

DZS900 Energy Meter User Manual



Heyuan Intelligence Technology Co., Ltd

IMPORTANT DECLARATIONS

Copyright © 2017 Heyuan Intelligence Technology Co., Ltd All Rights Reserved

This manual may not be reproduced, copied, transmitted or transcribed in whole or in part by any means without the expressed written permission of Heyuan. Any shall be investigated for legal responsibility in violation of copyright or other intellectual property rights of the Company. We check the user manual's contents regularly and will make necessary amendments in next version. Welcome to give advice for some unexpected errors. The rights of upgrading without notice are reserved.

Please read this manual carefully before the product is operated. And once you start operating the meter, you'll be considered to have read this manual and accept all our terms. Heyuan shall not be responsible or liable for any damages or injuries caused by improper meter installation and/or operation.

Attention:

Attention: the following symbols in this manual refer to meanings as follows



Electric Shock Symbol: Carries information about procedures which must be followed to reduce the risk of electric shock and danger to personal health



Safety Alert Symbol: Carries information about circumstances which if not considered may result in injury or death

The meter must be installed and operated by one who has experience with high-voltage devices or has qualifications. Please connect the meter to correct voltage before operating the meter. Please install and use the meter according to the user manual. Heyuan shall not be responsible or liable for any damages or injuries caused without following the instruction in the user manual.

Contents

Chapter 1 Meter Overview	1
Chapter 2 Specifications	1
2.1 Input Voltage	1
2.2 Input Current	1
2.3 Energy	1
2.4 Frequency Measurement	1
2.6 Communication	1
2.7 Power Supply	1
2.8 Working Condition	1
Chapter 3 Installation and Typical Wiring	2
3.1 Dimension (unit: mm) and Comparison Table of Digital Letters Displayed	2
3.2 Installation Method	2
Chapter 4 Terminals	3
4.1 Power Supply	3
4.2 Communication	3
4.3 Pulse Output of Imported Active Energy	3
Chapter 5 Typical Wiring	4
Chapter 6 Meter Display and Operation	4
Chapter 7 Parameters Setting Interface	6
Chapter 8 Common Fault Diagnosis and Solutions	10
Chapter 9 After-sales Service	11

Chapter 1 Meter Overview

DZ81-DZS900 is an advanced, smart multi-circuits networked multifunction energy meter. It is widely used in power distribution sites, energy management systems and intelligent monitoring systems of different industries. It can monitor up to 9 three-phase channels or 27 single-phase channels. It measures electric parameters i.e. three-phase/line voltage, zero-sequence voltage, and 9 three-phase channel current, active power, reactive power, apparent power, power factor, active energy, reactive energy and 27 single-phase channel energies. 2-channel 485 communication interfaces support standard Modbus RTU communication protocol.

Chapter 2 Specifications

2.1 Input Voltage

Reference Voltage: 3×220V/380V Voltage Range: 0~1.2Un

2.2 Input Current

Measuring Range: 1‰In~1In Secondary Current of CT: 20mA

Starting Current: 1‰In

Remark: the current ratio should be set first after CT (current transformer) is connected. E.g. as for CT with 60A/20Ma, its current ratio should be set as 60. The current values should be calculated according to the formulas in register table.

2.3 Energy

Accuracy Class: Class 0.5 Resolution: 0.1kWh

2.4 Frequency Measurement

Frequency Measuring Range: 45~65Hz

2.5 Measuring Accuracy

Voltage/Current: 0.2% Energy Accuracy: Class 0.5 Power Factor: 1%

2.6 Communication

RS485/Modbus-RTU Communication Protocol Baud Rate: 2400~19200bps (programmable)
 DZ81-DZS900 adopts RS485 interfaces and Modbus RTU communication protocol. The terminals are 485A1,485B1,485A2 and 485B2. The RS485 transmission medium is shielded twisted pair. In addition, the RS485 interfaces can also be used for equipment maintenance and upgrading.

