ATZ3000 Comprehensive Monitoring Unit User's Manual V1.0

Hangzhou Antin Power Technology Co., Ltd

Declarations

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Content

Chapter 1 Product Overview

1.1 Product Introduction

This series of integrated monitoring device is a cost-effective power monitoring instrument developed for low-voltage power systems such as commercial buildings, municipal buildings, industrial automation and residential power consumption. Comprehensive monitoring device with industrial-grade microprocessor as the core, high processing speed, can provide high-precision voltage, current, power, frequency, active power, reactive power, power factor, total harmonics, sub-harmonics, pay rate and other measurements, through the RS-485 communication with the host computer to achieve the exchange of data, you can realize the intelligent management of electric energy. Comprehensive monitoring device adopts modular design, flexible configuration, easy to expand functions. Large dot-matrix liquid crystal display, easy to read data. Comprehensive monitoring device has a wide range of for, can be applied to a variety of intelligent buildings in the field of electricity, industrial power management system and energy efficiency management system, typical applications are: factory power system automation, load control; intelligent building system; power plant electrical DAS; reactive power compensation system.

1.2 Product Features

- Calculation of three-phase power parameters
- Time-based billing with 2 sets of rates and 8 time slots

- Continuous recording of SOE events by time scale
- Power quality can be monitored: harmonic distortion rate, unbalance, phase angle, K-factor
- Adjustable voltage-current ratio
- Support RS-485 communication, MODBUS-RTU protocol
- Adopt AC/DC dual-purpose power supply, high and low voltage isolation
- Dot matrix liquid crystal display

1.3 Product Parameters

Measurement and metrology	
Voltage	Phase voltage, line voltage
Current	Three-phase current
Active power	Split-phase and total active power
Reactive power	Split-phase and total reactive power
Apparent power	Split-phase and total apparent power
Power factor	Split-phase and total power factor
Frequency	45-65Hz
Electricity metering	
Active energy	Forward/reverse active energy

Reactive energy	Forward/reverse reactive energy
Communication function	
Communication protocols	MODBUS-RTU
Communication method	RS485

