Unit Certificate

FGW TG8 EZE

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No.: 968/GI 2311.01/26 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	**Hybrid Inverter Series SUN-29.9-50K** SUN-29.9K-SG01HP3-EU-BM3, SUN-29.9K-SG01HP3-EU-BM3-X1, SUN-30K-SG01HP3-EU-BM3, SUN-30K-SG01HP3-EU-BM3-X1, SUN-35K-SG01HP3-EU-BM3, SUN-35K-SG01HP3-EU-BM3-X1, SUN-40K-SG01HP3-EU-BM4, SUN-40K-SG01HP3-EU-BM4-X1, SUN-50K-SG01HP3-EU-BM4, SUN-50K-SG01HP3-EU-BM4-X1
Codes and Standards	VDE-AR-N 4110:2023 VDE-AR-N 4120:2018 FGW TG 8:2019 Revision 9 FGW TG 3:2023 Revision 26 FGW TG 4:2023 Revision 10
Scope and result	The power generating units mentioned above meet the requierements of standarts listed above. The conformity is declared by following documents: Evaluation Report-No.: 968/GI 2311.01/26, 2026-04-29 Validation Report-No.: 968/GI 2311.00/26, 2026-04-29 Test Report No.:CN25KWUB 001, dated 2025-11-24 The manufacturer has provided prrof of certification of the quality management system of his production facility in accordance with ISO 9001.
Specific provisions	The deviations and conditions for conformity according to the evaluation report must be observed. The corresponding conditions and deviations are listed following pages of the certificate.

Valid until 2031-04-29

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 2311.01/26 dated 2026-04-17. 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 http://www.fs-products.com.

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

Köln, 2026-04-29

Certification Body Safety & Security for Automation & Grid

Armin Kerperin

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DAkkS Deutsche Akkreditierungsstelle D-ZE-11052-02-02

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Technical data of the PGU:

Typ:	SUN-29.9K-SG01HP3-EU-BM3	SUN-30K-SG01HP3-EU-BM3	SUN-35K-SG01HP3-EU-BM3	SUN-40K-SH01HP3-EU-BM4	SUN-50K-SG01HP3-EU-BM4
Max. apparent power of PGU	29.9 kVA	33 kVA	38.5 kVA	44 kVA	55 kVA
Rated active power:	29.9 kW	30 kW	35 kW	40 kW	50 kW
Max. Output active power	29.9 kW	30 kW	35 kW	40 kW	50 kW
Active power (P_{600}):	29.91 kW	30.01 kW	35.01 kW	40.01 kW	50.01 kW
Rated voltage	230/400 V_{AC}				
Nominal frequency:	50 Hz / 60 Hz				
Minimum required short-circuit power (only for type 1 PGU):	N/A				
Firmware-Version:	1098				

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TP-6036 Version: 1.0

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Typ:	SUN-29.9K-SG01HP3EU-BM3-X1	SUN-30K-SG01HP3-EU-BM3-X1	SUN-35K-SG01HP3-EU-BM3-X1	SUN-40K-SH01HP3-EU-BM4-X1	SUN-50K-SG01HP3-EU-BM4-X1
Max. apparent power of PGU	29.9 kVA	33 kVA	38.5 kVA	44 kVA	55 kVA
Rated active power:	29.9 kW	30 kW	35 kW	40 kW	50 kW
Max. Output active power	29.9 kW	30 kW	35 kW	40 kW	50 kW
Active power (P_{600}):	29.91 kW	30.01 kW	35.01 kW	40.01 kW	50.01 kW
Max. Input DC voltage	230/400 V_{AC}				
Nominal frequency:	50 Hz / 60 Hz				
Minimum required short-circuit power (only for type 1 PGU):	N/A				
Firmware-Version:	1098				

Validated Simulation Model:

Reference name: SUN-(29_9-50)K-EU-BM3_VDE_V2_Encrypted.pfd

MD5 Checksum: ba07f92d0f2684abca014f438235f313

Simulation platform: DIgSILENT PowerFactory 2024 SP4

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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, interharmonics and supraharmonics	--
Quasi-static operation	--
Pole angle and grid oscillations	--
Reactive power supply	▪ To meet the requirements for fixed Q control and fixed Cos φ control according to VDE-AR-N 4120, an external PGS controller with valid component certificate is required. This must be implemented on PGS level and evaluated during system certification. ▪ **Q(U) control:** 1) A voltage deadband cannot be set. If required, this has to be implemented on PGS level (e.g. via PGS controller). 2) An external interface for specifying the reference voltage U/Uc is not implemented. If required, this has to be implemented on PGS level (e.g. via PGS controller). ▪ **Q(P) control**: The PGU control only supports four 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). --
Method for reactive power supply	--