Communication Default Value				
Address	Baud Rate	Data Bits	Stop Bits	Parity
01	9600bps	8	1	No

2.7 Power Supply

Working Range: AC85~265V

Power Consumption: <3VA

Power supply of DZ81-DZS900 is AC85 ~ 265V(45 ~ 55HZ) or DC85 ~ 300V. The power-line terminals are L/+ and N/-.

2.8 Working Condition

Operating Temperature: -20°C ~ +65°C

Storage Temperature: -40°C ~ +85°C

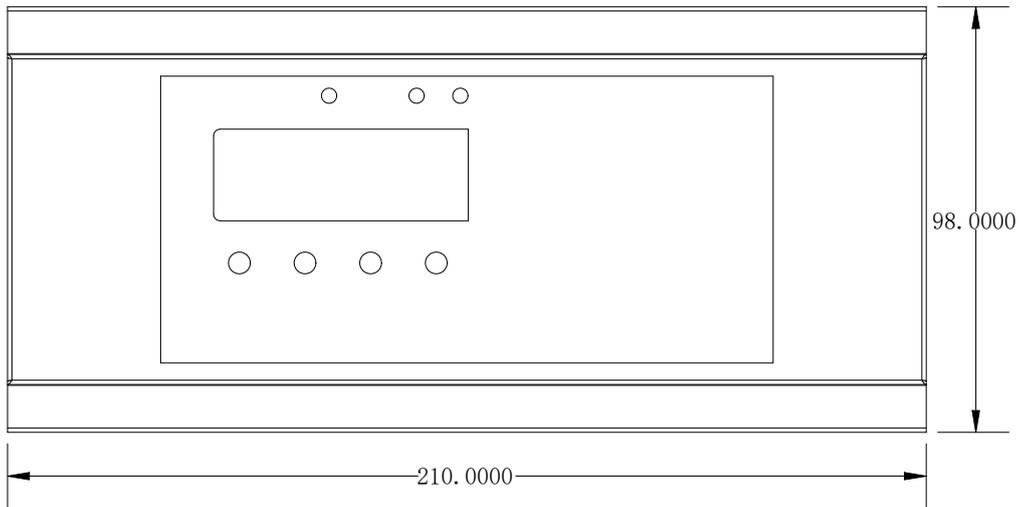
Relative Humidity: 20% ~ 90%(non-condensing)

2.9 Pulse Output of Imported Active Energy

Pulse Constant	Pulse Width	Max. Current	Working Voltage
9600imp/kWh	50±2ms	10mA(DC)	5V~24V

Chapter 3 Installation and Typical Wiring

3.1 Dimension (unit: mm) and Comparison Table of Digital Letters Displayed



Front View

A	b	c	d	E	F	G	H	I	J	K	L
A	b	c	d	E	F	G	H	I	J	K	L
M	n	o	P	q	r	S	t	U	v	W	X
M	n	o	P	q	r	S	t	U	v	W	X
Y	Z	1	2	3	4	5	6	7	8	9	0
Y	Z	1	2	3	4	5	6	7	8	9	0

Comparison Table of Digital Letters Display

Model No.	Cut-out Size		Dimension		
	W.	L.	L.	W.	H.
DZ81-DZS900	35	210	210	98	46.1

3.2 Installation Method

Installation Environment: DZS900 should be installed in a dry and dust free environment. Avoid exposing meter to excessive heat, radiation and high electrical noise sources.

Install Method: DIN rail Mounting.

