129

AEM 三相嵌入式多功能电能表

AEM Three-phase Electricity Meter

安装使用说明书 V1.2

User's Manual (V1.2)

安科瑞电气股份有限公司

Acrel Co., Ltd.

申明

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1 概述 Overview

AEM 三相嵌入式多功能电能表，是主要针对电力系统，工矿企业，共用设施的电能统计、管理需求而设计的一款智能仪表。集成全部电力参数测量及全面的电能计量及考核管理，提供上 24 时、上 31 日以及上 12 月的各类电能数据统计。具有 31 次分次谐波与总谐波含量检测，带有开关量输入和继电器输出可实现“遥信”和“遥控”功能，并具备报警输出。带有 RS485 通信接口，可选用 MODBUS-RTU 或 DL/T645-2007 协议。该电力仪表可广泛应用于各种控制系统，SCADA 系统和能源管理系统中。

AEM three-phase embedded multi-function electricity meter is a smart meter designed for power supply system, industrial and mining enterprises and utilities to calculate the electricity consumption and manage the electric demand. It integrates the measurement of all electrical parameters with the comprehensive electricity metering and management provides various data on previous 24 hours, previous 31 days and previous 12 months, checks the 31st harmonic content and the total harmonic content, realizes the remote communication and the remote control with switching input and relay output and boasts the alarm output. It is fitted with RS485 communication port and adapted to MODBUS-RTU or DL/T645-2007 protocol. AEM electricity meter can be used in all kinds of control systems, SCADA systems and energy management systems.

2 功能列表 List of functions

仪表型号	基本功能	外形	备注
AEM96	三相所有电力参数测量、四象限电能计量、复费率、最大需量、历史电能统计、开关量事件记录、历史极值记录、31 次分次谐波及总谐波含量分析、分相谐波及基波电参量（电压、电流、功率）、开关量、报警输出、RS485（MODBUS 或 DL/T645-2007 协议）	96 型	1、历史电能统计包括：上 12 时、上 31 日、上 12 月电能统计 2、复费率可设 4 个时区、两套时段表、12 个日时段、4 个费率 3、96 型：2DO4DI

Model	Basic functions	Form	Remark
AEM96	Measurement of all electric parameters in three phases, four-quadrant electricity metering, multi-rate tariff, peak demand, historical data on electricity consumption, Switching input incident record , historical extremes records ,analysis of 31st harmonic content and total harmonic content, A,B,C Three phase and Fundamental parameter(Voltage ,current ,power). switching value, alarm output, RS485 (MODBUS or DL/T645-2007 protocol)	96	1. Historical data on electricity consumption: data on electricity consumption covering previous 12 hours, previous 31 days and previous 12 months 2. Multi-rate tariff: maximum 4 time zones, 2 time schedules, 12 day time periods, 4 tariff rates 3.AEM96: 2DO4DI

3 技术参数 Technical parameters

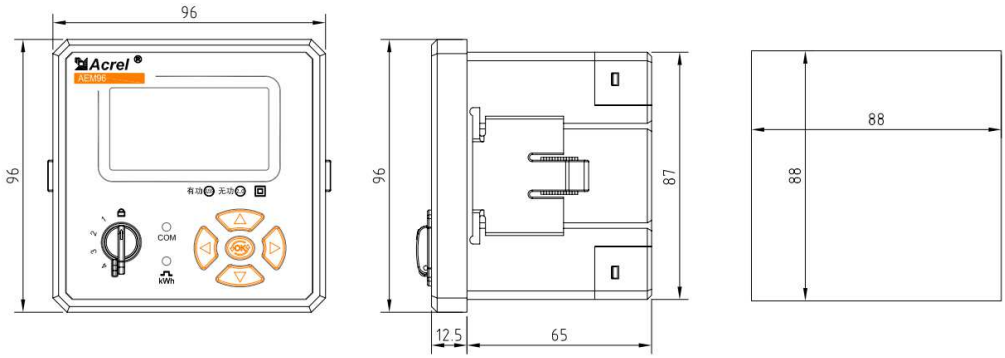
项目			性能参数
规格			三相三线、三相四线
测量	电压	参比电压 Un	AC220V、AC100V、AC57.7V
		测量范围	0.7Un~1.3Un
		极限电压	1.9Un
		功耗	<0.05VA(单相)
		阻抗	>2MΩ
		精度等级	RMS 精度 0.2 %
	电流	测量范围	1.5(6)A
		功耗	<0.05VA(单路额定电流)
		精度等级	RMS 精度 0.2 %
	功率		有功、无功、视在功率，精度 0.5%
	电网频率		45～65Hz，精度 0.2 %
	分次谐波		2～31 次，精度±5 %
计量	电能		有功电能 (准确度等级 0.5S) 无功电能(准确度等级 2 级)
	时钟		≤0.5s/d
数字信号	电量脉冲输出		1 路有功光耦输出、1 路无功光耦输出
	开关量输出		2 路继电器输出
	开关量输入		4 路光耦输入，有源+12V
通	接口与通信规约		RS485 口: Modbus RTU 规约

信	通信地址范围	Modbus RTU:0~ 247;
	波特率	选配低速（支持 1200bps~9600bps）或高速（1200bps~38400bps）
环境	工作温度	-25℃~+60℃
	极限工作温度	-35℃~+70℃
	相对湿度	≤95%（无凝露）
工作电源		交直流两用电源(范围：AC85V~265V，DC100-380V) 功耗：≤1W，2VA

Item			Performance parameters
Specification			3-phase 3-wire, 3-phase 4-wire
Measurement	Voltage	Reference voltage, Un	AC220V、AC100V、AC57.7V
		Measuring range	0.7Un~1.3Un
		Limit voltage	1.9Un
		Power dissipation	<0.05VA (single phase)
		Impedance	>2MΩ
		Accuracy class	RMS, accuracy: 0.2 %
	Current	Measuring range	1.5(6)A
		Power dissipation	<0.05VA (single-circuit rated current)
		Accuracy class	RMS, accuracy: 0.2 %
	Frequency		Active, reactive and apparent power, accuracy: 0.5%
	Line frequency		45-65Hz, accuracy: 0.2 %
	fractional harmonic		2^{nd}-31^{st} harmonic, accuracy: ±5 %
Metering	Electric energy		Active energy ((accuracy class: 0.5S) Reactive energy (accuracy class: 2)
	Clock		≤0.5s/d
Digital signal	Electrical pulse output		1-way active optical coupling output, 1-way reactive optical coupling output
	Switching output		2-way relay output
	Switching input		4-way optical coupling input (AEM96),, active +12V
Communication	Port and communication protocol		RS485 port: Modbus RTU protocol
	Range of communication address		Modbus RTU: 0-247
	Baud rate		Low rate (1200bps-9600bps) or high rate (1200bps-38400bps)
Environ	Working temperature		-25℃-+60℃

ment	Extreme working temperature	-35℃-+70℃
	Relative humidity	≤95% (without dewing)
Working power		AC/DC power supply (voltage range: AC85V-265V, DC100-380V) Power dissipation: ≤1W，2VA

4 外形尺寸（单位：mm）Overall dimensions (unit: mm)



