

#### Copyright © Huawei Technologies Co., Ltd. 2024. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

#### Trademark Notice

HUAWEI, and are trademarks or registered trademarks of Huawei Technologies Co., Ltd.

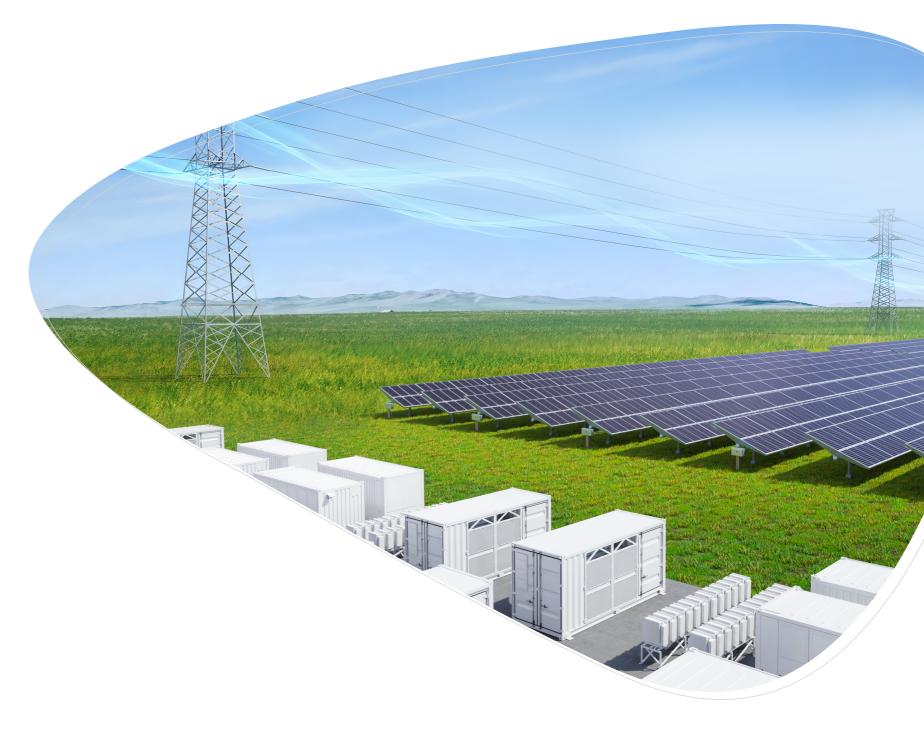
Other trademarks, product, service and company names mentioned are the property of their respective owners.

#### **General Disclaime**

The information in this document may contain predictive statements including, without limitation, statements regarding the future financial and operating results, future product portfolio, new technology, etc. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied in the predictive statements. Therefore, such information is provided for reference purpose only and constitutes neither an offer nor an acceptance. Huawei may change the information at any time without notice.

#### HUAWEI TECHNOLOGIES CO., LTD.

Huawei Industrial Base, Bantian Longgang Shenzhen 518129, P.R. China Tel: 400-822-9999 Solar.Huawei.com



# **Fusionsolar**Utility Smart PV & ESS Solution





Huawei is a leading global provider of information and communications technology (ICT) infrastructure and smart devices. With integrated solutions across four key domains – telecom networks, IT, smart devices, and cloud services – we are committed to bringing digital to every person, home and organization for a fully connected, intelligent world. Huawei's end-to-end portfolio of products, solutions and services are both competitive and secure. Through open collaboration with ecosystem partners, we create lasting value for our customers, working to empower people, enrich home life, and inspire innovation in organizations of all shapes and sizes. At Huawei, innovation focuses on customer needs. We invest heavily in basic research, concentrating on technological breakthroughs that drive the world forward.



**Employees** 

207,000+



**Employees Work in R&D** 





**Countries and Regions** 

170+



Interbrand Best Global Brands

92nd



in Global R&D Investment

**NO.5** 

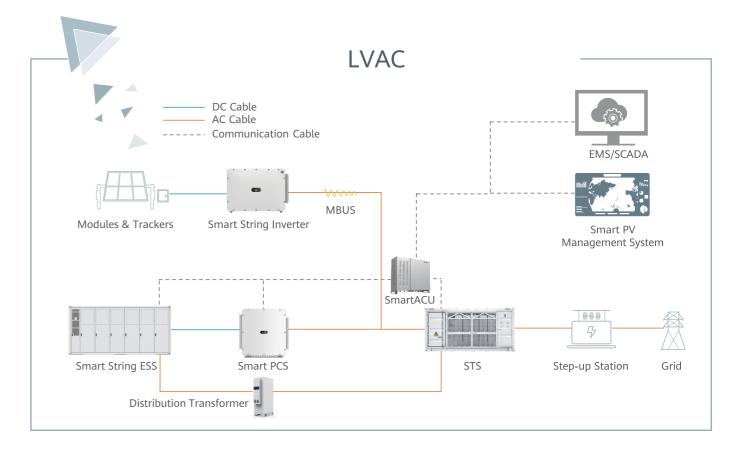


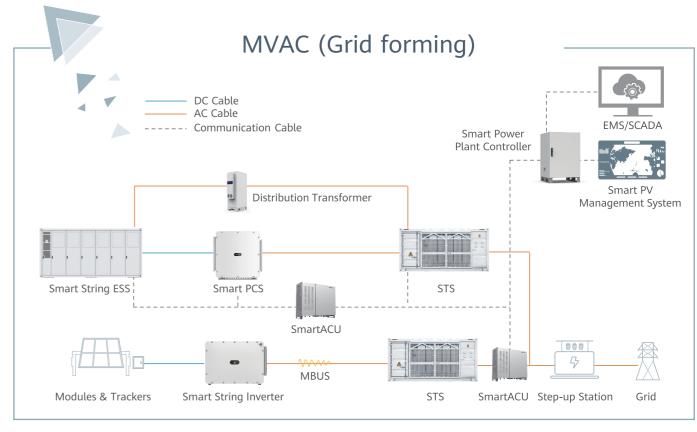
**Boston Consulting Group Most Innovative Companies** 

8th

# **Smart PV & ESS Solution**

Optimal Investment Grid Supporting Smart O&M Safe & Reliable







# ➤ SUN2000-330KTL-H1

# **Smart String Inverter**

For APAC, LATAM & EUROPE





**Efficiency** 

≥ 99.0%



Detection

Connector-level Self-cleaning





Fan



Protection

MBUS MBUS

Supported



String-level

Disconnection

(SSLD)

Smart IV Curve

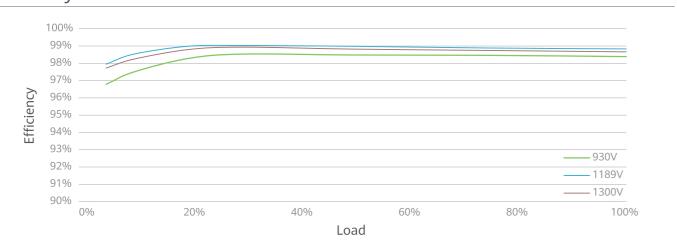
Diagnosis

Supported

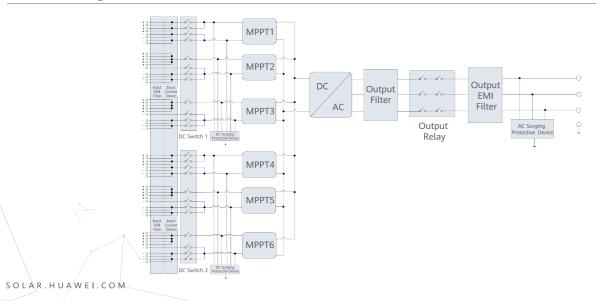
Arresters for

DC & AC

(SCLD) **Efficiency Curve** 



#### Circuit Diagram



	Efficiency
Max. Efficiency	≥ 99.03%
European Efficiency	≥ 98.8%
	Input
Max. Input Voltage	1,500 V
Number of MPPT	6
Max. Current per MPPT	65 A
Max. Short Circuit Current per MPPT	115 A
Max. PV Inputs per MPPT	4/5/5/4/5/5
Start Voltage	550 V
MPPT Operating Voltage Range	500 V ~ 1,500 V
Nominal Input Voltage	1,080 V
	Output
Nominal AC Active Power	300,000 W
Max. AC Apparent Power	330,000 VA
Max. AC Active Power (cosφ=1)	330,000 W
Nominal Output Voltage	800 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Nominal Output Current	216.6 A
Max. Output Current	238.2 A
Adjustable Power Factor Range	0.8 LG 0.8 LD
Total Harmonic Distortion	THD <sub>i</sub> < 1% (Rated)
'	Protection
Smart String-level Disconnection (SSLD)	Yes
Smart Connector-level Detection (SCLD)	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Detection	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Detection Unit	Yes
	Communication
Display	LED Indicators, WLAN + APP
USB	Yes
MBUS	Yes
RS485	Yes
	General
Dimensions (W x H x D)	1,048 x 732 x 395 mm
Weight (with mounting plate)	≤ 112 kg
Operating Temperature Range	-25°C ~ 60°C
Cooling Method	Smart Air Cooling
Max. Operating Altitude without Derating	4,000 m
Relative Humidity	0 ~ 100% (Non-condensing)
DC Connector	HH4SMM4TMSPA / HH4SFM4TMSPA
AC Connector	Support OT / DT Terminal (Max. 400 mm²)
Protection Degree	IP 66
Anti-corrosion Protection	C5-Medium
Topology	Transformerless
· · r · · · · 5)	Standards Compliance

# **>>** SUN2000-330KTL-H2

# **Smart String Inverter**

For MEA, Eurasian





Max.