Chapter 4 Terminals

1	2	3	4	5	6	7	8		9	10	11	12
In1	Ic1	Ib1	Ia1	In2	Ic2	Ib2	Ia2		In3	Ic3	Ib3	Ia3
Current of 1 st Circuit				Current of 2 nd Circuit					Current of 3 th Circuit			

13	14	15	16	17	18	19	20	21	22	23	24
In4	Ic4	Ib4	Ia4	NC	NC	In5	Ic5	Ib5	Ia5	NC	NC
Current of 4 th Circuit						Current of 5 th Circuit					

25	26	27	28	29	30	31	32	33	34
Ua	NC	NC	Ub	NC	NC	Uc	NC	NC	Un
Votage									

Upper Row of Terminals

68	67	66	65	64	63	62	61	60	59	58	57
Ia9	Ib9	Ic9	In9	Ia8	Ib8	Ic8	In8	Ia7	Ib7	Ic7	In7
Current of 9 th Circuit				Current of 8 th Circuit				Current of 7 th Circuit			

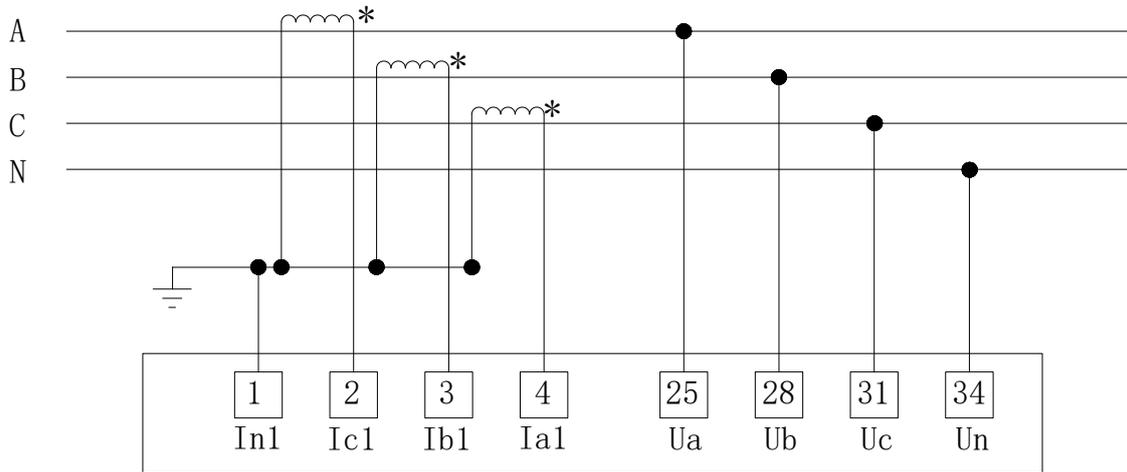
56	55	54	53	52	51	50	49	48	47	46	45
Ia6	Ib6	Ic6	In6	NC	NC	NC	NC	P1+	P1-	P2+	P2-
Current of 6 th Circuit								1st Pulse		2nd Pulse	

44	43	42	41	40	39	38	37	36	35
485B2	485A2	485B1	485A1	NC	NC	N/-	L/+	NC	PG
1 st Way RS485Communication		2 nd Way RS485Communication					Power Supply		

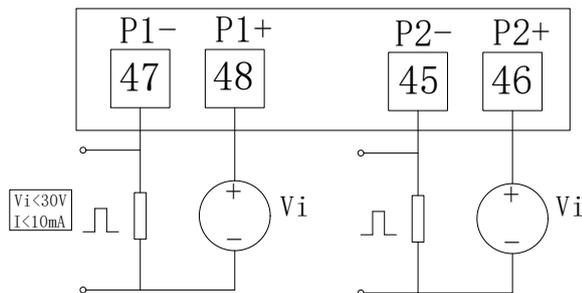
Lower Row of Terminals

Chapter 5 Typical Wiring

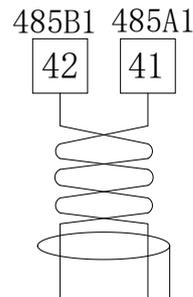
5.1 Voltage and Current Wiring (remark: wiring of circuits from 1st to 9th is the same)



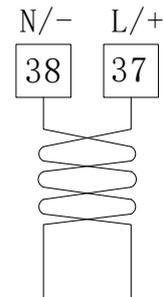
5.2 Interfaces of Energy Pulse Output



5.3 RS485 Wiring



5.4 Power Wiring

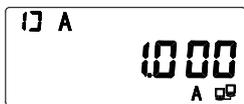


Chapter 6 Meter Display and Operation



On voltage display interface, the present phase A voltage is 220.00V.