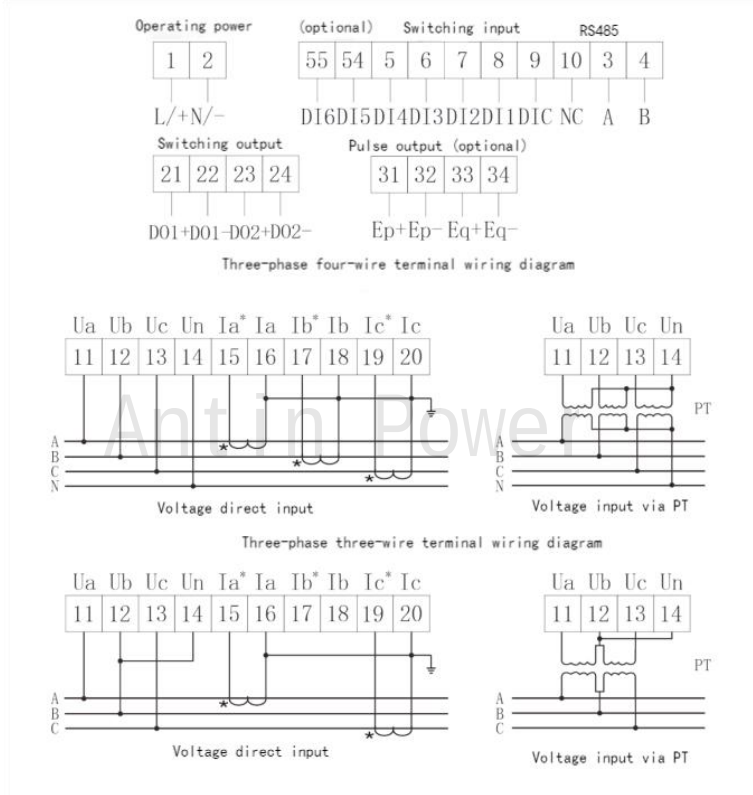
Chapter 2 Technical Specifications

2.1 Technical Parameters

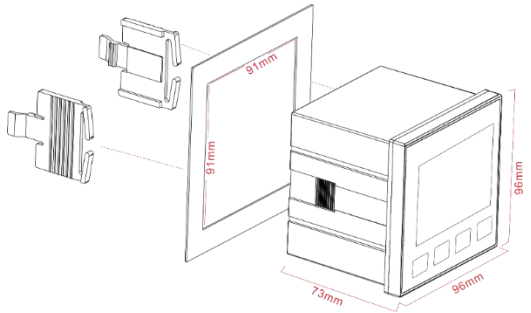
Technical Parameters			norm
Applicable networks			Three-phase four-wire, three-phase three-wire
Operating power		Voltage range	AC/DC85~265V
		Power wastage	<2W
Accuracy Class			Reactive 1 level, the rest 0.5 level
Input	Voltage	Rating	AC 100V、220V、400V
		Power wastage	<0.02VA/phase@220V
		(electrical) impedance	≥200kΩ
	Current	Rating	AC 5A(0.02A-5A)
		Overloaded	1.2x continuous, 10x (10s)）
		Power wastage	<0.02VA/phase@5A
		(electrical) impedance	≥0.1Ω
	Frequency		45Hz~65Hz
Communication interface			RS485/Modbus-RTU
Circumstances	Temperature		Operating Temperature: -25℃~75℃, Storage: -40℃~85℃
	Humidity		≤95%RH, non-condensing, non-corrosive gas place

EMC Electromagnetic Compatibility	Height above sea level	≤3000m
	Electrostatic discharge immunity	IV级 （GB/T 17626.2 IEC 61000-4-2）
	Immunity to radiofrequency electromagnetic field radiation	III级 （GB/T 17626.3 IEC 61000-4-3）
	Electrical fast transient pulse group immunity	IV级 （GB/T 17626.4 IEC 61000-4-4）
	Surge immunity	IV级 （GB/T 17626.5 IEC 61000-4-5）
	RF conducted immunity	III级 （GB/T 17626.6 IEC 61000-4-6）
	Work frequency magnetic field immunity	IV级 （GB/T 17626.8 IEC 61000-4-8）
	Oscillatory wave immunity	III级 （GB/T 17626.12 IEC 61000-4-12）
	EMI limit values	In line with（GB/T 14598.16 IEC 60255-25）
Electrical insulation properties	Dielectric strength	2kV frequency voltage, 1 minute (GB/T 13729)
	Electrical insulation resistance	Not less than 100MΩ （GB/T 13729）
	Impulse voltage	5kV，12/50μs （GB/T 13729）
Mechanical property	Vibration Response/Endurance	I级 （GB/T 11287）
	Shock Response/Endurance	I级 （GB/T 14537）
	Collision Response	I级 （GB/T 14537）

2.2 Wiring Diagram



2.3 Outline/opening dimensions and installation drawings



Chapter 3 Operating Instructions

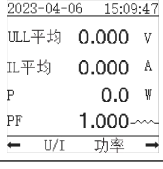
3.1 Key Description

Unit has four buttons "F1"、"F2"、"F3"、"F4", Corresponding to the definition of the key and then the bottom line of the LCD screen display, the possible text as follows：

Key contents	Key Meaning
	Left Flip Shift to the left when entering a digit by digit Option changes during parameter setting
	Right Flip

	Refer to "previous page" when browsing parameters, and increase the value when setting parameters.
	Next page" for parameter browsing, decreasing value for parameter setting.
Confirm	When setting parameters, enter the modification state or confirm parameter modification.
Exit	Exit this level of the menu
Textual content (e.g., "U/I," "power," etc.)	Go to the corresponding content submenu

3.2 Main interface

	Display contents of the main interface

	Level 1 menu	Secondary menu	Three-tier menu
U/I	Phase voltage		
	Line voltage		

	Current		
	In		
	Frequency		
	Voltage angle		
	Current angle		
	Vector graphics		
	U1 waveform		
	U2 waveform		
	U3 waveform		
	I1 waveform		
	I2 waveform		
	I3 waveform		
	Running time		
	Fundamental voltage		
	Fundamental current		
Power	Total power		
	Active power		
	Reactive power		
	Apparent power		
	Power factor		

	Fundamental power factor		
Electricity	Sum of Electricity		
	Active degree of electricity		
	Reactive power		
	Apparent electrode		
Requirement	Maximum demand	Maximum power requirement	
		Maximum current demand	
	Real-time demand	Real-time power demand	
		Current demand in real time	
Harmonic	Fundamental	Total Voltage Harmonics	
		Total current harmonics	
		K-factor	
		Voltage crest factor	

