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1. About This Manual

Afore smart meter is an intelligent control device, which is designed for grid-connected inverters. Its main function is to measure the generation and consumption, transmit the data to the inverter through RS485 communication, to ensure that the generated power of the inverter is less or equal to the user's load. Achieve the purpose of no power feed into the grid.

This manual describes the installation, operation and maintenance of the following Afore Smart Meter.

For Single-phase System Application

SAPM-10kW

For Three-phase System Application

TAPM-50kW, TAPM-130kW

2. Parameter

Туре	SAPM-10KW	TAPM-50KW	TAPM-130KW
Power (kW)	10	50	130
Max Power (kW)	18	55	150
Accuracy(%)	1	1	1
Rating voltage (V)	230	230/400	230/400
Voltage Range (V)	184-253	320-440	320-440
Rating Current (A)	50	72.5	200(MAX 5000)
Max Current (A)	80	80	220(MAX 5000)
Connection For Measurement (Hz)	Direct Connect	Direct Connect	Via CT(current transducers)
Frequency Range(Hz)	45-65	45-65	
Grid Type	L+N		3P+N
Communication	RS485	RS485	
Dimmension (W,L,H , mm)	30 x 100 x 65	70 >	x 100 x 65
IP		IP20	
Installation		35mm Rail	





a. Single-phase Smart Meter



b. Three-phase Smart Meter



3. RJ45 Wiring



Note:

 CAT5/CAT6 cable should be used between smart meter and inverter Maximum length of cable less than 300m
 Meter connection on the inverter
 The meter needs to be connected to the inverter's Zero-injection

port (RJ45 terminal).





RJ45 Pin order for single-phase inverter





RJ45 Pin order for three-phase inverter





568B Standard

1. White green	5. White blue
2. Green	6. Orange
3. White orange	7. White brown
4 Blue	8 Brown

1. White orange	5. White blue
2. Orange	6. Green

3. White blue 7. White brown

8. Brown

4. Blue



Note:

- 1.For single-phase inverter, please follow below pin order RS485A(Pin 7) to single-phase meter (Pin 24) RS485B(Pin 8) to single-phase meter (Pin 25)
- 2.For three-phase inverter, please follow below pin order RS485A(Pin 1) to three-phase meter (Pin 24) RS485B(Pin 2) to three-phase meter (Pin 25)

4. Connect the Smart Meter to Single-phase System

4.1 System Diagram



4.2 Inverter Setting







 Step 3

 Image: Step 3

 Image:

4.3 Single-phase System Wiring Diagram





Note:

If multiple inverters are connected to one smart meter, the total power of the inverters should not exceed 10kW.

5. Single-phase Smart Meter FAQ

a. After complete wiring between smart meter and inverter. The power ^P display on the smart meter will synchronize with inverter Pac display.





b. If the Zero-injection function is not activated or communication cable is not well connected, the power displayed on the inverter is Pac=0W.



c. If the smart meter's pin order is incorrect wiring, the Smart Meter and the inverter Pac will display negative values.





Note :

Due to the fluctuation on the grid side, the data transition delay will occur between smart meter and inverter. And the values displayed on the smart meter and inverter will be different.

6. Explanation of Smart Meter Display Content

Page	Content	Description
Page1	0.0E5 U	AC Voltage
Page2	l 5.00Ô	AC Current
Page3		AC Power
Page4	FE 1.000	Power Factor
Page5	F 50.00	AC Frequency
Page6		Total Power Consumption
Page7	EExp. IOO	Total Power Feed into Grid
Page8	rodbus	Modbus Communication
Page9	8n l	8 Communication data position
Page10	NO.	Communication Address
Page11	₽₽ ₽₽	Baud Rate



Note :

Don't press the button for long time, or you may change the default setting.

