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ADW300 Wireless Metering Meter

Installation and Use Manual V1.2

Acrel Electric Co., Ltd.

Declaration

Acrel reserves the right to modify the product specifications herein without notification. Please consult the local agent about the latest specifications before placing a purchase order.

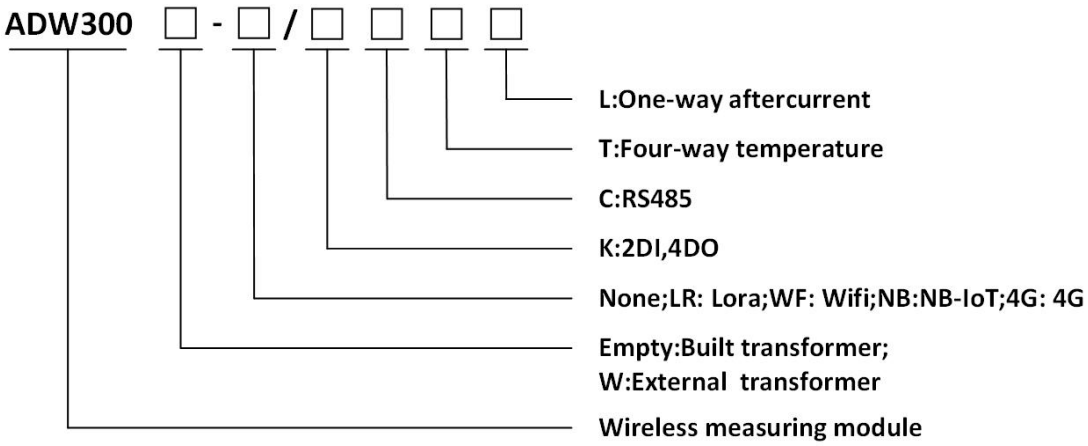
Contents

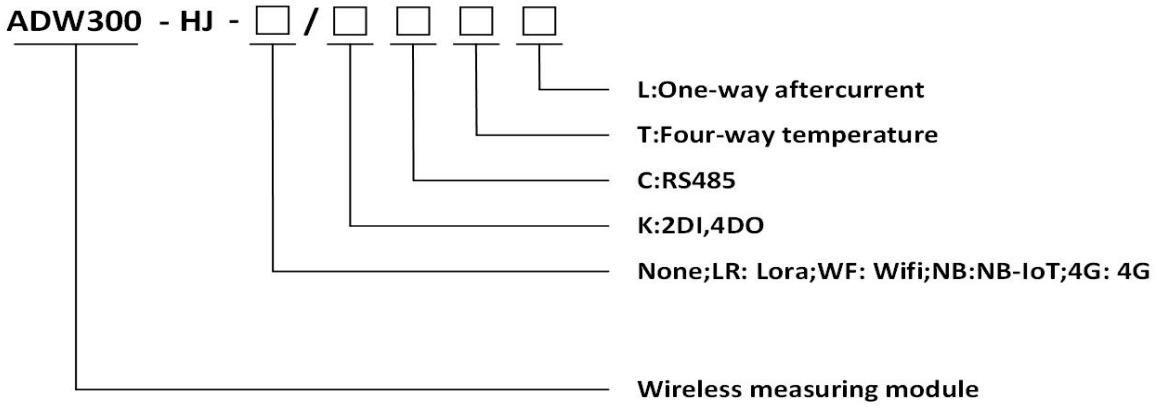
1 Overview

ADW300 Wireless Metering Meter is mainly used to metering three phase active energy on low voltage network. The product boasts of advantages including compact size, high precision, rich features. According to different requirements, there are many communications functions like RS485 communication, WIFI, NB, 4G, adding the new current sampling mode using external transformer. It can be flexibly installed in the distribution box to achieve sub-item electric energy metering, operation and maintenance supervision or power monitoring requirements for different regions and different loads.

2 Product model and specification

2.1 Naming Rules





2.2 Functional Characteristics

Chart 1 Functions of ADW300

Functions	Description
Display mode	LCD
Energy metering	Active kWh (positive and negative)，quadrant reactive

	power energy
Electrical measurement	U、I、 P、Q、S、PF、F
Harmonic function	THDv、Harmonic on 2nd-31st
Pulse output	Active pulse output
Three-phase unbalance degree	Voltage unbalance,current unbalance
Temperature measurement	Temperature of A/B/C/N（Alternate configuration:T）
DI/DO	4DI,2DO（Alternate configuration:K）
Aftercurrent	One-way aftercurrent（Alternate configuration:L）
LED display	Pulse LED display
External current transformer	External open type current transformer（Alternate configuration:W）
Electrical parameter	Undervoltage, undercurrent, overcurrent, underload, etc
Communication	Infrared communication
	RS485（Alternate configuration:C）
	Wireless transmission on 470MHz（Alternate configuration:LR）
	WIFI（Alternate configuration:WF）
	NB-IOT（Alternate configuration:NB）
	4G（Alternate configuration:4G）

3 Technical parameter

3.1 Electrical performance

Chart 2 Electrical performance of ADW300

Voltage input	Rated voltage	3×57.7/100V，3×220/380V，3×380/660V，3×100V, 3×380V，3×660V，3×400/690V，3×230/400V
	Reference frequency	50Hz
	Consumption	<0.5VA (Each phase)
Current input	Input current	3×1(6)A ；3×1(6)A（ADW300W）, 3×20(100)A（ADW300W）
	Start current	1‰ Ib (Class 0.5S)，4‰ Ib (Class 1)
	Consumption	<1VA (Each phase)
Auxiliary power	Power Supply	AC 85~265V
	Power consumption	<2W
Measurement	Standard	IEC 62053-22:2003，IEC 62053-21:2003

performance	Active energy accuracy	Class 0.5S（ADW300），Class 1（ADW300W）
	Temperature accuracy	±2℃
Pulse	Width of pulse	80±20ms
	Pulse constant	6400imp/kWh , 400imp/kWh
Communication	Wireless	Transmission on 470MHz and maximum distance in open space is 1km; 2G；NB；4G
	Infrared communication	The constant baud rate is 1200
	Interface	RS485(A、B)
	Connection mode	Shielded twisted pair conductors
	Protocol	MODBUS-RTU