IP66

MBUS **MBUS** 

Smart



**Efficiency** ≥ 99.0%

Connector-level Self-cleaning Detection (SCLD)

Fan

Protection

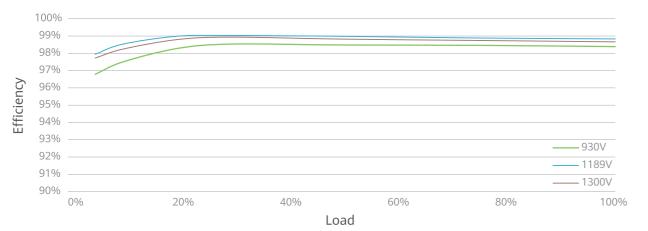
Supported

String-level Disconnection (SSLD)

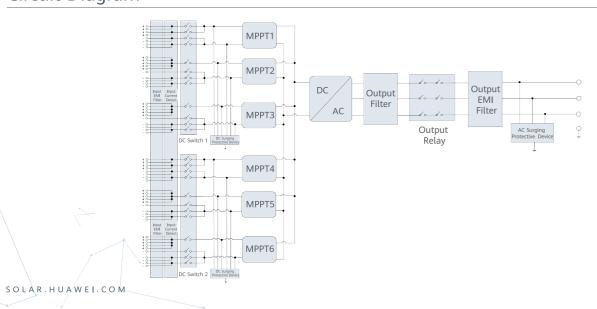
Smart IV Curve Diagnosis Supported

Arresters for DC & AC

#### **Efficiency Curve**



#### Circuit Diagram



## **Technical Specifications**

	Efficiency
Max. Efficiency	≥ 99.0%
European Efficiency	≥ 98.8%
	Input
Max. Input Voltage	1,500 V
Number of MPPT	6
Max. Current per MPPT	65 A
Max. Short Circuit Current per MPPT	115 A
Max. PV Inputs per MPPT	4/5/5/4/5/5
Start Voltage	550 V
MPPT Operating Voltage Range	500 V ~ 1,500 V
Nominal Input Voltage	1,080 V
	Output
Nominal AC Active Power	275,000 W¹
Max. AC Apparent Power	330,000 VA
Max. AC Active Power (cosφ=1)	330,000 W
Nominal Output Voltage	800 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Nominal Output Current	198.5 A
Max. Output Current	240.3 A
Adjustable Power Factor Range	0.8 LG 0.8 LD
Total Harmonic Distortion	THD <sub>i</sub> < 1% (Rated)
	Protection
Smart String-level Disconnection (SSLD)	Yes
Smart Connector-level Detection (SCLD)	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Detection	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Detection Unit	Yes
	Communication
Display	LED Indicators, WLAN + APP
USB	Yes
MBUS	Yes
RS485	Yes
	General
Dimensions (W x H x D)	1,048 x 732 x 395 mm
Weight (with mounting plate)	 ≤ 112 kg
Operating Temperature Range	-25°C ~ 60°C
Cooling Method	Smart Air Cooling
Max. Operating Altitude without Derating	4,000 m
Relative Humidity	0 ~ 100% (Non-condensing)
DC Connector	HH4SMM4TMSPA / HH4SFM4TMSPA
AC Connector	Support OT / DT Terminal (Max. 400 mm²)
Protection Degree	IP 66
Anti-corrosion Protection	C5-Medium
Topology	Transformerless
1 - 37	Standards Compliance

1: Environmental temperature is 50°C 05/06

# **>>** SUN2000-215KTL-H0 **Smart String Inverter**





**MPPTs** 



**Efficiency** 

≥99.0%

Smart String-level

Disconnection



Curve

Diagnosis Supported

(MBUS MBUS

Supported



Design

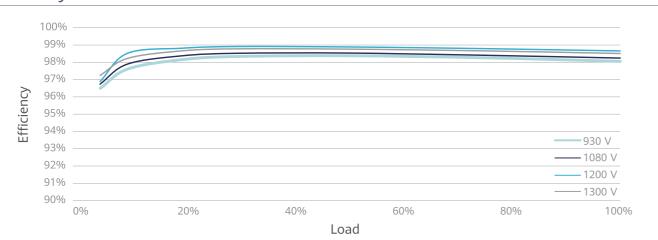
Surge

Arresters for

DC & AC

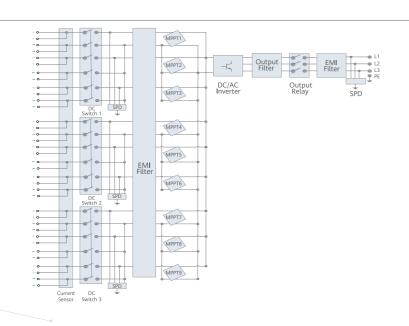
IP66 Protection

Efficiency Curve



## Circuit Diagram

SOLAR.HUAWEI.COM

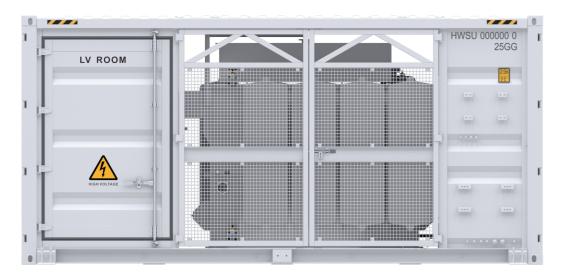


	Efficiency
Max. Efficiency	99.00%
European Efficiency	98.80%
	Input
Max. Input Voltage	1,500 V
Max. Current per MPPT	30 A
Max. Short Circuit Current per MPPT	50 A
Start Voltage	550 V
MPPT Operating Voltage Range	500 V ~ 1,500 V
Nominal Input Voltage	1,080 V
Number of Inputs	18
Number of MPPT	9
	Output
Nominal AC Active Power	200,000 W
Max. AC Apparent Power	215,000 VA
Max. AC Active Power (cosφ=1)	215,000 W
Nominal Output Voltage	800 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Nominal Output Current	144.4 A
Max. Output Current	155.2 A
Adjustable Power Factor Range	0.8 LG 0.8 LD
Total Harmonic Distortion	THD <sub>i</sub> < 1% (Rated)
	Protection
Smart String-level Disconnection (SSLD)	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Detection	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Detection Unit	Yes
	Communication
Display	LED Indicators, WLAN + APP
USB	Yes
MBUS	Yes
RS485	Yes
	General
Dimensions (W x H x D)	1,035 x 700 x 365 mm
Weight (with mounting plate)	≤ 86 kg
Operating Temperature Range	-25°C ~ 60°C
Cooling Method	Smart Air Cooling
Max. Operating Altitude without Derating	4,000 m
Relative Humidity	0 ~ 100% (Non-condensing)
DC Connector	MC4 EVO2
AC Connector	Support OT / DT Terminal
Protection Degree	IP66
Anti-corrosion Protection	C5-Medium
Topology	Transformerless
	Standards Compliance

# ▶ JUPITER-3000K-H1-GF

# **Smart Transformer Station**

For EUROPE





#### Simple

Prefabricated and pre-tested, no Internal cabling needed onsite Compact 20' HC container design for easy transportation



#### Smart

Real-time detection of transformer, LV panel and RMU high precision sensor of LV electricity parameters Remote control of ACB and MV circuit breaker



#### **Efficient**

High efficiency transformer for higher yields Lower self-consumption for higher yields

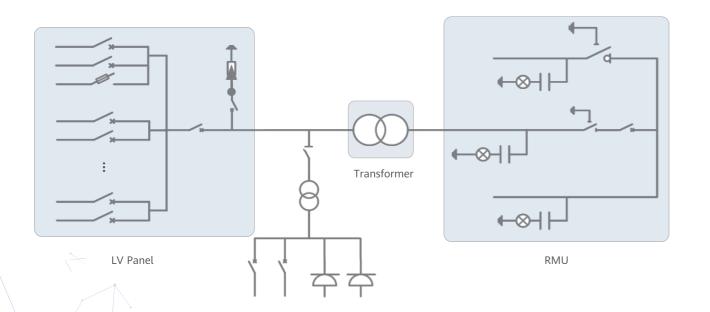


#### Reliable

Robust design against harsh environments optimal cooling Design for high availability and easy O&M Comprehensive tests from components, device to solution

# Schematic Diagram

SOLAR.HUAWEI.COM



#### **Technical Specifications**

	Input	
vailable Inverters / PCS	LUNA2000-200KTL-H1	
Maximum LV AC Inputs	37	
AC Power	3,300 kVA @40°C/ 3,025 kVA @50°C <sup>1</sup>	
Rated Input Voltage	800 V	
LV Panel Segregation	Form 2b	
.V Main Switches	ACB (2,900 A / 800 V / 3P, 1 x 1 pcs)	
V Main Switches for LUNA2000-200KTL-H1	MCCB (250 A / 800 V / 3P, 2 x 18 pcs)	
V Main Switches for DTS-200K-D0	MCCB (250 A / 800 V / 3P, 1 x 1 pcs)	
	Output	
Rated Output Voltage	30 kV, 33 kV, 35 kV <sup>2</sup>	
requency	50 Hz	
Fransformer Type	Oil-immersed, Conservator Type	
Fransformer Cooling Type	ONAN	
Fransformer Tappings	±2 x 2.5%	
Fransformer Oil Type	Mineral Oil (PCB Free)	
Fransformer Vector Group	Dy11	
Fransformer Min. Peak Efficiency Index	Tier 1 or Tier 2 In Accordance with EN 50588-1	
RMU Type	SF <sub>6</sub> Gas Insulated	
RMU Transformer Protection Unit	MV Vacuum Circuit Breaker Unit	
RMU Cable Incoming / Outgoing Unit	Direct Cable Unit or Cable Load Break Switch Unit	
Auxiliary Transformer	Dry Type Transformer, 5 kVA, Single-phase, li0	
Output Voltage of Auxiliary Transformer	230 /127Vac	
	Protection	
Fransformer Monitoring & Protection	Oil Level, Oil Temperature, Oil Pressure and Buchholz	
Protection Degree of MV & LV Room	IP 54	
MV Internal Arcing Fault Classification of STS	IAC AFLR 20 kA 1s	
MV Arc Releasing	MV Upward Arc Releasing for Higher Safety	
MV Relay Protection	50/51, 50N/51N	
V Overvoltage Protection	Type I+II	
Anti-corrosion Protection	C5	
	Features	
2 kVA UPS	Optional <sup>3</sup>	
MV Surge Arrester for Transformer	Optional <sup>3</sup>	
<u> </u>	General	
Dimensions (W x H x D)	6,058 x 2,896 x 2,438 mm (20' HC Container)	
Weight Vision (Vision III)	< 23 t	
Operating Temperature Range	-25°C~ 60°C <sup>4</sup> (-13°F ~ 140°F)	
Relative Humidity	0% ~ 95%	
Max. Operating Altitude	1.000 m <sup>5</sup>	
MV-LV AC Connections	Prewired and Pretested, No Internal Cabling Onsite	
LV & MV Room Cooling	Smart Cooling without Air-across for Higher Availability	
Communication	Modbus TCP, Preconfigured with SmartACU	
Applicable Standards	IEC 62271-202, EN 50588-1, IEC 60076, IEC 62271-200, IEC 61439-1	

09/10

<sup>1 -</sup>More detailed AC power of STS, please refer to the de-rating curve.

