

DZ81-DZS500 Smart Three Phase Meter User Manual



Heyuan Intelligence Technology Co., Ltd

IMPORTANT DECLARATIONS

Copyright © 2018 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: 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 instructions 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
2.5 Measuring Accuracy	1
2.6 Communication	1
2.7 Power Supply	1
2.8 Pulse Output of Import Active Energy	1
2.9 Working Condition	2
Chapter 3 Dimension and Installation	2
3.1 Dimension	2
3.2 Installation Method	2
Chapter 4 Terminals	2
4.1 Digital Input Status	2
4.2 Digital Output Status	2
4.3 Energy Pulse Output Status	3
4.4 Upper Row of Terminals	3
4.5 Lower Row of Terminals	3
4.6 Standard Definition of Terminal Block	3
Chapter 5 Typical Wiring	4
Chapter 6 Meter Display and Operation	5
Chapter 7 After-sales Service	18
Chapter 8 Contact Us	18

Chapter 1 Meter Overview

DZ81-DZS500 is an advanced, smart networked electricity energy meter. It is widely used in power distribution sites, energy management systems and intelligent monitoring systems of different industries. It measures electric parameters i.e. three-phase/line voltage, three-phase current, zero-sequence voltage, zero-sequence current, voltage unbalance, current unbalance, active power, reactive power, power factor, frequency, load property, 2~31st harmonic analysis, active energy, reactive energy and multi-tariff energy etc.

Display: LED display.

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: 5A

Starting Current: 1%In

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)

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

2.7 Power Supply

Power Supply: AC85~265V(45 ~ 55HZ)/ DC85 ~ 300V

Power Consumption: <3VA

Power-line Connection Terminals: L/+ and N/-

2.8 Pulse Output of Import Active Energy

Pulse Constant	Pulse Width	Max. Current	Working Voltage
2000imp/kWh	50±2ms	10mA(DC)	5V~24V

2.9 Working Condition

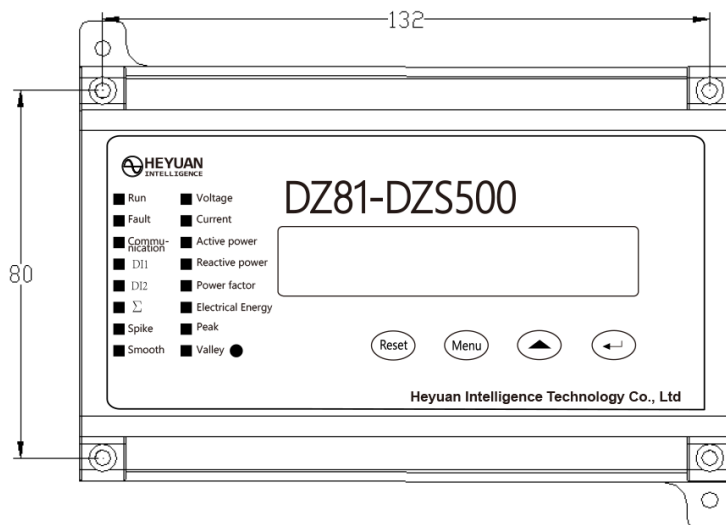
Operating Temperature: -20℃ ~ +65℃

Storage Temperature: -40℃ ~ +85℃

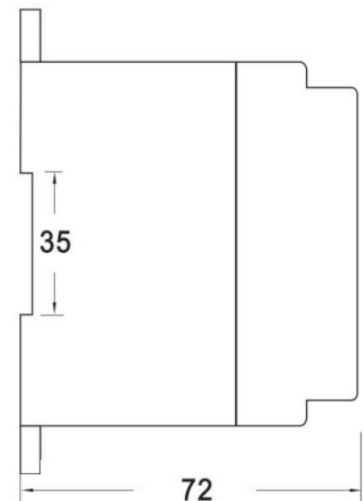
Relative Humidity: 20% ~ 90%(non-condensing)

Chapter 3 Dimension and Installation

3.1 Dimension (unit: mm)



Front View



Side View

3.2 Installation Method

Installation Environment: DZS500 should be installed in a dry and dust free environment. Avoid exposing meter to excessive heat, radiation and high electrical noise sources.