主视　　左视　　开孔尺寸

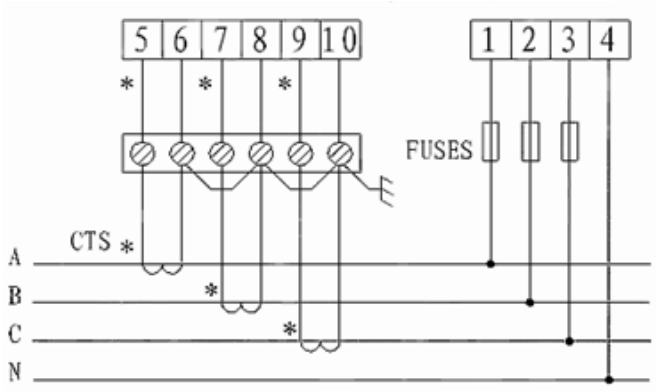
Front View　　Left View　　Hole Size

96 型尺寸

Dimensions of AEM96

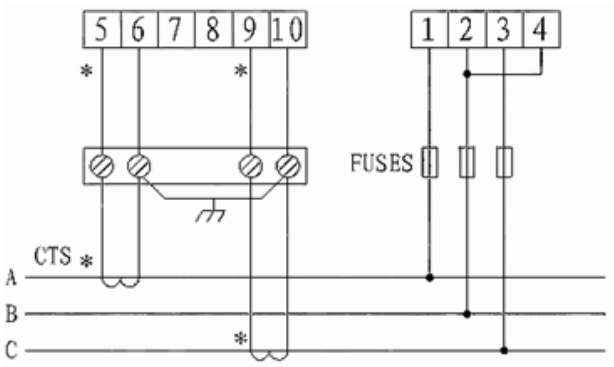
5 接线与安装 Wiring and installation

5.1 电压、电流信号端子 Voltage and current signal terminals



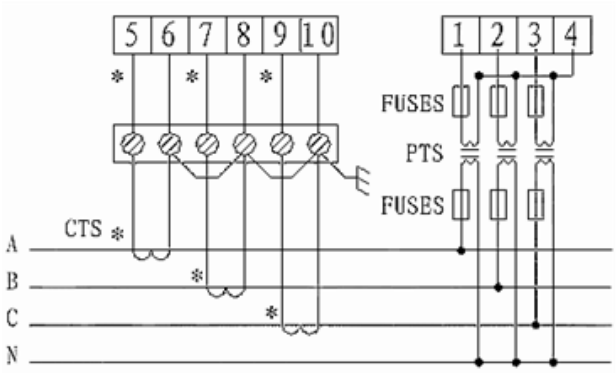
3CT(三相四线)

3CT (3-phase 4-wire)



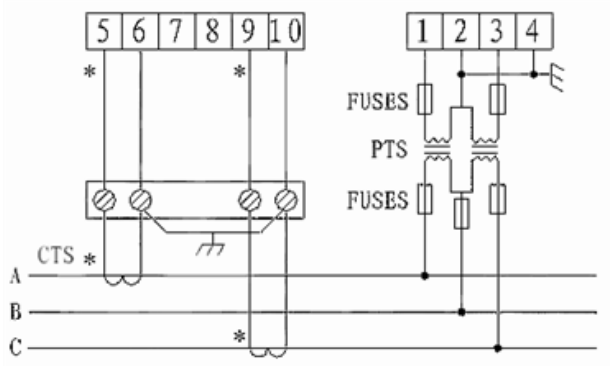
2CT(三相三线)

2CT (3-phase 3-wire)



3PT、3CT(三相四线)

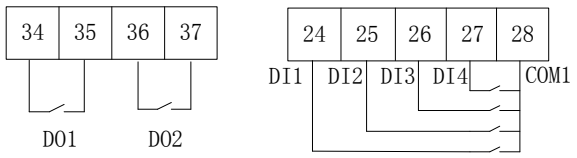
3PT, 3CT (3-phase 4-wire)



2PT、2CT(三相三线)

2PT, 3CT (3-phase 3-wire)

5.2 开关量输入/输出端子 Switching input/ output terminals



开关量输出 开关量输入

Switching output Switching input

开关量输出为继电器输出，可实现“遥控”和报警输出。

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

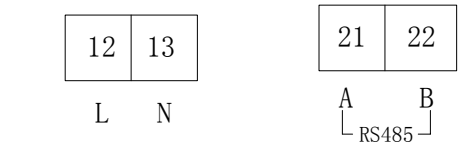
开关量输入是采用开关信号输入方式，仪表内部配备+12V 的工作电源，无须外部供电。当外部接通或断开时，经过仪表开关输入模块采集其接通或断开信息并通过仪表本地显示。

开关量输入不仅能够采集和显示本地的开关信息，同时可以通过仪表的 RS485 实现远程传输功能，即“遥信”功能。

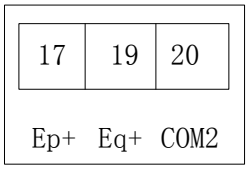
The switching input is realized by switching signal input. The meter has a built-in +12V working power supply so that it does not require external power supply. The meter collects the external break-make information with switching input module and displays it locally. The switching input not only collects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

5.3 电源端子、RS485 通讯端子、脉冲输出端子

Power supply terminal, RS485 communication terminal, pulse output terminal



辅助电源 Auxiliary power supply　　通信 Communication



96 型脉冲端子

Pulse terminals of AEM96

注：17、20 为有功电能脉冲，19、20 为时钟与无功电能复用脉冲，默认为时钟脉冲。

Note: terminals 17 and 20: active energy pulse terminals; terminals 19 and 20: clock/ reactive energy common pulse terminal, default: clock pulse terminal

6 主要功能特点 Main function features

6.1 测量功能 Measurement

能测量全电力参数包括电压 U、电流 I、有功功率 P、无功功率 Q、视在功率 S、功率因素 PF、电压不平衡度、电流的不平衡度、频率、31 次分次谐波及总谐波含量。其中电压 U 保留 1 位小数，频率 F 保留 2 位小数，电流 I 保留 3 位小数，功率 P 保留 4 位小数, 不平衡度△保留 2 位小数。

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.

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

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

6.2 计量功能 Metering

能计量当前组合有功电能，正向有功电能，反向有功电能，感性无功电能，容性无功电能，视在电能。

Meter the current combined active energy, positive active energy, negative active energy, inductive reactive energy and capacitive reactive energy and Apparent energy.

6.3 分时功能 Tiered pricing

两套时段表,一年可以分为 4 个时区,每套时段表可设 12 个日时段,4 个费率(F1、F2、F3、F4 即尖峰平谷) 。分时计费的基本思想就是把电能作为一种商品，利用经济杠杆，用电高峰期电价高，低谷时电价低，以便削峰填谷，改善用电质量，提高综合经济效益。

Set two time schedules and 4 time zones of year. A time schedule includes 12 day time periods and 4 rates (F1, F2, F3 and F4: sharp rate, peak rate, flat rate and off rate). The basic idea of tiered pricing structure is to consider the electric energy as a commodity. The electricity price is higher during the sharp and peak periods while it is relatively lower during the off period. By means of economic lever, such pricing structure will balance the electricity consumption between sharp and peak periods and off period, improve the service efficiency of utility and increase the overall economic benefits.

6.4 需量功能 Demand

有关需量的相关概念如下：

Demand-related concepts are listed as follows:

需　　量	需量周期内测得的平均功率叫需量
最大需量	在指定的时间区内需量的最大值叫最大需量
滑差时间	从任意时刻起，按小于需量周期的时间递推测量需量的方法，所测得的需量叫滑差式需量。递推时间叫滑差时间
需量周期	连续测量平均功率相等的时间间隔, 也叫窗口时间

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

缺省需量周期为 15 分钟，滑差时间为 1 分钟。

The default demand period is 15 minutes and the default sliding window time is 1 minute.

需量周期与滑差时间可设置，详见 7.3。

Both demand period and sliding window time are adjustable. Refer to the details of setting in 7.3.

能测量 8 种最大需量即 A/B/C 三相电流、正向有功、反向有功、感性无功、容性无功、视在功率最大需量以及最大需量发生的时间。

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.

显示实时的 8 种需量即 A/B/C 三相电流、正向有功、反向有功、感性无功、容性无功、视在功率需量。

show real time eight demands, i.e. A/B/C three-phase current ,positive active, negative active, inductive reactive , capacitive reactive and apparent power demands .

6.5 历史数据统计功能 Historical data

能统计上 24 时、上 31 日、以及上 12 月的历史电能(包括 4 象限、各费率电能)

Record the historical data on electricity consumption covering previous 24 hours, previous 31 days and previous 12 months (including four quadrant and multi-rate tariff).

6.6 开关量输入输出功能 Switching input/ output

有两路开关量输出，4 路开关量输入，开关量输出为继电器输出，可以实现“遥控”和报警输出。开关量输入不仅能够采集和显示本地的开关信息，同时可以通过仪表的 RS485 实现远程传输功能，即“遥信”功能。

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

7 操作与显示 Operations and display

7.1 按键功能说明 Key functions

总共有 5 个按键，包括 4 个方向键和一个中间 OK 键，使用 OK 键切换 8 大分类界面，在编程界面中切换需要修改的参数。左右按键在电能显示界面中（AEM96）切换当前电能的不同时段即尖、峰、平、谷显示，在历史电能统计界面中用于切换上一时、日、月电能显示在编程界面中用于移动光标。

There are four keys, i.e. four direction keys and one OK in the middle. Operate OK to make a change among eight screens and parameters to be modified on the programming screen. Operate keys Left and Right to change the display of current energy during sharp, peak, flat or off period on screen Energy Display (AEM96) and the display of historical data on energy during previous hour, day or month on screen Historical Data and to move the cursor on screen Programming.