2 -Rated output voltage from 10 kV to 35 kV, more available upon request

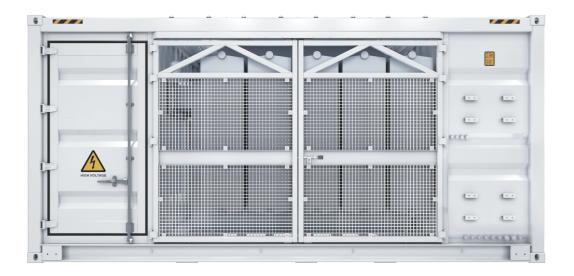
3 -Extra expense needed for optional features which standard product doesn't contain, more options upon request.

4 -When ambient temperature ≥55°C, awning shall be equipped for STS on site by customer.

5 -For higher operating altitude, please consult with Huawei.

# ► JUPITER-9000K/6000K/3000K-H1

# **Smart Transformer Station**





#### Simple

Prefabricated and pre-tested, no Internal cabling needed onsite Compact 20' HC container design for easy transportation



#### Smart

Real-time detection of transformer, LV panel and RMU high precision sensor of LV electricity parameters Remote control of ACB and MV circuit breaker



#### **Efficient**

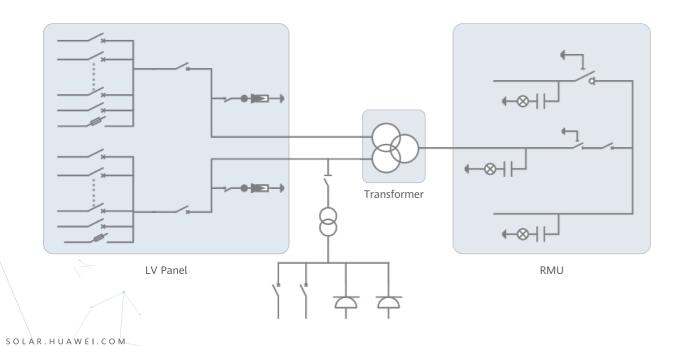
High efficiency transformer for higher yields Lower self-consumption for higher yields



#### Reliable

Robust design against harsh environments optimal cooling Design for high availability and easy O&M Comprehensive tests from components, device to solution

#### Schematic Diagram



#### **Technical Specifications**

Model	JUPITER-9000K-H1	JUPITER-6000K-H1	JUPITER-3000K-H1		
	Input				
Available Inverters / PCS	SUN2000-330KTL-H	1 / SUN2000-330KTL-H2 / LU	JNA2000-200KTL-H1		
Max. LV AC Inputs	30	22	11		
AC Power	9,000 kVA @40°C <sup>1</sup>	6,600 kVA @40°C 1	3,300 kVA @40°C <sup>1</sup>		
Rated Input Voltage		800 V			
LV Panel Segregation		Form 2b			
LV Main Switches	ACB (4,000 A, 2 x 1 pcs)	ACB (2,900 A, 2 x 1 pcs)	ACB (2,900 A, 1 x 1 pcs		
LV Main Switches for Inverters / PCS	MCCB (400 A, 2 x 15 pcs)	MCCB (400 A, 2 x 11 pcs)	MCCB (400 A, 11 pcs)		
	Output				
Rated Output Voltage		10~35 kV <sup>2</sup>			
Frequency	50 Hz or 60 Hz				
Transformer Type	C	il-immersed, Conservator Typ	pe		
Transformer Cooling Type		ONAN			
Transformer Tappings		± 2 x 2.5%			
Transformer Oil Type		Mineral Oil (PCB Free)			
Transformer Vector Group	Dy11-y11		Dy11		
Transformer Min. Peak Efficiency Index	Tier 1 or Tier 2 In Accordance with EN 50588-1				
RMU Type		SF <sub>6</sub> Gas Insulated			
RMU Transformer Protection Unit	N	IV Vacuum Circuit Breaker Ur	nit		
RMU Cable Incoming / Outgoing Unit	Direct Cab	le Unit or Cable Load Break S	Switch Unit		
Auxiliary Transformer	Dry Type	Transformer, 5 kVA, Single-	phase, li0		
Output Voltage of Auxiliary Transformer		230 / 127 Vac			
	Protection				
Transformer Detection & Protection	Oil Level, Oi	l Temperature, Oil Pressure a	and Buchholz		
Protection Degree of MV & LV Room		IP 54			
Internal Arcing Fault of STS		IAC A 20 kA 1s			
MV Relay Protection		50/51, 50N/51N			
LV Overvoltage Protection	Type I+II				
Anti-rodent Protection		C5-Medium			
	Features				
2 kVA UPS		Optional <sup>3</sup>			
MV Surge Arrester for Transformer		Optional <sup>3</sup>			
	General				
Dimensions (W x H x D)	6,058 x 2,8	396 x 2,438 mm (20' HC ISO	Container)		
Weight	< 28 t	< 23 t	< 15 t		
Operating Temperature Range	-25°C ~ 60°C ⁴				
Relative Humidity	0% ~ 95% (Non-condensing)				
Max. Operating Altitude		1,000 m <sup>5</sup>			
MV-LV AC Connections	Prewired a	nd Pretested, No Internal Cab	oling Onsite		
LV & MV Room Cooling	Smart Coolin	g without Air-across for High	er Availability		
Communication	Modbus To	CP, Preconfigured with Smart	ACU2000D		
	Standards Compliand	~e			

11/12

<sup>1:</sup> More detailed AC power of STS, please refer to the de-rating curve.

<sup>2:</sup> Rated output voltage from 10 kV to 35 kV, more available upon request
3: Extra expense needed for optional features which standard product doesn't contain, more options upon request.
4: When ambient temperature ≥55 C, awning shall be equipped for STS on site by customer.
5: For higher operating altitude, pls consult with Huawei.

# ► JUPITER-9000K-H0 / STS-6000K/3000K-H1 **Smart Transformer Station**





#### Simple

Prefabricated and pre-tested, no Internal cabling needed onsite Compact 20' HC container design for easy transportation



#### Smart

Real-time detection of transformer, LV panel and RMU high precision sensor of LV electricity parameters Remote control of ACB and MV circuit breaker



#### **Efficient**

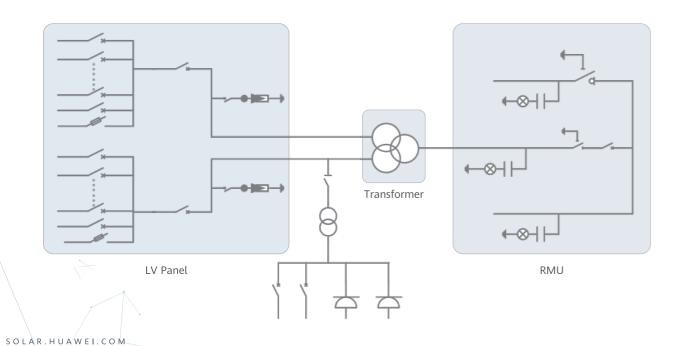
High efficiency transformer for higher yields Lower self-consumption for higher yields



#### Reliable

Robust design against harsh environments optimal cooling Design for high availability and easy O&M Comprehensive tests from components, device to solution