		Unbalance	
		Voltage sequence component	
		Current sequence component	
	Histogram	U1 odd harmonic	
		U2 odd harmonic	
		U3 odd harmonic	
		I1 odd harmonic	
		I2 odd harmonic	
		I3 odd harmonic	
	L1	L1 odd harmonic	
		L1 even harmonic	
	L2	L2 odd harmonic	
		L2 even harmonic	
	L3	L3 odd harmonic	
		L3 even harmonic	
Best value	Maximum values	U/I	Phase voltage max.
			Line voltage max.
			Maximum value of current
			Inc Max
		Power	Maximum active

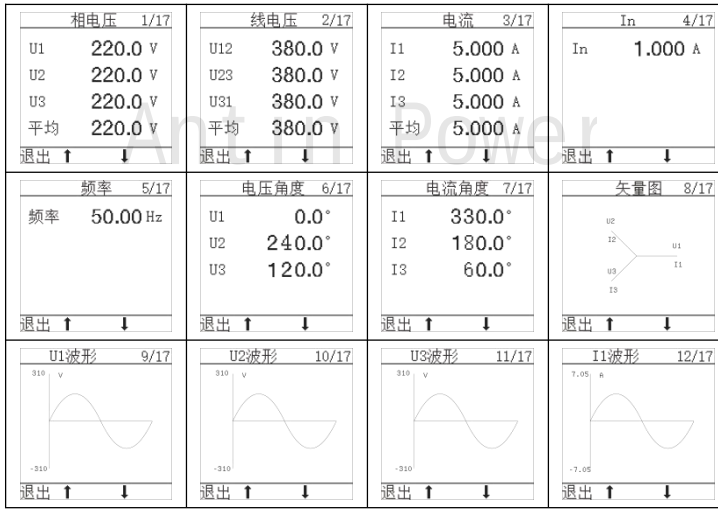
			power
			Maximum reactive power
			Maximum apparent power
			Power factor max.
		Harmonic	Maximum value of total voltage harmonics
			Maximum value of total current harmonics
			Maximum K-factor
			Maximum value of the crest factor
	Minimum value	U/I	Phase voltage min.
			Line voltage min.
			Current Minimum
			Inc Min.
		Power	Minimum active power
			Reactive power min.

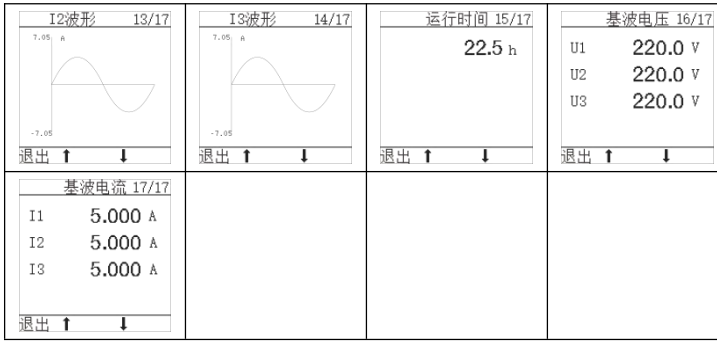
			Apparent power minimum
			Power factor min.
		Harmonic	Voltage total harmonic min.
			Current total harmonic min.
			Minimum value of K-factor
			Crest Factor Min.
I/O	DI status		
	DI pulse counting		
	DO state		
Tariff	Points, peaks, flats, valleys F5、F6、F7、F8	Active degree of electricity	
		Reactive power	
		Apparent electrode	
Set up	For detailed functions, please see "Parameter Setting Menu".		

3.3 Display screen

3.3.1 U/I menu

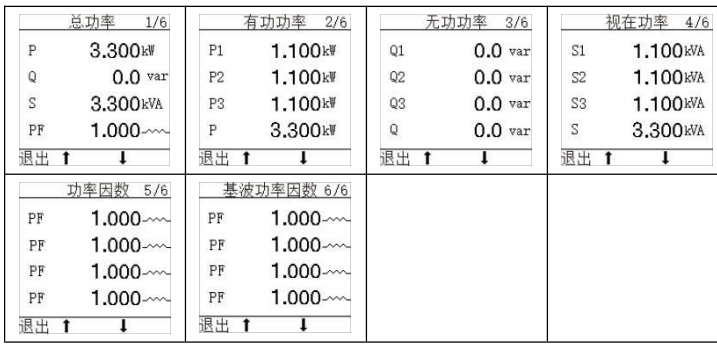
Display parameters such as phase voltage, line voltage, current, In, frequency, voltage angle, current angle, vector diagram, U1 waveform, U2 waveform, U3 waveform, I1 waveform, I2 waveform, I3 waveform, running time, fundamental voltage, fundamental current, etc. The specific display interface is as follows：