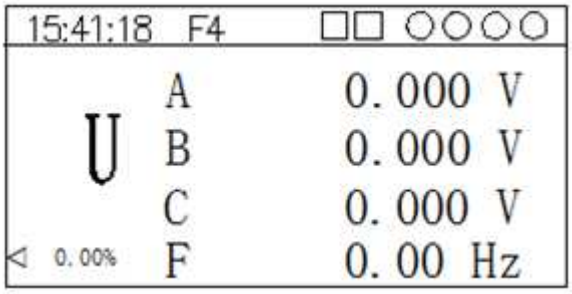
7.2 显示界面 Screens

显示界面主体可分类为 8 大界面，使用中间的 OK 键进行切换，8 大界面分别是电力参数、当前电能、时统计历史电能、日统计历史电能、月统计历史电能、最大需量、基本信息、谐波含量。

There are mainly eight screens. Operate OK to make a change among eight screens. They are Electrical Parameters, Current Energy, Historical Hourly Data, Historical Daily Data, Historical Monthly Data, Maximum Demand, Basic Information and Harmonic Content.

电力参数界面 用上下键切换，分别显示电压、电流、有功功率、无功功率、视在功率、功率因素、电压电流相角度。除功率因数外，按左右键可切换显示当前电参量极大、极小值及发生时间。

Electrical Parameters Make a change among voltage, current, active power, reactive power, apparent power and power factor by keys Up and Down and Voltage current phase Angle. Except power factor，Make a change among display of all electric parameters Maximum，Minimum and occurrence time by keys



（AEM96）

图 1.1 电压界面

Fig. 1.1 Voltage

当前电能界面 用上下键切换当前组合有功电能、正向有功、反向有功、感性无功、容性无功电能，左右键切换总、尖、峰、平、谷电能显示

Current Energy Make change of current combined active energy, positive active, negative active, inductive reactive and capacitive reactive energy by keys Up and Down and change the display of current energy during sharp, peak, flat or off period by keys Left and Right.

图 1.2 电能界面

Fig. 1.2 Energy

Current combined active energy Sharp Peak Flat Off Total

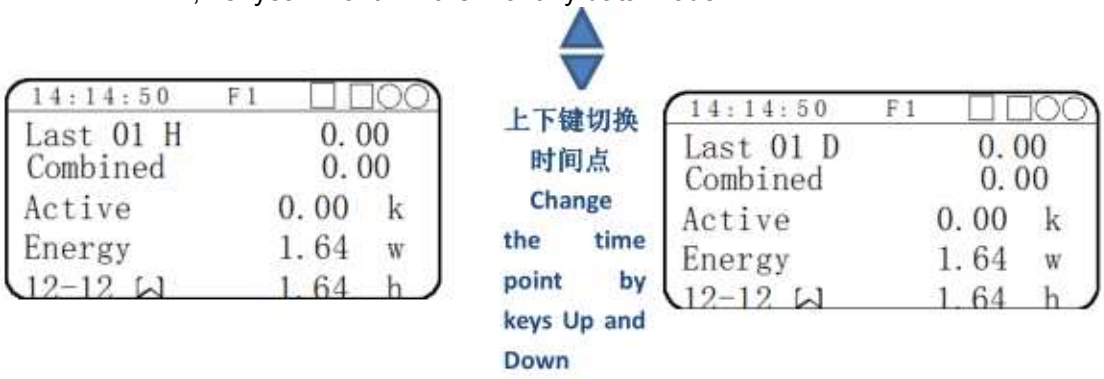
Current positive active energy Sharp Peak Flat Off Total

历史统计电能界面(时、日、月 3 个)切换方式相同，上下键切换时间点、左右键切换电能类型，并且在界面的左下角显示历史时间点，根据统计界面的不同时间点的意义不同

Historical Data (hourly, daily and monthly) Make a change in the same way. Operate keys Up and Down to change the time point and keys Left and Right to change the type of historical data. The previous time point is shown in the left lower corner of screen. The meaning of time point varies with the type of historical data.

XX-XX ： 时统计时， 表示 DD-HH，前代表日，后代表时
日统计时， 表示 MM-DD，前代表月，后代表日
月统计时， 表示 YY-MM， 前代表年，后代表月

XX-XX: DD-HH, i.e. day-hour in the hourly data mode
MM-DD, i.e. month-day in the daily data mode
YY-MM, i.e. year-month in the monthly data mode



1.3 历史统计电能界面

Fig. 1.3 Historical Data

Active energy during the previous hour Sharp Peak Flat Off Total

Active energy during the previous day Sharp Peak Flat Off Total

最大需量界面按上下键切换，依次显示当前正向有功最大需量、反向有功、感性无功、容性无功、A 相电流、B 相电流、C 相电流、视在功率最大需量。

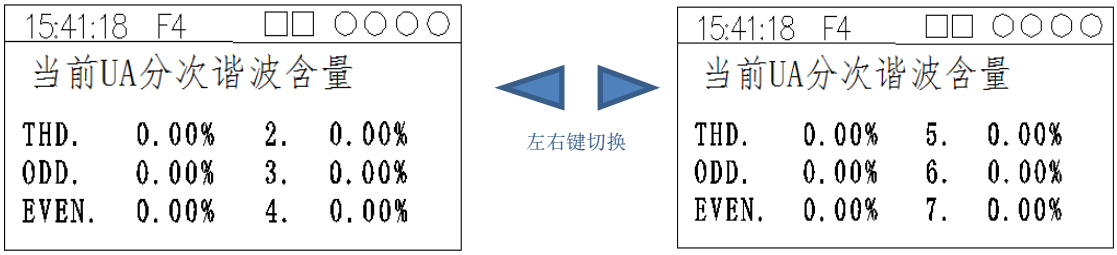
Maximum Demand Operate keys Up and Down to display the maximum positive active demand, negative active demand, inductive reactive A/B/C three-phase current demand and capacitive reactive demand in turn.

基本信息界面包括通讯地址、波特率、协议、PT、CT、错误及版本号指示。

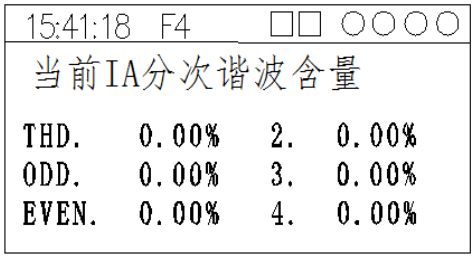
Basic Information Display the communication address, baud rate, protocol, PT, CT, fault and version number.

谐波含量显示界面包含 31 次分次谐波及总谐波含量的显示，按左右键可切换当前所显示的谐波次数，按上下键切换当前所显示的谐波类型（依次为 Ua、Ub、Uc、Ia、Ib、Ic）。

Harmonic Content Display 31st harmonic content and total harmonic content. Operate keys Left and Right to check the number of current harmonic and keys Up and Down to check the type of current harmonic (Ua, Ub, Uc, Ia, Ib, Ic in turn).



上下键切换



（AEM96）

图 1.4 谐波含量显示界面

Fig. 1.4 Harmonic Content

Current harmonic content

7.3 编程界面与编程操作 Programming screen and operations

仪表左侧的旋钮为编程选择键，可选择 1、2、3、4 编程界面分别代表通信时间设置、系统设置、开出设置、第一套时段表设置。

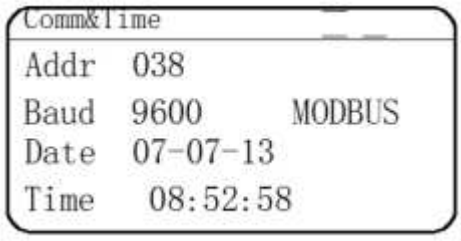
Operate the knob on the left of meter to select a programming screen. Programming screens 1, 2, 3 and 4 are used to set the communication time, system parameters, switching output and 1st time schedule.