#### Schematic Diagram



44  9,000 kVA @40°C ¹  B (4,000 A, 2 x 1 pcs)  CB (400 A, 2 x 22 pcs)  Output   Dy11-y11  Tier 1 or  M  Direct Cab  Dry Type Transforr	e, li0	44  4 (@40°C 1  0 V  1 2b  A, 2 x 1 pcs)  6 kV 2  60 Hz  conservator Typ  AN  2.5%  (PCB Free)  dance with EN  nsulated  wit Breaker Un  e Load Break S  Dry 1	17 3,400 kVA @40°C ¹  ACB (2,900 A, 1 pcs)  MCCB (250 A, 17 pcs)  Dy11 50588-1  iit  iwitch Unit Type Transformer,	
44  9,000 kVA @40°C ¹  B (4,000 A, 2 x 1 pcs)  CB (400 A, 2 x 22 pcs)  Output   Dy11-y11  Tier 1 or  M  Direct Cab  Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	6,800 kVA  800 Form ACB (2,900 A  MCCB (250 A  10~35 50 Hz /  0il-immersed, Co  ON, ± 2 x :  Mineral Oil  Tier 2 In Accord  SF6 Gas In  IV Vacuum Circ  le Unit or Cable mer, e, li0	44  4 (@40°C 1  0 V  1 2b  A, 2 x 1 pcs)  6 kV 2  60 Hz  conservator Typ  AN  2.5%  (PCB Free)  dance with EN  nsulated  wit Breaker Un  e Load Break S  Dry 1	17 3,400 kVA @40°C ¹  ACB (2,900 A, 1 pcs)  MCCB (250 A, 17 pcs)  Dy11 50588-1  iit  iwitch Unit Type Transformer,	
Dy11-y11  Tier 1 or  Dy Type Transforr 5 kVA, Single-phas 230 / 127 Vac	6,800 kVA  800 Form ACB (2,900 A  MCCB (250 A  10~35 50 Hz /  oil-immersed, Co  ON, ± 2 x:  Mineral Oil  Tier 2 In Accord SF6 Gas In  IV Vacuum Circ le Unit or Cable mer, e, li0	a @40°C 1 b V c 2b c A, 2 x 1 pcs) c kV 2 d 60 Hz c onservator Typ AN 2.5% (PCB Free)  d ance with EN c nsulated cuit Breaker Un c Load Break S Dry	3,400 kVA @40°C 1  ACB (2,900 A, 1 pcs)  MCCB (250 A, 17 pcs)  Dy11  50588-1  iit  iwitch Unit  Type Transformer,	
B (4,000 A, 2 x 1 pcs) CB (400 A, 2 x 22 pcs) Output  Dy11-y11 Tier 1 or  M Direct Cab Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	800 Form ACB (2,900 A MCCB (250 A  10~35 50 Hz / Oil-immersed, Co ON/ ± 2 x X Mineral Oil  Tier 2 In Accord SF6 Gas In IV Vacuum Circ le Unit or Cable mer, e, li0	A, 2 x 1 pcs) A, 2 x 1 pcs) A, 2 x 17 pcs) A kV <sup>2</sup> A b kV <sup>2</sup> A conservator Type A conserv	ACB (2,900 A, 1 pcs) MCCB (250 A, 17 pcs)  De  Dy11  50588-1  iit  iwitch Unit  Type Transformer,	
Dy11-y11 Tier 1 or  Direct Cab Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	Form  ACB (2,900 A  MCCB (250 A  10~35  50 Hz /  Oil-immersed, Co  ON,  ± 2 x i  Mineral Oil  Tier 2 In Accord  SF6 Gas In  IV Vacuum Circ  le Unit or Cable  mer, e, li0	A, 2 x 1 pcs) A, 2 x 1 pcs) A, 2 x 17 pcs) A, 2 x 17 pcs) A KV <sup>2</sup> A CONTRACT Type AN	Dy11 50588-1  iit iwitch Unit Type Transformer,	
Dy11-y11 Tier 1 or  Direct Cab Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	ACB (2,900 A  MCCB (250 A  10~35  50 Hz /  Oil-immersed, Co  ON,  ± 2 x :  Mineral Oil  Tier 2 In Accord  SF6 Gas In  IV Vacuum Circ  le Unit or Cable  mer, e, li0	A, 2 x 1 pcs) A, 2 x 17 pcs) A, 2 x 17 pcs) A, 2 x 17 pcs) A KV <sup>2</sup> B KV <sup>2</sup> B CONTRIBUTION OF The Conservator Type AN	Dy11 50588-1  iit iwitch Unit Type Transformer,	
Dy11-y11 Tier 1 or  Direct Cab Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	MCCB (250 A  10~35  50 Hz /  Oil-immersed, Co  ON,  ± 2 x i  Mineral Oil  Tier 2 In Accord  SF <sub>6</sub> Gas In  IV Vacuum Circ  le Unit or Cable  mer, e, li0	6 kV <sup>2</sup> 60 Hz conservator Typ AN 2.5% (PCB Free)  dance with EN nsulated ruit Breaker Un the Load Break S Dry	Dy11 50588-1  iit iwitch Unit Type Transformer,	
Output  Output  Dy11-y11  Tier 1 or  M  Direct Cab  Dry Type Transforr 5 kVA, Single-phas  230 / 127 Vac	10~35 50 Hz / bil-immersed, Co ON, ± 2 x Mineral Oil Tier 2 In Accord SF6 Gas In IV Vacuum Circ le Unit or Cable mer, e, li0	6 kV <sup>2</sup> 60 Hz conservator Typ AN 2.5% (PCB Free)  dance with EN nsulated ruit Breaker Un e Load Break S	Dy11 50588-1  iit iwitch Unit Type Transformer,	
Dy11-y11 Tier 1 or  N Direct Cab Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	50 Hz /  Dil-immersed, Co  ON,  ± 2 x 2  Mineral Oil  Tier 2 In Accord  SF <sub>6</sub> Gas In  IV Vacuum Circ  le Unit or Cable  mer, e, li0	60 Hz conservator Typ AN 2.5% (PCB Free)  dance with EN consulated cuit Breaker Under Load Break S Dry	Dy11 50588-1  iit iwitch Unit Type Transformer,	
Dy11-y11 Tier 1 or  M Direct Cab Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	50 Hz /  Dil-immersed, Co  ON,  ± 2 x 2  Mineral Oil  Tier 2 In Accord  SF <sub>6</sub> Gas In  IV Vacuum Circ  le Unit or Cable  mer, e, li0	60 Hz conservator Typ AN 2.5% (PCB Free)  dance with EN consulated cuit Breaker Under Load Break S Dry	Dy11 50588-1  iit iwitch Unit Type Transformer,	
Dy11-y11 Tier 1 or  M Direct Cab Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	Mineral Oil  Tier 2 In Accord  SF6 Gas In  IV Vacuum Circ le Unit or Cable mer, e, li0	onservator Typ AN 2.5% (PCB Free)  dance with EN nsulated uit Breaker Un e Load Break S Dry	Dy11 50588-1  iit iwitch Unit Type Transformer,	
Dy11-y11 Tier 1 or  M Direct Cab Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	ON, ± 2 x 2  Mineral Oil  Tier 2 In Accord  SF <sub>6</sub> Gas In  IV Vacuum Circ  le Unit or Cable  mer, e, li0	AN 2.5% (PCB Free)  dance with EN nsulated ruit Breaker Un e Load Break S Dry	Dy11 50588-1  iit iwitch Unit Type Transformer,	
Tier 1 or  M  Direct Cab  Dry Type Transforr 5 kVA, Single-phas  230 / 127 Vac	± 2 x Mineral Oil  Tier 2 In Accord  SF <sub>6</sub> Gas In  IV Vacuum Circ  le Unit or Cable  mer, e, li0	2.5%  (PCB Free)  dance with EN  nsulated  uit Breaker Un e Load Break S  Dry	50588-1  iit  iwitch Unit  Type Transformer,	
Tier 1 or  M  Direct Cab  Dry Type Transforr 5 kVA, Single-phas  230 / 127 Vac	Mineral Oil Tier 2 In Accord SF6 Gas In IV Vacuum Circ le Unit or Cable mer, e, li0	(PCB Free)  dance with EN nsulated ruit Breaker Un e Load Break S	50588-1  iit iwitch Unit Type Transformer,	
Tier 1 or  M  Direct Cab  Dry Type Transforr 5 kVA, Single-phas  230 / 127 Vac	Tier 2 In Accord  SF <sub>6</sub> Gas Ir  IV Vacuum Circ  le Unit or Cable  mer, e, li0	dance with EN nsulated ruit Breaker Un e Load Break S Dry	50588-1  iit  iwitch Unit  Type Transformer,	
Tier 1 or  M  Direct Cab  Dry Type Transforr 5 kVA, Single-phas  230 / 127 Vac	SF <sub>6</sub> Gas Ir IV Vacuum Circ le Unit or Cable mer, e, li0	nsulated ruit Breaker Un e Load Break S Dry T	50588-1  iit  iwitch Unit  Type Transformer,	
M Direct Cab Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	SF <sub>6</sub> Gas Ir IV Vacuum Circ le Unit or Cable mer, e, li0	nsulated ruit Breaker Un e Load Break S Dry T	nit Switch Unit Type Transformer,	
Direct Cab Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	IV Vacuum Circ le Unit or Cable mer, e, li0	uit Breaker Un e Load Break S Dry 1	witch Unit Type Transformer,	
Direct Cab Dry Type Transforr 5 kVA, Single-phas 230 / 127 Vac	le Unit or Cable mer, e, li0	e Load Break S Dry	witch Unit Type Transformer,	
Dry Type Transform 5 kVA, Single-phas 230 / 127 Vac	mer, e, li0	Dry 7	Type Transformer,	
5 kVA, Single-phas 230 / 127 Vac	e, li0			
		Dry Type Transformer, 5 kVA, Single-phase, li0  Dry Type Transformer, 5 kVA, Three-phase, Dyn11		
Protection				
TOUCCUOIT				
Oil Level, Oi	l Temperature,	Oil Pressure a	nd Buchholz	
	IP 5	54		
	IAC A 20	0 kA 1s		
50/51, 50N/51N				
Type I+II				
C5-Medium				
Features				
	Optio	nal <sup>3</sup>		
General	•			
6,058 x 2.8	396 x 2,438 mm	n (20' HC <b>I</b> SO (	Container)	
< 28 t			< 15 t	
-25°C ~ 60°C ⁴				
-				
•				
Modbus TCP, Preconf	figured	Modbus	s RTU, Preconfigured n SmartACU2000D	
	6,058 x 2,8 < 28 t  Prewired a  Smart Coolin  Modbus TCP, Preconf	Features  Optio Optio  General  6,058 x 2,896 x 2,438 mm  < 28 t < 2  -25°C ~  0% ~ 95% (No  1,000  Prewired and Pretested, N	Features  Optional <sup>3</sup> Optional <sup>3</sup> General  6,058 x 2,896 x 2,438 mm (20' HC ISO 6)  < 28 t < 22 t  -25°C ~ 60°C <sup>4</sup> 0% ~ 95% (Non-condensing)  1,000 m <sup>5</sup> Prewired and Pretested, No Internal Cab  Smart Cooling without Air-across for High  Modbus TCP, Preconfigured Modbu	

IEC 62271-202, EN 50588-1, IEC 60076, IEC 62271-200, IEC 61439-1

- 1: More detailed AC power of STS, please refer to the de-rating curve.
- 2: Rated output voltage from 10 kV to 35 kV, more available upon request
  3: Extra expense needed for optional features which standard product doesn't contain, more options upon request.
- 4: When ambient temperature ≥55 C, awning shall be equipped for STS on site by customer. 5: For higher operating altitude, pls consult with Huawei.

# ► LUNA2000-213KTL-H0 **Smart PCS (Preliminary)**





Efficiency 99%





Protection



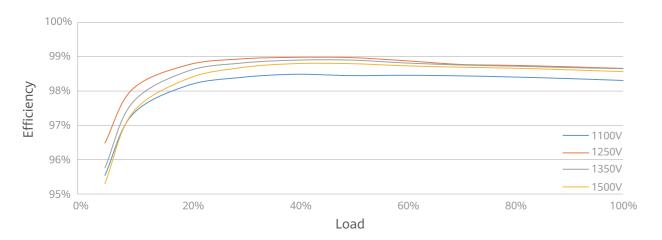
Active

**Breaking Device** 



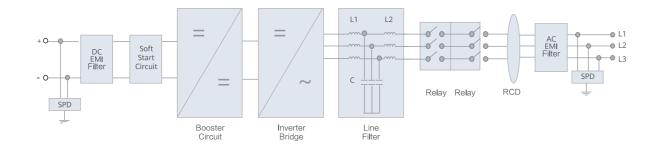
Smart Grid Forming Algorithm

Efficiency Curve



## Circuit Diagram

SOLAR.HUAWEI.COM



LUNA2000-213KTL-H0

## Technical Specifications (Preliminary)

	Efficiency
Max. Efficiency	99.01%
	DC Side
Rated DC Voltage	1,331 V
Max. DC Voltage	1,500 V
Operating DC Voltage Range	800 V ~ 1,500 V
Rated Power Operating Voltage Range	1100V ~ 1500 V
Max. DC Current	218.5 A
Max. Number of Inputs	1
	AC Side
Rated AC Active Power	213,000 W @40°C; 192,000 W @50°C
Max. Apparent Power	236,400 VA
Rated AC Voltage	800 V
Rated AC Grid Frequency	50 Hz / 60 Hz
Max. AC Current	170.6 A
Adjustable Power Factor Range	-1 +1
Max. Total Harmonic Distortion	THD: ≤ 1.5% (Rated)
	Protection
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
Insulation Resistance Detection	Yes
Residual Current Protection	Yes
DC Surge Protection	Type II
AC Surge Protection	Type II
	Communication
Display	LED Indicators, WLAN + APP
USB	Yes
Communication Protocol	Ethernet, CAN
	General
Dimension (W x H x D)	875 x 865 x 365 mm
Weight	≤ 110 kg
Operating Temperature Range	-25°C ~ 60°C
Cooling Method	Smart Air Cooling
Max. Operating Altitude without Derating	4,700 m
Relative Humidity	0 ~ 100% (Non-condensing)
DC Connector	OT / DT Terminal
AC Connector	OT / DT Terminal
Protection Degree	IP66
Anti-corrosion Degree	C5-Medium
Topology	Transformerless
St	andards Compliance

# ► LUNA2000-4.5MWH-2H1

# Smart String Energy Storage System (Preliminary)











Smart O&M

**Ultra Safety** 

**Native Stability** 

Higher Revenue

**Technical Specifications** 

Battery Container			
Model	LUNA2000-4.5MWH-2H1		
DC Rated Voltage	1,331.2 V		
DC Max. Voltage	1,500 V		
Nominal Energy Capacity	4,472 kWh		
Charge & Discharge Rate	≤ 0.5 C		
Rated Power	2,236 kW		
Dimension (W x H x D)	6,058 x 2,896 x 2,438 mm		
Weight	≤ 41 t		
Operation Temperature Range	-30°C ~ 55°C		
Storage Temperature Range	-40°C ~ 60°C		
Relative Humidity	0 ~ 100% (Non-condensing)		
Max. Operating Altitude	4,700 m		
Cooling Method	Liquid Cooling		
Fire Suppression System	Water Sprinkler, Novec 1230 (Optional)		
Communication Interface	Ethernet / SFP		
Communication Protocol	Modbus TCP		
Protection Degree	IP55		
Anti-corrosion Degree	C5-Medium		

#### Standards Compliance

RoHS, IEC62477-1, IEC62040-1, IEC61000-6-2, IEC62933-5-2, UL9540A, IEC62619, UN38.3, etc.

