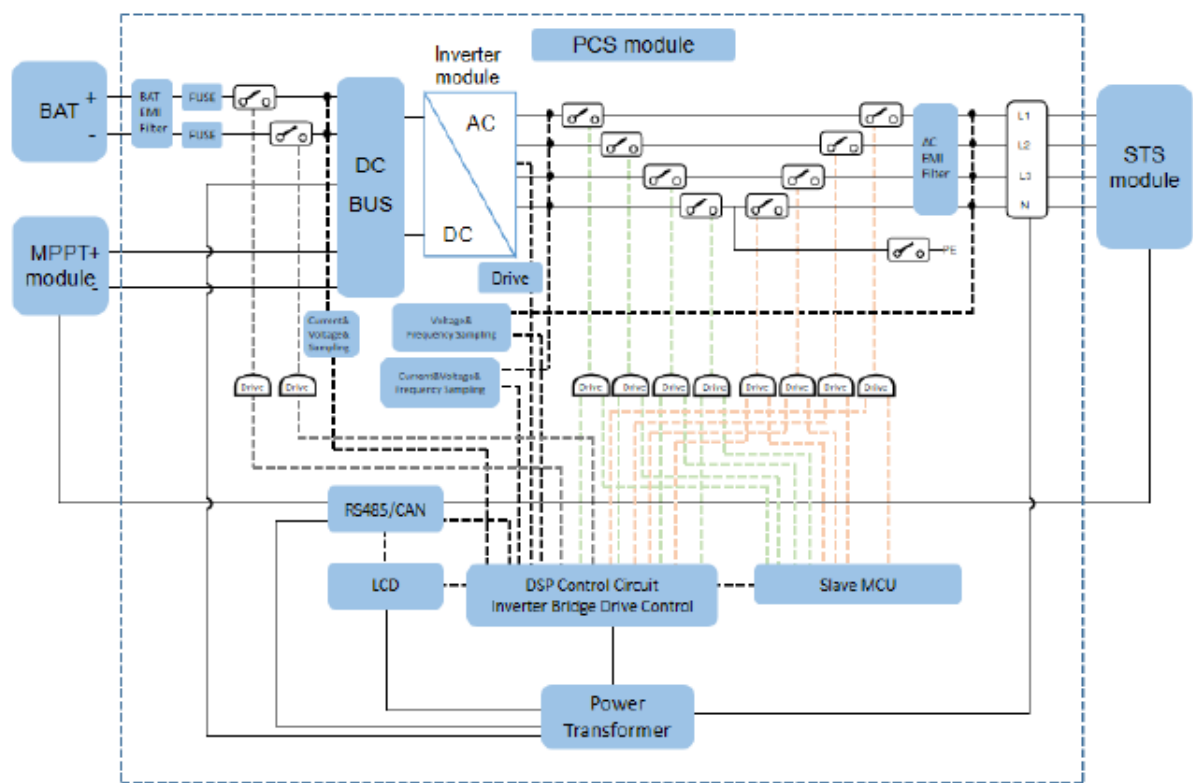


Figure 1: Schematic overview of PCS Module

Unit Certificate

Nr.: 968/GI 2333.01/26

Grid Integration of Distributed Energy Resources

SUN-MPPT-L01-EU-AM8

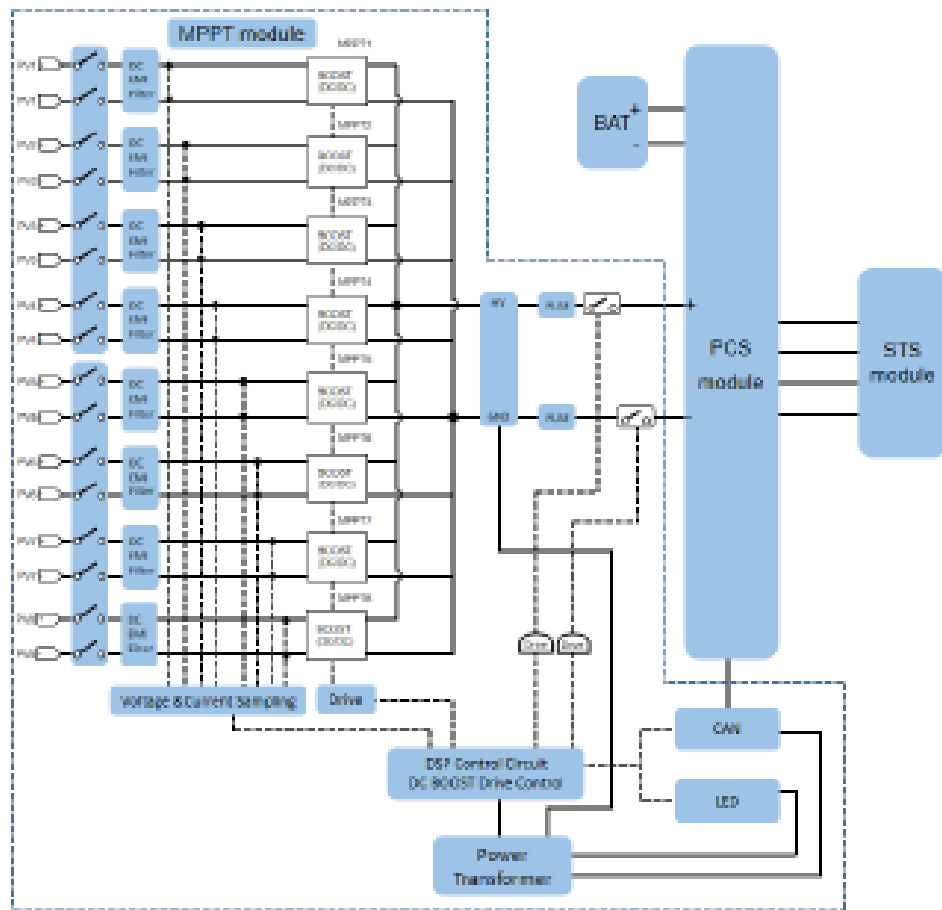