在进入各编程界面之前需要输入密码，如果密码正确则可以进入相应的编程界面，若密码错误，则无法进入编程界面，等待重新输入密码。

To enter a programming screen, input a correct password. If the password is wrong, the corresponding screen will not be accessible and system will wait the user to input a correct password.

1. 本编程界面主要设置通信相关及时间参数，如地址、波特率等，其中 96 型用英文显示设置界面如下图所示：

Set parameters relating to communication and time, such as address and baud rate on this screen. The English screen of Model AEM96 is shown as follows:



(AEM96)

图 1.5 通讯和时间设置界面

Fig. 1.5 Communication and Time Setting

Address

Baud rate

Address

Baud rate

Protocol

Date

Time

2. 本编程界面主要设置系统参数，如密码、背光时间、线制、需量周期、PT、CT 等设置界面如下图所示：

Set system parameters, such as password, backlight time, line system, demand period, PT and CT on the screen as shown.

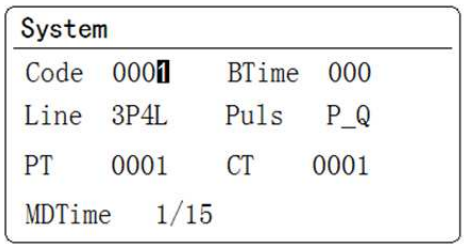


图 1.6 系统参数设置界面

Fig. 1.6 System Parameter Setting

Code 为密码；

Code: password

BTime 为背光时间，设置为 0 时屏幕常亮；

BTime: backlight time. The screen will be always bright if the BTime is set to 0.

Line 为线制选择；

Line: selection of line system

Puls 为端子 19 功能选择，选择 P_Q 时 19 端子输出无功脉冲，选择 P_T 时 19 端子输出时间脉冲；

Puls: function selection of terminal 19. Terminal 19 outputs the reactive pulse if P_Q is selected. Terminal 19 outputs the time pulse if P_T is selected.

MDTime 为需量周期与滑差时间，一共有四档选择，分别是需量周期 15 分钟、30 分钟、45 分钟、60 分钟，相应的滑差时间也成比例，原则是需量周期/滑差时间 = 15；

MDTime: demand time and sliding window time. It has four options of demand time, i.e. 15 minutes, 30 minutes, 45 minutes and 60 minutes. The sliding window time is proportional to the demand period. In principle, the ratio of demand time to the sliding window time is 15.

3. 本编程界面设置开关量的输出的类型及报警类型，其中可设置开关量是否为报警输出，报警输出的报警阈值、延时时间、脉冲宽度等，同样 96 型为英文显示如下图所示：

Set the type of switching output and alarm on the screen. The switching value can be set to be alarm output, threshold value of alarm output, delay time, pulse width or otherwise. The English screen of Model AEM96 is shown as follows:

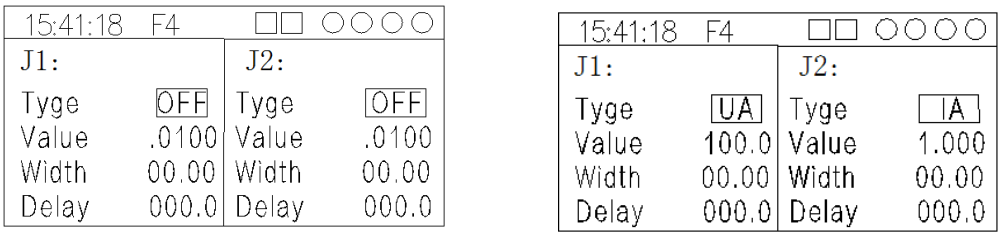


图 17 报警设置界面

Fig. 1.7 Alarm Setting

Type 为报警类型，选择 OFF 则表示不是报警输出，为遥控功能，选择 OFF 后界面中

其他设置均无效，除 OFF 外，可选择 U、I、两类数据的<>报警类型，其中 Ux、Ix 表示任一项电压或电流满足条件时报警输出, M1 至 M4 分别表示正向有功需量、反向有功需量、正向无功需量、反向无功需量；

Type: type of alarm. Selection of OFF indicates the remote control rather than alarm output. And such selection invalidates other selections on the screen. Besides OFF, user may select the type of alarm <> of U and I. Ux and Ix reflects the alarm output if any voltage or current meets requirements. M1 to M4 four reperesents forward demand for active power、 reversing demand for active power、forward demand for reactive power、 reversing demand for reactive power;

Value 为报警阈值。

Value: threshold value of alarm.

Width 为脉冲宽度，此值设为 0 时报警为电平输出，满足条件时常闭，不满足时常开；若不为零，比如设置为 1.0，则满足条件后继电器闭合 1s,即单位为 10s;

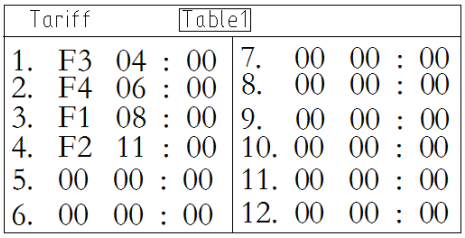
Width: pulse width. An alarm is a level output if the width is set to zero. It is normally closed if requirements are met and normally open if requirements are not met. If the width is set to 1.0, for example, rather than 0, the relay is closed for 1s when requirements are met. In other words, the unit is 1s.

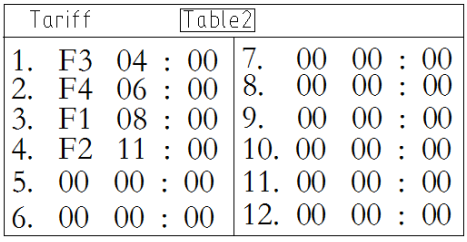
Delay 为报警延时，设为 0 时无延时，立即响应，若不为 0，则设置的延时时间后响应。

Delay: alarm delay. If it is set to zero, an alarm will be given without delay. If the setting is not zero,**set the delay time after response .**

4　本编程界面可设置第一段时段表，F1、F2、F3、F4 分别代表尖、峰、平、谷 4 个不同时段，其界面如下图所示。

Set the first time schedule on the screen. F1, F2, F3 and F4 indicate the sharp, peak, flat and off periods. The following figure illustrates the screen:





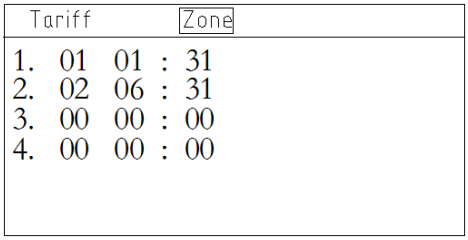


Table1:时段 1.Table2:时段 2. Zone:时区

ZONE:01.31-06.31

ZONE:January 31---june 30　use Table1 and　other times Table2

图 1.8　时段表设置界面

Fig. 1.8 Time Schedule Setting

8 通信说明 Communication instructions

仪表 RS485 通信接口支持 MODBUS-RTU 通信协议，通信口波特率可在 600bps、1200bps、2400 bps、4800 bps、9600bps、19200 bps 和 38400bps 之间设置，校验位为无校验。

RS485 port of electricity meter supports the MODBUS-RTU communication protocol. The baud rate of communication port can be set to 600bps, 1200bps, 2400bps, 4800bps, 9600bps, 19200bps and 38400bps. The check digit is set to None.

仪表的 RS485 通信口要求使用屏蔽双绞线连接，布线时要考虑整个网络的布局：如通信线缆的长度、走向、上位机的位置、网络末端的匹配电阻、通信转换器、网络可扩展性、网络覆盖范围、环境的电磁干扰情况等因素，都要综合考虑。

RS485 port is connected with shielded twisted wire. The wiring must consider the network layout, such as the length and route of communication line, position of host computer, network end resistor, communication converter, network expandability, network coverage and environmental electromagnetic interference.

注：

Note:

① 在布线工程上要严格按要求施工；

The wiring work must observe applicable requirements strictly.

② 对于暂时不需要通信的仪表都要将他们连接到 RS-485 网络上，以便于诊断和测试；

Even though some meters do not require the communication temporarily, it is still necessary to connect them to RS-485 network for troubleshooting and test.

③ 进行 RS-485 电缆连接时，尽量使用双色双绞线，所有的 485 通信口“A”端接同一种颜色，“B”端接另一种颜色。

Select the double-color twisted wire, wherever possible, for RS-485 connection. For all RS485 ports, the color of wire at side A is same and the color of wire at side B is same too.