Installation Method: DIN rail Mounted

Chapter 4 Terminals

4.1 Digital Input Status

Terminal No.	Terminal Description	Remark
20	DI COM	passive dry contact, internal power supply (DC24V)
21	DI 1	
22	DI 2	

4.2 Digital Output Status

Terminal No.	Terminal Description	Remark
25	Protect Normally Open DO NO1	contact capacity 10A/250VAC
26	COM K1	
27	Protect Normally Closed NC1	
28	Normally Open DO NO2	
29	COM K2	
30	Normally Closed DO NC2	

4.3 Energy Pulse Output Status

Terminal No.	Terminal Description	Remark
31	Active Energy Pulse Output P+	null
32	Active Energy Pulse Output P-	

4.4 Upper Row of Terminals

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
COM	DI1	DI2			NO1	K1	NC1	NO2	K2	NC2	P+	P-	A+	B-	G
DI			Null		Protect DO			DO2			Pulse Output		Communication Interface		

4.5 Lower Row of Terminals

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
IA*	IA	IB*	IB	IC*	IC	VA	VB	VC	VN				L/+	N/-	⏏
Current Input						Voltage Input				Null			Power Supply		

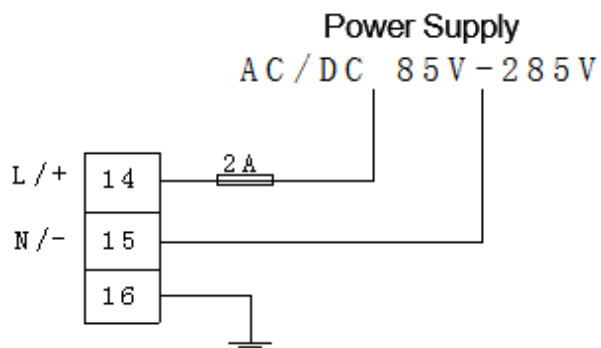
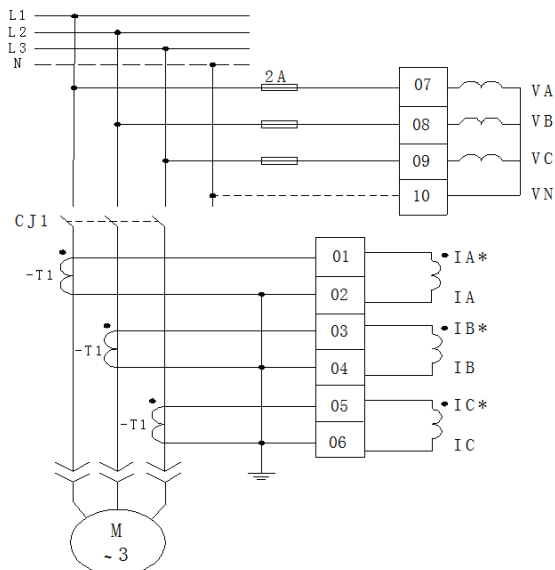
4.6 Standard Definition of Terminal Block