Press buttons "▲" and "▼" to cyclically switch from phase A voltage, to phase B voltage, to phase C voltage, to average voltage and to zero sequence voltage. Press "←" to switch to the current display interface. If display values don't comply with real values, please check the setting value of PT ratio on chapter 8.



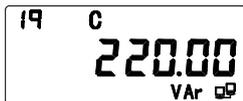
On current display interface, the present current value of phase A from the first circuit is 1.000A. Press buttons "▲" and "▼" to cyclically switch phase A current, phase B current, phase C current from the 9 circuits. Press button "←" to switch to the active power display interface. If display values don't comply with real values, please check the setting value of CT ratio on chapter 8.



On current display interface, the present current value of phase A from the first circuit is 1.000A. Press buttons "↑" and "↓" to cyclically switch phase A current, phase B current, phase C current from the 9 circuits. Press button "←" to switch to the active power display interface. If display values don't comply with real values, please check the setting value of CT ratio on chapter 8.



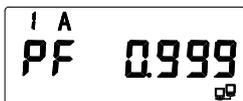
On active power display interface, the present active power of phase A from the first circuit is 220.00W. Press buttons "↑" and "↓" to cyclically switch phase A, phase B and phase C active power from the 9 circuits. Press button "←" to switch to the reactive power display interface. If display values don't comply with real values, please check the setting values of CT and PT ratio on chapter 8.



On reactive power display interface, the present reactive power of phase C from the third circuit is 220.00VAr. Press "↑" and "↓" to cyclically switch phase A, phase B and phase C reactive power from the 9 circuits. Press button "←" to switch to the apparent power display interface. If display values don't comply with real values, please check the setting values of CT and PT ratio on chapter 8.



On apparent power display interface, the present apparent power of phase A from the fourth circuit is 220.00VA. Press buttons "↑" and "↓" to cyclically switch phase A apparent power, phase B apparent power, phase C apparent from the 9 circuits. Press button "←" to switch to the power factor display interface. If display values don't comply with real values, please check the setting values of CT and PT ratio on chapter 8.



On power factor display interface, the present power factor of phase A from the fifth circuit is 0.999. Press buttons "↑" and "↓" to cyclically switch phase A power factor, phase B power factor, phase C power factor from the 9 circuits. Press button "←" to switch to the energy display interface.

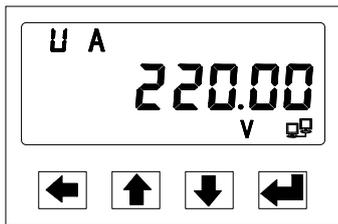


On energy display interface, press buttons "↑" and "↓" to cyclically display total active energy, import active energy, export active energy, total reactive energy, import reactive energy and export reactive energy from one circuit. Press button "←" to switch back to single-phase energy display interface.



On single-phase energy display interface, it displays the present total active energy of phase A from the first circuit. Press buttons "↑" and "↓" to cyclically display total energy of phase A, phase B and phase C from 9 circuits. Press button "←" to switch back to voltage display interface.

Chapter 7 Parameters Setting Interface



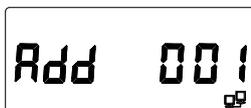
In the display interface of measured value, press buttons the "←" and "←" at the same time, it will entry system parameters setting mode. Under setting mode, the button "←" will be used for digital shift, it can edit 1 digit shift left each time, and the digit will be flashing. The button "↑" is used to plus 1, i.e., the flashing digit will be plus 1 when pressing "↑" each time. If the flashing digit is 9, then press "↑", the digit will become 0. The button "↓" is used to minus 1, i.e., the flashing digit will be minus 1 when pressing "↓" each time. If the flashing digit is 0, then press "↓", the digit will become 9. The button "←" is used to confirm setting and entry the next setting interface. At any setting interface, press "←" and "←", it will quit setting mode and display measurement data.