④ RS-485 总线(从上位机通信口开始到任一被连接的仪表终端通信口)长不超过 1200 米。

The maximum length of RS-485 bus (from the communication port of host computer to the end communication port of any connected meter) is 1200m.

8.1 地址表 Address list

仪表支持 MODBUS-RTU 协议中的 03H 命令与 10H 命令，03H 为读多个寄存器，10H 为写多个寄存器，协议数据格式请自行查询。下表为仪表的寄存器地址表：

The meter supports command 03H and 10H in the MODBUS-RTU protocol. Command 03H is to read several registers and command 10H is to write several registers. Users are responsible for checking the protocol data format. The following table lists the addresses of meter registers.

地址 Addressb	数据 Data	长度(字节)	备注 Remark
0000H	地址 Address	2	
0001H	波特率 Baud rate	2	1:9600;2:4800;3:2400;4:1200
0002H	运行控制字 Running control byte	2	注 1 Note 1
0003H	背光时间 Backlight time	2	
0004H	VT	2	
0005H	CT	2	
0006H	复用脉冲选择 Common pulse selection	2	0:无功脉冲;1:时钟脉冲 0: reactive pulse; 1: clock pulse
0007H	脉冲常数 Pulse constant	2	
0008H	滑差时间/需量周期 Sliding window time/ demand period	2	
0009H	密码 Password	2	
000AH	日期时间 Date time	6	秒、分、时、日、月、年 second 、Minute 、 hour 、day、month、Year
000DH	时区 Time zone	16	单数寄存器为四个时段表号，双数寄存器为日期（高位为月，低位为日） Odd registers are number of 4 time lists, even registers are date(month on high byte, day on low byte)
0015H	时段表 1 Time schedule 1	48	单数寄存器为 12 个费率时段，双数寄存器为时间（高位为时，低位为分） Odd registers are 12 periods of rate, even registers are time(hour on high byte, minute on low byte)
002DH	时段表 2 Time schedule 2	48	同上 Same as above
0045H	J1 控制 J1 control	2	继电器 1：0:断开;1:闭合 Rely 1: 0 disconnect; 1 connect
0046H	J2 控制 J2 control	2	继电器 2：0:断开;1:闭合 Rely 2: 0 disconnect; 1 connect
0047H	开关量状态 Status of switching value	2	
0048H	J1 输出脉宽 J1 output pulse width	2	注 2 Note 2

0049H	J1 报警类型 Type of J1 alarm		
004AH	J1 报警阈值 Threshold value of J1 alarm		
004BH	J1 报警延时 Delay of J1 alarm		
004CH	J2 输出脉宽 J2 output pulse width		
004DH	J2 报警类型 Type of J2 alarm		
004EH	J2 报警阈值 Threshold value of J2 alarm		
004FH	J2 报警延时 Delay of J2 alarm		
0050H	UA	2	保留 1 位小数 1 decimal place 无符号整型 Unsigned int
0051H	UB		
0052H	UC		
0053H	UAB		
0054H	UBC		
0055H	UCA		
0056H	IA	2	保留 3 位小数 3 decimal places 无符号整型 Unsigned int
0057H	IB		
0058H	IC		
0059H	IN		
005AH	PA	2	保留 4 位小数 4 decimal places 无符号整型 Unsigned int
005BH	PB		
005CH	PC		
005DH	PT		
005EH	QA		
005FH	QB		
0060H	QC		
0061H	QT		
0062H	SA		
0063H	SB		
0064H	SC		
0065H	ST		
0066H	PFA	2	保留 3 位小数 无符号整型 3 decimal places, unsigned int
0067H	PFB		
0068H	PFC		
0069H	PF		

006AH	功率方向 Power direction	2	注 3 Note 3
006BH	频率 Frequency	2	保留 2 位小数，无符号整型 2 decimal placles, unsigned int
006CH	当前正向有功需量 Current forward demand for active power	2	保留 4 位小数 无符号整型 4 decimal places, unsigned int
006DH	当前反向有功需量 Current reversing demand for active power	2	
006EH	当前正向无功需量 Current forward demand for reactive power	2	
006FH	当前反向无功需量 Current reversing demand for reactive power	2	
0070H	正向有功最大需量 Maximum forward demand for active power	2	
0071H	发生时间 Time of occurrence	4	分、时、日、月 Minute 、 hour 、day、 month
0073H	反向有功最大需量 Maximum reversing demand for active power	2	
0074H	发生时间 Time of occurrence	4	分、时、日、月 Minute 、 hour 、day、 month
0076H	正向无功最大需量 Maximum forward demand for active power	2	
0077H	发生时间 Time of occurrence	4	分、时、日、月 Minute 、 hour 、day、 month
0079H	反向无功最大需量 Maximum reversing demand for active power	2	
007AH	发生时间 Time of occurrence	4	分、时、日、月 Minute 、 hour 、day、 month
007CH	当前组合有功总电能 Current assemblage total active energy	4	保留 2 位小数，无符号整型 2 decimal places, unsigned int
007EH	当前正向有功总电能 Current forward total active energy	4	
0080H	当前反向有功总电能 Current reversing total active energy	4	
0082H	当前正向无功总电能 Current forward total reactive energy	4	
0084H	当前反向无功总电能 Current reversing total reactive energy	4	

0086H	当前组合有功尖电能 Current Sharp-period combined active energy	4
0088H	当前组合有功峰电能 Current Peak-period combined active energy	4
008AH	当前组合有功平电能 Current Flat-period combined active energy	4
008CH	当前组合有功谷电能 Current valley-period combined active energy	4
008EH	当前正向有功尖电能 Current forward active energy on Sharp-period	4
0090H	当前正向有功峰电能 Current forward active energy on Peak-period	4
0092H	当前正向有功平电能 Current forward active energy on Flat-period	4
0094H	当前正向有功谷电能 Current forward active energy on Valley-period	4
0096H	当前反向有功尖电能 Current reversing active energy on Sharp-period	4
0098H	当前反向有功峰电能 Current reversing active energy on Peak-period	4
009AH	当前反向有功平电能 Current reversing active energy on Flat-period	4
009CH	当前反向有功谷电能 Current reversing active energy on Valley-period	4
009EH	当前正向无功尖电能 Current forward reactive energy on Sharp-period	4
00A0H	当前正向无功峰电能 Current forward reactive energy on Peak-period	4

00A2H	当前正向无功平电能 Current forward reactive energy on Flat-period	4
00A4H	当前正向无功谷电能 Current forward reactive energy on Valley-period	4
00A6H	当前反向无功尖电能 Current reversing reactive energy on Sharp-period	4
00A8H	当前反向无功峰电能 Current reversing reactive energy on Peak-period	4
00AAH	当前反向无功平电能 Current reversing reactive energy on Flat-period	4
00ACH	当前反向无功谷电能 Current reversing reactive energy on valley -period	4
00AEH	A 相组合有功总电能 Total amount of phase A combined active energy	4
00B0H	A 相正向有功总电能 Total amount of phase A positive active energy	4
00B2H	A 相反向有功总电能 Total amount of phase A negative active energy	4
00B4H	A 相正向无功总电能 Total amount of phase A positive reactive energy	4
00B6H	A 相反向无功总电能 Total amount of phase A negative active energy	4
00B8H	B 相组合有功总电能 Total amount of phase B combined active energy	4
00BAH	B 相正向有功总电能 Total amount of phase B positive active energy	4
00BCH	B 相反向有功总电能 Total amount of phase B negative active energy	4