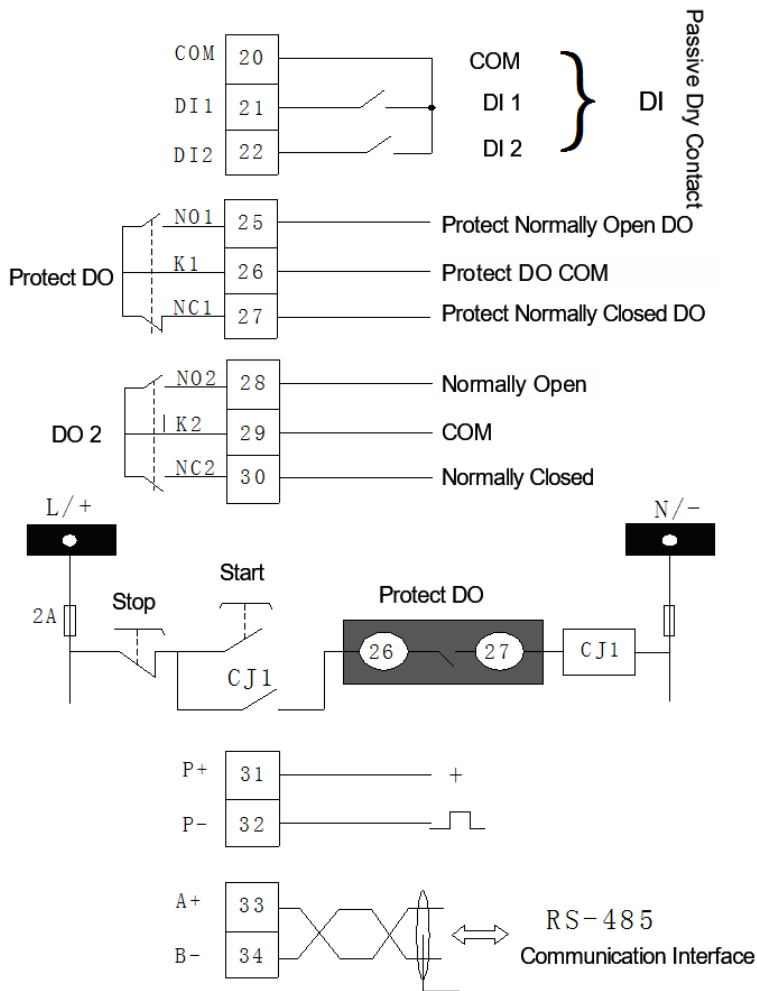
Terminal No.	Terminal Description	Original Status	Remark
01	Current Input IA *		AC 3×5(6)A
02	Current Input IA		
03	Current Input IB *		
04	Current Input IB		
05	Current Input IC *		
06	Current Input IC		
07	Voltage Input VA		AC 3×220V/380V
08	Voltage Input VB		

09	Voltage Input VC		power supply: AC 85V~265V / DC 85~300V
10	Neutral Line Input VN		
14	Meter Power Input L/+		
15	Meter Power Input N/-		
16	GND		

Terminal No.	Terminal Description	Original Status	Remark
20	DI COM		passive dry contact, internal power supply (DC24V)
21	DI 1		
22	DI 2		
25	Protect Normally Open DO NO1	normally open	contact capacity 10A/250VAC
26	COM K1		
27	Protect Normally Closed DO NC1	normally closed	
28	Normally Open DO NO2	normally open	
29	COM K2		
30	Normally Closed DO NC2	normally closed	
31	Active Energy Pulse Output P+		
32	Active Energy Pulse Output P-		
33	Communication RS485 A+		RS485 interfaces, Modbus RTU communication protocol
34	Communication RS485 B-		
35	G		

Chapter 5 Typical Wiring





Chapter 6 Meter Display and Operation

1st Interface, Start-up Interface



This interface displays the present meter address, communication baud rate, software version number when power up and reset. It will enter next interface automatically 3 seconds later.

2nd Interface, Phase A Current (IA) Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 3rd interface. Press button “Menu”, it will enter 8th interface.

3rd Interface, Phase B Current (IB) Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 4th interface. Press button “Menu”, it will enter 8th interface.

4th Interface, Phase C Current (IC) Interface



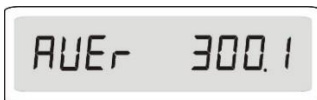
Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 5th interface. Press button “Menu”, it will enter 8th interface.

5th Interface, Zero-sequence Current Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 6th interface. Press button “Menu”, it will enter 8th interface.

6th Interface, Average Current Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 7th interface. Press button “Menu”, it will enter 8th interface.

7th Interface, Current Imbalance Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 2nd interface. Press button “Menu”, it will enter 8th interface.

8th Interface, Phase Voltage (Ua) Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 9th interface. Press button “Menu”, it will enter 16th interface.

9th Interface, Phase Voltage (Ub) Interface

 Ubn 232.6

Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 10th interface. Press button “Menu”, it will enter 16th interface.

10th Interface, Phase Voltage (Uc) Interface

 UCn 232.4

Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 11th interface. Press button “Menu”, it will enter 16th interface.