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Proof	Deviation / Restriction
Grid perturbations – switching operations	--
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Method for reactive power supply	--

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Proof	Deviation / Restriction
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	▪ As the evaluation of this function only includes the behavior of type 2 generating units, it needs to be evaluated on PGS level if the PGU is used as part of a storage system. Implementation of this function on PGS level might be necessary (e.g. PGS-controller) and needs to be considered accordingly during system certification.
Connecting – limit values for connection without prior protection tripping	▪ According to the manufacturer declaration the PGU will follow the command from the PGP controller and only connect after the external “enable” signal is released when apply the grid code VDE-AR-N 4120. This feature is not verified in the laboratory test and therefore must be evaluated as part of system certification.
Connecting – limit values for connection with prior protection tripping	--
Connecting – Active power gradient	--
FRT – dynamic grid support	▪ The HVRT and LVRT entry thresholds (>1.1UN or <0.9UN) as well as zero current crossing thresholds (0.7UN) are default values and cannot be set through the parameters in software. Specifical projects settings should be implemented by changing underlying codes. This needs to be considered during system certification accordingly.
FRT – Contribution to short-circuit current	--
Protection technology and settings – readability of the protection settings	▪ As the PGUs SUN-(29.9-50)K-SG01HP3-EU-BM3/4-X1 do not contain a display, this has to be considered on project level. With regard to the requirements of the corresponding grid provider, an appropriate device to check the protection settings has to be provided on demand or should be stored on site.
Protection technology and settings – Test terminal block	▪ If required, this has to be installed separately.

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Proof	Deviation / Restriction
Protection technology and settings – Setting range	--
Protection technology and settings – Accuracy	▪ In some test cases, the sum response times of the protection devices exceed the limit of 100 ms. The decoupling protection should be implemented on PGS level and evaluated during system certification. The additional tripping time needs to be considered during system certification accordingly.
Protection technology and settings – Independence of protection functions	--
Protection technology and settings – auxiliary power supply	--
Protection technology and settings – section switch	--

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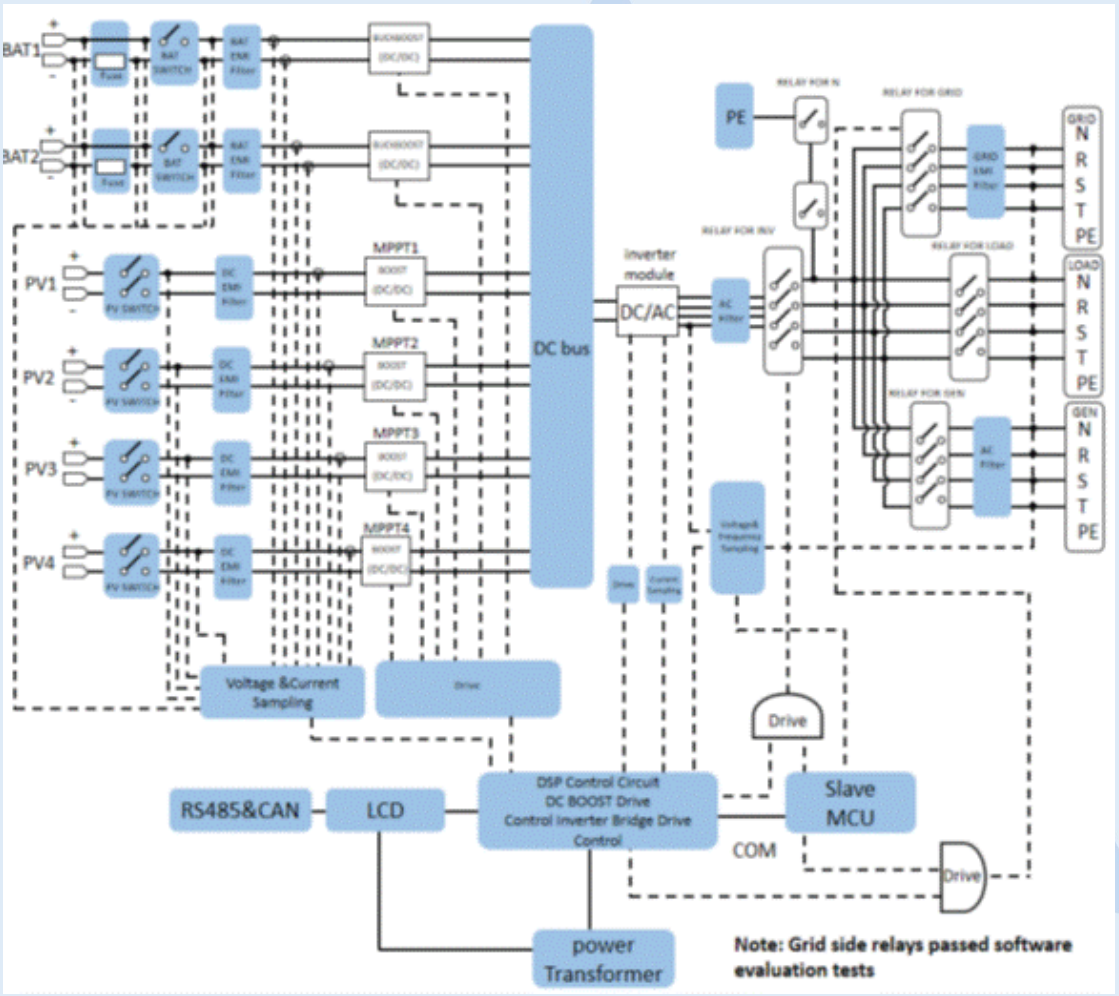
Schematic overview of the PGU:

SUN-(29.9-50)K-SG01HP3-EU-BM3/4:



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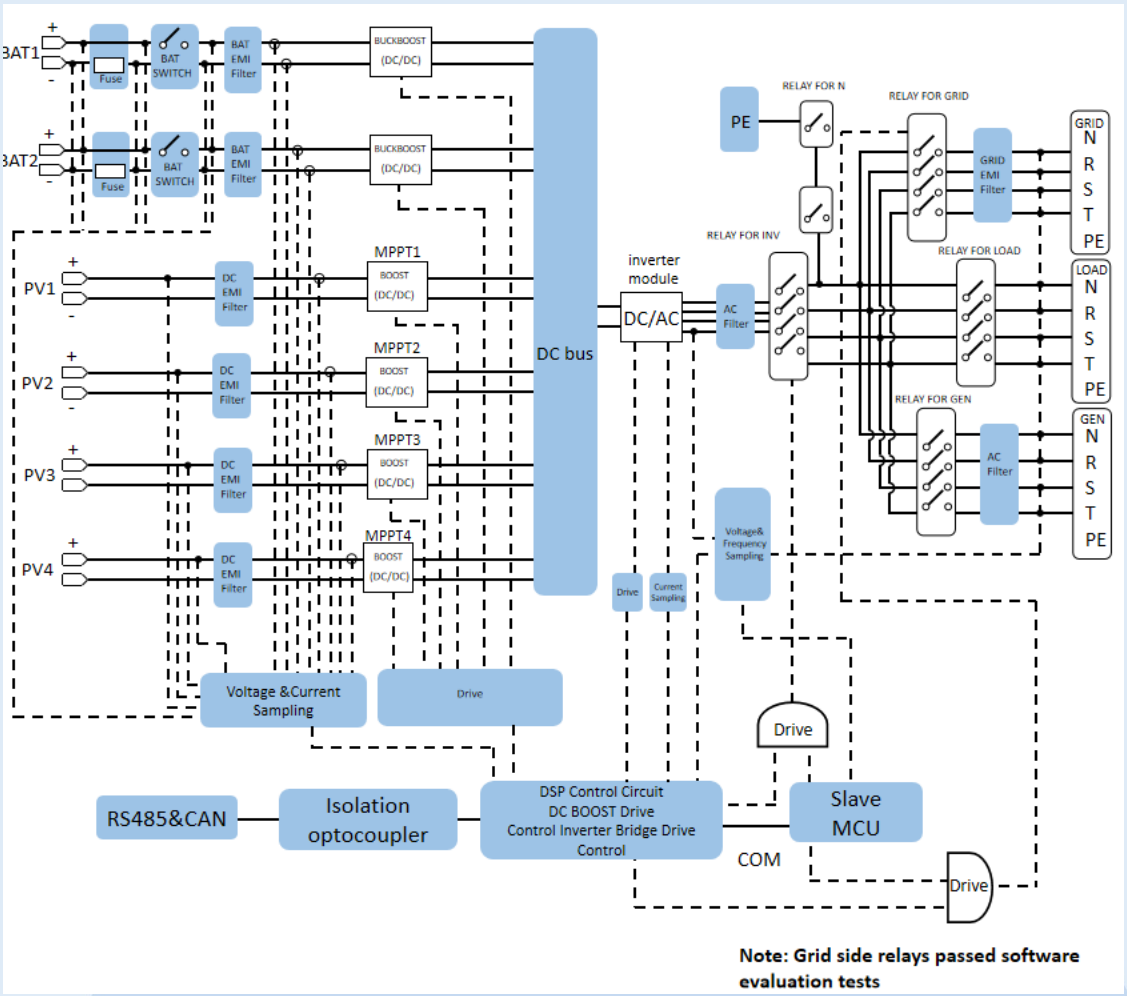
SUN-(29.9-50)K-SG01HP3-EU-BM3/4-X1:



Note: Grid side relays passed software evaluation tests

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