00BEH	B 相正向无功总电能 Total amount of phase B positive reactive energy	4	
00C0H	B 相反向无功总电能 Total amount of phase B negative reactive energy	4	
00C2H	C 相组合有功总电能 Total amount of phase C combined active energy	4	
00C4H	C 相正向有功总电能 Total amount of phase C positive active energy	4	
00C6H	C 相反向有功总电能 Total amount of phase C negative active energy	4	
00C8H	C 相正向无功总电能 Total amount of phase C positive reactive energy	4	
00CAH	C 相反向无功总电能 Total amount of phase C negative reactive energy	4	
00CCH	THDUa	2	保留 2 位小数，无符号整型 2 decimal places, unsigned int
00CDH	THDUb		
00CEH	THDUc		
00CFH	THDIa		
00D0H	THDIb		
00D1H	THDIc		
00D2H	THUa(2-31 次谐波) THUa (2^{nd}-31^{st} harmonic)	2×30	每一次谐波长度为 1 个寄存器 保留 2 位小数，无符号整型 Each harmonic length is a register. 2 decimal places, unsigned int
00F0H	THUb(2-31 次谐波) THUb (2^{nd}-31^{st} harmonic)	2×30	
010EH	THUc(2-31 次谐波) THUc (2^{nd}-31^{st} harmonic)	2×30	
012CH	THIa(2-31 次谐波) THIa (2^{nd}-31^{st} harmonic)	2×30	
014AH	THIb(2-31 次谐波) THIb (2^{nd}-31^{st} harmonic)	2×30	
0168H	THIc(2-31 次谐波) THIc (2^{nd}-31^{st} harmonic)	2×30	
0186H	A 相基波电压 phase A fundamental voltage	2	保留 1 位小数 无符号整型

0187H	B 相基波电压 phase B fundamental voltage		1 decimal places, unsigned int
0188H	C 相基波电压 phase C fundamental voltage		
0189H	A 相谐波电压 phase A harmonic voltage		
018AH	B 相谐波电压 phase B harmonic voltage		
018BH	C 相谐波电压 phase C harmonic voltage		
018CH	A 相基波电流 phase A fundamental current	2	保留 3 位小数 无符号整型 3 decimal places, unsigned int
018DH	B 相基波电流 phase B fundamental current		
018EH	C 相基波电流 phase C fundamental current		
018FH	A 相谐波电流 phase A harmonic current		
0190H	B 相谐波电流 phase B harmonic current		
0191H	C 相谐波电流 phase C harmonic current		
0192H	A 相基波有功功率 phase A fundamental active power	2	保留 4 位小数,无符号整型 4 decimal places, unsigned int
0193H	B 相基波有功功率 phase B fundamental active power		
0194H	C 相基波有功功率 phase C fundamental active power		
0195H	总基波有功功率 Total fundamental active power		
0196H	A 相基波无功功率 phase A fundamental reactive power		
0197H	B 相基波无功功率 phase B fundamental reactive power		
0198H	C 相基波无功功率 phase C fundamental reactive power		
0199H	总基波无功功率 Total fundamental reactive power		
019AH	A 相谐波有功功率 phase A harmonic active power		
019BH	B 相谐波有功功率 phase B harmonic active power		

019CH	C 相谐波有功功率 phase C harmonic active power		
019DH	总谐波有功功率 Total harmonic active power		
019EH	A 相谐波无功功率 phase A harmonic reactive power		
019FH	B 相谐波无功功率 phase B harmonic reactive power		
01A0H	C 相谐波无功功率 phase C harmonic reactive power		
01A1H	总谐波无功功率 Total harmonic reactive power		
01A2H	电压不平衡度 Voltage imbalance	2	2 decimal places, unsigned int(0.01%)
01A3H	电流不平衡度 Current imbalance		
01A4H	A 电流与 A 电压相角 A voltage and A current Angle	2	2 decimal places, unsigned int
01A5H	B 电流与 B 电压相角 B voltage and B current Angle		
01A6H	C 电流与 C 电压相角 C voltage and C current Angle		
01A7H	正向视在电能 Positive Apparent energy	4	2 decimal places, unsigned int
01A9H	尖视在电能 Apparent energy Sharp-period	4	
01ABH	峰视在电能 Apparent energy Peak-period	4	
01ADH	平视在电能 Apparent energy Flat-period	4	
01AFH	谷视在电能 Apparent energy valley -period	4	
01B1H	当前 A 相电流需量 Current A-phase current demand	2	保留 4 位小数 无符号整型 4 decimal places, unsigned int
01B2H	当前 B 相电流需量 Current B-phase current demand	2	
01B3H	当前 C 相电流需量 Current C-phase current demand	2	
01B4H	当前视在功率需量 Current apparent power requirements	2	

01B5H	A 相电流最大需量 Maximum demand of A phase current	2	保留 4 位小数 无符号整型 4 decimal places, unsigned int
01B6H	发生时间 Time of occurrence	4	分、时、日、月 Minute 、 hour 、day、 month
01B8H	B 相电流最大需量 Maximum demand of B phase current	2	保留 4 位小数 无符号整型 4 decimal places, unsigned int
01B0H	发生时间 Time of occurrence	4	分、时、日、月 Minute 、 hour 、day、 month
01BBH	C 相电流最大需量 Maximum demand of C phase current	2	保留 4 位小数 无符号整型 4 decimal places, unsigned int
01BCH	发生时间 Time of occurrence	4	分、时、日、月 Minute 、 hour 、day、 month
01BEH	视在功率最大需量 Maximum apparent power demand	2	保留 4 位小数 无符号整型 4 decimal places, unsigned int
01BFH	发生时间 Time of occurrence	4	分、时、日、月 Minute 、 hour 、day、 month
01C1H	A 相电压奇次总谐波 A phase voltage odd total harmonic	2	2 decimal places, unsigned int
01C2H	B 相电压奇次总谐波 B phase voltage odd total harmonic	2	
01C3H	C 相电压奇次总谐波 C phase voltage odd total harmonic	2	
01C4H	A 相电流奇次总谐波 Odd total harmonic of A - phase current	2	
01C5H	B 相电流奇次总谐波 Odd total harmonic of B - phase current	2	
01C6H	C 相电流奇次总谐波 Odd total harmonic of C - phase current	2	
01C7H	A 相电压偶次总谐波 A phase voltage even total harmonic	2	
01C8H	B 相电压偶次总谐波 B phase voltage even total harmonic	2	
01C9H	C 相电压偶次总谐波 C phase voltage even total harmonic	2	

01CAH	A 相电流偶次总谐波 A phase current even total harmonic	2	
01CBH	B 相电流偶次总谐波 B phase current even total harmonic	2	
01CCH	C 相电流偶次总谐波 C phase current even total harmonic	2	
01CDH	当前组合无功总电能 Current combined total reactive energy	4	2 decimal places, unsigned int
01CFH	当前第一象限无功电能 The current first quadrant reactive energy	4	
01D1H	当前第二象限无功电能 Current second quadrant reactive energy	4	
01D3H	当前第三象限无功电能 Current third quadrant reactive energy	4	
01D5H	当前第四象限无功电能 Current fourth quadrant reactive energy	4	

注 1：

Note 1

运行控制字 Running control byte	
高字节 High byte	低字节 Low byte
线制 Line system	协议 Protocol

注 2：

Note 2

报警类型 Type of alarm	
高字节 High byte	低字节 Low byte
0:关闭报警功能 0: disable the alarm function	0：>;1: <
1-4：UA、UB、UC、Ux	
5-8：IA、IB、IC、Ix	

输出脉宽 Output pulse width
0：电平方式输出 0: level output
>0：脉宽单位为 0.1s >0: pulse width in 0.1s
报警延时 Delay of alarm
0：无延时 0: no delay

9-12：PA、PB、PC、PT	

>0：延时单位为 0.01s >0: delay in 0.01s

注 3：

Note 3

D7	D6	D5	D4	D3	D2	D1	D0
Qt	Qc	Qb	Qa	Pt	Pc	Pb	Pa

每位代表一个功率的方向，1 为反向，0 为正向

Each byte represents one power direction. In details, 1 represents the reversing direction and 0 represents the forward direction.

注 4：DI 状态(0x47)

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				DI4	DI3	DI2	DI1

1 为闭合，0 为断开

1 represents the reversing direction and 0 represents the forward direction.