11th Interface, Line Voltage (Uab) Interface

 UAb 402.6

Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 12th interface. Press button “Menu”, it will enter 16th interface.

12th Interface, Line Voltage (Ubc) Interface

 Ubc 402.7

Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 13th interface. Press button “Menu”, it will enter 16th interface.

13th Interface, Line Voltage (Uca) Interface

 UCA 402.5

Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 14th interface. Press button “Menu”, it will enter 16th interface.

14th Interface, Zero-sequence Voltage (3U0) Interface

 3U0 032.7

Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 15th interface. Press button “Menu”, it will enter 16th interface.

15th Interface, Frequency FREQ Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 8th interface. Press button “Menu”, it will enter 16th interface.

16th Interface, Three-Phase Total Active Power Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 17th interface. Press button “Menu”, it will enter 19th interface.

17th Interface, Three-Phase Total Reactive Power Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 18th interface. Press button “Menu”, it will enter 19th interface.

18th Interface, Three-Phase Total Power Factor Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 16th interface. Press button “Menu”, it will enter 19th interface.

19th Interface, Import Total Active Energy Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will enter 20th interface to query import active energy in sharp period. Press button “Menu”, it will enter 21th interface.

20th Interface, Import Active Energy Interface



Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will display import active energy in sharp, peak, off-peak and shoulder period in turn. Press button “Menu”, it will enter 21th interface.

Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will display export reactive energy in sharp, peak, off-peak and shoulder period in turn. Press button “Menu”, it will enter 27th interface.

27th Interface, Present Time Interface



The present interface displays hour, minute, second, year, month, day from left to right. Press buttons “▲” or “Menu” to check other parameters. Press button “▲”, it will switch time interface. Press button “Menu”, it will enter 2nd interface.

28th Interface, Password Authentication Interface



Hold down button “←” until it displays “PASS” on the left and “0000” on the right. At this time, the first-digit value can be modified. Press button “▲”, it will modify values. Each time press button “▲”, it will plus 1. After completing modification, press button “←” to shift next digit. Next digits can be modified as above. The default password is “5555”. After completing all modifications, press button “←” to pass password authentication and enter parameter setting interface. If password is wrong, press button “←” to enter 2nd interface. And hold down button “←” until it displays “PASS” on the left and “0000” on the right. Then correct password can be entered.

29th Interface, Parameter Group 1 Interface



Press button “←” to enter parameter group 1 and then enter 30th interface. Press button “Menu” to switch and enter parameter groups.

30th Interface, Meter Address Interface



Meter address is important for meter to communicate and there should not be repetitive addresses in same communication network segment because wrong meter address may lead to conflict. The present interface shows that the default meter address is “1”. After completing modification, press button “←” and it will enter 31st interface.

31st Interface, Communication Baud Rate Interface



Communication baud rate in same communication network segment should be the same. User should set communication baud rate according to conditions on sites and communication distance. Communication baud rates can be set as follows (unit: bps) by press button “▲”.

Interface Display	2400	4800	9600	19200	38400
----------------------	------	------	------	-------	-------

The present interface shows that the default baud rate is “9600”. After completing modification, press button “←” and it will enter 32nd interface.

32nd Interface, Display Mode Interface



Press button “▲” to set the display mode as automatic cyclical display *AUTO* or button operation display *PEyb*. The present interface displays button operation display. After completing modification, press button “←” and it will enter 33rd interface.

33rd Interface, Wiring Mode Interface



Press button “▲” to choose the wiring mode from *3-44* (3-phase 4-wire Y wiring) or *3-3U* (3-phase 3-wire Δ wiring). When choosing *3-44* (3-phase 3-wire Δ wiring), it will display interfaces of three phase current, three phase line voltage, three phase total power etc. After completing modification, press button “←” and it will enter 34th interface.

34th Interface, Energy Metering Direction Interface



Press button “▲” to choose the energy metering direction from *dir t* (bidirectional energy metering) or *no* (only metering import active energy). After completing modification, press button “←” and it will enter 35th interface.

