제　　목 : 2025년 10월 18일, 8차 보고서
작 성 자 : 이종주
작성일자 : 2025년 08월 25일
수정일자 : 2025년 10월 18일

제 조 사 : Sungrow
제 품 명 : SG110CX, SG1250UD, SG1500

그림 1 제품 사진 (SG110CX)

그림 2 제품 사진 (SG1250UD, SG1500UD)

1. 일반 사항

표 1 기술 사양

Type designation	SG110CX	SG1250UD	SG1500UD
Input (DC)			
Max. PV input voltage	1100 V	1100 V	
Min. PV input voltage / Startup input voltage	200 V / 250 V	520 V / 540 V	580 V / 600 V
MPP voltage range for nominal power	550V – 850 V	520 – 850 V	580 – 850 V
No. of independent MPP inputs	9	2	
No. of DC inputs	2	12 (Optional: 12 – 18)	14 (Optional: 12 – 18)
Max. PV input current	26 A * 9	2 * 1356 A	2 * 1448 A
Max. DC short-circuit current	40 A * 9	3200 A	
Output (AC)			
AC output power	110 kVA @ 45 ℃ / 100 kVA @ 50 ℃	1375 kVA @ 45 ˚C / 1250 kVA @ 50 ˚C	1650 kVA @ 45 ˚C / 1500 kVA @ 50 ˚C
Max. AC output current	158.8 A	2222 A	2381 A
Nominal AC voltage	3 / N / PE, 400 V	360 V	400 V
AC voltage range	320 – 460 V	288 – 414 V	320 – 460 V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz	
THD	< 3 % (at nominal power)	< 3 % (at nominal power)	
DC current injection	< 0.5 % In	< 0.5 % of nominal output current	
Power factor at nominal power	> 0.99	> 0.99	
Adjustable power factor	0.8 leading – 0.8 lagging	0.8 leading – 0.8 lagging	
Feed-in phases / Connection phases	3 / 3	3 / 3	
Efficiency			
Max. efficiency	98.70%	99.00%	
Euro. efficiency	98.50%	98.70%	

Protection		
DC input protection	Yes	Circuit breaker
AC output protection	Yes	Circuit breaker
Overvoltage protection	DC Type II / AC Type II	DC Type II / AC Type II
Grid monitoring / Ground fault monitoring	Yes / Yes	Yes / Yes
Insulation monitoring		Yes
Overheat protection		Yes
Anti-PID function	Available (PID recovery function)	Yes
General Data		
Dimensions (W*H*D)	1051*660*362.5 mm	2150 * 2120 * 850 mm
Weight	89 kg	1900 kg
Isolation method	Transformerless	Transformerless
Degree of protection	IP66	IP65
Auxilury power supply	-	220 Vac, 2 kVA
Night power consumption	< 2W	< 40 W
Operating ambient temperature range	-30 to 60 ℃ (> 50 ℃ derating)	-35 to 60 ℃ (> 50 ℃ derating)
Allowable relative humidity range (non-condensing)	0 – 100 %	0 – 95 %
Cooling method	Smart forced air cooling	Temperature controlled forced air cooling
Max. operating altitude	4000 m (> 3000 m derating)	4500 m (> 3000 m derating)
Display	LED, Bluetooth+APP	Touch screen
Communication	RS485 / Optional: Wi-Fi, Ethernet	RS485, Ethernet
Compliance	IEC 62109, IEC 61727, IEC 62116, IEC 60068, IEC 61683, VDE-AR-N 4110:2018, VDE-AR-N 4120:2018, IEC 61000-6-3, EN 50549, AS/NZS 4777.2:2015, CEI 0-21, VDE 0126-1-1/A1 VFR 2014, UTE C15-712-1:2013, DEWA	IEC62109-1, IEC62109-2, IEC61727, IEC62116
Grid support	Q at night function, LVRT, HVRT,active & reactive power control and power ramp rate control	LVRT, HVRT, active & reactive power control and power ramp rate control

2. SG110CX - Multi-MPPT String Inverter for 1000 Vdc System

표 2 적용대상 모델 사양

Model series	Model	Code	MPPT	String/ MPPT	Power limited range (0.1%)	Power limited range (0.1kW)	Reactive power limited range (0.1kvar)
SG25 ~110CX	SG110CX	0x2C06	9	2	0-1100	0-1100	-660~660
SG25 ~125CX -P2	SG110CX-P2	0x2C40	12	2	0-1100	0-1100	-660~660

2.1. 동작 정보 변수

표 3 Running Information Variable (RO (read-only) register, Support Modbus Command 0x04)

No.	Name	Register	Data type	Data range	Unit/Ratio	Remarks
1	Protocol No.	4950 - 4951	U32			
2	Protocol version	4952 - 4953	U32			
3	ARM software version	4954 - 4968	UTF-8			
4	DSP software version	4969 - 4983	UTF-8			
5	Reserved	4984 - 4989	U16			
6	SN	4990 - 4999	UTF-8			Data type : UTF-8
7	Device type code	5000	U16			See Appendix 1 Adaptive Inverter Models.
8	Nominal active power	5001	U16		0.1kW	
9	Output type	5002	U16	0-two phase; 1-3P4L; 2-3P3L		0 : Only 5019、5022 address value is vaild ; 1 : 5019-5021addr essis"phasexvoltag e" 2 : 5019-5021addr essis"x-xlinevoltage "
10	Daily power yields	5003	U16		0.1kWh	
11	Total power yields	5004 - 5005	U32		kWh	Compared with "Total power yields" 5144–5145, only the

						resolution is different.
12	Total running time	5006 - 5007	U32		h	
13	Internal temperature	5008	S16		0.1℃	
14	Total apparent power	5009 - 5010	U32		VA	
15	MPPT 1 voltage	5011	U16		0.1V	See Appendix 1 Adaptive Inverter Models.
16	MPPT 1 current	5012	U16		0.1A	
17	MPPT 2 voltage	5013	U16		0.1V	
18	MPPT 2 current	5014	U16		0.1A	
19	MPPT 3 voltage	5015	U16		0.1V	
20	MPPT 3 current	5016	U16		0.1A	
21	Total DC power	5017 - 5018	U32		W	
22	A-B line voltage/phase A voltage	5019	U16		0.1V	Output type (address: 5002) is 1:uploadphasevoltage; 2:uploadlinevoltageExceptSG5.5RS-JP
23	B-C line Voltage/phase B voltage	5020	U16		0.1V	
24	C-A line Voltage/phase C voltage	5021	U16		0.1V	
25	Phase A current	5022	U16		0.1A	Except SG5.5RS-JP
26	Phase B current	5023	U16		0.1A	
27	Phase C current	5024	U16		0.1A	
28	Reserved	5025 - 5030	U32			
29	Total active power	5031 - 5032	S32		W	
30	Total reactive power	5033 - 5034	S32		Var	
31	Power factor	5035	S16		0.001	> 0 means leading <0meanslagging
32	Grid frequency	5036	U16		0.1Hz	Compared with "Grid frequency" 5148, only the resolution is different.
33	Reserved	5037	U16			
34	Work state 1	5038	U16	See Appendix WorkingState 1.		Data of address 5039 - 5045 are additional
	Fault/Alarm time: Year	5039	U16			Fault/Alarm time and code (5039 - 5045) are valid only when the device work state is fault (0x5500) or alarm (0x9100) Except SG5.5RS-JP
	Fault/Alarm time: Month	5040	U16			
	Fault/Alarm time: Day	5041	U16			
	Fault/Alarm time: Hour	5042	U16			
	Fault/Alarm time: Minute	5043	U16			

	Fault/Alarm time: Second	5044	U16			
	Fault/Alarm code 1	5045	U16	See Appendix Device Fault Code.		
	Reserved	5046 - 5048	U16			
35	Nominal reactive power	5049	U16		0.1kVar	
36	Reserved	5050 - 5070	U32			
37	Array insulation resistance	5071	U16	1 - 20000	1kΩ	
38	Reserved	5072-5076	U16			
39	Active Power Regulation Setpoint	5077 - 5078	U32		1W	Except SG5.5RS-JP
40	Reactive Power Regulation Setpoint	5079 - 5080	S32		1Var	Except SG5.5RS-JP
41	Work state 2	5081 - 5082	U32	See Appendix WorkingState 2.		Except SG5.5RS-JP
42	Meter power	5083~5084	S32		1W	Only supported in the scenario where a smart energy meter is connected to the inverter for feed-in limitation. Onlyvalidformodels : SG2.0-10RS,SG3.0-25RT, SG3.0-25RT-P2
43	Reserved	5085~5090	S32			
44	Load power	5091~5092	S32		1W	
45	Reserved	5093 - 5112	S32			
46	Daily running time	5113	U16		min	Except SG5.5RS-JP
47	Present country	5114	U16			
48	MPPT 4 voltage	5115	U16		0.1V	Except SG5.5RS-JP See Appendix 1 Adaptive Inverter Models.
49	MPPT 4 current	5116	U16		0.1A	
50	MPPT 5 voltage	5117	U16		0.1V	
51	MPPT 5 current	5118	U16		0.1A	
52	MPPT 6 voltage	5119	U16		0.1V	
53	MPPT 6 current	5120	U16		0.1A	
54	MPPT 7 voltage	5121	U16		0.1V	
55	MPPT 7 current	5122	U16		0.1A	
56	MPPT 8 voltage	5123	U16		0.1V	
57	MPPT 8 current	5124	U16		0.1A	
58	Power factor Setpoint	5125	S16		0.001	Except SG5.5RS-JP
59	Reserved	5126 - 5127	U16			