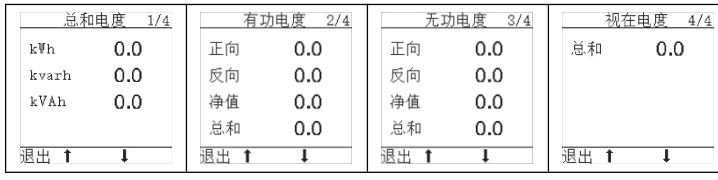
3.3.2 Power menu

Display parameters such as total power, active power, reactive power, apparent power, power factor, base wave power factor, etc. The specific display interface is as follows：



3.3.3 Electricity menu

Displays the parameters of summed degree, active degree, reactive degree, apparent degree, etc. The specific display interface is as follows：



3.3.4 Requirements menu

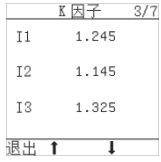
The demand menu is divided into two sub-menus (maximum, real-time), which display the power demand and current demand, respectively, as follows：

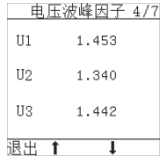
Maximum		Real time	
功率最大需量 1/2 P 15.094 kW 2023-04-06 15:09:47 Q -5.094 var 2023-04-06 15:09:47 S 15.094 kVA 2023-04-06 15:09:47 退出	电流最大需量 2/2 755.0 A 2023-04-06 15:09:47 755.0 A 2023-04-06 15:09:47 755.0 A 2023-04-06 15:09:47 退出	功率实时需量 1/2 P 0.0 W Q 0.0 var S 0.0 VA 退出	电流实时需量 2/2 I1 0.000 A I2 0.000 A I3 0.000 A 退出

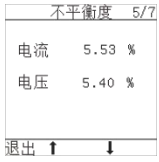
3.3.5 Harmonics menu

The Harmonics menu is divided into five sub-menus (Basic, Histogram, L1, L2, L3), of which "L1", "L2" and "L3" show the odd harmonics and even harmonics, respectively. The details are as follows：

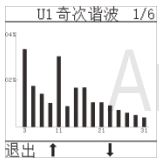
Basic

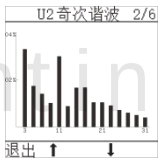


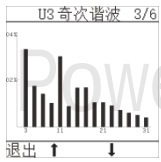


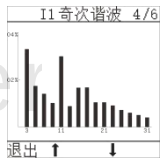


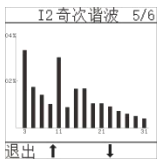
Histogram

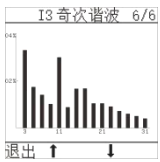










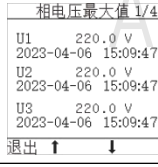
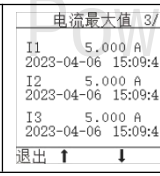
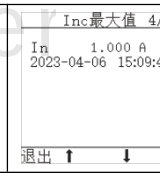
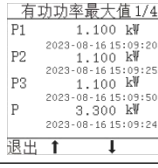
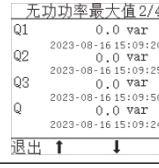
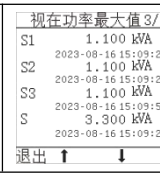
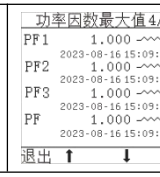


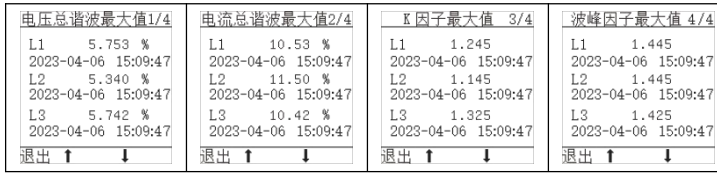
L1（L2、L3 the same as L1）

3.3.6 Best Value Menu

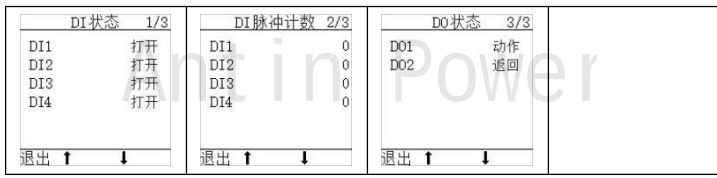
Maximum menu is divided into two submenus (maximum, minimum), "maximum" and "minimum" below the three levels of the same menu, respectively, to display the U/I, power, harmonics, the specific content is as follows：