Figure 2: Schematic overview of MPPT Module (SUN-MPPT-L01-EU-AM8)

Unit Certificate

Nr.: 968/GI 2333.01/26

Grid Integration of Distributed Energy Resources

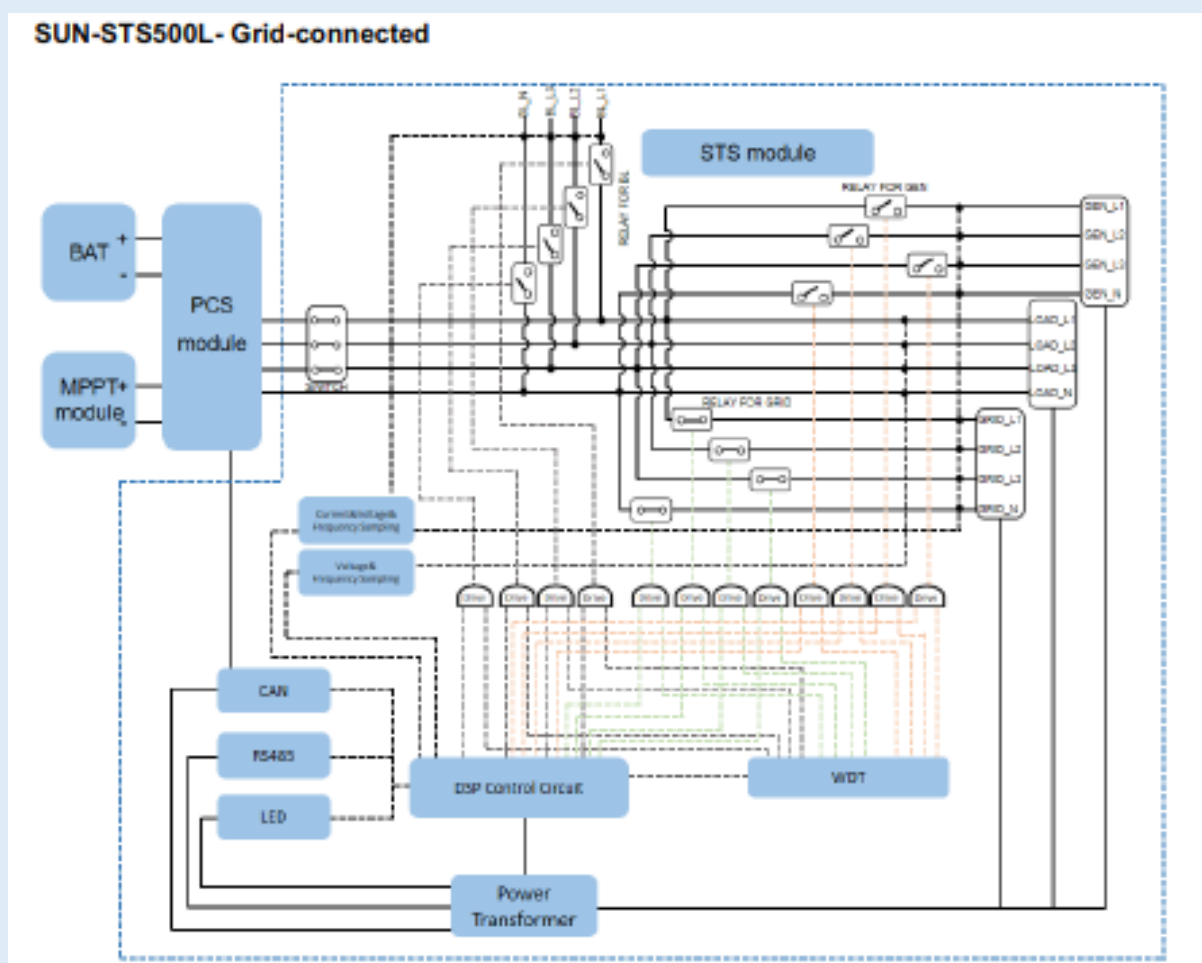


Figure 3: Schematic overview of STS Module (SUN-STS500L),(only grid-connected mode will be evaluated)