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**INDUSTRY STANDARD OF THE  
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**Technical requirements of utility meters data transmission  
(English Translation)**

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### 1 Scope

This standard specifies the functional requirements, physical layer, data link layer, data security, application layer for data transmission of household metering instruments (hereinafter referred to as meters).

This standard is applicable to the automatic reading system, for data exchange between the master station and the slave station, one master and one slave, or one master and multiple slaves.

### 2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document;

for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 778.1 Measurement of water flow in fully charged closed conduits - Meters for cold potable water and hot water - Part 1.Specifications

GB/T 6968 Diaphragm gas meters

GB/T 19582.1 Modbus industrial automation network specification - Part 1.

Modbus application protocol

GB/T 19897.1-2005 Automatic meter reading system lower layer communication protocol - Part 1.direct local data exchange

GB/T 26831.2 Society energy metering for reading system specification - Part 2.

Physical and link layer

### 3 Terms and definitions

The following terms and definitions apply to this document.

#### 3.1

Automatic meter reading system

The system, by which the data of multiple slave stations is read automatically by the master station, through the physical channel, referred to as the automatic meter reading (AMR).

#### 3.2

Master station

A device that selects one, a group or all of the slave stations AND initiates an information exchange with the slave stations. It can be a concentrator, a handheld device, a computer, or other data terminal.

#### 3.3

Slave station

A device, that has a unique identification address in the entire network, receives information from the master station, exchanges information with the master station.

**Note:** In this standard, it refers to instrument.

#### 3.4

Bus

A physical cline, that connects the master station with multiple slave stations.

### 4.1 General requirements

#### 4.1.1

The automatic meter reading system shall have the ability to identify different types of slave stations and two-way communication.

### 4.2 Function of master station

#### 4.2.1

It shall be able to automatically read and receive the data of each slave station, according to the set time; have the functions of real-time random reading and selective reading by address.

#### **4.2.2**

It shall be able to set the initial parameters of the master station, such as time, etc.;  
there shall be measures to prevent unauthorized personnel from operating.

#### **4.2.3**

It shall be able to realize the time calibration of the slave station system.

### **4.3 Function of slave station**

#### **4.3.1**

It shall be able to receive and respond to the master station's reading information.

### **4.4 Data transmission reliability**

#### **4.4.1**

The one-time reading success rate is calculated, according to formula (1).

### **4.5 Meters**

#### **4.5.1**

The accuracy of the water meter shall comply with the relevant provisions of  
GB/T 778.1.

#### **4.5.2**

The output parameters of the water meter shall include the current cumulative

#### **4.5.6**

The output parameters of the heat (cold) meter shall include real-time time, heating (cooling) volume on settlement day, current heating (cooling) volume, thermal power, instantaneous flow, cumulative flow, water supply temperature, return water temperature, cumulative working time, etc.

### **5.1 Interface form**

Instrument communication interfaces include M-Bus interface, RS-485 interface, wireless transceiver interface, optical interface. When using other interfaces, it shall comply with the provisions of relevant standards.

### **5.4 Wireless transceiver interface**

The radio frequency, which is used by the wireless transceiver interface, is preferably the 433 MHz frequency band, the 470MHz frequency band, the 780 MHz frequency band or the 868 MHz frequency band. Transmission power and other main technical indicators shall

comply with relevant national requirements.

## **6.1 Protocol communication method**

This protocol adopts the half-duplex communication mode of master-slave structure.

## **6.3 Frame format**

### **6.3.1**

The frame format shall comply with the provisions of Table 2.

### **6.3.4**

The format of the control code (C) is as shown in Figure 3.

### **6.3.6**

The data field (DATA) includes data identification, serial number, data; its structure changes with the function of the control code.

### **6.3.7**

The check code (CS) is one byte; all bytes, from the frame start character (including the frame start character) to the check code, are accumulated in binary arithmetic, excluding the overflow value which exceeds FFH.

## **6.4 Transmission requirements**

### **6.4.1**

Preamble byte. When using wired interface, 2 bytes ~ 4 bytes FEH shall be sent, before sending frame information.

### **6.4.4**

Error control. If the receiver detects a checksum, even check bit or format error, it shall abandon the information frame and not respond.

### **6.4.5**

Transmission rate. The commonly used rates are 300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps.

## **7.1 Security requirements**

It shall comply with the relevant provisions of the national password management.

## **7.3 Key management**

The 16-byte key is defined and managed by the vendor and the user. The key management shall be secure and reliable.