Batte	ery PACK
Cell Material	LFP
Number of Cell	104
Nominal Capacity	280 Ah / 93.18 kWh
Protection Degree	IP65
Weight	670±10 kg
Dimensions (W x H x D)	785 x 249 x 2182 mm

# **▶** DTS-200K-D0

# **Distribution Transformer**



Rated Input Voltage  Max. Input Current at Nominal Voltage  Max. Input Current at Nominal Voltage  Rated Output Voltage  Rated Output Voltage  Rated Output Voltage  ABACT Frequency  Fransformer Type  Fransformer Type  Fransformer Cooling Type  Fransformer Vectoring Group  Fransformer Winding  Fransformer Insulation Class  Fransformer Impedance (at 145°C)  Fransformer No-load Loss  Fransformer No-load Loss  Fransformer Load Loss  Cablings  Number of outputs  Cablings  Protection  Protection  Protection Degree  Protection Degree  Protection Degree  Protection  Fransformer Protection  Fransformer Range  Fransformer		Electrical			
Max. Input Current at Nominal Voltage         151.6 A           Rated Output Voltage         400V (3P) /110V (1P)           Rated Frequency         50 / 60 Hz           Transformer Type         Dry Type           Transformer Cooling Type         AF           Transformer Vectoring Group         Dyn11yn11           Transformer Tappings         ± 2 x x 2.5%           Transformer Vinding         Al           Transformer Insulation Class         H           Transformer Impedance (at 145°C)         4% (±10%) @50Hz / 4.8% (±10%) @60Hz           Transformer No-load Loss         ≤ 500 W (+15%)           Transformer Load Loss         S 3,044 W (+15%)           Cablings           Number of outputs         Five MCCBs, each connected to two outputs           Cabling mode         Routed in and out from the bottom           Protection           Protection           Protection           Transformer Protection           Transformer Temperature Protection           Environment           Operating Temperature Range         - 30°C ~ 55°C           Relative Humidity         0% ~ 95% (Non-condensing)           Max. Operating Altitude         4,000 m	AC Power	210 kVA@ 400 Vac / 4 kVA@ 110 Vac			
Rated Output Voltage 400V (3P) /110V (1P)  Rated Frequency 50 / 60 Hz  Transformer Type Dry Type  Transformer Cooling Type AF  Transformer Vectoring Group Dyn11yn11  Transformer Tappings ± 2 x 2.5%  Transformer Winding Al  Transformer Insulation Class H  Transformer Insulation Class S  Transformer No-load Loss ≤ 500 W (+15%)  Transformer No-load Loss ≤ 3,044 W (+15%)  Cablings  Number of outputs Five MCCBs, each connected to two outputs  Cabling mode Routed in and out from the bottom  Protection Degree IP 55  LV SPD Type II  Transformer Protection Transformer Temperature Protection  Environment  Operating Temperature Range - 30°C ~ 55°C  Relative Humidity 0% ~ 95% (Non-condensing)  Max. Operating Altitude 4,000 m  Weight < 1.3 t  Communication Mode Dry Contacts	Rated Input Voltage	ed Input Voltage 800 Vac			
Rated Frequency 50 / 60 Hz  Transformer Type Dry Type  Transformer Cooling Type AF  Transformer Vectoring Group Dyn11yn11  Transformer Tappings ± 2 x 2.5%  Transformer Winding Al  Transformer Insulation Class H  Transformer Impedance (at 145°C) 4% (±10%) Ø50Hz / 4.8% (±10%) Ø60Hz  Transformer No-load Loss ≤ 500 W (+15%)  Transformer Load Loss ≤ 3,044 W (+15%)  Cablings  Number of outputs Five MCCBs, each connected to two outputs  Cabling mode Routed in and out from the bottom  Protection Degree IP 55  LV SPD Type II  Transformer Protection Transformer Temperature Protection  Environment  Operating Temperature Range 30°C ~ 55°C  Relative Humidity 0% ~ 95% (Non-condensing)  Max. Operating Altitude 4,000 m  General  Dimensions (W x H x D) 900 x 2,100 x 1,200 mm  Weight < 1.3 t  Communication Mode	Max. Input Current at Nominal Voltage	151.6 A			
Transformer Type  Transformer Cooling Type  Transformer Cooling Type  Transformer Vectoring Group  Transformer Tappings  Transformer Winding  Transformer Insulation Class  Transformer Impedance (at 145°C)  Transformer Impedance (at 145°C)  Transformer No-load Loss  Transformer No-load Loss  Transformer Load Loss  Transformer Load Loss  Transformer Load Loss  Transformer No-load Loss  Transformer No-load Loss  Transformer No-load Loss  Transformer No-load Loss  Transformer Load Loss  Transformer Load Loss  Transformer Load Loss  Transformer Type  Transformer Protection  Protection  Protection  Protection  Protection Degree  IP 55  LV SPD  Type II  Transformer Protection  Transformer Temperature Protection  Environment  Operating Temperature Range  - 30°C ~ 55°C  Relative Humidity  0% ~ 95% (Non-condensing)  Max. Operating Altitude  4,000 m  General  Dimensions (W x H x D)  900 x 2,100 x 1,200 mm  Veight  Communication Mode  Dry Contacts	Rated Output Voltage	400V (3P) /110V (1P)			
Transformer Cooling Type Transformer Vectoring Group Transformer Vectoring Group Transformer Vectoring Group Transformer Tappings  \$\frac{1}{2}\times 2.5\times 5.5\times 5.5\t	Rated Frequency	50 / 60 Hz			
Transformer Vectoring Group  Transformer Tappings  \$\frac{\text{t}}{2} \times 2.5\%  Transformer Winding  Al  Transformer Insulation Class  H  Transformer Impedance (at 145°C)  \$\frac{\text{t}}{4\% (\text{\text{\text{t}}}10\%) \@50Hz / 4.8\% (\text{\text{\text{\text{t}}}10\%) \@60Hz}}  Transformer No-load Loss  \$\leq 500 \ \ \ \ (\text{\text{\text{t}}}10\%) \@50Hz / 4.8\% (\text{\text{\text{\text{\text{t}}}}10\%) \@60Hz}  Transformer No-load Loss  \$\leq 500 \ \ \ \ \ (\text{	Transformer Type	Dry Type			
Transformer Tappings ± 2 x 2.5%  Transformer Winding Al  Transformer Insulation Class H  Transformer Impedance (at 145°C) 4% (±10%) @50Hz / 4.8% (±10%) @60Hz  Transformer No-load Loss ≤ 500 W (+15%)  Transformer Load Loss ≤ 3,044 W (+15%)  Cablings  Number of outputs Five MCCBs, each connected to two outputs  Cabling mode Routed in and out from the bottom  Protection  Protection Degree IP 55  LV SPD Type II  Transformer Protection Transformer Temperature Protection  Environment  Operating Temperature Range - 30°C ~ 55°C  Relative Humidity 0% ~ 95% (Non-condensing)  Max. Operating Altitude 4,000 m  General  Dimensions (W x H x D) 900 x 2,100 x 1,200 mm  Weight < 1.3 t  Communication Mode Dry Contacts	Transformer Cooling Type	AF			
Transformer Winding  Transformer Insulation Class  H  Transformer Impedance (at 145°C)  4% (±10%) @50Hz / 4.8% (±10%) @60Hz  500 W (+15%)  Transformer No-load Loss  ≤ 3,044 W (+15%)  Cablings  Number of outputs  Cablings  Number of outputs  Five MCCBs, each connected to two outputs  Cabling mode  Routed in and out from the bottom  Protection  Protection Degree  IP 55  LV SPD  Type II  Transformer Protection  Environment  Operating Temperature Range  - 30°C ~ 55°C  Relative Humidity  Max. Operating Altitude  4,000 m  General  Dimensions (W x H x D)  900 x 2,100 x 1,200 mm  Weight  < 1.3 t  Communication Mode	Transformer Vectoring Group	Dyn11yn11			
Transformer Insulation Class  Transformer Impedance (at 145°C)  4% (±10%) @50Hz / 4.8% (±10%) @60Hz  500 W (+15%)  Transformer No-load Loss   Cablings  Number of outputs  Five MCCBs, each connected to two outputs  Cabling mode  Routed in and out from the bottom  Protection  Protection  Protection Degree  IP 55  LV SPD  Type II  Transformer Protection  Environment  Operating Temperature Range  Relative Humidity  Max. Operating Altitude  General  Dimensions (W x H x D)  Weight  Communication Mode  P( 15%) (4.8% (±10%) @60Hz  4,000 m  60	Transformer Tappings	± 2 x 2.5%			
Transformer Impedance (at 145°C)  4% (±10%) @50Hz / 4.8% (±10%) @60Hz  Transformer No-load Loss  ≤ 500 W (+15%)  Cablings  Number of outputs  Cabling mode  Five MCCBs, each connected to two outputs  Cabling mode  Protection  Protection  Protection Degree  IP 55  LV SPD  Type II  Transformer Protection  Environment  Operating Temperature Range  Relative Humidity  Max. Operating Altitude  General  Dimensions (W x H x D)  Weight  Cablings  4% (±10%) @50Hz / 4.8% (±10%) @60Hz  4,000 m  General  Dimensions (W x H x D)  900 x 2,100 x 1,200 mm  Value of the South Altitude  Pry Contacts	Transformer Winding	Al			
Transformer No-load Loss   S 500 W (+15%)  Transformer Load Loss  Cablings  Number of outputs  Five MCCBs, each connected to two outputs  Cabling mode  Routed in and out from the bottom  Protection  Protection  Protection Degree  IP 55  LV SPD  Type II  Transformer Protection  Environment  Operating Temperature Range  Power and Spown (Non-condensing)  Max. Operating Altitude  General  Dimensions (W x H x D)  Weight  Communication Mode  S 3,044 W (+15%)  Five MCCBs, each connected to two outputs  Routed in and out from the bottom  Transformer Temperature Protection  Transformer Temperature Protection  Environment  O% ~ 95% (Non-condensing)  4,000 m  General  Dimensions (W x H x D)  900 x 2,100 x 1,200 mm  ✓ 1.3 t  Communication Mode	Transformer Insulation Class	Н			
Transformer Load Loss  Cablings  Number of outputs  Five MCCBs, each connected to two outputs  Routed in and out from the bottom  Protection  Protection Degree  IP 55  LV SPD  Type II  Transformer Protection  Environment  Operating Temperature Range  Relative Humidity  Max. Operating Altitude  General  Dimensions (W x H x D)  Weight  Communication Mode  Server MCCBs, each connected to two outputs  Five MCCBs, each connected to two outputs  Anount outputs  Five MCCBs, each connected to two outputs  Five MCCBs, each connected to two outputs  Anount outputs  Server MCCBs, each connected to two outputs  In MacCBs, each connected to two outputs  Five MCCBs, each connected to two outputs  Anount outputs  Server MCCBs, each connected to two outputs  Five MCCBs, each connected to two outputs  Anount outputs  Server MCCBs, each connected to two outputs  Anount outputs  Server MCCBs, each connected to two outputs  Server MCCBs, each connected to two outputs  Five MCCBs, each connected to two outputs  Five MCCBs, each connected to two outputs  Server MCCBs, each connected to two outputs  Five	Transformer Impedance (at 145°C)	4% (±10%) @50Hz / 4.8% (±10%) @60Hz			
Cablings Number of outputs Five MCCBs, each connected to two outputs Cabling mode Routed in and out from the bottom  Protection Protection Protection Degree IP 55 LV SPD Type II Transformer Protection  Environment  Operating Temperature Range Protection Coperating Temperature Range Relative Humidity Ow ~ 95% (Non-condensing) Max. Operating Altitude A,000 m  General  Dimensions (W x H x D)  900 x 2,100 x 1,200 mm  Weight Communication Mode Dry Contacts	Transformer No-load Loss	≤ 500 W (+15%)			
Number of outputs  Cabling mode  Routed in and out from the bottom  Protection  Protection  Protection  Protection Degree  LV SPD  Type II  Transformer Protection  Environment  Operating Temperature Range  Relative Humidity  Max. Operating Altitude  General  Dimensions (W x H x D)  Weight  Communication Mode  Five MCCBs, each connected to two outputs  Routed in and out from the bottom  Protection  Frotection  Transformer Temperature  Five MCCBs, each connected to two outputs  And out from the bottom  For Cabling  And Output  And Output  And Output  Five MCCBs, each connected to two outputs  And out from the bottom  For Cabling  And Output  And Ou	Transformer Load Loss	≤ 3,044 W (+15%)			
Routed in and out from the bottom  Protection  Protection Degree IP 55  LV SPD Type II  Transformer Protection  Environment  Operating Temperature Range - 30°C ~ 55°C  Relative Humidity 0% ~ 95% (Non-condensing)  Max. Operating Altitude 4,000 m  General  Dimensions (W x H x D) 900 x 2,100 x 1,200 mm  Weight < 1.3 t  Communication Mode Dry Contacts		Cablings			
Protection Degree IP 55  LV SPD Type II  Transformer Protection Transformer Temperature Protection  Environment  Operating Temperature Range - 30°C ~ 55°C  Relative Humidity 0% ~ 95% (Non-condensing)  Max. Operating Altitude 4,000 m  General  Dimensions (W x H x D) 900 x 2,100 x 1,200 mm  Veight < 1.3 t  Communication Mode Dry Contacts	Number of outputs	Five MCCBs, each connected to two outputs			
Protection Degree IP 55  LV SPD Type II  Transformer Protection Transformer Temperature Protection  Environment  Operating Temperature Range - 30°C ~ 55°C  Relative Humidity 0% ~ 95% (Non-condensing)  Max. Operating Altitude 4,000 m  General  Dimensions (W x H x D) 900 x 2,100 x 1,200 mm  Weight < 1.3 t  Communication Mode Dry Contacts	Cabling mode	Routed in and out from the bottom			
Type II  Transformer Protection  Transformer Temperature Protection  Environment  Operating Temperature Range  Relative Humidity  Max. Operating Altitude  General  Dimensions (W x H x D)  Weight  Communication Mode  Type II  Transformer Temperature Protection  Environment  0% ~ 95% (Non-condensing)  4,000 m  General  00 x 2,100 x 1,200 mm  < 1.3 t  Communication Mode  Type II  Transformer Temperature Protection  Environment  0% ~ 95% (Non-condensing)  4,000 m  4,000 m  Condensity  4,000 m  Condensity  Figure 1		Protection			
Transformer Protection  Transformer Temperature Protection  Environment  Operating Temperature Range  - 30°C ~ 55°C  Relative Humidity  Max. Operating Altitude  General  Dimensions (W x H x D)  Weight  - 30°C ~ 55°C  90% ~ 95% (Non-condensing)  4,000 m  - 50°C ~ 55°C  Owner of the protection	Protection Degree	IP 55			
Environment  Operating Temperature Range - 30°C ~ 55°C  Relative Humidity 0% ~ 95% (Non-condensing)  Max. Operating Altitude 4,000 m  General  Dimensions (W x H x D) 900 x 2,100 x 1,200 mm  Veight < 1.3 t  Communication Mode Dry Contacts	LV SPD	Type II			
Operating Temperature Range - 30°C ~ 55°C  Relative Humidity 0% ~ 95% (Non-condensing)  Max. Operating Altitude 4,000 m  General  Dimensions (W x H x D) 900 x 2,100 x 1,200 mm  < 1.3 t  Communication Mode Dry Contacts	Transformer Protection	Transformer Temperature Protection			
Relative Humidity 0% ~ 95% (Non-condensing)  Max. Operating Altitude 4,000 m  General  Dimensions (W x H x D) 900 x 2,100 x 1,200 mm  < 1.3 t  Communication Mode Dry Contacts		Environment			
Max. Operating Altitude  General  Dimensions (W x H x D)  Weight  Communication Mode  4,000 m  900 x 2,100 x 1,200 mm  < 1.3 t  Dry Contacts	Operating Temperature Range	- 30°C ~ 55°C			
General  Dimensions (W x H x D)  Weight  Communication Mode  General  900 x 2,100 x 1,200 mm  < 1.3 t  Dry Contacts	Relative Humidity	idity 0% ~ 95% (Non-condensing)			
Dimensions (W x H x D)         900 x 2,100 x 1,200 mm           Weight         < 1.3 t	Max. Operating Altitude 4,000 m				
Weight < 1.3 t  Communication Mode Dry Contacts		General			
Communication Mode Dry Contacts	Dimensions (W x H x D)	900 x 2,100 x 1,200 mm			
,	Weight	< 1.3 t			
Cooling Type Smart Cooling without Air-across for Higher Availability	Communication Mode	Dry Contacts			
	Cooling Type	Smart Cooling without Air-across for Higher Availability			
		IEC 60076, IEC 61439			