7.1 password setting interface



Press buttons the "←" and "←" at the same time, it will entry system parameters setting mode. Entry password setting interface, the default password is 0000. If the password is not correct, press "←"(U/I) then the upper right corner will show the warning sign. If the password is correct, press "←", it will entry address setting interface.

7.2 address setting interface



Entry address setting interface. The present display means the meter address is 001. Setting range is 1-247. Press the buttons of "↑" and "↓" and ← to set value. (the address setting should be compliance with the requirements refer to register table) Press "←" to confirm and entry setting interface of communication parameters.

7.3 communication parameter 1 setting interface



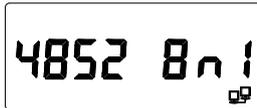
Entry communication parameter 1 setting interface. The present display means the parameter of RS485 1 communication is "8n1". Press the buttons of "↑" and "↓" to set the parameters as "8n1", "8o1", "8e1". Press "←" to confirm and entry setting interface of baud rate.

7.4 baud rate setting interface



Entry baud rate setting interface. The present display means the baud rate of RS485 1 is 9600. Press the buttons of "↑" and "↓" to set the parameters as 2400, 4800, 9600, 19200. After setting, press "←" to confirm and entry setting interface of communication parameter 2

7.5 communication parameter 2 setting interface



Entry communication parameter 2 setting interface. The present display means the parameter of RS485 communication is "8n1". Press the buttons of "↑" and "↓" to set the parameters as "8n1", "8o1", "8e1". Press "←" to confirm and entry setting interface of baud rate.

7.6 baud rate setting interface



Entry baud rate setting interface. The present display means the baud rate of RS485 1 is 9600. Press the buttons of "↑" and "↓" to set the parameters as 2400, 4800, 9600, 19200. After setting, press "←" to confirm and entry setting interface of voltage connection mode.

7.7 voltage connection mode setting interface



Entry voltage connection mode setting interface. Press the buttons of "↑" and "↓" to set the voltage wiring. 3Ln is the connection mode of 3 phase 4 wire, 2LL is the connection mode of 3 phase 3 wire. After setting, press "←" to confirm and entry voltage ratio setting interface

7.8 voltage ratio setting interface



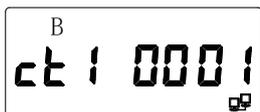
Entry voltage ratio setting interface, setting range is 1~9999.(Voltage ratio setting should be compliance with the requirements refer to register table) Press the buttons of "↑" and "↓" and ← to set value. After setting, press "←" to confirm and entry current ratio setting interface of circuit 1 phase A.

7.9 current ratio setting interface of circuit 1 phase A



Entry current ratio setting interface of circuit 1 phase A. The present display means the current ratio value of circuit 1 phase A is 1. Press the buttons of "↑" and "↓" and ← to set value. After setting, press "←" to confirm and entry current ratio setting interface of circuit 1 phase B.

7.10 current ratio setting interface of circuit 1 phase B



Entry current ratio setting interface of circuit 1 phase B. The present display means the current ratio value of circuit 1 phase B is 1. Press the buttons of "↑" and "↓" and ← to set value. After setting, press "←" to confirm and entry current ratio setting interface of circuit 1 phase C.

7.11 current ratio setting interface of circuit 1 phase C



Entry current ratio setting interface of circuit 1 phase C. The present display means the current ratio value of circuit 1 phase C is 1. Press the buttons of "↑" and "↓" and ← to set value. After setting, press "←" to confirm and entry current ratio setting interface of circuit 2 phase A.(the rest circuit of 2~9 can be done in the same manner.)After setting current ratio of circuit 9 phase C, press "←" to confirm and entry setting interface of energy pulse output channel 1.