U/I			
			
Power			
			
Harmonic			



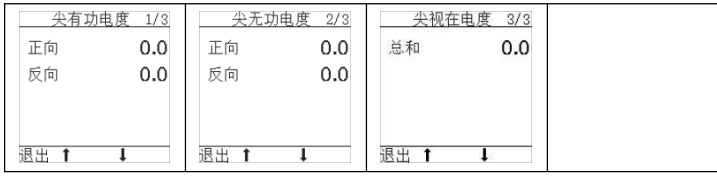
3.3.7 I/O Menu

Displays parameters such as DI status, DI pulse count, DO status, etc. The specific display interface is as follows：



3.3.8 Rate Menu

The rate menu is divided into eight submenus (sharp, peak, flat, valley, F5, F6, F7, F8), which display active, reactive, and apparent degrees of electricity as follows：



3.3.9 Setup Menu

Setting menu, default password: 1000, refer to Parameter Setting for detailed settings.

3.4 Parameter setting menu

Parameters		Clarification	Scope/Options to be selected	Default value
Secondary menu	Three-tier menu			
Basic parameters				
Wiring Method		Setting the wiring method	3P3W/3P4W	3P4W

PT primary side		Setting the primary side rated voltage	1~1000000V	230
PT secondary side		Setting the rated voltage of the secondary side	1~690V	230
CT primary side		Setting the primary side rated current	1~30000A	5
CT secondary side		Setting the rated current of the secondary side	1~5A	5
Power Factor Algorithm		Setting the power factor algorithm	IEC/IEEE	IEC
Apparent power algorithm		Setting the apparent power algorithm	Vector/Constant	Vector
I1 Direction		Phase A current direction setting	Forward/Reverse	Forward
I2 Direction		Phase B current direction setting	Forward/Reverse	Forward
I3 Direction		Phase C current direction setting	Forward/Reverse	Forward
Harmonic calculation		Setting the harmonic calculation method	THDf/THDr	THDf

method				
Slip time		Setting the slip time	1~60	1
Duty cycle		Setting the demand cycle	1~60	15
Pulse constant		Setting the pulse constant	1000/3200	3200
Communications parameter				
Address		Setting the communication address	1~247	1
Baud		Setting the baud rate	2400/4800/9600	9600
Check digit		Setting the parity bit	No parity/ Odd parity/ Even parity	Uncalibrated
DO parameters				
DO1/DO2	Monitoring Objects	Setting up monitoring objects	U1/U2/U3/UNav/U12/U23/U31/UUav/I1/I2/I3/Iav/In/P1/P2/P3/Psum/Q1/Q2/Q3/Qsum/S1/S2/S3/Ssum/PF1/PF2/PF3/PF	NULL
	Unit	Monitoring target units		NULL

	Upper alarm value	Setting the upper limit alarm value		
	Lower bound release value	Setting the upper release value		
	Lower limit alarm value	Setting the lower limit alarm value		
	Lower bound release value	Setting the lower release value		
	Motion Delay	Setting the action delay	0~9999ms	200
	Action Type	Setting the action type	Power level/Pulse	Power level
	Pulse width	Setting the pulse width	0~9999ms	1000
DI parameters				
Filtering time		Setting the filter time	1~250ms	100
Clear Count DI1		Clear Count DI1	Yes/No	No
Clear Count DI2		Clear Count DI2	Yes/No	No
Clear Count DI3		Clear Count DI3	Yes/No	No
Clear Count DI4		Clear Count DI4	Yes/No	No
Date Time				
Time		Display device time	Like 13:50:23	

Date		Display device date	Like 2023/04/28	
Maintenance of installations				
Remove power			Yes/No	No
Removal requirement			Yes/No	No
Clarity is the best value			Yes/No	No
Clear running time			Yes/No	No
Restore Factory Settings			Yes/No	No
Time-based billing				
Table 1 on rates of payment		Setting of payment rates Table 1		
Table 2 of the rates of payment		Setting of payment rates Table 2		
Fee Schedule Switching Date	Fee Meter Switching Capability	Setting whether to switch meters	Yes/No	No
	Fee Schedule Switching Date	Setting the meter switchover date		

After-sales service

1. If the user does not understand the description in the manual during installation and commissioning, please contact the aftersales team.
2. The company's technology is ready to answer product-related questions.
3. The problems arising in the use of the product will be replied within one working day.
4. Our company has a one-year free warranty for the above products from the date of sale.

Technical descriptions are subject to change without notice

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