# ► SPPC2000

# **Smart Power Plant Controller**







POC PT/CT Direct Sampling



PV&ESS Synergy





Fast Active/Reactive Power Response

Power Oscillation Damping

## **Technical Specifications**

Model	SPPC2000-A01	SPPC2000-A02	
	Device Management		
Networking Mode	Active/Standby and Ma	ster-Slave Control Mode	
	Features		
Active Power Control	System-level 30ms-40ms Dynamic Reactive Power Response		
Frequency Control (P-F)	P-F Curve	e Control	
Reactive Power Control (Q or PF)	Reactive Power Control with Dy	ynamic or Fixed Q/PF Setpoints	
Voltage Control (Q-U)	Q-U Curve Control		
Smart Reactive Power Compensation	System Level Dynamic Reactive Power	Response Based on Inverter/Converter	
Ramp Control (Active and Reactive Power)	Control the Active/Reactive Po	wer Up and Down Ramp Rates	
Cooperative Control of PV and ESS	Ye	es es	
Power Oscillation Damping (POD)	Oscillation Suppression	• •	
Waveform Recording Function	Supports Instantaneous Value (0.5ms) and r	ms Value Recording of Current and Voltag	
Time Synchronization Function	Supports IRIGB (≤ 1 ms) and Other Tim		
Circuit Breaker Status Acquisition and Control	Control Substations Disco	nnection and Connection	
Simulation Model	PSSE, DigSILENT, PSCAD		
PT/CT Sampling current	1A	5A	
	Communication Interface		
Ethernet	6 + 2		
Optical Ethernet	SFP x 2, 100 / 1,000 Mbps		
RS485	COM x 4		
Current/Voltage Sampling	6U + 6I		
CAN	2		
Communication Protocol	Modbus-TCP, IEC60870-5-104, GOOSE		
	Interaction		
WEB		es	
НМІ	Smart PV Mana Smart Energy Man	ngement System nagement System	
	General		
Dual Power Supply	AC: 90 V~264 V, 47 Hz ~ 63 Hz, DC: 110 V ± 10%, 220 V ± 10%		
DC/AC Surge Arrester	Type II		
Dimensions (H x L x W)	1000 x 650 x 650 mm (Without Base)		
Weight	≤ 80 kg (Without Pallet and Optional Components)		
Operating Temperature Range	-25°C ~ 60°C		
Relative Humidity	0% ~ 100% (Non-condensing)		
Max. Operating Altitude	4,000 m		
Protection Degree	IP:	55	
Anti-corrosion Protection	C5-Me	edium	
Installation Options	Floor Mounting, Wall	Mounting (Optional)	