3.2 Work environment

Chart 3 Work environment

Temperature range	Operating temperature	-20℃~55℃
	Storage temperature	-40℃~70℃
Humidity		≤95% (No condensation)
Altitude		<2000m

4 Dimension and installing description

4.1 Dimension (Unit: mm)

（1） Dimensions of ADW300

Chart 4 Dimension of Residual Current transformer

Specifications	Current Rating	Inside diameters Φ mm	Outside diameters Φ mm	Weight
AKH-0.66L45	16～100A	45	76	0.18
AKH-0.66L80	100～250A	80	120	0.42
AKH-0.66L100	250～400A	100	140	0.50
AKH-0.66L150	400～800A	150	190	1.32
AKH-0.66L200	800～1500A	200	240	1.94

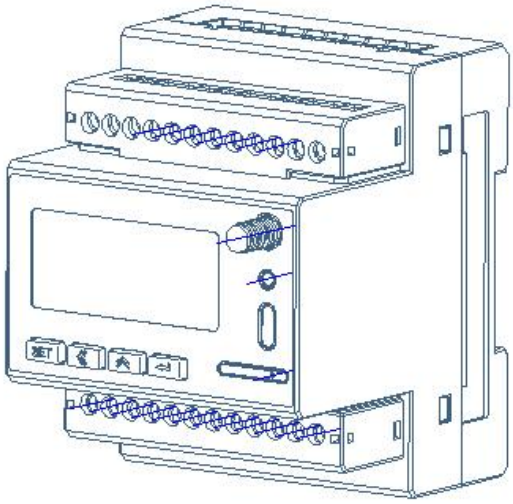


Figure 1 Rendering of ADW300

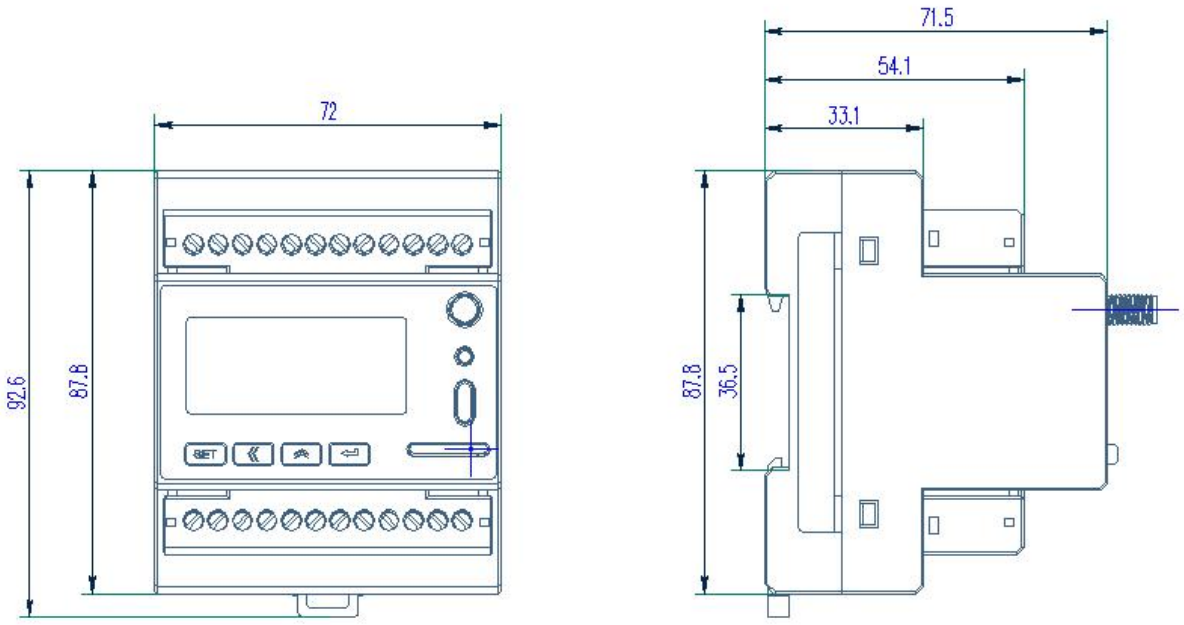


Figure 2 Dimension of ADW300

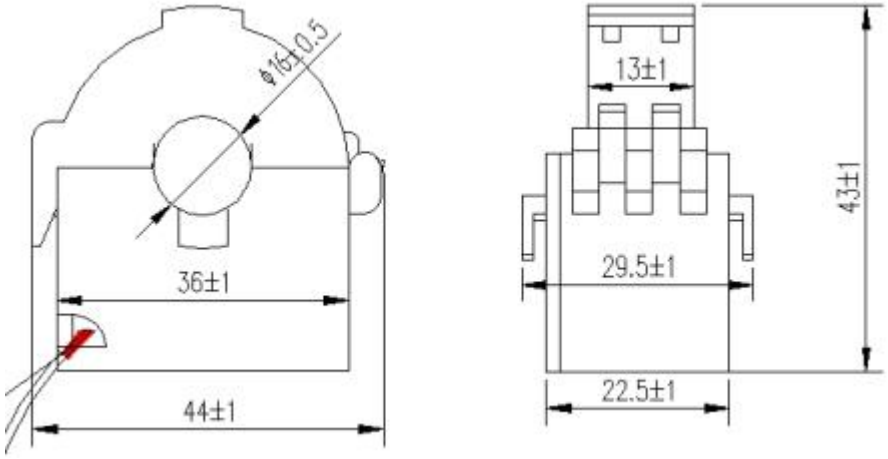
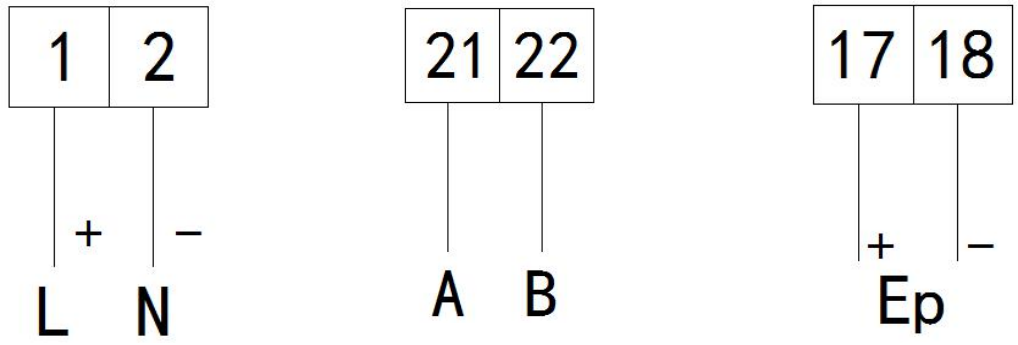