8.2 历史电能数据读取

Historical data reading

区间首地址（高字节） Starting address of interval (high byte)	历史数据类型 Type of historical data
11-28	上 1 时-上 24 时 Previous 1 hour- previous 24 hours
29-47	上 1 日-上 31 日 Previous 1 day- previous 31 days
48-53	上 1 月-上 12 月 Previous 1 month –previous 12 month

各区间偏移地址(低字节） Offset address of interval (low byte)	数据类型 Data type
00	记录日期时间 Recording date time
03	历史组合有功总电能 Total amount of historical combined active energy
05	历史正向有功总电能 Total amount of historical forward active energy
07	历史反向有功总电能 Total amount of historical reversing active energy
09	历史正向无功总电能 Total amount of historical forward reactive energy
0B	历史反向无功总电能 Total amount of historical

	reversing reactive energy
0D	历史组合有功尖电能 Sharp-period amount of historical combined active energy
0F	历史组合有功峰电能 Peak-period amount of historical combined active energy
11	历史组合有功平电能 Flat-period amount of historical combined active energy
13	历史组合有功谷电能 Valley-period amount of historical combined active energy
15	历史正向有功尖电能 Sharp-period amount of historical forward active energy
17	历史正向有功峰电能 Peak-period amount of historical forward active energy
19	历史正向有功平电能 Flat-period amount of historical forward active energy
1B	历史正向有功谷电能 Valley -period amount of historical forward active energy
1D	历史反向有功尖电能 Sharp-period amount of historical reversing active energy
1F	历史反向有功峰电能 Peak-period amount of historical reversing active energy
21	历史反向有功平电能 Flat-period amount of

	historical reversing active energy
23	历史反向有功谷电能 Valley -period amount of historical reversing active energy
25	历史正向无功尖电能 Sharp-period amount of historical forward reactive energy
27	历史正向无功峰电能 Peak-period amount of historical forward reactive energy
29	历史正向无功平电能 Flat-period amount of historical forward reactive energy
2B	历史正向无功谷电能 Valley -period amount of historical forward reactive energy
2D	历史反向无功尖电能 Sharp-period amount of historical reversing reactive energy
2F	历史反向无功峰电能 Peak-period amount of historical reversing reactive energy
31	历史反向无功平电能 Flat-period amount of historical reversing reactive energy
33	历史反向无功谷电能 Valley-period amount of historical reversing reactive energy
35	A 相组合有功总电能 Total amount of phase A combined active energy
37	A 相正向有功总电能 Total amount of phase A

	forward active energy
39	A 相反向有功总电能 Total amount of phase A reversing active energy
3B	A 相正向无功总电能 Total amount of phase A forward reactive energy
3D	A 相反向无功总电能 Total amount of phase A reversing reactive energy
3F	B 相组合有功总电能 Total amount of phase B combined active energy
41	B 相正向有功总电能 Total amount of phase B forward active energy
43	B 相反向有功总电能 Total amount of phase B reversing active energy
45	B 相正向无功总电能 Total amount of phase B forward reactive energy
47	B 相反向无功总电能 Total amount of phase B reversing reactive energy
49	C 相组合有功总电能 Total amount of phase C combined active energy
4B	C 相正向有功总电能 Total amount of phase C forward active energy
4D	C 相反向有功总电能 Total amount of phase C reversing active energy
4F	C 相正向无功总电能 Total amount of phase C forward reactive energy
51	C 相反向无功总电能 Total amount of phase C reversing reactive energy
53	视在总电能 Apparent total electrical

	energy
55	视在尖电能 Apparent electrical energy
57	视在峰电能 Apparent peak power energy
59	视在平电能 Apparent flat electrical energy
5B	视在谷电能 Visual valley power energy

历史电能的读取寄存器地址分为高字节低字节两部分，读取时需要将两个表格中的字节拼接得到寄存器地址，比如要读上 4 时历史正向无功总电能则地址可查表为 1409H。

The register address of historical data is divided into two parts, high byte and low byte. Combining bytes in two tables and then getting the register address of historical data. For example, if you want to read the total amount of historical forward reactive energy for the previous 4 hours, the address will be 1409H.

8.3 历史报警输出事件读取

8.3 Historical Alarm output reading

区间首地址（高字节） Starting address of interval (high byte)	历史数据类型 Type of historical data
03	报警输出事件记录 Alarm output event log

各区间偏移地址（低字节） Offset address of interval (low byte)	数据类型 Data type
00	上一次报警输出记录 Last 1 alarm output record
05	上二次报警输出记录 Last 2 alarm output record
0A	上三次报警输出记录 Last 3 alarm output record
0F	上四次报警输出记录 Last 4 alarm output record
14	上五次报警输出记录 Last 5 alarm output record
19	上六次报警输出记录 Last 6 alarm output record
1E	上七次报警输出记录 Last 7 alarm output record

23	上八次报警输出记录 Last 8 alarm output record
28	上九次报警输出记录 Last 9 alarm output record
2D	上十次报警输出记录 Last 10 alarm output record

备注：每条事件记录长度为 5 个字，具体数据排布均参照下表：

寄存器地址 ADDRH ADDRL	事件名称 event names	数据类型 Data type	备注 Note
0300H	上一次报警输出记录 The previous alarm output record	发生时间的秒、分 Occurrence time (minute, second)	高字节为秒 high byte : seconds
0301H		发生时间的时、日 Occurrence time (hour, day)	高字节为时 high byte : Hours
0302H		发生时间的月、年 Occurrence time of Month and year	高字节为月 high byte : Month
0303H		开关状态及编号 switch status and number	高字节：DO 口编号（0：DO1,1：DO2） 低字节：开关状态（0：断开，1：闭合） high byte :DO number(0 : DO1, 1 :DO2) Low byte: switch status(0: off, 1: on)
0304H		报警类型 alarm type	高字节：越限类型（0：大于阈值，1：小于阈值） 低字节：具体报警参数（见注 2） high byte : Limit Alarm (0 :over threshold , 1 :below threshold) Low byte: Alarm parameters (Note 2)

8.4 历史开关量输入事件读取

8.4 Historical Switching input reading

区间首地址（高字节） Starting address of interval (high byte)	历史数据类型 Type of historical data
03	开关量输入事件记录 Switching input incident record

各区间偏移地址（低字节） Offset address of interval (low byte)	数据类型 Data type
32	上一次开关量输入记录 Last 1 Switching input record
37	上二次开关量输入记录 Last 2 Switching input record

3C	上三次开关量输入记录 Last 3 Switching input record
41	上四次开关量输入记录 Last 4 Switching input record
46	上五次开关量输入记录 Last 5 Switching input record
4B	上六次开关量输入记录 Last 6 Switching input record
50	上七次开关量输入记录 Last 7 Switching input record
55	上八次开关量输入记录 Last 8 Switching input record
5A	上九次开关量输入记录 Last 9 Switching input record
5F	上十次开关量输入记录 Last 10 Switching input record

备注：每条事件记录长度为 5 个字，具体数据排布均参照下表：

寄存器地址 ADDRH ADDRL	事件名称 event names	数据类型 **Data type**	备注 Note
0332H	上一次开关量输入记录 Last 1 Switching input record	发生时间的秒、分 Occurrence time of seconds and minutes	高字节为秒 high byte : seconds
0333H		发生时间的时、日 Occurrence time of Hours and days	高字节为时 high byte : Hours
0334H		发生时间的月、年 Occurrence time of Month and year	高字节为月 high byte : Month
0335H		开关状态及编号 switch status and number	高字节：DI 口编号（0：DI1，1：DI2，2：DI3,3：DI4） 低字节：开关状态（0：断开，1：闭合） high byte :DO number(0：DI1，1：DI2，2：DI3,3：DI4) Low byte: switch status(0: off, 1: on)
0336H		预留 reservation	

8.5 极值及发生时间记录读取

8.5 Record of extreme value and occurrence time

极大值记录：

Maximum records:

区间首地址（高字节）Starting address of interval (high byte)	历史数据类型 Type of historical data
04	当月极值及发生时间记录 Extremum of the month and Occurrence time
05	上一月极值及发生时间记录 Extremum of last 1 month and Occurrence time
06	上二月极值及发生时间记录 Extremum of last 2 month and Occurrence time
07	上三月极值及发生时间记录 Extremum of last 3 month and Occurrence time

各区间偏移地址（低字节）Offset address of interval (low byte)	数据类型 Data type
00	A 相电压极大值及发生时间记录 Voltage of A phase maximum value and occurrence time
03	B 相电压极大值及发生时间记录 Voltage of B phase maximum value and occurrence time
06	C 相电压极大值及发生时间记录 Voltage of C phase maximum value and occurrence time
09	AB 线电压极大值及发生时间记录 Voltage between A-B maximum value and occurrence time
0C	BC 线电压极大值及发生时间记录 Voltage between A-B maximum value and occurrence time
0F	CA 线电压极大值及发生时间记录 Voltage between A-B maximum value and occurrence time
12	A 相电流极大值及发生时间记录 Electricity of A phase maximum value and occurrence time
15	B 相电流极大值及发生时间记录 Electricity of B phase maximum value and occurrence time
18	C 相电流极大值及发生时间记录 Electricity of C phase maximum value and occurrence time
1B	三相电流矢量和极大值及发生时间记录 Three phase current vector sum maximum value and occurrence time
1E	A 相有功功率极大值及发生时间记录 Active power of A phase maximum value and occurrence time
21	B 相有功功率极大值及发生时间记录 Active power of B phase maximum value and occurrence time