60	Monthly power yields	5128 - 5129	U32		0.1kWh	Except SG5.5RS-JP
61	MPPT 9 voltage	5130	U16		0.1V	Except SG5.5RS-JP See Appendix 1 Adaptive Inverter Models.
62	MPPT 9 current	5131	U16		0.1A	
63	MPPT 10 voltage	5132	U16		0.1V	
64	MPPT 10 current	5133	U16		0.1A	
65	MPPT 11 voltage	5134	U16		0.1V	
66	MPPT 11 current	5135	U16		0.1A	
67	MPPT 12 voltage	5136	U16		0.1V	
68	MPPT 12 current	5137	U16		0.1A	
69	Reserved	5138 - 5143	U16			
70	Total power yields	5144 - 5145	U32		0.1kWh	Except SG5.5RS-JP
71	Negative voltage to the ground	5146	S16	-30000	0.1V	Except SG5.5RS-JP
72	Bus voltage	5147	U16	0 - 15000	0.1V	
73	Grid frequency	5148	U16		0.01Hz	
74	Reserved	5149	U16			
75	PID work state	5150	U16	2: PID Recover Operation 4:Anti-PIDOperation8:PID Abnormity		Refer to inverter user manual to check if it has the PID function
76	PID alarm code	5151	U16	See Appendix 5 PID Alarm Code		
77	Reserved	5152-5193	U16			

표 4 PV String current information

No.	Name	Register	Data type	Data range	Unit/Ratio	Remarks
1	String 1 current	7013	U16		0.01A	Before checking the current information of one input, please make sure the hardware supports this function. If parameter can be viewed in the LCD panel or APP software (default menu-running information), the corresponding address is
2	String 2 current	7014	U16		0.01A	
3	String 3 current	7015	U16		0.01A	
4	String 4 current	7016	U16		0.01A	
5	String 5 current	7017	U16		0.01A	
6	String 6 current	7018	U16		0.01A	
7	String 7 current	7019	U16		0.01A	
8	String 8 current	7020	U16		0.01A	
9	String 9 current	7021	U16		0.01A	
10	String 10 current	7022	U16		0.01A	
11	String 11 current	7023	U16		0.01A	
12	String 12 current	7024	U16		0.01A	

13	String 13 current	7025	U16		0.01A	readable. Except SG5.5RS-JP
14	String 14 current	7026	U16		0.01A	
15	String 15 current	7027	U16		0.01A	
16	String 16 current	7028	U16		0.01A	
17	String 17 current	7029	U16		0.01A	
18	String 18 current	7030	U16		0.01A	
19	String 19 current	7031	U16		0.01A	
20	String 20 current	7032	U16		0.01A	
21	String 21 current	7033	U16		0.01A	
22	String 22 current	7034	U16		0.01A	
23	String 23 current	7035	U16		0.01A	
24	String 24 current	7036	U16		0.01A	

2.2. 파라미터 설정 정의

표 5 Parameter Setting Definition (RW (Read-Write) Register, Support Modbus Command 0x03/0x06/0x10)

No.	Name	Register	Data type	Data range	Unit/Ratio	Remarks
1	Clock: Year	5000	U16	2000 -		
2	Clock: Month	5001	U16	1-12		
3	Cock: Day	5002	U16	1-31		Receive time synchronization setting of the monitoring system
4	Clock: Hour	5003	U16	0-23		
5	Clock: Minute	5004	U16	0-59		
6	Clock: Second	5005	U16	0-59		
7	Start/Stop	5006	U16	0xCF (Start) 0xCE(Stop)		
8	Power limitation switch	5007	U16	0xAA: Enable; 0x55:Disable		Available when the power limitation switch (5007) is
9	Power limitation setting	5008	U16	If the inverter supports ActivePowerOverload(5020)andenabled,setrangeis0-1000, elseseeAppendix1AdaptiveInverterModels.	0.10%	enabled
10	Reserved	5009-5018	U16			
11	PF setting	5019	S16	-1000 - -800 800-1000	0.001	Available when the reactive power adjustment switch (5036) is set to power factor setting valid

						(0xA1) >0meansleading <0meanslagging
12	Active Power Overload	5020	U16	0xAA: Enable; 0x55:Disable		Enable: The inverter dispatches based on the maximum apparent power. Disable: The inverter dispatches based on the rated power. ExceptSG5.5RS-JP
13	Reserved	5021 - 5032	U16			
14	Reactive Power Ratio at Night	5033	S16	0 - 1000 0--1000	0.10%	Available when the reactive power generation at night (5035) is enabled Except SG5.5RS-JP
15	Local / remote control	5034	U16	1-Remote, 2-Local 3-Local&remote		1-Remote: Can only set via this protocol 2-Local:Canonlysetviaapp 3-Local&remote:Cansetviathisprotocolorapp,thelatestsettingwilltakeeffect. ExceptSG5.5RS-JP
16	Night SVG Switch	5035	U16	0xAA: Enable; 0x55:Disable		Except SG5.5RS-JP
17	Reactive power adjustment mode	5036	U16	0x55: OFF, power factor returns to 1, reactive power percentage returns to 0; 0xA1:powerfactorsettingvalid,Reactivepowerpercentagereturnsto0;0xA2:Reactivepowerpercentagesettingvalid,powerfactorreturnsto1; 0xA3:EnableQ(P)curveconfiguration;0xA4:EnableQ(U)curveconfiguration		
18	Reactive power percentage setting	5037	S16	0 - 1000 0--1000	0.10%	Available when the reactive power adjustment switch (5036) is set to Reactive power setting valid (0xA2)percentage
19	Reserved	5038				
20	Power limitation adjustment	5039	U16	See Appendix Adaptive Inverter Models.	0.1kW	Available when the power limitation switch (5007) is enabled. ExceptSG5.5RS-JP
21	Reactive power adjustment	5040	S16	See Appendix Adaptive Inverter Models.	0.1kVar	Available when the reactive power adjustment switch (5036) is set to Reactive power percentage setting valid (0xA2). ExceptSG5.5RS-JP

22	PID Recovery	5041	U16	0xAA: Enable; 0x55:Disable		Except SG5.5RS-JP
23	Anti-PID	5042	U16	0xAA: Enable; 0x55:Disable		Only valid for SG136TX
24	Reserved	5043 - 5047	U16	See Appendix Q(P)Curve1. Thereactivepoweradjustmentswitch(5036)issettoEnableQ(P)curve(0xA3)		
25	Q(P) curve 1	5048-5077			Only valid for maintenance models	
26	Q(U) curve 1	5078-5115	See Appendix Q(U) Curve 1. Thereactivepoweradjustmentswitch(5036)issettoEnableQ(U)curve(0xA4)		Only valid for maintenance models	
27	Q(P) curve 2	5116-5134	See Appendix Q(P) Curve 2. Thereactivepoweradjustmentswitch(5036)issettoEnableQ(P)curve(0xA3)		Except SG5.5RS-JP	
28	Q(U) curve 2	5135-5154	See Appendix Q(U) Curve 2. Thereactivepoweradjustmentswitch(5036)issettoEnableQ(U)curve(0xA4)		Except SG5.5RS-JP	
비고 및 검토 사항						
Note 1: The parameter settings for night SVG and PID will be invalid if the inverter does not support the functions. Please refer to the corresponding user manual to check if it supports the functions. Note 2: The inverter models on sale support Q(P) curve 2 and Q(U) curve 2 by default, and the inverter models phased out now support Q(P) curve 1 and Q(U) curve 1.						

2.3. Active Power Regulation

표 6 Active Power Regulation Parameters

No.	Name	Register	Data type	Data range	Unit/Ratio	Remarks
1	Power limitation switch	5007	U16	0xAA: Enable 0x55:Disable		Available when the power limitation switch (5007) is enabled.

2	Power limitation setting	5008	U16	If the inverter supports Active Power Overload (5020) and it is enabled, the set range is 0-1000, else see Appendix Adaptive Inverter Models.	0.10%	
3	Active Power Overload	5020	U16	0xAA: Enable 0x55: Disable		Enable: The inverter dispatches based on the maximum apparent power. Disable:Theinverter dispatchesbasedon theratedpower.
4	Power limitation adjustment	5039	U16	See Appendix Adaptive Inverter Models.	0.1kW	Available when the power limitation switch (5007) is enabled.