Figure 3 Dimension of transformer HCT16K-FJ

4.2 Interfaces of Auxiliary power supply, Communication and Pulse

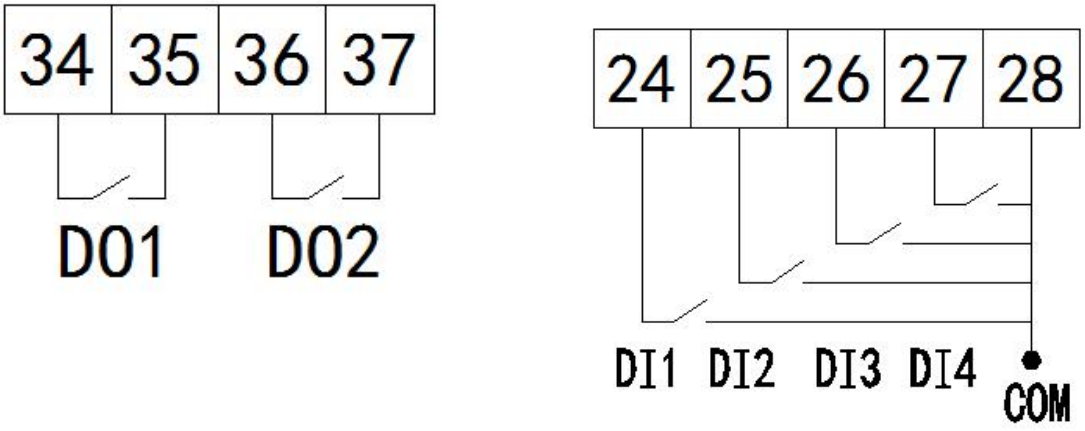


Auxiliary power supply Interface Communication Interface Pulse Interface

4.3 Interfaces of DI and DO

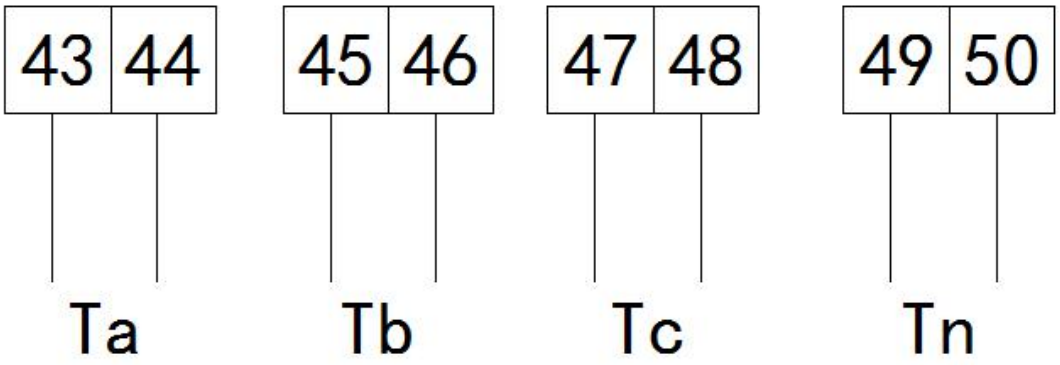
The digital output is realized by relay for remote control and alarm output.

The digital input is realized by digital signal input. The meter has a built-in +12V working power supply so that it does not require external power supply. The meter collects the external break-make information with digital input module and displays it locally. The digital input not only collects and displays the local break-time information but also provides the remote transmission, i.e. remote communication, with RS485.

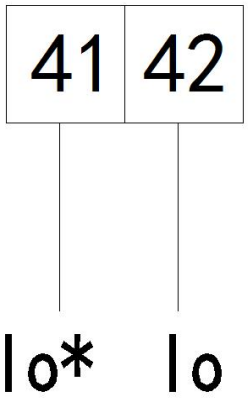


Digital output Digital input

4.4 Interfaces of Temperature and Aftercurrent



Temperature input

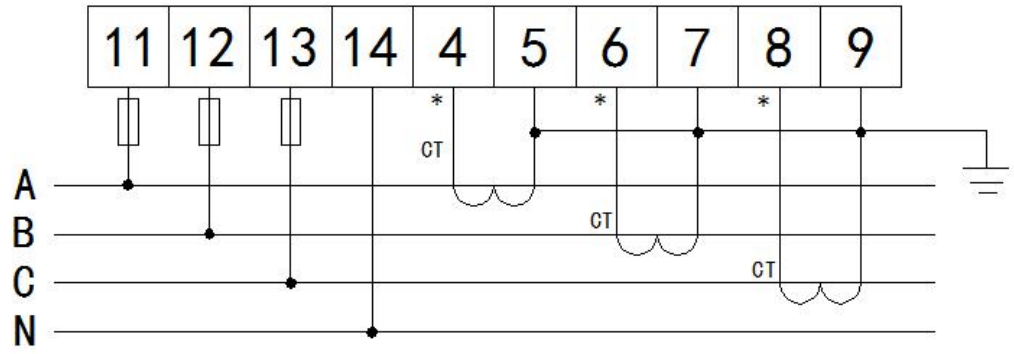


Aftercurrent input

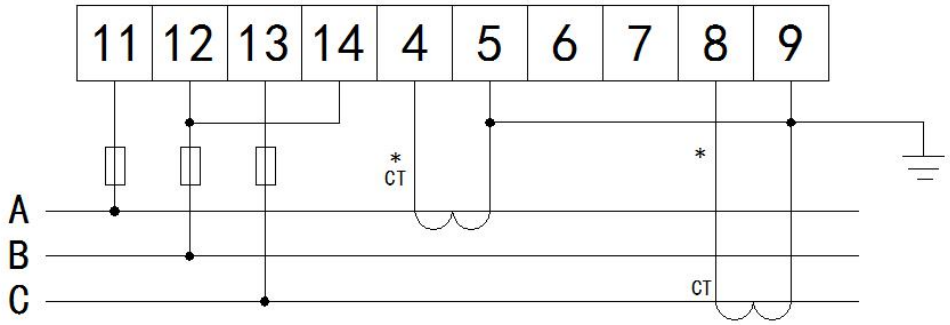
4.5 Instruction of wiring

There are four modes of connection like 3-phase 4-wire (current connected via CT), 3-phase 3-wire (current connected via CT), 3-phase 4-wire (current connected via PT and CT) and 3-phase -wire (current connected via PT and CT).