24	C 相有功功率极大值及发生时间记录 Active power of C phase maximum value and occurrence time
27	总有功功率极大值及发生时间记录 Total active power maximum value and occurrence time
2A	A 相无功功率极大值及发生时间记录 Reactive power of A phase maximum value and occurrence time
2D	B 相无功功率极大值及发生时间记录 Reactive power of B phase maximum value and occurrence time
30	C 相无功功率极大值及发生时间记录 Reactive power of C phase maximum value and occurrence time
33	总无功功率极大值及发生时间记录 Total reactive power maximum value and occurrence time
36	A 相视在功率极大值及发生时间记录 Apparent power of A phase maximum value and occurrence time
39	B 相视在功率极大值及发生时间记录 Apparent power of B phase maximum value and occurrence time
3C	C 相视在功率极大值及发生时间记录 Apparent power of C phase maximum value and occurrence time
3F	总视在功率极大值及发生时间记录 Total apparent power maximum value and occurrence time

极小值记录：

Minimum record:

区间首地址（高字节） Starting address of interval (high byte)	历史数据类型 Type of historical data
04	当月极值及发生时间记录 Extremum of the month and Occurrence time
05	上一月极值及发生时间记录

各区间偏移地址（低字节） Offset address of interval (low byte)	数据类型 Data type
42	A 相电压极小值及发生时间记录 Voltage of A phase Minimum Value and occurrence time
45	B 相电压极小值及发生时间记录

	Extremum of last 1 month and Occurrence time
06	上二月极值及发生时间记录 Extremum of last 2 month and Occurrence time
07	上三月极值及发生时间记录 Extremum of last 3 month and Occurrence time

	Voltage of B phase Minimum Value and occurrence time
48	C 相电压极小值及发生时间记录 Voltage of C phase Minimum Value and occurrence time
4B	AB 线电压极小值及发生时间记录 Voltage between A-B Minimum Value and occurrence time
4E	BC 线电压极小值及发生时间记录 Voltage between B-C Minimum value and occurrence time
51	CA 线电压极小值及发生时间记录 Voltage between C-A Minimum value and occurrence time
54	A 相电流极小值及发生时间记录 Electricity of A phase Minimum value and occurrence time
57	B 相电流极小值及发生时间记录 Electricity of B phase Minimum value and occurrence time
5A	C 相电流极小值及发生时间记录 Electricity of C phase Minimum value and occurrence time
5D	三相电流矢量和极小值及发生时间记录 Three phase current vector sum Minimum value and occurrence time
60	A 相有功功率极小值及发生时间记录 Active power of A phase Minimum value and occurrence time
63	B 相有功功率极小值及发生时间记录 Active power of B phase Minimum value and occurrence time
66	C 相有功功率极小值及发生时间记录 Active power of C phase Minimum value and occurrence time
69	总有功功率极小值及发生时间记录 Total active power Minimum value and occurrence time
6C	A 相无功功率极小值及发生时间记录 Reactive power of A phase Minimum value and occurrence time
6F	B 相无功功率极小值及发生时间记录

	Reactive power of B phase Minimum value and occurrence time
72	C 相无功功率极小值及发生时间记录 Reactive power of C phase Minimum value and occurrence time
75	总无功功率极小值及发生时间记录 Total reactive power Minimum value and occurrence time
78	A 相视在功率极小值及发生时间记录 Apparent power of A phase Minimum value and occurrence time
7B	B 相视在功率极小值及发生时间记录 Apparent power of B phase Minimum value and occurrence time
7E	C 相视在功率极小值及发生时间记录 Apparent power of C phase Minimum value and occurrence time
81	总视在功率极小值及发生时间记录 Total apparent power Minimum value and occurrence time

备注：每条极值及发生时间记录长度为 3 个字，具体数据排布均参照下表：

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

寄存器地址 ADDRH ADDRL	事件名称 event names	数据类型 Data type	备注 Note
0400H	A 相电压极大值及发生时间记录 Maximum voltage of A phase and occurrence time	极值具体数据 The data of Maximum voltage of A phase	具体数据类型及小数位参考 8.1 地址表 data and decimal place refer to address table 8.1
0401H		发生时间的分、时 Occurrence time of minutes and hours	高字节为分 high byte : minutes
0402H		发生时间的日、月 Occurrence time of Days and months	高字节为日 high byte : Days

8.6 历史需量记录读取

8.6 read records from a historical demand

区间首地址（高字节）Starting address of	历史数据类型 Type of historical data	各区间偏移地址(低字节）Offset address of interval	数据类型 Data type

interval (high byte)	
08	历史需量记录 Historical Demand record
09	历史需量记录 Historical Demand record

(low byte)	
00	上一月需量记录 Last 1 month Demand
0C	上二月需量记录 Last 2 month Demand
18	上三月需量记录 Last 3 month Demand
24	上四月需量记录 Last 4 month Demand
30	上五月需量记录 Last 5 month Demand
3C	上六月需量记录 Last 6 month Demand
48	上七月需量记录 Last 7 month Demand
54	上八月需量记录 Last 8 month Demand
60	上九月需量记录 Last 9 month Demand
6C	上十月需量记录 Last 10 month Demand
78	上十一月需量记录 Last 11 month Demand
84	上十二月需量记录 Last 12 month Demand

备注：每条事件记录长度为 12 个字，具体数据排布均参照下表：

Note：The length of each event record is 24 bits, and the data configuration can be referred as below:

寄存器地址 ADDRH ADDRL	事件名称 event names	数据类型 Data type	备注 Note
0800H	上一次开关量输入记录 Last 1 Switching input record	正向有功需量 Forward active demand	需量数据 Demand Data
0801H		发生时间的分、时 Occurrence time of seconds and minutes	高字节为分 high byte : minutes

0802H		发生时间的日、月 Occurrence time of Days and months	高字节为日 high byte : Days
0803H		反向有功需量 reversing active demand	需量数据 Demand Data
0804H		发生时间的分、时 Occurrence time of minutes and hours	高字节为分 high byte : minutes
0805H		发生时间的日、月 Occurrence time of Days and months	高字节为日 high byte : Days
0806H		正向无功需量 forward reactive demand	需量数据 Demand Data
0807H		发生时间的分、时 Occurrence time of minutes and hours	高字节为分 high byte : minutes
0808H		发生时间的日、月 Occurrence time of Days and months	高字节为日 high byte : Days
0809H		反向无功需量 reversing reactive demand	需量数据 Demand Data
080AH		发生时间的分、时 Occurrence time of minutes and hours	高字节为分 high byte : minutes
080BH		发生时间的日、月 Occurrence time of Days and months	高字节为日 high byte : Days

寄存器地址 ADDRH ADDRL	事件名称 event names	数据类型 Data type	备注 Note
0900H	上一次开关量输入记录	A 相电流需量 A-phase current demand	需量数据 Demand Data
0901H		发生时间的分、时 Occurrence time of seconds and minutes	高字节为分 high byte : minutes

0902H		发生时间的日、月 Occurrence time of Days and months	高字节为日 high byte : Days
0903H		B 相电流需量 B-phase current demand	需量数据 Demand Data
0904H		发生时间的分、时 Occurrence time of seconds and minutes	高字节为分 high byte : minutes
0905H		发生时间的日、月 Occurrence time of Days and months	高字节为日 high byte : Days
0906H		C 相电流需量 C-phase current demand	需量数据 Demand Data
0907H		发生时间的分、时 Occurrence time of seconds and minutes	高字节为分 high byte : minutes
0908H		发生时间的日、月 Occurrence time of Days and months	高字节为日 high byte : Days
0909H		视在功率需量 apparent power requirements	需量数据 Demand Data
090AH		发生时间的分、时 Occurrence time of seconds and minutes	高字节为分 high byte : minutes
090BH		发生时间的日、月 Occurrence time of Days and months	高字节为日 high byte : Days

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