2.4. Reactive Power Regulation

표 7 Reactive Power Regulation Parameters

No.	Name	Register	Data type	Data range	Unit/Ratio	Remarks
1	PF setting	5019	S16	-1000 - -800 800-1000	0.001	Available when the reactive power adjustment switch (5036) is set to power factor setting valid (0xA1) >0meansleading <0meanslagging
2	Reactive power adjustment mode	5036	U16	0x55: OFF, power factor returns to 1, reactive power percentage returns to 0; 0xA1:powerfactorsetting valid,Reactivepowerpercentagereturnsto0; 0xA2:Reactivepowerpercentagesettingvalid,powerfactorreturnsto1; 0xA3:EnableQ(P)curveconfiguration; 0xA4:EnableQ(U)curveconfiguration		

3	Reactive power percentage setting	5037	S16	0 - 1000 0--1000	0.10%	Available when the reactive power adjustment switch (5036) is set to Reactive power percentage setting valid (0xA2)
4	Reactive power adjustment	5040	S16	See Appendix 1 Adaptive Inverter Models.	0.1kVar	Available when the reactive power adjustment switch (5036) is set to Reactive power percentage setting valid (0xA2)
5	Q(P) curve 1	5048-5077		See Appendix Q(P) Curve 1. Thereactivepoweradjustmentswitch(5036)issettoEnableQ(P)curve(0xA3)		Valid for maintenance models
6	Q(U) curve 1	5078-5115		See Appendix Q(U) Curve 1. Thereactivepoweradjustmentswitch(5036)issettoEnableQ(U)curve(0xA4)		Valid for maintenance models
7	Q(P) curve 2	5116-5134		See Appendix Q(P) Curve 2. Thereactivepoweradjustmentswitch(5036)issettoEnableQ(P)curve(0xA3)		
8	Q(U) curve 2	5135-5154		See Appendix Q(U) Curve 2. Thereactivepoweradjustmentswitch(5036)issettoEnableQ(U)curve(0xA4)		

2.5. Appendix – Working State

표 8 Working State 1 (Register 5038)

State	**Value read by register 5038**	**Paraphrase**	**Grid-connected power generation**
Run	0x0	After being energized, inverter tracks the PV arrays' maximum power point (MPP) and converts the DC power into AC power. This is the normal operation mode.	Yes
Stop	0x8000	Inverter is stopped.	No
Key stop	0x1300	Inverter will stop operation by manually "stop" via app. In this way, inverter internal DSP stops. To restart the inverter, manually start via app.	No
Emergency Stop	0x1500	When the dry contact signal of the inverter is triggered by external device, the inverter performs an emergency shutdown and the inverter is in stop state. This function is supported only when the inverter has dry contact terminal in	No

		hardware.	
Standby	0x1400	Inverter enters standby mode when DC side input is insufficient. In this mode inverter will wait within the standby duration.	No
Initial standby	0x1200	The inverter is in the initial power-on standby state.	No
Starting	0x1600	The inverter is initializing and synchronizing with the grid	No
Alarm run	0x9100	Warning information is detected.	Yes
Derating run	0x8100	The inverter derates actively due to environmental factors such as temperature or altitude.	Yes
Dispatch run	0x8200	The inverter runs according to the scheduling instructions received from the monitoring background.	Yes
Fault	0x5500	If a fault occurs, inverter will automatically stop operation, and disconnect the AC relay. The fault information will be displayed in the app. Once the fault is removed in recovery time, inverter will automatically resume running.	No
Communicate fault	0x2500	The internal communication between the ARM and DSP of the inverter fails, and the ARM cannot obtain the status of the DSP running information.	Unconfirmed
Uninitialized	0x1111	The inverter is not initialized.	No

표 9 Working State 2 (Register 5081-5082)

State	**Corresponding Bit in register 5081-5082**	**Notes**
Run	0	Total run state bit BIT17
Stop	1	
Initial standby	2	
Key stop	3	
Standby	4	
Emergency Stop	5	
Starting	6	
Fault	9	Total fault state bit BIT18
Alarm run	10	Total run state bit BIT17
Derating run	11	Total run state bit BIT17
Dispatch run	12	Total run state bit BIT17
Communicate fault	13	Total fault state bit BIT18
Total run bit	17	Device is grid-connected running
Total fault bit	18	Device is in fault stop state

2.6. Appendix – Device Fault Code

표 10 Fault codes

Fault code	Fault name
2, 3, 14, 15	Grid Overvoltage
4, 5	Grid Undervoltage
8	Grid Overfrequency
9	Grid Underfrequency
10	Grid Power Outage
12	Excess Leakage Current
13	Grid Abnormal
17	Grid Voltage Imbalance
28, 29, 208, 448–479	PV Reserve Connection Fault
532–547, 564–579	PV Reverse Connection Alarm
548–563, 580–595	PV Abnormal Alarm
37	Excessively High Ambient Temperature
43	Excessively Low Ambient Temperature
39	Low System Insulation Resistance
106	Grounding Cable Fault
88	Electric Arc Fault
84	Reverse Connection Alarm of the Meter/CT
514	Meter Communication Abnormal Alarm
323	Grid Confrontation
75	Inverter Parallel Communication Alarm
7, 11, 16,19–25, 30–34, 36, 38, 40–42, 44–50, 52–58,60–68, 85, 87, 92, 93,100–105, 107–	System Fault
114, 116–124, 200–211, 248–255, 300–322, 324–326,401–412, 600–603, 605, 608, 612, 616,	
620, 622–624, 800, 802, 804, 807, 1096–1122	
59, 70–72, 74, 76, 82, 83, 89, 77–81, 216–218, 220–231, 432–434, 500–513, 515–518, 900,	System Alarm
901, 910,911 , 635, 636, 637,638, 86, 396-397, 1124-1127	
264–283	MPPT Reverse Connection
332–363	Boost Capacitor Overvoltage Alarm
364–395	Boost Capacitor Overvoltage Fault
1548–1579	String Current Reflux
1600-1611	PV Grounding Fault
1616	System Hardware Fault

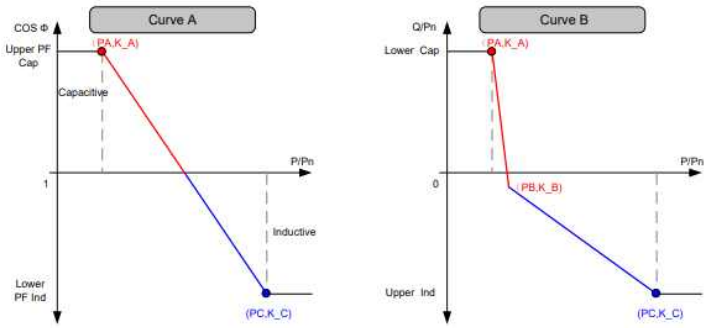
2.7. Appendix – PID Alarm Code

표 11 PID Alarm Code

Fault code	Fault name
432	PID impedance abnormity
433	PID function abnormity
434	PID overvoltage/overcurrent protection

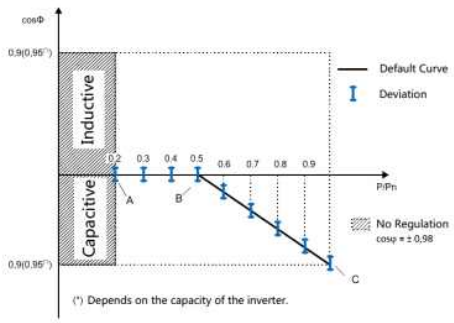
2.8. Appendix – Q(P) Curve 1

5048~5064, Not Italy curve



Curve	5048	U16	0 - 1, 0 Curve A, 1 Curve B		Curve A:PA <PC Curve B: (PA≤PB≤PC, but PA!=PC) and (KA≤KB≤KC or KA≥KB≥KC,but KA!=KC)
PB	5049	U16	200-1000, Curve B is valid	0.1%	
KB	5050	S16	-500-500 Curve B is valid	0.001	
PA	5051	U16	Curve A:0~500 Curve B:100-1000	0.1%	
PC	5052	U16	Curve A:500~1000 Curve B:200-1000	0.1%	
KA	5053	S16	Curve A:900~1000 Curve B:-500-500	0.001	
KC	5054	S16	Curve A:900~1000 Curve B:-500-500	0.001	
Reserved	5055-5064				

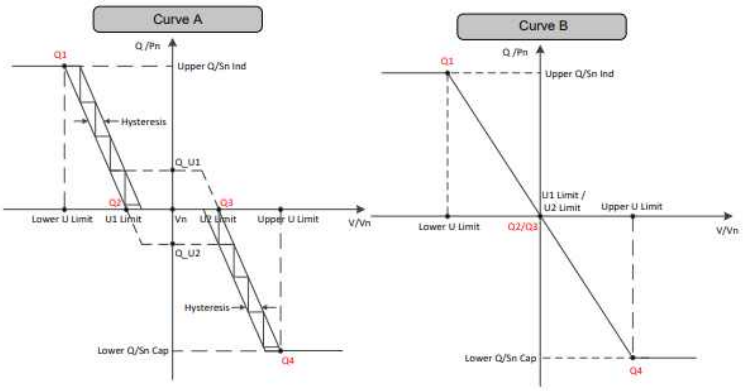
5065~5077, Italy curve



powerA	5065	U16	200~1000	0.1%	powerA<=powerB<powerC
powerB	5066	U16	200~1000	0.1%	
powerC	5067	U16	200~1000	0.1%	
PF_max	5068	U16	900~1000	0.001	
Uin	5069	U16	1000~1100	0.1%	Uin>Uout
Uout	5070	U16	900~1000	0.1%	
Reserved	5071~5077	U16			