35th Interface, DO Mode Interface



Press button “▲” to set pulse output time of relay. When setting time as “0”, the default DO is level mode. After completing modification, press button “←” and it will enter 36th interface.

36th Interface, Energy Pulse Interface



It displays energy pulse values which each active energy kWh and reactive energy kvarh corresponds to separately. After completing modification, press button “←” and it will enter 37th interface.

37th Interface, Demand Cycle Interface



Demand refers to the maximum value of energy in a certain cycle. The demand cycle can be any one from 5 minutes, 10 minutes, 15 minutes, 30 minutes and 60 minutes, which can be set by pressing button “▲”. After completing modification, press button “←” and it will enter 38th interface.

38th Interface, Start-up Diagram Interface



Press button “▲” to set start-up time and trigger mode. **P-SE** refers to self-judgement and **DI 2** refers to DI2 trigger mode. After completing modification, press button “←” and it will enter 39th interface.

39th Interface, Start-up Hour Interface for Settlement



It displays the energy settlement hours for last 10 days. Press button “▲” to set settlement time. After completing modification, press button “←” and it will enter 40th interface.

40th Interface, User's Password Interface



User can modify password. The present interface displays the default password. After completing modification, press button “←” and it will enter 41st interface.

41st Interface, Exiting Parameter Group 1 Interface



Press button “←” to Exiting parameter group 1 and enter 2nd interface.

29th Interface, Parameter Group 2 Interface



Press button “←” to enter parameter group 2 and enter 42nd interface.

42nd Interface, CT Ratio Interface



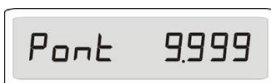
The present interface displays the CT ratio as 5.000. After completing modification, press button “←” and it will enter 43rd interface.

43rd Interface, PT Ratio Interface



The present interface displays the PT ratio as 100.0. After completing modification, press button “←” and it will enter 44th interface.

44th Interface, Power Range Interface



The present interface displays the unit of power as kW and maximum power is 9.999kW. After completing modification, press button “←” and it will enter 45th interface.

45th Interface, Rated Voltage Interface



User can set rated voltage. The decimal position of rated voltage is the same with that of PT ratio. After completing modification, press button “←” and it will enter 46th interface.

46th Interface, Rated Current Interface

Ed-A 2.250

User can set rated current. The decimal position of rated current is the same with that of CT ratio. After completing modification, press button “←” and it will enter 47th interface.

47th Interface, Exiting Parameter Group 2 Interface

2-E

Press button “←” to exit parameter group 2 and enter 2nd interface.

29th Interface, Parameter Group 3 Interface

545.3

Press button “←” to enter parameter group 3 and enter 46th interface.

48th Interface, Proportion of Starting Current to Rated Current Interface

1-5tAr 25

The setting range for the proportion is 10%~50%. Press button “▲” to set the proportion. After completing modification, press button “←” and it will enter 49th interface.

49th Interface, Start-up Time Interface

t-5tAr 0 10

The setting range is 1~250s. Press button “▲” to set the time. After completing modification, press button “←” and it will enter 50th interface.

50th Interface, Shut down time Interface

t-5toP 020

The setting range is 1~250s. Press button “▲” to set the downtime. After completing modification, press button “←” and it will enter 51st interface.

51st Interface, Harmonic Content Interface

tHdA 06.2

Press button “▲” to cyclical display harmonic content of IA, IB, IC, UA, UB and UC. Press

button “←” and it will enter 52nd interface.

52nd Interface, Over-current Protection Interface



Press button“▲” to set *ALr* as alarm, *CUE* as tripping and *d1 5* as invalid. The setting value range is [105%~200%]Ie, action time 0.1s~25.0s and setting difference 0.1s. The present interface displays the over-current protection setting as tripping. When current of any phase is more than 120% of rated current, delay 5s to trip. After completing modification, press button “←” and it will enter 53rd interface.

53rd Interface, Over-voltage Protection Interface



Press button“▲” to set *ALr* as alarm, *CUE* as tripping and *d1 5* as invalid. The setting value range is [105%~200%]Ue, action time 0.1s~25.0s and setting difference 0.1s. The present interface displays the over-voltage protection setting as tripping. When voltage of any phase is more than 130% of rated voltage, delay 5s to trip. After completing modification, press button “←” and it will enter 54th interface.