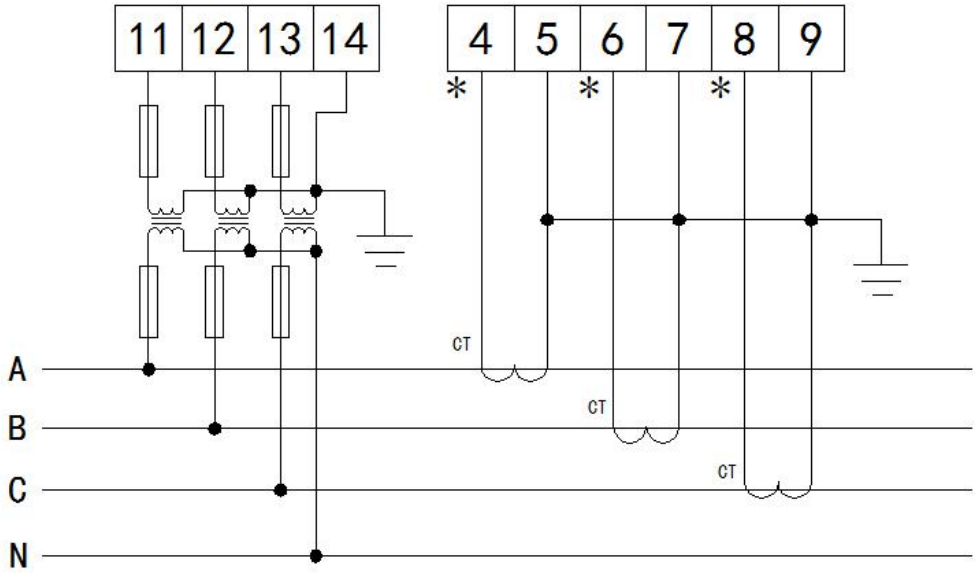
4.5.1 ADW300



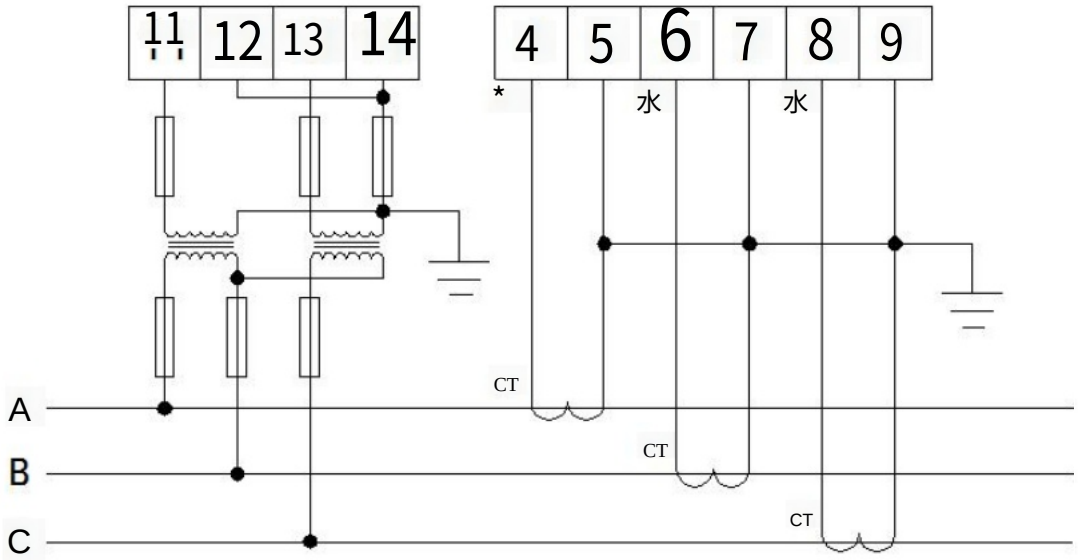
3-phase 4-wire (current connected via CT)



3-phase 3-wire (current connected via CT)

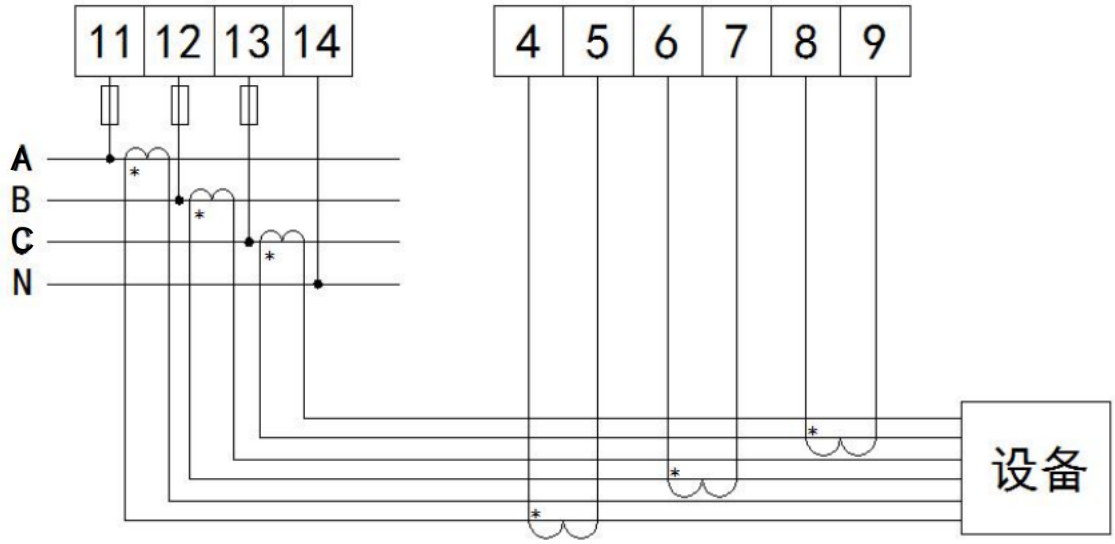


3-phase 4-wire (current connected via PT and CT)