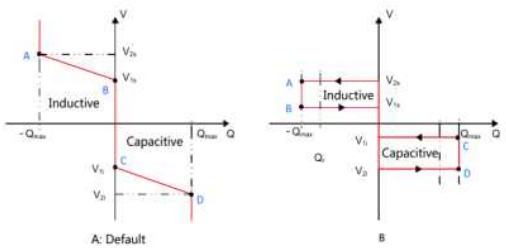
2.9. Appendix – Q(U) Curve 1

5078~5097, Not Italy curve



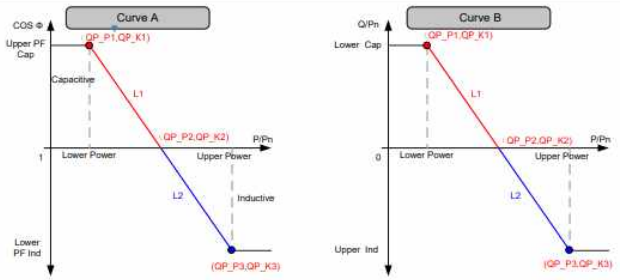
Curve	5078	U16	0-1, 0 Curve A, 1 Curve B		Curve A: (U1Limit+Hysteresis<U2 Limit-Hysteresis) and (-Upper Q/Sn<=Q_U1<= Lower Q/Sn) and (-Upper Q/Sn<=Q_U2<= Lower Q/Sn) Curve: U1 Limit == U2 Limit
Q_U1	5079	S16	-500-500, Curve A is valid	0.1%	
Q_U2	5080	S16	-500-500, Curve A is valid	0.1%	
Lower ULimit	5081	U16	800~1000	0.1%	
Upper U Limit	5082	U16	1000~1200	0.1%	
U1 Limit	5083	U16	900~1100	0.1%	
U2 Limit	5084	U16	900~1100	0.1%	
Hysteresis	5085	U16	0~50, Curve A is valid	0.1%	
Lower Q/Sn	5086	U16	(Ind) 0~ 500	0.1%	
Upper Q/Sn	5087	U16	(Cap) 0~500	0.1%	
Reserved	5088-5097				

5098~5115, Italy curve



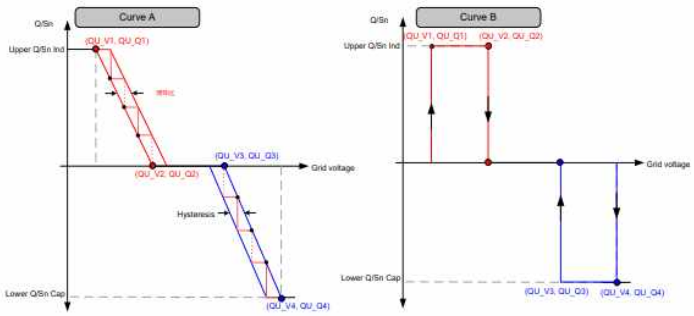
V1i	5098	U16	900~1100	0.1%	
V2i	5099	U16	900~1100	0.1%	V2i < V1i < V1s < V2s
V1s	5100	U16	900~1100	0.1%	
V2s	5101	U16	900~1100	0.1%	
Qmax	5102	U16	500~1000	0.001	
Pin	5103	U16	200~1000	0.1%	Pin > Pout
Pout	5104	U16	10~200	0.1%	
Curve	5105	U16	0-1, 0 Curve A, 1 Curve B		
Reserved	5106~5115				

2.10. Appendix – Q(P) Curve 2



Curve	5116	U16	0-1 0: Curve A 1: Curve B		1. QP_P1<= QP_P2< QP_P3 2.If QP_P1= QP_P2, QP_K1= QP_K2
QP_P1	5117	U16	100~1000	0.1%	QP_EnableMode: Enter and exit Q (P) mode conditions, 0xAA, unconditional entry and exit; 0x55, conditional entry and exit: the voltage is higher than QP_EnterVoltageRatio, the voltage is lower than UoutQP_ExitVoltageRatio, and the power is lower than QP_ExitPowerRatio
QP_P2	5118	U16	200~1000	0.1%	
QP_P3	5119	U16	200~1000	0.1%	
QP_K1	5120	S16	Curve A: 800~1000 Curve B: -600-600	0.001	
QP_K2	5121	S16	Curve A: 800~1000 Curve B: -600-600	0.001	
QP_K3	5122	S16	Curve A: 800~1000 Curve B: -600-600	0.001	
QP_EnterVoltageRatio	5123	U16	1000~1100	0.1%	
QP_ExitVoltageRatio	5124	U16	900~1000	0.1%	
QP_ExitPowerRatio	5125	U16	10-200	0.1%	
QP_EnableMode	5126	U16	0xAA Yes 0x55 No		
Reserved	5127-5134	U16			

2.11. Appendix – Q(U) Curve 2



Q(U) Curve	5135	U16	0-1 0: Curve A; 1: Curve B		QU_V1≤QU_V2≤QU_V3≤QU_V4
Hysteresis Ratio	5136	U16	0~50	0.1%	QU_EnableMode: Enter and exit Q (U) mode conditions, 0xAA, unconditional entry and exit; 0x55, conditional entry and exit: the current power is higher than QU_EnterPower, and the current power is lower than QU_ExitPower. 0x5A, conditional entry PF is lower than QU_LimitPFValue
QU_V1	5137	U16	800~ 1000	0.1%	
QU_Q1	5138	S16	-600-0	0.1%	
QU_V2	5139	U16	800~1000	0.1%	
QU_Q2	5140	S16	-600-600	0.1%	
QU_V3	5141	U16	1000~1200	0.1%	
QU_Q3	5142	S16	-600-600	0.1%	
QU_V4	5143	U16	1000~1200	0.1%	
QU_Q4	5144	S16	0-600	0.1%	
QU_EnterPower	5145	U16	200-1000	0.1%	
QU_ExitPower	5146	U16	10-200	0.1%	
QU_EnableMode	5147	U16	0xAA Yes 0x55 No		
Reserved	5148~5154				

3. SG1250UD, SG1500 - Outdoor Inverter for 1000 Vdc System

참고:

SG1250UD-V11, SG1250UD-MV-V11, SG1500UD-V11, SG1500UD-MV-V11, SG1250UD-V21 및 SG1500UD-V21의 경우, unit 3과 unit 4의 다음 주소 및 상태가 유효하지 않음(invaild).

unit 3/4의 DC voltage/current(addr. 15088~15091), unit 3/4의 running data(addr. 15390~15629), unit 3/4의 start/stop(addr. 15024~15025); 그리고 bit 3, bit 4, bit 8, bit 9, bit 10의 통신 이상 상태가 유효하지 않음.

Data type:

- U16 16-bit unsigned integer, big-endian
- S16 16-bit signed integer, big-endian
- U32 32-bit unsigned integer; little-endian for double-word data. Big-endian for byte data
- U32 32-bit signed integer; little-endian for double-word data. Big-endian for byte data

3.1. Definition of running information variable address (Address type: 3X)

표 12 Total running Information

No.	Name	Address	Data type	Data range	Unit	Note
1	Device type code	15070	U16	SG1250UD/ SG1250UD-MV :0x015D SG1500UD/ SG1500UD-MV : 0 x 0 1 5 B SG2500UD: 0x3406 SG2500UD-M V : 0 x 3 4 0 7 SG3000UD: 0x340E SG3000UD-MV:0x340F		
2	Nominal output power	15071	U16	SG1250UD/ SG1250UD-MV : 1 2 5 0 k W SG1500UD/	0.1kW	

				SG1500UD-MV :1500kW SG2500UD/ SG2500UD-MV :2500kW SG3000UD/ SG3000UD-MV :3000kW		
3	Output type	15072	U16	2: 3P3L		
4	Daily power yields	15073~ 15074	U32		0.1kWh	
5	Monthly power yields	15075~ 15076	U32		kWh	
6	Total power yields	15077~ 15078	U32		kWh	
7	CO2 reduction	15079 ~15080	U32		Kg	
8	Daily grid-connection minutes	15081	U16	Indicatethegrid-connection time of the present day	min	
9	Total running time	15082 ~15083	U32		h	
10	DC voltage of unit 1	15084	U16		0.1V	
11	DC current of unit 1	15085	U16		0.1A	
12	DC voltage of unit 2	15086	U16		0.1V	
13	DC current of unit 2	15087	U16		0.1A	
14	DC voltage of unit 3	15088	U16		0.1V	
15	DC current of unit 3	15089	U16		0.1A	
16	DC voltage of unit 4	15090	U16		0.1V	
17	DC current of unit 4	15091	U16		0.1A	
18	Total DC power	15092 ~15093	U32		W	
19	A-B line voltage	15094	U16		0.1V	
20	B-C line voltage	15095	U16		0.1V	
21	C-A line voltage	15096	U16		0.1V	
22	Phase A current	15097	U16		0.1A	