7.12 energy pulse output channel 1 setting interface



Entry the channel setting interface of energy pulse constant. The value is energy pulse output of which circuit. The present display is energy pulse of circuit 1. Press the buttons of "↑" and "↓" to select energy pulse output channel. After setting,

press "←" to confirm and entry energy pulse output type setting interface of channel 1.

7.13 energy pulse output 1 type setting interface



Entry energy pulse output 1 type setting interface. Press the buttons of "↑" and "↓" to set the energy pulse output type. Each value meaning: 1 is full-wave active power, 2 is full-wave reactive power, 3 is full-wave apparent power, 4 is fundamental wave active power, 5 is fundamental wave reactive power, 6 is fundamental wave apparent power. After setting, press "←" to confirm and entry setting interface of energy pulse output channel 2.

7.14 energy pulse output channel 2 setting interface



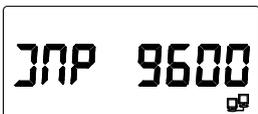
Entry the channel setting interface of energy pulse constant. The value is energy pulse output of which circuit. The present is energy pulse of circuit 1. Press the buttons of "↑" and "↓" to select energy pulse output channel. After setting, press "←" to confirm and entry type setting interface of energy pulse output channel 2.

7.15 energy pulse output 2 type setting interface



Entry energy pulse output 2 type setting interface. Press the buttons of "↑" and "↓" to set the energy pulse output type. Each value meaning: 1 is full-wave active power, 2 is full-wave reactive power, 3 is full-wave apparent power, 4 is fundamental wave active power, 5 is fundamental wave reactive power, 6 is fundamental wave apparent power. After setting, press "←" to confirm and entry setting interface of energy pulse constant.

7.16 energy pulse constant setting interface



Entry the setting interface of energy pulse constant. Press buttons of "↑" and "↓" to set energy pulse constants. After setting "IMP 9600", press button "←" to confirm and return to communication address setting interface.

Chapter 8 Common Fault Diagnosis and Solutions

11.1 Abnormal Display

11.1.1 Question (hereafter referred to as Q): Not display or black screen

Answer (hereafter referred to as A): Check whether the working power of meter is connected or not. If it is connected, use a digital multimeter to measure whether phase voltages of the meter between A and N, B and N, C and N are AC220V. If not, check whether the switch of the distribution box is connected or not.

11.1.2 Q: Lacking Phases (generally of three-phase meter), or Too Large or Too Small Voltage & Current

- A: 1) Confirm the module number of meter;
2) Confirm the wiring method which is generally 3 phase 4 wire 3LN

11.2 Q: Abnormal Communication

A: 1) Confirm the meter model number.
2) Confirm whether the address, baud rate, connection of 485A/485B are correct or not.

11.3 Q: Inaccurate Energy Measurement.

A: Confirm the meter models, the function of energy measurement and correct current transformer ratio setting. Third,)

- 1) Confirm that the voltage and current display normally.
- 2) Confirm that the active power and power factor display normally by calculating voltage and current.
- 3) Make an energy experiment by recording the whole parameters per hour, and confirm that energy is measured normally, that is the product of the power and time period is the same as the energy in the time period.

Chapter 9 After-sales Service

Product Warranty

1. The product warranty period is three years.
2. The company is responsible for free maintenance or exchange within three-year warranty period.
3. The cost of the components and freight shall be charged for improper meter installation and/or operation.
4. Over the warranty period, part of the maintenance cost according to actual situation will be charged.

Service Guarantee

1. Product technical consulting and quality complaints will be replied within 12 hours.
2. Solutions for quality complaints will be provided within 24 hours.
3. Except statutory holidays and force majeure.

Contact Us

Headquarter Add.: 7F No.1 Aosheng Building, 1166 Xinluo Street, High-tech Development Zone, Jinan, P.R. China 250101

Factory Add.: 2F Innovation Factory, Feiyue Road, High-tech Development Zone, Jinan, P.R. China 250101

Tel: +86 68621770-863

Code: 250101

E-mail: info@heyuanintel.com