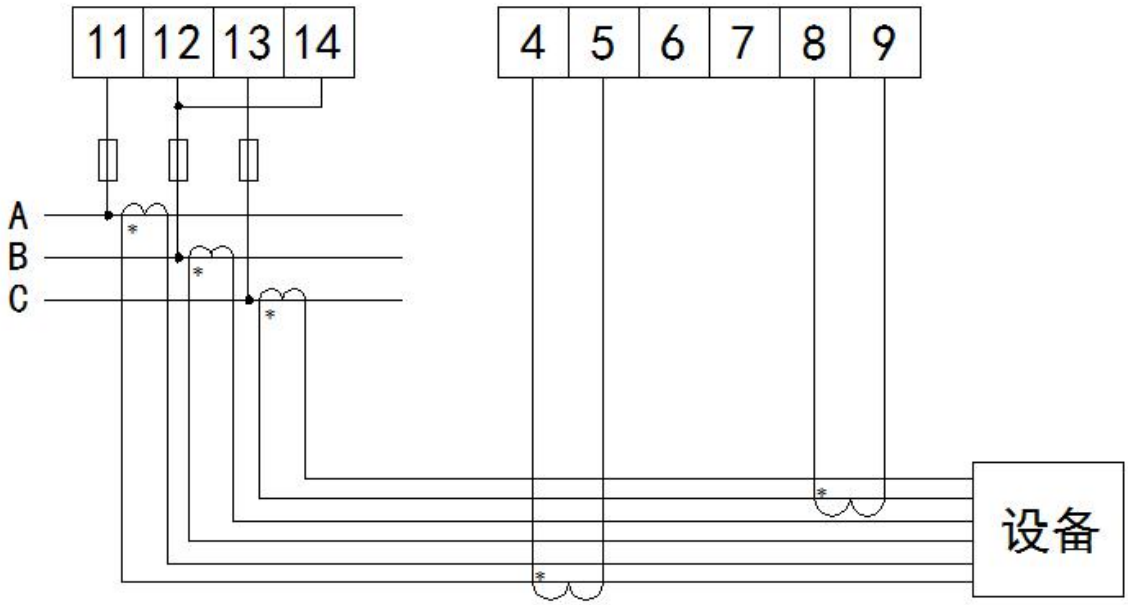


3-phase 3-wire(current connected via PT and CT)

4.5.2 ADW300W



3-phase 4-wire



3-phase 3-wire

5 Main functions and features

5.1 Measurement

Measure all electrical parameters, including voltage U, current I, active power P, reactive power Q, apparent power S, power factor PF, Voltage imbalance, Current imbalance, frequency, 31st harmonic content and total harmonic content . The measured voltage U keeps one decimal place, the measured frequency F keeps two decimal places, the measured current I keeps three decimal places and the measured power P keeps four decimal places. Voltage imbalance and Current imbalance keeps four decimal places.

Example: U = 220.1V, f = 49.98HZ, I = 1.999A, P = 0.2199KW, △=0.00%

Supporting 4-way temperature measurement，range：-40～99℃，accuracy：±2℃

Supporting aftercurrent measurement，The initial range：0～1000mA，Range multiples can be set（1～60）

5.2 Metering

It can measure the current combined active power, positive active power, reverse active power, inductive reactive power, capacitive reactive power, as seen in the electric power.

5.3 Tiered pricing

Two sets of time tables, a year can be divided into four time zones, each set of time

table can set 12 days, four rates (F1, F2, F3, F4 namely Sharp,peak,flat and valley).

5.4 Demand

Demand-related concepts are listed as follows:

Demand	Average power measured during the demand period
Max. demand	Maximum amount of demand during a specified period of time
Sliding window time	A recurrence method to measure the demand from any time point during a period shorter than the demand period. The demand measured by this means is called sliding demand. The recurrence time is sliding window time.
Demand period	Time interval when the same average power is measured continuously, also known as window time

Measure eight maximum demands, i.e. A/B/C three-phase current ,positive active, negative active, inductive reactive , capacitive reactive and apparent power demands and the time of maximum demand.

5.5 Historical data

Record the historical data on electricity consumption covering previous 12 months (including four quadrant and multi-rate tariff).

5.6 Digital input/ output

There are two-way Digital output and four-way Digital input. The Digital output is realized by relay for remote control and alarm output. The Digital input not only collects and displays the local break-time information but also provides the remote transmission, i.e. remote communication, with RS485.

5.7 Wireless Communication Function

The ADW300 supports LORA, WIFI, NB, and 4G communications. Specific agreements on WIFI, NB and 4G communications can be obtained by contacting relevant personnel of our company.

6 Communication description

6.1 Protocol

The meters adapt Modbus protocol. Please refer to the relevant standards for more information.

6.2 MODBUS

MODBUS-RTU protocol has 03H and 10H command to read and write registers respectively. The following chart is registers' address list:

Start Address（Hexadecimal）	Start Address（Decimal）	Variable	Length	R/W	Notes
0000H	0	Address	2	R/W	1～247
0001H	1	Baud rate	2	R/W	1：1200bps 2：3400bps 3：4800bps 4：9600bps
0002H	2	Spreading factor	2	R/W	6~12
0003H	3	Frequency channel setting	2	R/W	0-45 (Communication with the same frequency host)
0004H	4	High byte: parity mode, low byte: stop Bit	2	R/W	High byte: 0-none, 1-even, 2-odd; low byte: 0- 1 stop Bit, 1- 2 stop Bit
0005H	5	Reserved			
0006H	6	Pulse constant			
0007H	7	Backlight Time			
0008H	8	Code			
0009H~000CH	9-12	Reserved			
000DH	13	Current specification			
000EH	14	PT			
000FH	15	CT			
0010H	16	Temperature of N phase	2	R	Int unit 0.1℃
0011H~0013H	17-19	Time, date (second, minute, hour, day, month, year)			
0014H	20	Voltage of A phase	2	R	Int Keep 1 decimal places (The real value is the showed value divide 10.The following data all in this rule.)
0015H	21	Voltage of B phase	2	R	
0016H	22	Voltage of C phase	2	R	
0017H	23	Voltage between A-B	2	R	
0018H	24	Voltage between B-C	2	R	
0019H	25	Voltage between C-A	2	R	
001AH	26	Electricity of A phase	2	R	Int unit A Keep 2 decimal places
001BH	27	Electricity of B phase	2	R	
001CH	28	Electricity of C phase	2	R	
001DH	29	Vector sum of 3-phase current	2	R	