23	Phase B current	15098	U16		0.1A	
24	Phase C current	15099	U16		0.1A	
25	Total active power	15100 ~15101	U32		W	
26	Total reactive power	15102 ~15103	S32		var	
27	Total apparent power	15104 ~15105	U32		VA	
28	Power factor	15106	S16		0.001	
29	Grid frequency	15107	U16		0.1Hz	
30	Nominal reactive output power	15108	U16	SG1250UD/SG1250UD-MV :825kVar SG1500UD/SG1500UD-MV :990kVar SG2500UD/SG2500UD-MV :1650kVar SG3000UD/SG3000UD-MV :1980kVar	0.1kvar	
31	Power limitation actual value feedback	15109 ~15110	U32		W	
32	Reactive power adjustment actual value feedback	15111 ~15112	S32		var	
33	Power factor feedback	15113	S16		0.001	
34	Transformer node state	15114	U16	Appendix 5		
35	Annual power yields	15115-15116	U16*2		kWh	
36	Work state of complete machine	15117-15118	U32	Appendix8		
37	Transformer oil temperature	15119	S16		0.1℃	
38	Reserved	15120 ~15149	U16*33			

표 13 Running data of unit 1

No.	Name	Address	Data type	Data range	Unit	Note
1	Daily power yields	15150~15151	U32		0.1kWh	
2	Monthly power yields	15152~15153	U32		kWh	
3	Total power yields	15154~15155	U32		kWh	
4	Daily grid-connection minutes	15156	U16	Indicatethegrid-connection time of the present day	min	
5	Total running time	15157~15158	U32		h	
6	Internal temp.	15159	S16		0.1℃	
7	DC voltage	15160	U16		0.1V	
8	DC current	15161	U16		0.1A	
9	Total DC power	15162~15163	U32		W	
10	A-B line voltage	15164	U16		0.1V	
11	B-C line voltage	15165	U16		0.1V	
12	C-A line voltage	15166	U16		0.1V	
13	Phase A current	15167	U16		0.1A	
14	Phase B current	15168	U16		0.1A	
15	Phase C current	15169	U16		0.1A	
16	Active power	15170~15171	U32		W	
17	Reactive power	15172~15173	S32		var	
18	Power factor	15174	S16		0.001	
19	Grid frequency	15175	U16		0.1Hz	
20	Inverter efficiency	15176	U16		0.1%	
21	Reserved	15177	U16			
22	State Time: Year	15178	U16			
23	State Time: Month	15179	U16			
24	State Time: Day	15180	U16			
25	State Time: Hour	15181	U16			
26	State Time: Minute	15182	U16			
27	State Time: Second	15183	U16			
28	Reserved	15184	U16			
29	Nominal reactive output power	15185	U16		0.1kvar	
30	Fault state 1	15186~15187	U32	RefertoAppendix1		
31	Fault state 2	15188~15189	U32	RefertoAppendix1		
32	Fault state 3	15190~15191	U32	RefertoAppendix1		

33	Fault state 4	15192~15193	U32	RefertoAppendix1		
34	Node state 1	15194~15195	U32	RefertoAppendix3		
35	Node state 2	15196~15197	U32	RefertoAppendix3		
36	Module Temp. 1	15198	S16		0.1℃	
37	Module Temp. 2	15199	S16		0.1℃	
38	Module Temp. 3	15200	S16		0.1℃	
39	Module Temp. 4	15201	S16		0.1℃	
40	Module Temp. 5	15202	S16		0.1℃	
41	Module Temp. 6	15203	S16		0.1℃	
42	Positive resistance to the ground	15204~15205	U32		0.01kΩ	
43	Negative resistance to the ground	15206~15207	U32		0.01kΩ	
44	Work state	15208~15209	U32	RefertoAppendix2		
45	Alarm run	15210~15211	U32	RefertoAppendix4		
46	Negative voltage to the ground	15212	S16		0.1V	
47	Annual power yields	15213~15214	U16*2		kWh	
48	CO2 reduction	15215~15216	U16*2		Kg	
49	Work state 1	15217	U16	RefertoAppendix9		XinJiang grid
50	Work state 2	15218	U16	RefertoAppendix10		NingXiagrid
51	Reserved	15219	U16			
52	Node state 3	15220~15221	U16*2	RefertoAppendix3		
53	Reserved	15222~15249	U16*28			
54	Current of 1st input	15250	S16		0.1A	
55	Current of 2nd input	15251	S16		0.1A	
56	Current of 3rd input	15252	S16		0.1A	
57	Current of 4th input	15253	S16		0.1A	
58	Current of 5th input	15254	S16		0.1A	
59	Current of 6th input	15255	S16		0.1A	
60	Current of 7th input	15256	S16		0.1A	
61	Current of 8th input	15257	S16		0.1A	
62	Current of 9th input	15258	S16		0.1A	

63	Current of 10th input	15259	S16		0.1A	
64	Current of 11th input	15260	S16		0.1A	
65	Current of 12th input	15261	S16		0.1A	
66	Reserved	15262~15269	U16*8			

표 14 Running data of unit 2

No.	Name	Address	Data type	Data range	Unit	Note
1	Daily power yields	15270~15271	U32		0.1kWh	
2	Monthly power yields	15272~15273	U32		kWh	
3	Total power yields	15274~15275	U32		kWh	
4	Daily grid-connection minutes	15276	U16	Indicatethegrid-connection time of the present day	min	
5	Total running time	15277~15278	U32		h	
6	Internal temp.	15279	S16		0.1℃	
7	DC voltage	15280	U16		0.1V	
8	DC current	15281	U16		0.1A	
9	Total DC power	15282~15283	U32		W	
10	A-B line voltage	15284	U16		0.1V	
11	B-C line voltage	15285	U16		0.1V	
12	C-A line voltage	15286	U16		0.1V	
13	Phase A current	15287	U16		0.1A	
14	Phase B current	15288	U16		0.1A	
15	Phase C current	15289	U16		0.1A	
16	Total active power	15290~15291	U32		W	
17	Reactive power	15292~15293	S32		var	
18	Power factor	15294	S16		0.001	
19	Grid frequency	15295	U16		0.1Hz	
20	Inverter efficiency	15296	U16		0.1%	
21	Reserved	15297	U16			
22	State Time: Year	15298	U16			
23	State Time: Month	15299	U16			
24	State Time: Day	15300	U16			
25	State Time: Hour	15301	U16			
26	State Time: Minute	15302	U16			
27	State Time: Second	15303	U16			

28	Reserved	15304	U16			
29	Nominal reactive output power	15305	U16		0.1kvar	
30	Fault state 1	15306~15307	U32	RefertoAppendix1		
31	Fault state 2	15308~15309	U32	RefertoAppendix1		
32	Fault state 3	15310~15311	U32	RefertoAppendix1		
33	Fault state 4	15312~15313	U32	RefertoAppendix1		
34	Node state 1	15314~15315	U32	RefertoAppendix3		
35	Node state 2	15316~15317	U32	RefertoAppendix3		
36	Module Temp. 1	15318	S16		0.1℃	
37	Module Temp. 2	15319	S16		0.1℃	
38	Module Temp. 3	15320	S16		0.1℃	
39	Module Temp. 4	15321	S16		0.1℃	
40	Module Temp. 5	15322	S16		0.1℃	
41	Module Temp. 6	15323	S16		0.1℃	
42	Positive resistance to the ground	15324~15325	U32		0.01kΩ	
43	Negative resistance to the ground	15326~15327	U32		0.01kΩ	
44	Work state	15328~15329	U32	RefertoAppendix2		
45	Alarm run	15330~15331	U32	RefertoAppendix4		
46	Negative voltage to the ground	15332	S16		0.1V	
47	Annual power yields	15333~15334	U16*2		kWh	
48	CO2 reduction	15335~15336	U16*2		Kg	
49	Work state 1	15337	U16	RefertoAppendix9		XinJiang grid
50	Work state 2	15338	U16	RefertoAppendix10		NingXiagrid
51	Reserved	15339	U16			
52	Node state 3	15340~15341	U16*2	RefertoAppendix3		
53	Reserved	15342~15369	U16*28			
54	Current of 1st input	15370	S16		0.1A	
55	Current of 2nd input	15371	S16		0.1A	
56	Current of 3rd input	15372	S16		0.1A	
57	Current of 4th input	15373	S16		0.1A	

58	Current of 5th input	15374	S16		0.1A	
59	Current of 6th input	15375	S16		0.1A	
60	Current of 7th input	15376	S16		0.1A	
61	Current of 8th input	15377	S16		0.1A	
62	Current of 9th input	15378	S16		0.1A	
63	Current of 10th input	15379	S16		0.1A	
64	Current of 11th input	15380	S16		0.1A	
65	Current of 12th input	15381	S16		0.1A	
66	Reserved	15382~15389	U16*8			