Please confirm the available countries with Huawei Fusionsolar engineers

# ➤ SmartACU2000D

# **Smart Array Controller**







Without SmartPID2000 Module







SmartPID2000 & Smartlogger3000B pre-installed with multiple interfaces

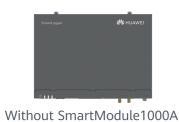


Industrial-level application and high reliability

Model	SmartACU2000D-D-08	SmartACU2000D-D-09	SmartACU2000D-D-10	SmartACU2000D-D-11
		Configuration		l .
SmartLogger	SmartLogger3000B x 1			
SmartModule1000A	Opti	onal	Standar	d with 1
RS485	COM x 6, 1,200 / 2,400 / 4,800 / 9,600 / 19,200 / 115,200 bps			
Number of MBUS Module <sup>1</sup>	1	1	2	2
Number of SmartPID2000	0	1	2	2
Switch with 4*SFP and 8*100 / 1,000 Mbps	Optional with 1 Standard with 2			Standard with 2
		Environment		
Operating Temperature Range	-40°C ~ 60°C			
Relative Humidity	0% ~ 100% (Non-condensing)			
Max. Operating Altitude		4,00	0 m	
		Electrical		
AC Input Voltage for Cabinet		100 V ~ 240 V	, L / N (L)+ PE	
AC Input Voltage for MBUS	380 V ~ 800 V, 3Ph			
AC Input Voltage for PID	380 V ~ 800 V, 3Ph + FE (Functional Earth)			
AC Input Frequency	50 Hz / 60 Hz			
Power Supply	Standard: 12 V DC			
		Mechanical		
Cable Entries	Bottom in & out			
Maintenance	Front			
Dimensions (W x H x D)	640mm×770mm×365mm 880mm×770mm×369mm			
Weight	33kg	54kg	64kg	66kg
Protection Degree	IP65			
Installation Options		Wall Mounting, Rack M	ounting, Pole Mounting	

<sup>1:</sup> Compatible with communication mode of PLC (Power Line Communication).

# **▶** SmartLogger3000B





With SmartModule1000A







Smart

Connecting up to 200 devices, One-click commissioning

Simple

Deployment wizard allowed, including parameters configuration, devices connection

Reliable

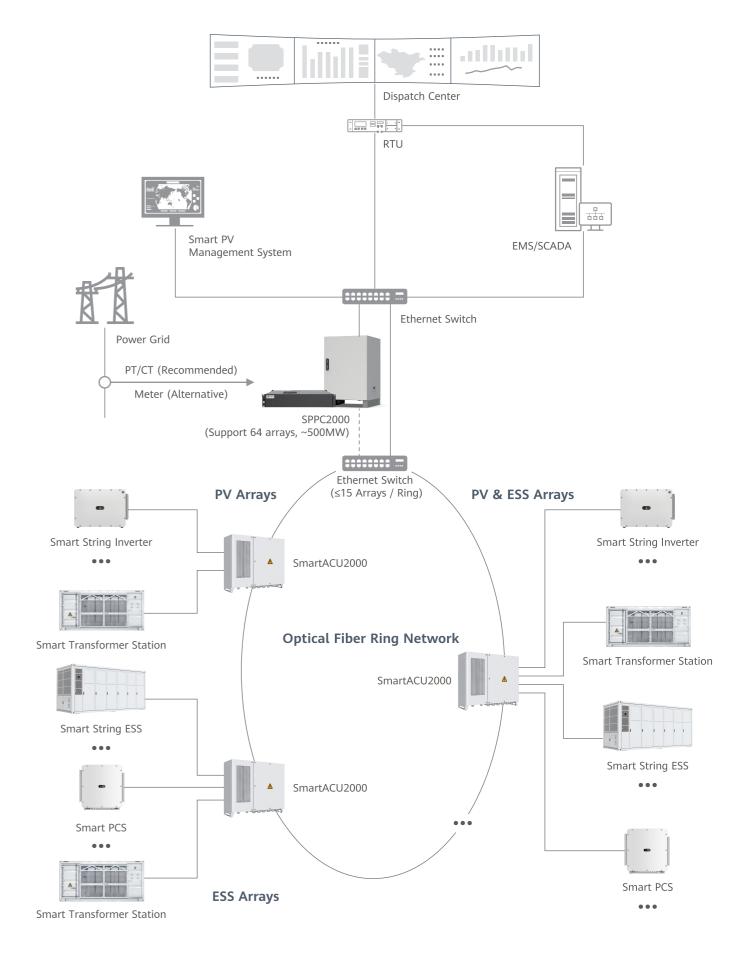
Safety improvement by lightning protection module

#### **Technical Specifications**

ı		
Model	SmartLogger3000B	SmartLogger3000B with SmartModule1000A
'	Device Management	
Max. Manageable Devices	20	0
Max. Manageable Smart String Inverters <sup>1</sup>	150	
Max. Manageable Smart PCS / Smart String ESS <sup>1</sup>	44 / 24	
<u>'</u>	Communication Interface	
WAN	WAN x 1, 10 / 100 / 1,000 Mbps	
LAN	LAN x 1, 10 / 100 / 1,000 Mbps	LAN x 3, 10 / 100 / 1,000 Mbps
Optical Ethernet	SFP x 2, 100 / 1,000 Mbps	
MBUS	MBUS x 1, 115.2 kbps, Compatible with PLC	
RS485	COM x 3	COM x 6
Digital / Analog Input / Output	DI x 4, DO x 2, AI x 4	DI x 8, DO x 2, AI x 7
PT100 / PT1000	0	2
Active DO	12 V, 100 mA (connection with relay, sensor)	
'	Communication Protocol	
Ethernet	Modbus-TCP, IEC 60870-5-104	
RS485	Modbus-RTU, IEC 60870-5-103 (standard), DL / T645	
	Interaction	
LED	LED Indicator x 3	LED Indicator x 5
WEB	Embedd	ed Web
USB	USB 2.0 x 1	
APP	Communication by WLAN for commissioning	
	Environment	
Operating Temperature Range	-40°C ~	- 60°C
Storage Temperature Range	-40°C ~ 70°C	
Relative Humidity	5% ~ 95% (Non-condensing)	
Max. Operating Altitude	4,000 m	
· · · · ·	Electrical	
Power Adapter	AC input: 100 V ~ 240 V, 50 Hz / 60 Hz; DC output: 12 V, 2 A	
DC Power Supply	24 V, 0.8 A	
Power Consumption	Typical 9 W, Max. 15 W	Typical 10 W, Max. 18 W
	Mechanical	
Dimensions (W x H x D, without mounting ears)	225 x 160 x 44 mm	350 x 160 x 44 mm
Weight	2 kg	3 kg
Protection Degree	IP2	20
Installation Options	Wall Mounting, DIN Rail Mounting, Tabletop Mounting	

<sup>1:</sup> One smartlogger supports max. manageable devices for either smart string inverter or Smart string ESS in one power block

# **▶** Grid Networking Architecture



<sup>\*</sup>For details about the project configuration and sales area, contact Huawei engineers. SPPC does not support the PV & ESS low-voltage AC coupling solution.

# **>>** SEMS2000

# Smart Energy Management System (Preliminary)





#### Comprehensive management

Multi-level refined management Second-level performance curve drawing



#### **Efficient collaboration**

Power generation plan curve PV&ESS synergy optimization





#### Intelligent diagnosis

Full-link multi-dimensional plant diagnosis Cell/module fault pre-warning

#### Secure and reliable

IEC62443 certification. 99.99% availability

#### **Technical Specifications**

	Parameter	Description		
	EMS o	cabinet		
WxDxH	600mm×2200mm×1200mm (47u) Weight		Net weight approx. 210 kg, full configuration approx. 600 kg	
Temperature	5 - 30°C	Power	Supply	200V~240V, 50/60Hz
Protection Grade	IP20	Altitude		≤4000m
	Sei	rver		
Model	TaiShan 200 (2280)	Hard	l Disk	8*1.92T SATA SSD
WxDxH	482.6mm*790mm*88.9mm. (2U)	Fa	ans	Four hot-swappable fans in N+1 redundancy
CPU	2*Kunpeng 920 - 48core @2.6GHz	20 - 48core @2.6GHz External Interface		8*GE
Database	GaussDB	Power	supply	2 x 900 W, 1+1 Redundancy
Operating system	EulerOS	Net v	veight	Approx. 30 kg
Memory	4*64G Certification		CCC/CE, etc.	
	Swit	tches		
Model	CloudEngine S5735-S24ST4XE	-V2	Clo	oudEngine S5735-S24T4XE-V2
$W \times D \times H$	420mm*442mm*43.6mm (1U)		4	20mm*442mm*43.6mm (1U)
Net Weight	4.95 kg			4.34 kg
Memory	2GB		2GB	
Power Supply	2*180W, 1+1 redundancy		2*180W, 1+1 redundancy	
Interface	Eight gigabit electrical ports, four 10GE optical ports, and 24 gigabit optical ports		24 GE electrical ports and 4 10GE optical ports	
Rated Voltage	100V AC~240V AC; 50/60Hz			100V AC~240V AC; 50/60Hz
Certification	CE/VCCI, etc.			CE/VCCI, etc.

# **▶** Smart PV Plant Management System

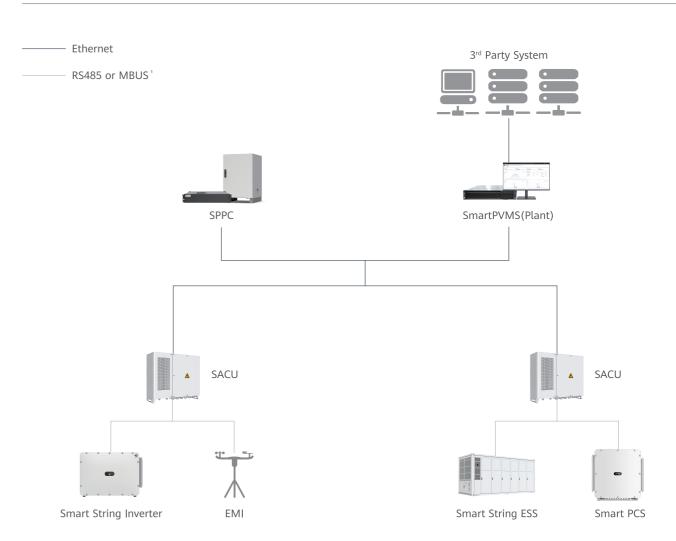


Efficient O&M

Compatible with 3rd party system

#### Network

**Refined Management** 



<sup>1 -</sup> Compatible with communication mode of PLC (Power Line Communication).