001EH	30	Active power of A phase	4	R	Int unit kW Keep 3 decimal places
0020H	32	Active power of B phase	4	R	
0022H	34	Active power of C phase	4	R	
0024H	36	Total active power	4	R	
0026H	38	Reactive power of A phase	4	R	Int unit kVar Keep 3 decimal places
0028H	40	Reactive power of B phase	4	R	
002AH	42	Reactive power of C phase	4	R	
002CH	44	Total reactive power	4	R	
002EH	46	Apparent power of A phase	4	R	Int unit kVA Keep 3 decimal places
0030H	48	Apparent power of B phase	4	R	
0032H	50	Apparent power of C phase	4	R	
0034H	52	Total apparent power	4	R	
0036H	54	Power factor of A phase	2	R	Int Keep 3 decimal places
0037H	55	Power factor of B phase	2	R	
0038H	56	Power factor of C phase	2	R	
0039H	57	Total power factor	2	R	
003AH	58	State of DI	2	R	Int Bit0：DI1 Bit1：DI2 Bit2：DI3 Bit3：DI4
003BH	59	Frequency of power	2	R	Int Keep 2 decimal places
003CH	60	Total energy consumption	4	R	Int unit kWh Keep 2 decimal places
003EH	62	Forward active energy consumption	4	R	
0040H	64	Reversing active energy consumption	4	R	
0042H	66	Forward reactive energy consumption	4	R	Int unit kVarh Keep 2 decimal places
0044H	68	Reversing reactive energy consumption	4	R	
0046H	70	Total energy consumption on A phase	4	R	Int unit kWh Keep 2 decimal places
0048H	72	Forward active energy consumption on A phase	4	R	
004AH	74	Reversing active energy consumption on A phase	4	R	
004CH	76	Forward reactive energy consumption on A phase	4	R	Int unit kVarh Keep 2 decimal places
004EH	78	Reversing reactive energy	4	R	

		consumption on A phase			
0050H	80	Total energy consumption on B phase	4	R	Int unit kWh Keep 2 decimal places
0052H	82	Forward active energy consumption on B phase	4	R	
0054H	84	Reversing active energy consumption on B phase	4	R	
0056H	86	Forward reactive energy consumption on B phase	4	R	Int unit kVarh Keep 2 decimal places
0058H	88	Reversing reactive energy consumption on B phase	4	R	
005AH	90	Total energy consumption on C phase	4	R	Int unit kWh Keep 2 decimal places
005CH	92	Forward active energy consumption on C phase	4	R	
005EH	94	Reversing active energy consumption on C phase	4	R	
0060H	96	Forward reactive energy consumption on C phase	4	R	Int unit kVarh Keep 2 decimal places
0062H	98	Reversing reactive energy consumption on C phase	4	R	
0064H	100	Maximum forward active demand in current month	4	R	Int unit KW Keep 3 decimal places
0066H~0067H	102-103	Occur time	4	R	Minute, hour, day, month
0068H	104	Maximum reversing active demand in current month	4	R	Int unit kVar Keep 3 decimal places
006AH~006BH	106-107	Occur time	4	R	Minute, hour, day, month
006CH	108	Maximum forward reactive demand in current month	4	R	Int unit kVar Keep 3 decimal places
006EH~006FH	110-111	Occur time	4	R	Minute, hour, day, month
0070H	112	Maximum reversing reactive demand in current month	4	R	Int unit kVar Keep 3 decimal places
0072H~0073H	114-115	Occur time	4	R	Minute, hour, day, month
0074H	116	THDUa	2	R	Total distortion rate of voltage and current on each phase Int Keep 2 decimal places
0075H	117	THDUb	2	R	
0076H	118	THDUc	2	R	
0077H	119	THDIa	2	R	
0078H	120	THDIb	2	R	
0079H	121	THDIc	2	R	
007AH	122	THUa(Harmonic on	2×30	R	Harmonic voltage on 2nd-31st

		2nd-31st)			Int Keep 2 decimal places
0098H	152	THUa(Harmonic on 2nd-31st)	2×30	R	
00B6H	182	THUb(Harmonic on 2nd-31st)	2×30	R	
00D4H	212	THUc(Harmonic on 2nd-31st)	2×30	R	Harmonic current on 2nd-31st Int Keep 2 decimal places
00F2H	242	THIa(Harmonic on 2nd-31st)	2×30	R	
0110H	272	THIb(Harmonic on 2nd-31st)	2×30	R	
012EH	302	Fundamental voltage on A phase	2	R	Int unit V Keep 1 decimal places
012FH	303	Fundamental voltage on B phase	2	R	
0130H	304	Fundamental voltage on C phase	2	R	
0131H	305	Harmonic voltage on A phase	2	R	
0132H	306	Harmonic voltage on B phase	2	R	
0133H	307	Harmonic voltage on C phase	2	R	
0134H	308	Fundamental current on A phase	2	R	Int unit A Keep 2 decimal places
0135H	309	Fundamental current on B phase	2	R	
0136H	310	Fundamental current on C phase	2	R	
0137H	311	Harmonic current on A phase	2	R	
0138H	312	Harmonic current on B phase	2	R	
0139H	313	Harmonic current on C phase	2	R	
013AH	314	Fundamental active power on A phase	4	R	Int unit kW Keep 3 decimal places
013CH	316	Fundamental active power on B phase	4	R	
013EH	318	Fundamental active power on C phase	4	R	
0140H	320	Fundamental active power	4	R	
0142H	322	Fundamental reactive power on A phase	4	R	Int unit kVar