표 15 Running data of unit 3

No.	Name	Address	Data type	Data range	Unit	Note
1	Daily power yields	15390~15391	U32		0.1kWh	
2	Monthly power yields	15392~15393	U32		kWh	
3	Total power yields	15394~15395	U32		kWh	
4	Daily grid-connection minutes	15396	U16	Indicatethegrid-connection time of the present day	min	
5	Total running time	15397~15398	U32		h	
6	Internal temp.	15399	S16		0.1℃	
7	DC voltage	15400	U16		0.1V	
8	DC current	15401	U16		0.1A	
9	Total DC power	15402~15403	U32		W	
10	A-B line voltage	15404	U16		0.1V	
11	B-C line voltage	15405	U16		0.1V	
12	C-A line voltage	15406	U16		0.1V	
13	Phase A current	15407	U16		0.1A	
14	Phase B current	15408	U16		0.1A	
15	Phase C current	15409	U16		0.1A	
16	Total active power	15410~15411	U32		W	
17	Reactive power	15412~15413	S32		var	
18	Power factor	15414	S16		0.001	
19	Grid frequency	15415	U16		0.1Hz	

20	Inverter efficiency	15416	U16		0.1%	
21	Reserved	15417	U16			
22	State Time: Year	15418	U16			
23	State Time: Month	15419	U16			
24	State Time: Day	15420	U16			
25	State Time: Hour	15421	U16			
26	State Time: Minute	15422	U16			
27	State Time: Second	15423	U16			
28	Reserved	15424	U16			
29	Nominal reactive output power	15425	U16		0.1kvar	
30	Fault state 1	15426~15427	U32	RefertoAppendix1		
31	Fault state 2	15428~15429	U32	RefertoAppendix1		
32	Fault state 3	15430~15431	U32	RefertoAppendix1		
33	Fault state 4	15432~15433	U32	RefertoAppendix1		
34	Node state 1	15434~15435	U32	RefertoAppendix3		
35	Node state 2	15436~15437	U32	RefertoAppendix3		
36	Module Temp. 1	15438	S16		0.1℃	
37	Module Temp. 2	15439	S16		0.1℃	
38	Module Temp. 3	15440	S16		0.1℃	
39	Module Temp. 4	15441	S16		0.1℃	
40	Module Temp. 5	15442	S16		0.1℃	
41	Module Temp. 6	15443	S16		0.1℃	
42	Positive resistance to the ground	15444~15445	U32		0.01kΩ	
43	Negativeresistance to the ground	15446~15447	U32		0.01kΩ	
44	Work state	15448~15449	U32	RefertoAppendix2		
45	Alarm run	15450~15451	U32	RefertoAppendix4		
46	Negative voltage to the ground	15452	S16		0.1V	
47	Annual power yields	15453~15454	U16*2		kWh	
48	CO2 reduction	15455~15456	U16*2		Kg	
49	Work state 1	15457	U16	RefertoAppendix9		XinJiang grid
50	Work state 2	15458	U16	RefertoAppendix10		NingXiagrid
51	Reserved	15459	U16			
52	Node state 3	15460~15461	U16*2	RefertoAppendix3		

53	Reserved	15462~15489	U16*28			
54	Current of 1stinput	15490	S16		0.1A	
55	Current of 2ndinput	15491	S16		0.1A	
56	Current of 3rd input	15492	S16		0.1A	
57	Current of 4th input	15493	S16		0.1A	
58	Current of 5th input	15494	S16		0.1A	
59	Current of 6th input	15495	S16		0.1A	
60	Current of 7th input	15496	S16		0.1A	
61	Current of 8th input	15497	S16		0.1A	
62	Current of 9th input	15498	S16		0.1A	
63	Current of 10th input	15499	S16		0.1A	
64	Current of 11th input	15500	S16		0.1A	
65	Current of 12th input	15501	S16		0.1A	
66	Reserved	15502~15509	U16*8			

표 16 Running data of unit 4

No.	Name	Address	Data type	Data range	Unit	Note
1	Daily power yields	15510~15511	U32		0.1kWh	
2	Monthl ypower yields	15512~15513	U32		kWh	
3	Total power yields	15514~15515	U32		kWh	
4	Daily grid-connection minutes	15516	U16	Indicatethegrid-connection time of the present day	min	
5	Total running time	15517~15518	U32		h	
6	Internal temp.	15519	S16		0.1℃	
7	DC voltage	15520	U16		0.1V	
8	DC current	15521	U16		0.1A	
9	Total DC power	15522~15523	U32		W	
10	A-B linevoltage	15524	U16		0.1V	
11	B-C linevoltage	15525	U16		0.1V	
12	C-A linevoltage	15526	U16		0.1V	

13	Phase A current	15527	U16		0.1A	
14	Phase B current	15528	U16		0.1A	
15	Phase C current	15529	U16		0.1A	
16	Total active power	15530~15531	U32		W	
17	Reactive power	15532~15533	S32		var	
18	Power factor	15534	S16		0.001	
19	Grid frequency	15535	U16		0.1Hz	
20	Inverter efficiency	15536	U16		0.1%	
21	Reserved	15537	U16			
22	State Time: Year	15538	U16			
23	State Time: Month	15539	U16			
24	State Time: Day	15540	U16			
25	State Time: Hour	15541	U16			
26	State Time: Minute	15542	U16			
27	State Time: Second	15543	U16			
28	Reserved	15544	U16			
29	Nominal reactive output power	15545	U16		0.1kvar	
30	Fault state 1	15546~15547	U32	ReftoAppendix1		
31	Fault state 2	15548~15549	U32	ReftoAppendix1		
32	Fault state 3	15550~15551	U32	ReftoAppendix1		
33	Fault state 4	15552~15553	U32	ReftoAppendix1		
34	Node state 1	15554~15555	U32	ReftoAppendix3		
35	Node state 2	15556~15557	U32	ReftoAppendix3		
36	Module Temp. 1	15558	S16		0.1℃	
37	Module Temp. 2	15559	S16		0.1℃	
38	Module Temp. 3	15560	S16		0.1℃	
39	Module Temp. 4	15561	S16		0.1℃	
40	Module Temp. 5	15562	S16		0.1℃	
41	Module Temp. 6	15563	S16		0.1℃	
42	Positive resistance to the ground	15564~15565	U32		0.01kΩ	
43	Negative resistance to the ground	15566~15567	U32		0.01kΩ	
44	Work state	15568~15569	U32	ReftoAppendix2		
45	Alarm run	15570~15571	U32	ReftoAppendix4		
46	Negative voltage to the ground	15572	S16	-10000~10000	0.1V	
47	Annual power yields	15573~15574	U16*2		kWh	

48	CO2 reduction	15575~15576	U16*2		Kg	
49	Work state 1	15577	U16	RefertoAppendix9		XinJiang grid
50	Work state 2	15578	U16	RefertoAppendix10		NingXiagrid
51	Reserved	15579	U16			
52	Node state 3	15580~15581	U16*2	RefertoAppendix3		
53	Reserved	15582~15609	U16*28			
54	Current of 1st input	15610	S16		0.1A	
55	Current of 2ndinput	15611	S16		0.1A	
56	Current of 3rd input	15612	S16		0.1A	
57	Current of 4th input	15613	S16		0.1A	
58	Current of 5th input	15614	S16		0.1A	
59	Current of 6th input	15615	S16		0.1A	
60	Current of 7th input	15616	S16		0.1A	
61	Current of 8th input	15617	S16		0.1A	
62	Current of 9th input	15618	S16		0.1A	
63	Current of 10th input	15619	S16		0.1A	
64	Current of 11th input	15620	S16		0.1A	
65	Current of 12th input	15621	S16		0.1A	
66	Reserved	15622~15629	U16*8			

표 17 Running data of AC PMD1

No.	Name	Address	Data type	Data range	Unit	Note
1	Temperature	15650	S16		0.1℃	
2	Humidity	15651	U16		0.1%RH	
3	Reserved	15652	U16			
4	Alarmstate	15653	U16	RefertoAppendix6		
5	Nodestate	15654~15655	U32	RefertoAppendix7		
6	Reserved	15656	U16			

7	Reserved	15657	U16			
8	Phase A Voltage / AB line voltage	15658	U16		0.1V	
9	Phase B Voltage / BC line voltage	15659	U16		0.1V	
10	Reserved	15660	U16			
11	Internal power supply AB line voltage	15661	U16		0.1V	
12	Internal power supply BC line voltage	15662	U16		0.1V	
13	Internal power supply CA line voltage	15663	U16			
14	Phase A current	15664	U16		0.1A	
15	Phase B current	15665	U16		0.1A	
16	Phase C current	15666	U16		0.1A	

표 18 Running data of AC PMD2

No.	Name	Address	Data type	Data range	Unit	Note
1	Temperature	15667	S16		0.1℃	
2	Humidity	15668	U16		0.1% RH	
3	Reserved	15669	U16			
4	Alarmstate	15670	U16	ReftoAppendix6		
5	Nodestate	15671~15672	U32	ReftoAppendix7		
6	Reserved	15673	U16			
7	Reserved	15674	U16			
8	Phase A Voltage / AB line voltage	15675	U16		0.1V	
9	Phase B Voltage / BC line voltage	15676	U16		0.1V	
10	Reserved	15677	U16			
11	Internal power supply AB line voltage	15678	U16		0.1V	
12	Internal power supply BC	15679	U16		0.1V	

	line voltage					
13	Reserved	15680	U16			
14	Phase A current	15681	U16		0.1A	
15	Phase B current	15682	U16		0.1A	
16	Phase C current	15683	U16		0.1A	

3.2. Definition of parameter setting address (Address type: 4X)

표 19 Definition of parameter setting address (Address type: 4X)