# **▶** Smart PV Plant Management System

#### Main Functions

	Function	Description	
	Plant Overview	Provide an overview of the key information of the PV & ESS plant.	
Refined management	Multi-level Refined Management	Provide multi-level fine management of plants, arrays, equipment, and components (strings, batteries)	
	Alarm Management	Alarms can be filtered, graded, and redefined; One-click direct access to the alarm center from any interface throughout the system.	
	Remote Device Upgrade	Batch device upgrade through SmartPVMS(Plant) without going on-site.	
	Plant Diagnosis	Comprehensively evaluates plant performance and alarms, and analyze the loss.	
	Power Normalization	Intelligently analyze plant and array operation efficiency and identify inefficient arrays.	
Efficient O&M	Discreteness Analysis	Inverter/string discreteness and deviation rate analysis, identifying inefficient strings; linked to Smart IV Curve Diagnosis automatically for further inspection.	
_	Smart IV Curve Diagnosis	Realize string-level fault localization, provide diagnosis report, O&M report, revenue estimation report, etc.	
	Smart Tracker Control Algorithm (SDS)	Intelligent adjustment of the angle of the tracker to reduce shading and improve power generation efficiency	
Open Eco-syste	m	Data can transfer via northbound IEC104 and Restful API.	

#### Server Parameters

ltem	Standard Version	Premium Version
Model	TaiShan200 2280	TaiShan200 2280
Form Factor	2U rack server	2U rack server
CPU	2*Kunpeng 920-48core@2.6GHz	2xKunpeng 920-48core@2.6GHz
Memory	2*32GB	4*32GB
Internal Storage	2*1920GB	18*1920GB
Operating System	Euler OS	Euler OS
Database	Gauss DB	Gauss DB
Network Ports	8*GE	8*GE
Power Supply	22 hot-swappable PSUs, 1+1 redundancy	2 hot-swappable PSUs, 1+1 redundancy
Voltage	110/220 Vac	
Fan Modules	4 hot-swappable fan modules, N+1 redundancy	4 hot-swappable fan modules, N+1 redundancy
Operating Temperature	5°C ~ 40°C	5°C ~ 40°C
Dimensions (H x W x D)	86.1 x 447 x 790 mm	86.1 x 447 x 790 mm
Weight	27 kg	28 kg
Certification	CCC CQC RCM VCCI FCC&IC-SDoC CE-SDoC CB+NRTL, etc.	CCC CQC RCM VCCI FCC&IC-SDoC CE-SDoC CB+NRTL, etc.

# **▶** Smart I-V Curve Diagnosis

Smart I-V Curve Diagnosis is able to carry out online I-V curve analysis on entire strings with advanced diagnosis algorithm.

The scanning would help to find out and identify the strings with low performance or malfunction, which would help to achieve proactive maintenance, higher O&M efficiency and lower operation cost.





#### Smart

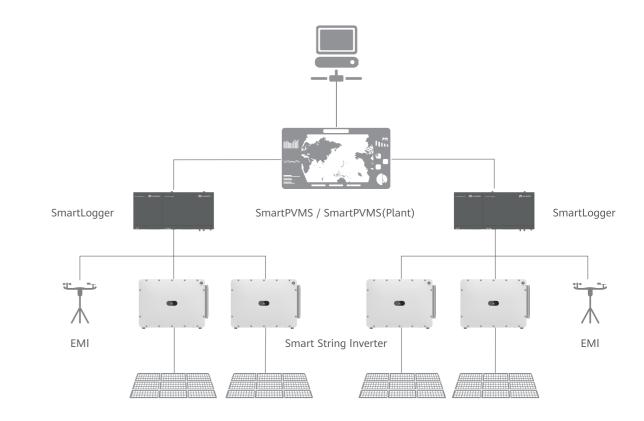
- Support plant-level, array-level and inverter-level analysis and diagnosis
- Support scheduled scanning and proactive presentation of reports
- Automatically identify different failure types and provide recovery suggestion
- Support export of ROI estimation reports and assist in accurate O&M



#### Efficient

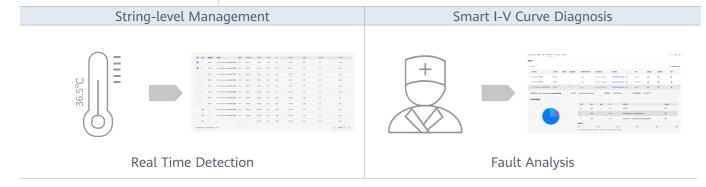
- One-click scanning without onsite experts or equipment
- SCompleting online I-V curve scanning on all strings
- Identification rate, recurrence rate, cause Identification accuracy > 95%

#### Network Structure

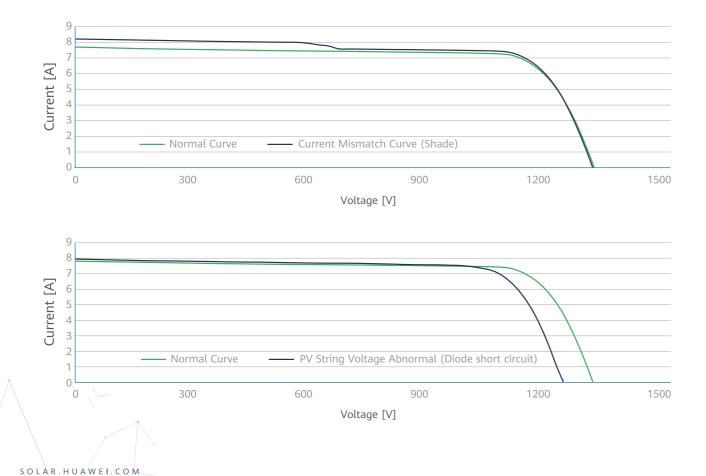


# **▶** Smart I-V Curve Diagnosis

Technical Specifications	
Smart String Inverter	SUN2000-330KTL-H1, SUN2000-330KTL-H2, SUN2000-215KTL-H0
Data Logger	SmartLogger3000
SmartPVMS, SmartPVMS(Plant)	SmartPVMS, SmartPVMS(Plant)
Sampling Points per I-V Curve	128
Voltage Accuracy	0.5%rdg. + 1dgt. (rdg.>5, dgt.= 0.3)
Current Accuracy	0.5%rdg. + 2dgt. (rdg.>0.3, dgt.= 0.006)
	Smart I-V Curve Diagnosis Verified by TÜV

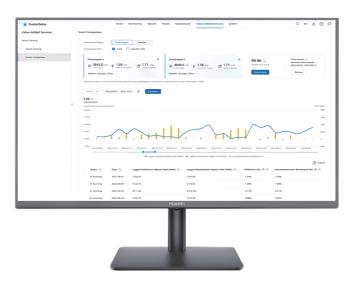


#### String I-V Curve Comparison



# **▶** Smart Tracker Control Algorithm (SDS)

Smart Tracker Control Algorithm (SDS) is a valuable software based and closed-loop control. By using the SDS, together with Smart PVMS, SmartLogger and SUN2000 inverters, the trackers' angle can be automatically controlled and optimally adjusted to achieve higher yields. The yields can be increased by ~1% especially in complex terrain and weather scenarios, and it will bring higher revenue to the customer.



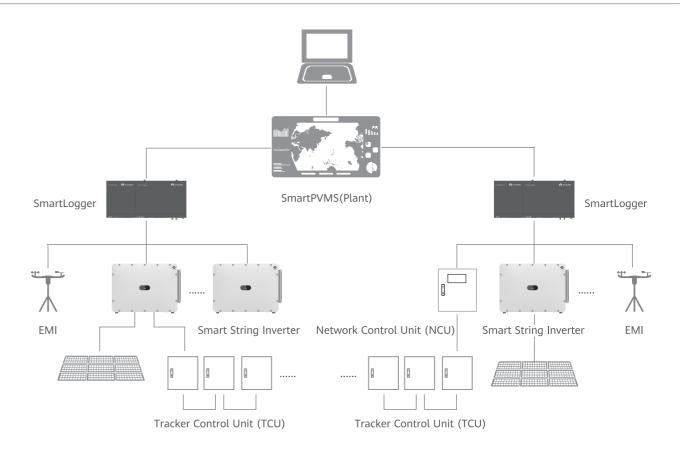


System level closed-loop control to keep the system operating in the state of maximum irradiation and optimal power output of PV module



Automatic tracking angle optimization and control by using AI technology, automatic sensing of shading and weather information. No need for additional sensing equipment, free from manual and empirical dependence

#### **Network Structure**



# **▶** Smart Tracker Control Algorithm (SDS)

Technical Specifications	
Smart String Inverter	SUN2000-215KTL-H0, SUN2000-215KTL-H3
Data Logger	SmartLogger3000 series
Management System	SmartPVMS(Plant)
Tracking Angle Accuracy	0.5°

Smart Tracker Control Algorithm Verified by TÜV

#### Comparison of Tracker Algorithms and Angles

SOLAR.HUAWEI.COM

# Reverse-tracking stage in the morning and at dusk Shadows in the front and back rows of modules, without consideration of complex terrain. The SDS algorithm allows trackers to find the optimal angle for each, effectively avoiding shadow occlusions. Traditional Tracker Algorithm Smart Tracker Control Algorithm

# Tracking the angle of the sun is not the best way to get maximum irradiation when without consideration that direct sunlight becomes diffuse reflection in this scenario. Trackers are flattened at a small angle to receive more diffuse light, so as to get maximum irradiation. Trackers are flattened at a small angle to receive more diffuse light, so as to get maximum irradiation.

# **▶** Success Stories

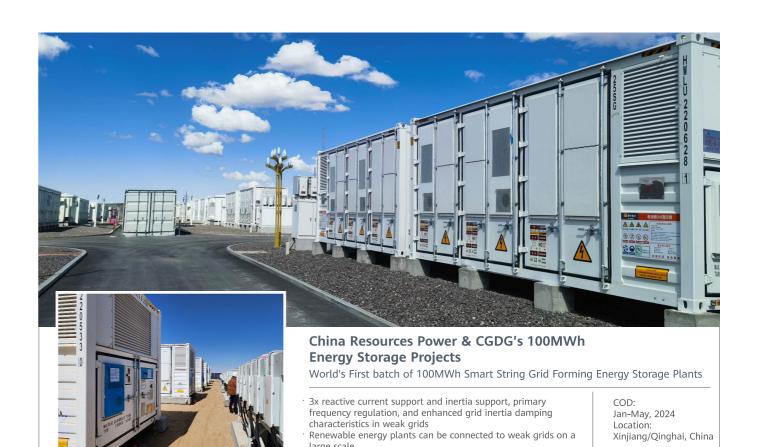




# **▶** Success Stories









31/32

S O L A R. H U A W E I. C O M

# **▶** Success Stories