0144H	324	Fundamental reactive power on B phase	4	R	Keep 3 decimal places
0146H	326	Fundamental reactive power on C phase	4	R	
0148H	328	Fundamental reactive power	4	R	
014AH	330	Harmonic active power on A phase	4	R	Int unit kW Keep 3 decimal places
014CH	332	Harmonic active power on B phase	4	R	
014EH	334	Harmonic active power on C phase	4	R	
0150H	336	Harmonic active power	4	R	
0152H	338	Harmonic reactive power on A phase	4	R	Int unit kVar Keep 3 decimal places
0154H	340	Harmonic reactive power on B phase	4	R	
0156H	342	Harmonic reactive power on C phase	4	R	
0158H	344	Harmonic reactive power	4	R	
015AH	346	Current forward active demand	4	R	Int unit kW Keep 3 decimal places
015CH	348	Current reversing active demand	4	R	
015EH	350	Current forward reactive demand	4	R	Int unit kVar Keep 3 decimal places
0160H	352	Current reversing reactive demand	4	R	
0162H	354	Voltage imbalance	2	R	Int unit 0.01%
0163H	355	Current imbalance	2	R	
0164H	356	Temperature on A phase	2	R	Int unit 0.1℃
0165H	357	Temperature on B phase	2	R	
0166H	358	Temperature on C phase	2	R	
0167H	359	Time zone number/Time zone date: day	2	R/W	Time list
0168H	360	Time zone date: month/Time zone number	2	R/W	
0169H	361	Time zone date: day/ Time zone date: month	2	R/W	
016AH	362	Time zone number/Time zone date: day	2	R/W	
016BH	363	Time zone date: month/Time	2	R/W	

		zone number			
016CH	364	Time zone date: day/ Time zone date: month	2	R/W	
016DH … 0181H	365-385	1-14 period of time Parameters setting information	2	R/W	1# time list
0182H … 0196H	386-406	1-14 period of time Parameters setting information	2	R/W	2# time list
0197H	407	Current total spike active energy	4	R	Int unit kWh Keep 2 decimal places
0199H	409	Current total peak active energy	4	R	
019BH	411	Current total flat active energy	4	R	
019DH	413	Current total valley active energy	4	R	
019FH	415	Current total spike forward active energy	4	R	
01A1H	417	Current total peak forward active energy	4	R	
01A3H	419	Current total flat forward active energy	4	R	
01A5H	421	Current total valley forward active energy	4	R	
01A7H	423	Current total spike reversing active energy	4	R	
01A9H	425	Current total peak reversing active energy	4	R	
01ABH	427	Current total flat reversing active energy	4	R	
01ADH	429	Current total valley reversing active energy	4	R	
01AFH	431	Current total spike forward reactive energy	4	R	Int unit kVarh Keep 2 decimal places
01B1H	433	Current total peak forward reactive energy	4	R	
01B3H	435	Current total flat forward reactive energy	4	R	
01B5H	437	Current total valley forward reactive energy	4	R	
01B7H	439	Current total spike reversing reactive energy	4	R	
01B9H	441	Current total peak reversing	4	R	

		reactive energy			
01BBH	443	Current total flat reversing reactive energy	4	R	
01BDH	445	Current total valley reversing reactive energy	4	R	
01BFH	447	wireless signal strength	2	R	Int
01C1H	449	Aftercurrent	2	R	Int unit A Keep 3 decimal places
01C2H	450	DO1	2	R/W	Int Bit0 effective
01C3H	451	DO2	2	R/W	Int Bit0 effective

6.3 Settings of Alarm

Start Address（Hexadecimal）	Start Address（Decimal）	Variable	Length	R/W	Notes
01DOH	464	Alarm permission bits	2	R/W	Bit0: overvoltage alarm permission bits Bit1: undervoltage alarm permission bits Bit2: overcurrent alarm permission bits Bit3: undercurrent alarm permission bits Bit4: overpower alarm permission bits Bit5: underpower alarm permission bits
01D1H	465	overvoltage alarm threshold	2	R/W	Int unit 0.1V
01D2H	466	overvoltage alarm time-delay	2	R/W	Int unit 0.01S
01D3H	467	undervoltage alarm threshold	2	R/W	Int unit 0.1V
01D4H	468	undervoltage alarm time-delay	2	R/W	Int unit 0.01S
01D5H	469	overcurrent alarm threshold	2	R/W	Int unit 0.01A
01D6H	470	Overcurrent alarm time-delay	2	R/W	Int unit 0.01S
01D7H	471	undercurrent alarm threshold	2	R/W	Int unit 0.01A

01D8H	472	undercurrent alarm time-delay	2	R/W	Int unit 0.01S
01D9H	473	overpower alarm threshold	2	R/W	Int unit 0.001kw
01DAH	474	overpower alarm time-delay	2	R/W	Int unit 0.01S
01DBH	475	underpower alarm threshold	2	R/W	Int unit 0.001kw
01DCH	476	underpower alarm time-delay	2	R/W	Int unit 0.01S
01DDH	477	DI1 Original state	2	R/W	0:Normal Open 1:Normal Close
01DEH	478	DI1 Setting	2	R/W	0:Not associated to DO 1:Associated to DO1 2:Associated to DO2
01DFH	479	DI2 Original state	2	R/W	0:Normal Open 1:Normal Close
01E0H	480	DI2 Setting	2	R/W	0:Not associated to DO 1:Associated to DO1 2:Associated to DO2
01E1H	481	DI3 Original state	2	R/W	0:Normal Open 1:Normal Close
01E2H	482	DI3 Setting	2	R/W	0:Not associated to DO 1:Associated to DO1 2:Associated to DO2
01E3H	483	DI4 Original state	2	R/W	0:Normal Open 1:Normal Close
01E4H	484	DI4 Setting	2	R/W	0:Not associated to DO 1:Associated to DO1 2:Associated to DO2
01E5H	485	DO1 Output mode	2	R/W	0:Electrical level 1:Purse
01E6H	486	DO1 Related content	2	R/W	0:DO 1: Total failure 2: Total failure +DI1+DI2 3:DI1 4:DI2 5:DI1+DI2
01E7H	487	DO1 Output pulse width	2	R/W	0:None 1:1S 2:2S 3:3S 4:4S 5:5S

01E8H	488	DO2 Output mode	2	R/W	0: Electrical level 1:Purse
01E9H	489	DO2 Related content	2	R/W	0:DO 1:Total failure 2: Total failure +DI1+DI2 3:DI1 4:DI2 5:DI1+DI2
01EAH	490	DO2 Output pulse width	2	R/W	0:None 1:1S 2:2S 3:3S 4:4S 5:5S
01EBH	491	Alarm state	2	R	Bit0: overvoltages alarm Bit1: undervoltage alarm Bit2: overcurrent alarm Bit3: undercurrent alarm Bit4: overpower alarm Bit5: underpower alarm Bit6:DO1 alarm Bit7:DO2 alarm Bit8:A phase lost current alarm Bit9:B phase lost current alarm Bit10:C phase lost current alarm Bit11:A phase lost voltage alarm Bit12:B phase lost voltage alarm Bit13:C phase lost voltage alarm Bit14: phase sequence error alarm