No.	Name	Address	Data type	Data range	Unit	Note
1	System clock: year	15000	U16			
2	System clock: month	15001	U16			
3	System clock: day	15002	U16			
4	System clock: hour	15003	U16			
5	System clock: minute	15004	U16			
6	System clock: second	15005	U16			
7	Start/stop	15006	U16	0xCF(start)/0xCE (stop)/others(nooperation)		
8	Reserved	15007	U16			
9	Power limitation setting	15008	U16	0-1100;Default:1100	0.1%	
10	Reserved	15009	U16			
11	State setting	15010	U16	1-3;Default:3 1:Remotecontrol 2:Localcontrol 3:Remote/Localcontrol		
12	Reactive power adjustment switch	15011	U16	0x55: OFF, power factor returns to 1; and reactive powerpercentagereturnsto 0 0xA1:powerfactorsettingis valid, and reactive power percentage returns to 0 0xA2: Reactive power percentage setting and reactive power adjustment actual value setting valid, power factor returns to 1 0xA3—QU mode setting enabled 0xA4: automatic voltage regulationsettingenabled 0xA5—QP mode setting enabled Default:0xA1		
13	Reactive power	15012	U16	-1000~10	0.1%	

	percentage setting			00, Default:0		
14	Power factor setting	15013	S16	-1000~-800,800~1000	0.001	
15	Power limitation actual value setting	15014	U16	0-Nominal outputpower*1.1	0.1kW	
16	Reactive power adjustment actual value setting	15015	S16	-Nominal reactive output power-Nominal reactive outputpower	0.1kvar	
17	Active power dispatch rise rate	15016	U16	1-1000;Default:1000	0.01%/s	
18	Active power dispatch decline rate	15017	U16	1-1000;Default:1000	0.01%/s	
19	Reserved	15018	U16			
20	Reserved	15019	U16			
21	Stop delay time T	15020	U16	0-600;Default:60	1s	
22	Stop slope L	15021	U16	0-1000;Default:1000	0.1%/s	
23	Inversion unit 1 start/stop	15022	U16	0xCF(start)/0xCE (stop)/others(nooperation)		
24	Inversion unit 2 start/stop	15023	U16	0xCF(start)/0xCE (stop)/others(nooperation)		
25	Inversion unit 3 start/stop	15024	U16	0xCF (start)/0xCE (stop)/others(nooperation)		
26	Inversion unit 4 start/stop	15025	U16	0xCF (start)/0xCE (stop)/others(nooperation)		
27	Reserved	15026	U16			
28	Reactive power dispatch rise rate	15027	U16	1-1000;Default:1000	0.01%/s	
29	Reactive power dispatch decline rate	15028	U16	1-1000;Default:1000	0.01%/s	
30	QU enable power point	15029	U16	0-000;Default:0	0.1%	
31	QU operating mode	15030	U16	0xA1—Reactivepowerratio mode 0xA2—Activepowerratio mode 0xA3—Powerfactormode Default:0xA1		

32	QU input voltage	15031	U16	0xB1—Real-timevoltage 0xB2—Record voltage Default:0xB1		
33	QU inductive power limit	15032	U16	0-1000;Default:500	0.1 %	
34	QU capacitive power limit	15033	U16	0-1000;Default:500	0.1 %	
35	QU power factor limit	15034	U16	800-1000;Default:1000	0.001	
36	Reserved	15035~15036	U16*2			
37	QU voltage risestart point	15037	U16	1000-1100;Default:1080	0.1 %	
38	QU voltage riseend point	15038	U16	1000-1100;Default:1100	0.1 %	
39	QU voltage drop start point	15039	U16	900-1000;Default:920	0.1%	
40	QU voltage drop end point	15040	U16	900-1000;Default:900	0.1%	
41	Reserved	15041~15042	U16*2			
42	Automatic voltage regulation benchmark	15043	U16	90-110;Default:100	1%	
43	Automatic voltage regulation hystersis (%)	15044	U16	0-10;Default:1	1%	
44	Reserved	15045~15049	U16*5			

3.3. Appendix – Fault state

표 20 Bit definition of fault state 1

No.	State	State code	Note
BIT0	DCundervoltage	0:Normal 1:Undervoltage	
BIT1	DCovervoltage	0:Normal 1:Overvoltage	
BIT2	ACundervoltage	0:Normal 1:Undervoltage	
BIT3	AC overvoltage	0:Normal 1:Overvoltage	

BIT4	Underfrequency	0:Normal 1:Underfrequency	
BIT5	Overfrequency	0:Normal 1:Overfrequency	
BIT6	Contactorfault	0:Normal 1:Fault	
BIT7	Islandingprotection	0:Normal 1:Fault	
BIT8	Senseinvaid	0:Normal 1:Fault	
BIT9	PDPprotection	0:Normal 1:Fault	
BIT10	Moduleovertemperature	0:Normal 1:Fault	
BIT11	Reactorovertemperature	0:Normal 1:Fault	
BIT12	Transformer overtemperature	0:Normal 1:Fault	
BIT13	DCleakagecurrent protection	0:Normal 1:Fault	
BIT14	ACleakagecurrent protection	0:Normal 1:Fault	
BIT15	Overloadprotection	0:Normal 1:Fault	
BIT16	Heat-sinkovertemperature	0:Normal 1:Fault	
BIT17	GFDIprotection	0:Normal 1:Fault	
BIT18	Fanfault	0:Normal 1:Fault	
BIT19	DCfusefault	0:Normal 1:Fault	
BIT20	Detectionfusefault	0:Normal 1:Fault	
BIT21	DCovercurrent	0:Normal 1:Overcurrent	
BIT22	ACovercurrent	0:Normal 1:Overcurrent	
BIT23	Frequencyabnormal	0:Normal 1:Fault	
BIT24	Temperatureabnormal	0:Normal 1:Fault	
BIT25	Hardwarefault	0:Normal 1:Fault	
BIT26	Earthingfault	0:Normal 1:Fault	

BIT27	Hardwareovercurrent	0:Normal 1:Fault	
BIT28	Controlcabinetfanfault	0:Normal 1:Fault	
BIT29	Inverterovervoltage	0:Normal 1:Fault	
BIT30~BIT31	Reserved		

표 21 Bit definition of fault state 2

No.	State	State code	Note
BIT0	Lowinsulationresistance	0:Normal 1:Fault	
BIT1	ACSPDfault	0:Normal 1:Fault	
BIT2	Samplingfault	0:Normal 1:Fault	
BIT3	(PV)reversepolarity	0:Normal 1:Fault	
BIT4	Controlpowersupply abnormal	0:Normal 1:Fault	
BIT5	Backuppowersupply abnormal	0:Normal 1:Alarm	
BIT6	ACcurrentunbalance	0:Normal 1:Fault	
BIT7	ACfusefault	0:Normal 1:Fault	
BIT8	DCSPDfault	0:Normal 1:Fault	
BIT9	DCsoftstartfault	0:Normal 1:Fault	
BIT10	DCinjectionfault	0:Normal 1:Fault	
BIT11	DCovervoltage2	0:Normal 1:Underfrequency	
BIT12	Reserved		
BIT13	Reserved		
BIT14	Controlcabinet temperatureabnormal	0:Normal 1:Fault	
BIT15	DCfusegrounding fault	0:Normal 1:Fault	
BIT16~ BIT21	Reserved	0:Normal 1:Fault	
BIT22	ACswitchfault	0:Normal 1:Fault	
BIT23	Softstartfault	0:Normal 1:Fault	

BIT24	DCvoltagesamplingfault	0:Normal 1:Fault	
BIT25~BIT31	Reserved		

표 22 Bit definition of fault state 3

No.	State	State code	Note
BIT0	Neutral point potential shift	0:Normal 1:Fault	
BIT1	Device code repeat fault	0:Normal 1:Fault	
BIT2	Parallel operation communication fault	0:Normal 1:Fault	
BIT3~BIT6	Reserved		
BIT7	Carrier sync fault	0:Normal 1:Fault	
BIT8~BIT31	Reserved		

3.4. Appendix – Event state

표 23 Event state bit definition

No.	State	State code	Note
BIT0	Running	1:running	
BIT1	Stop (normalstop)	1:Stop	
BIT2	Initial standby	1:Initialstandby	
BIT3	Key stop	1:Keystop	
BIT4	Standby	1:Standby	
BIT5	Emergency stop	1:Emergencystop	
BIT6	In startup	1:Instartup	
BIT7	Stopping	1:Stopping	
BIT8	Low insulation resistance	1:Lowinsulation resistance	
BIT9	Fault stop	1:Faultstop	
BIT10	Alarm run	1:Alarmrun	
BIT11	Derating run	1:Deratingrun	Activederatingdue toreasonssuchas device internal temp.
BIT12	Limited run	1:Limitedrun	Dispatchlimitation, dispatchvalueis lowerthan100%
BIT13	Reserved		
BIT14	Reserved		
BIT15	Reserved		
BIT16	Reserved		
			Including all