7. Connect the Smart Meter to Three-phase System

7.1 System Diagram

a. Three-phase System with TAPM-50KW Smart Meter



b. Three-phase System with TAPM-130KW Smart Meter



7.2 Inverter Setting (BNT003KTL - BNT020KTL)





7.3 Inverter Setting (BNT025KTL-BNT060KTL)

Step 1



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Step 2



7.4 Multiple Inverter System Connection Setting

a. For Three-phase 3-20kW Models Setting



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b. For Three-phase 25-60kW Models Setting





Para Adj Address: 01 Protocol: Meter Baud rate 9600

Note:

1.For the multiple-inverter system, set the Master inverter COM 2 address as 1, set the Salve inverter COM 2 address as 2, 3, 4... separately.

2.The total power of the inverters should not exceed 50kW (TAPM-50kW) / 130kW (TAPM-130kW).

7.5 Wiring Diagram

a. Three-phase Smart Meter (TAPM-50kW) Wiring Diagram



b. Three-phase Smart Meter (TAPM-130kW) Wiring Diagram





Note :

1. The CT (40:1, 200A) should be used with the smart meter. For other types of CT, please confirm with dealer before use.

2. Pay attention to the indication install direction of the CT, otherwise the inverter will not work properly.





8. Three-phase Smart Meter FAQ

8.1 TAPM-50kW Smart Meter

a. If the inverter operation normally and the smart meter wiring correctly. The total active power value (*P*_E) display on the smart meter will synchronize with inverter Total Pac(Pa+Pb+Pc) value display.



b. If the PQD function is not activated, COM 2 not setting or communication cable is not well connected, the power displayed on the inverter is Pac=0W.





c. If the smart meter's pin order is incorrect wiring, the Smart Meter and the inverter Pac will display negative values.







Due to the fluctuation on the grid side, the data transition delay will occur between smart meter and inverter. And the values displayed on the smart meter and inverter will be different.

8.2 TAPM-130kW Smart Meter

a. If the inverter operation normally and the smart meter wiring correctly. The total active power value (*P*_L) display on the smart meter will synchronize with inverter Total Pac(Pa+Pb+Pc) value display.





b. If the smart meter's pin wiring order is incorrect , the Smart Meter and the inverter Pac will be wrong display.





c. If the CT install direction is incorrect, the power on the smart meter and the inverter will display negative values.

d. If the CT wiring order is incorrect with smart meter, the power on the smart meter and the inverter will display negative values.



e. If the PQD function is not activated, COM 2 not setting or communication cable is not well connected, the power displayed on the inverter is Pac=0W.

~ .	Smart Power Meter
4 ED C TAPM-130KW 3*230/400V Max 200A 50/60Hz	PE 3.589 %
Œ	A SET ESC -





Note:

Do not connect the CT with port 10 of the meter, otherwise will lead short-circuit.

9. Explanation of Smart Meter Display Content

NUM	Display interface	Note
1		Total Active energy
2		Positive active energy
3		Reverse active energy
4	HOODOOD	Communication Protocol
5		
6	n (- <u>9</u> 500	Baud Rate
7	[][] {	Communication address
8	UR 2300,	Phase A Voltage
9	UP 550 h	Phase B Voltage
10	. 7202 [°]	Phase C Voltage
11	IA 5000 ·	Phase A Current
12	16 5001*	Phase B Current
13	I E 5.002 ×	Phase C Current
14	PL 329 1	Total power





NUM	Display interface	Note
15	PR (090%)	Phase A Power
16	РЬ (10 I»	Phase B Power
17		Phase C Power
18	F£ 0.500	Power Factor
19	FR 1.000	Phase A Power Factor
20	F6 0.500	Phase B Power Factor
21	FE -0.500	Phase C Power Factor

10. Trouble Shooting

Fault	Reason	Solution
No display	 Wiring error Supply voltage error 	 Please check the wiring Please check the power supply voltage
Communication failure	 Communication line connection error Communication cable failure Zero Injection function not activate 	 Please reconnect the communication cable Please replace the communication cable Activate the zero injection function of the inverter and restart the inverter
Meter shows negative value	 Current transformer is not placed in the right direction The smart meter is incorrect wiring 	 Please check the direction of the CT Please reconnect the meter
The great discrepancy between the measured value and the actual value	 Wiring error Voltage and current phase shifts are not the same 	 Please check the wiring Please check the meter wiring