6.4 Historical Data Memory

Start address (high byte)	Data type
48-53H	Last 1 month-last 12 months

Start address (low byte)	Data type
00H	Record date and time
03H	History total active energy
05H	History total forward active energy
07H	History total reversing active energy
09H	History total forward reactive energy

0BH	History total reversing reactive energy
0DH	Total active energy on A phase
0FH	Total forward active energy on A phase
11H	Total reversing active energy on A phase
13H	Total forward reactive energy on A phase
15H	Total reversing reactive energy on A phase
17H	Total active energy on B phase
19H	Total forward active energy on B phase
1BH	Total reversing active energy on B phase
1DH	Total forward reactive energy on B phase
1FH	Total reversing reactive energy on B phase
21H	Total active energy on C phase
23H	Total forward active energy on C phase
25H	Total reversing active energy on C phase
27H	Total forward reactive energy on C phase
29H	Total reversing reactive energy on C phase
2BH	Current spike electric energy
2DH	Current peak electric energy
2FH	Current flat electric energy
31H	Current valley electric energy
33H	Current forward active spike electric energy
35H	Current forward active peak electric energy
37H	Current forward active flat electric energy
39H	Current forward active valley electric energy
3BH	Current reversing active spike electric energy
3DH	Current reversing Active peak electric energy
3FH	Current reversing active flat electric energy
41H	Current reversing Active valley electric energy
43H	Current forward reactive spike electric energy
45H	Current forward reactive spike electric energy
47H	Current forward reactive flat electric energy
49H	Current forward reactive valley electric energy
4BH	Current reversing reactive spike electric energy
4DH	Current reversing reactive peak electric energy
4FH	Current reversing reactive flat electric energy
51H	Current reversing reactive valley electric energy

6.5 Record of extreme value and occurrence time

1） Maximum records：

Starting address of interval (high byte)	Type of historical data
04	Extremum of the month and Occurrence time
05	Extremum of last 1 month and Occurrence time
06	Extremum of last 2 month and Occurrence time
07	Extremum of last 3 month and Occurrence time

Offset address of interval (low byte)）	Data type
00	Voltage of A phase maximum value and occurrence time
03	Voltage of B phase maximum value and occurrence time
06	Voltage of C phase maximum value and occurrence time
09	Voltage between A-B maximum value and occurrence time
0C	Voltage between A-B maximum value and occurrence time
0F	Voltage between A-B maximum value and occurrence time
12	Electricity of A phase maximum value and occurrence time
15	Electricity of B phase maximum value and occurrence time
18	Electricity of C phase maximum value and occurrence time
1B	Three phase current vector sum maximum value and occurrence time
1E	Active power of A phase maximum value and occurrence time
22	Active power of B phase maximum value and occurrence time
26	Active power of C phase maximum value and occurrence time
2A	Total active power maximum value and occurrence time
2E	Reactive power of A phase maximum value and occurrence time
32	Reactive power of B phase maximum value and occurrence time
36	Reactive power of C phase maximum value and occurrence time
3A	Total reactive power maximum value

	and occurrence time
3E	Apparent power of A phase maximum value and occurrence time
42	Apparent power of B phase maximum value and occurrence time
46	Apparent power of C phase maximum value and occurrence time
4A	Total apparent power maximum value and occurrence time

2） **Minimum record:**

Starting address of interval (high byte)	Type of historical data
04	Extremum of the month and Occurrence time
05	Extremum of last 1 month and Occurrence time
06	Extremum of last 2 month and Occurrence time
07	Extremum of last 3 month and Occurrence time

Offset address of interval (low byte)）	Data type
4E	Voltage of A phase Minimum Value and occurrence time
51	Voltage of B phase Minimum Value and occurrence time
54	Voltage of C phase Minimum Value and occurrence time
57	Voltage between A-B Minimum Value and occurrence time
5A	Voltage between B-C Minimum value and occurrence time
5D	Voltage between C-A Minimum value and occurrence time
60	Electricity of A phase Minimum value and occurrence time
63	Electricity of B phase Minimum value and occurrence time
66	Electricity of C phase Minimum value and occurrence time
69	Three phase current vector sum Minimum value and occurrence time
6C	Active power of A phase Minimum value and occurrence time
70	Active power of B phase Minimum value and occurrence time
74	Active power of C phase Minimum value and occurrence time

78	Total active power Minimum value and occurrence time
7C	Reactive power of A phase Minimum value and occurrence time
80	Reactive power of B phase Minimum value and occurrence time
84	Reactive power of C phase Minimum value and occurrence time
88	Total reactive power Minimum value and occurrence time
8C	Apparent power of A phase Minimum value and occurrence time
90	Apparent power of B phase Minimum value and occurrence time
94	Apparent power of C phase Minimum value and occurrence time
98	Total apparent power Minimum value and occurrence time

Note：The record of every extreme value and occurrence time is 6 bits, and the data configuration can be refered as below:

ADDRH ADDRL	Event names	Data type	Note
0400H	Maximum voltage of A phase and occurrence time	The data of Maximum voltage of A phase	data and decimal place refer to address table 6.2
0401H		Occurrence time of minutes and hours	high byte : minutes
0402H		Occurrence time of Days and months	high byte : Days

7 Common troubleshooting

7.1 RS485 networking communication failure

Suggestion: Please first confirm whether the RS485 wiring is loose, AB connection reverse and other problems, and then check the table through the button to see if the general selection parameters, such as address, baud rate, check digit, etc., are set correctly.

7.2 Wireless communication failure of instrumentation

Suggestion: Please connect RS485 interface on the meter and USB convert to 485 serial port to read the parameters, and confirm whether the parameters are the same as the upper terminal wireless configuration (channel and spread spectrum factor). If different, please modify the meter's wireless parameters and retest the master terminal after the same, and if the same, it may be the meter and master terminal are in a relative long distance. It is too far to communicate or the scene is seriously disturbed. We can try to use the external antenna at the same time, or consider the newly added wireless master terminals, and then test it.