BIT17	Total signal bit of the running state	0:Stop 1:Running	runningstates: BIT0:Running BIT0:Stopping BIT8:Low insulation resistance BIT10:Alarmrun BIT 11: derating running BIT12:Limitedrun
BIT18	Total stop bit	0:Running 1:Stop	Includeallnon-fault stopstates: BIT 1: Stop BIT2:Initial standby BIT3:Keystop BIT 4: Standby BIT5:Emergency stop BIT6: In startup BIT9:Faultstop BIT19:Anti-PID running BIT27:Limited stop
BIT19	Anti-PI Drunning	1:Anti-PIDrunning	
BIT20	Unit communication failure	1:Communication abnormal	Abnormal communication betweenintelligent unitandDSP
BIT21~ BIT26	Reserved		
BIT27	Limited stop	1:Limitedstop	In the non-fault state, when the limitedpoweris0, limited stop is displayed
BIT28~ BIT31	Reserved		

3.5. Appendix – Node state

표 24 Definition of node state 1:

BIT	State	State code	Note
BIT0	AC circuit breaker state	0:Disconnected	

		1:Connected	
BIT1	AC main contactor state	0:Disconnected 1:Connected	
BIT2	DC circuit breaker 3 state	0:Disconnected 1:Connected	
BIT3	DC circuit breaker 1 state (DC switch state)	0:Disconnected 1:Connected	
BIT4	DCcircuitbreaker2state	0:Disconnected 1:Connected	
BIT5~BIT13	Reserved		
BIT14	Internal/Externalpower supplystate	0:External 1:Internal	
BIT15~BIT31	Reserved		

표 25 Definition of node state 2:

BIT	State	State code	Note
BIT0~BIT13	Reserved		

표 26 Definition of node state 3:

BIT	State	State code	Note
BIT0	Fuse node state/circuit breaker node state of the 1st input	0:Disconnected 1:Connected	
BIT1	Fuse node state/circuit breaker node state of the 2nd input	0:Disconnected 1:Connected	
BIT2	Fuse node state/circuit breaker node state of the 3rd input	0:Disconnected 1:Connected	
BIT3	Fuse node state/circuit breaker node state of the 4th input	0:Disconnected 1:Connected	
BIT4	Fuse node state/circuit breaker node state of the 5rd input	0:Disconnected 1:Connected	
BIT5	Fuse node state/circuit breaker node state of the 6th input	0:Disconnected 1:Connected	
BIT6	Fuse node state/circuit breaker node state of the 7th input	0:Disconnected 1:Connected	
BIT7	Fuse node state/circuit breaker node state of the 8th input	0:Disconnected 1:Connected	

BIT8	Fuse node state/circuit breaker node state of the 9th input	0:Disconnected 1:Connected	
BIT9	Fuse node state/circuit breaker node state of the 10th input	0:Disconnected 1:Connected	
BIT10	Fuse node state/circuit breaker node state of the 11th input	0:Disconnected 1:Connected	
BIT11	Fuse node state/circuit breaker node state of the 12th input	0:Disconnected 1:Connected	
BIT12	SPD node state	0:Disconnected 1:Connected	
BIT13~BIT31	Reserved		

3.6. Appendix – Alarm state

표 27 Definition of alarm state

BIT	State	State code	Note
BIT0	Temperature abnormal alarm	0:Normal 1:Alarm	
BIT1	Low insulation resistance	0:Normal 1:Alarm	
BIT2	LVRT running	0:Normal 1:Alarm	
BIT3	CT unbalance alarm	0:Normal 1:Alarm	
BIT4	DC fuse abnormal	0:Normal 1:Alarm	
BIT5	Reserved		
BIT6	DC sensor abnormal	0:Normal 1:Alarm	
BIT7	DC SPD alarm	0:Normal 1:Alarm	
BIT8	AC SPD alarm	0:Normal 1:Alarm	
BIT9	Bypass circuit breaker abnormal	0:Normal 1:Alarm	
BIT10	Bypass fuse abnormal	0:Normal 1:Alarm	
BIT11	Ground fuse abnormal	0:Normal 1:Alarm	

BIT12	DC switch abnormal	0:Normal 1:Alarm	
BIT13	Anti-PID power supply abnormal	0:Normal 1:Alarm	
BIT14	Reserved		
BIT15	Reserved		
BIT16	Reserved		
BIT17	Reserved		
BIT18	Fan abnormal	0:Normal 1:Alarm	
BIT19	External power supply abnormal	0:Normal 1:Alarm	
BIT20	DC bypass forward overcurrent alarm	0:Normal 1:Alarm	
BIT21	DC bypass reserve overcurrent alarm	0:Normal 1:Alarm	
BIT22	Reserved	0:Normal 1:Alarm	
BIT23	AC circuit breaker abnormal	0:Normal 1:Alarm	
BIT24	Electricity meter communication abnormal	0:Normal 1:Alarm	
BIT25	Reserved		
BIT26	Contactor contact abnormal	0:Normal 1:Alarm	
BIT27~BIT31	Reserved		

3.7. Appendix – Transformer node state

표 28 Transformer node state:

BIT	State	State code	Note
BIT0	Reserved		
BIT1	Reserved		
BIT2	Transformer oil temperature alarm	0:Normal 1:Alarm	
BIT3	Transformer oil temperature trip	0:Normal 1:trip	
BIT4	Pressure relief valve trip	0:Normal 1:Trip	
BIT5	Low oil level trip	0:Normal 1:trip	
BIT6	Load switch 1 ON position signal	0:OFF 1:ON	
BIT7	Load switch 1 OFF	0:OFF	

	position signal	1:ON	
BIT8	Reserved		
BIT9	Reserved		
BIT10	HV protection fuse phase A fuse signal	0:Normal 1:Fault	
BIT11	HV protection fuse phase B fuse signal	0:Normal 1:Fault	
BIT12	HV protection fuse phase C fuse signal	0:Normal 1:Fault	
BIT13	HV cabinet door travel switch	0:Disconnected 1:Connected	
BIT14	Load switch ON position signal state	0:Normal 1:Abnormal	
BIT15	Reserved		
비고 및 검토 사항			
참고: 일반 DI 노드 신호 상태로 사용되는 경우 BIT는 실제로 액세스된 신호에 따라 백그라운드 제조업체에서 정의됨			

3.8. Appendix – AC power state

표 29 Definition of AC power distribution alarm state

BIT	State	State code	Note
BIT0	Reserved		
BIT1	Reserved		
BIT2	Reserved		
BIT3	External power supply overvoltage	0:Normal 1:Alarm	
BIT4	External power supply undervoltage	0:Normal 1:Alarm	
BIT5	Internal power supply overvoltage	0:Normal 1:Abnormal	
BIT6	Internal power supply undervoltage	0:Normal 1:Abnormal	
BIT7	Overload	0:Normal 1:Abnormal	
BIT8	Shortcircuit	0:Normal 1:Abnormal	
BIT9~BIT10	Reserved		
BIT11	Power distribution and power supply abnormal	0:Normal 1:Abnormal	
BIT12	Inverter unit power supply abnormal	0:Normal 1:Abnormal	
BIT13~BIT15	Reserved		

표 30 Definition of AC power distribution node state

BIT	State	State code	Note
BIT0	Reserved		
BIT1	Internal power supply contactor KM1 node	0:Connected 1:Disconnected	
BIT2	External power supply contactor KM1 node	0:Connected 1:Disconnected	
BIT3	Power distribution internal/external power supply	0:Internalpower supply 1:Externalpower supply	
BIT4	Inverter unit internal/external power supply	0:Internalpower supply 1:Externalpower supply	
BIT5~BIT15	Reserved		

3.9. Appendix – Workstate

표 31 Work state of the complete machine

BIT	State	State code	Note
BIT0	Running state	0:Running 1:Stop	
BIT1	Communication state of inverter unit 1	0:Normal 1:Abnormal	
BIT2	Communication state of inverter unit 2	0:Normal 1:Abnormal	
BIT3	Communication state of inverter unit 3	0:Normal 1:Abnormal	SG2500UD/SG2500 UD-MV/ SG3000UD/SG3000 UD-MV
BIT4	Communication state of inverter unit 4	0:Normal 1:Abnormal	SG2500UD/SG2500 UD-MV/ SG3000UD/SG3000 UD-MV
BIT5	Integrated board communication state	0:Normal 1:Abnormal	
BIT6	Tributary board communication state	0:Normal 1:Abnormal	
BIT7	Temperature board communication state	0:Normal 1:Abnormal	
BIT8	Integrated board2 communication state	0:Normal 1:Abnormal	SG2500UD/SG2500 UD-MV/ SG3000UD/SG3000 UD-MV

BIT9	Tributary board2 communication state	0:Normal 1:Abnormal	SG2500UD/SG2500 UD-MV/ SG3000UD/SG3000 UD-MV
BIT10	Temperature board2 communication state	0:Normal 1:Abnormal	SG2500UD/SG2500 UD-MV/ SG3000UD/SG3000 UD-MV
BIT11~BIT31	Reserved		

표 32 Workstate 1

State code	State	Note
0	Standby	
1	Generation	
2	Self-derategeneration	
3	Limitedgeneration	
4	Plannedstop	
5	Limitedstop	
6	Faultstop	

표 33 Workstate 2

State code	State	Note
1	Run	
2	Stop	
3	Recondition	
4	Standby	

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