54th Interface, Under-voltage Protection Interface



Press button“▲” to set *ALr* as alarm, *CUE* as tripping and *d1 5* as invalid. The setting value range is [20%~100%]Ue, action time 0.1s~25.0s and setting difference 0.1s. The present interface displays the under-voltage protection setting as tripping. When maximum phase voltage is less than 80% of rated voltage, delay 5s to trip. After completing modification, press button “←” and it will enter 55th interface.

55th Interface, Short-phase Protection Interface



Press button“▲” to set *ALr* as alarm, *CUE* as tripping and *d1 5* as invalid. The action time 0.1s~25.0s and setting difference 0.1s. The present interface displays the short-phase protection setting as tripping. When there is short-phase for any phase current, delay 5s to trip. After completing modification, press button “←” and it will enter 56th

56th Interface, Imbalance Protection Interface



Press button“▲” to set *ALr* as alarm, *CUT* as tripping and *d1 S* as invalid. The setting value range is [10%~95%]Ie, action time 0.1s~25.0s and setting difference 0.1s. The present interface displays the imbalance protection setting as tripping. When current imbalance is more than 30%, delay 10s to trip. After completing modification, press button “←” and it will enter 57th interface.

57th Interface, Zero-sequence Over-Current Protection Interface



Press button“▲” to set *ALr* as alarm, *CUT* as tripping and *d1 S* as invalid. The setting value range is [30%~100%]Ie, action time 0.1s~25.0s and setting difference 0.1s. The present interface displays the over-current protection setting as tripping. When zero-sequence current is more than 80% of rated current, delay 5s to trip. After completing modification, press button “←” and it will enter 58th interface.

58th Interface, Zero-sequence Over-voltage Protection Interface



Press button“▲” to set *ALr* as alarm, *CUT* as tripping and *d1 S* as invalid. The setting value range is [30%~100%]Ue, action time 0.1s~25.0s and setting difference 0.1s. The present interface displays the zero-sequence over-voltage protection setting as tripping. When zero-sequence voltage is more than 50% of rated voltage, delay 5s to trip. After completing modification, press button “←” and it will enter 59th interface.

59th Interface, Exiting Parameter Group 3 Interface



Press button “←” to exit parameter group 3 and enter 2nd interface.

29th Interface, Parameter Group 4 Interface

545.4

Press button “←” to enter parameter group 4 and enter 60th interface.

60th Interface, Time of Use Interface (10 TOUs Settable)

1 StA-01.00

1 ENd-07.00

Press button “▲” to set the starting and ending time of TOU. Press button “←” to switch and set TOUs. After setting all 10 TOUs, press button “←” and it will enter 61st interface.

61st Interface, Exiting Parameter Group 4 Interface

4-E

Press button “←” to exit parameter group 4 and enter 2nd interface.

29th Interface, Parameter Group 5 Interface

545.5

Press button “←” to enter parameter group 5 and then enter 62nd interface.

62nd Interface, SOE Query Interface

01 Lo-U

LL 08.52.08

hh20 13.04.20

The present interface displays causes and time of event-1. Press button “←” to query SOE and enter 63rd interface.

The causes of SOE are remarked as follows

Over-Current	Over-Voltage	Under-Voltage	Short-Phase	Unbalance	Zero-Sequence Current	Zero-Sequence Over-Voltage
HI -I	HI -U	Lo-U	LoSt	BrERd	HI -I 0	HI -U0
DI1 Connected	DI1 Disconnected	DI2 Connected	DI2 Disconnected	Clear Energy	Parameter Modification	
dl 1-1	dl 1-0	dl 2-1	dl 2-0	cLE	SEt5	

6.63 63rd Interface, Exiting Parameter Group 5 Interface

5-E

Press button “←” to exit parameter group 5 and enter 2nd interface.

Chapter 7 After-sales Service

Product Warranty

1. The product warranty period is one year.
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.

Chapter 8 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

E-mail: info@heyuanintel.com

Website: heyuanintel.com