# Smart Card Water Meter Introduction

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1. Smart Card Solution

The IC Card Intelligent Water Meter adopts the most advanced microprocessor and measures of intelligent design to integrate the functions of data collecting/saving, LCD display, automatic control, etc. It has the features of high-level integration, excellent reliability, accurate measuring, efficient control, convenient management, good appearance, high-level safety/sanitation, easy installation/utilization, etc, so it's a perfect choice for scientific management of water measuring and charging in cities. The IC card intelligent water meter consists of the hard/software instruments, including Water meter, IC card, Card reader/writer and Sales software; and the computer to establish a complete management system for utilization and management operations. IC card is the core carrier for exchange of information and data.

2. Water Meter

2.1. Appearance
2.2. Overall Dimension

<table>
<thead>
<tr>
<th>DN</th>
<th>Length (L)</th>
<th>Width (W)</th>
<th>Height (H)</th>
<th>Connection Pipe Thread</th>
<th>Tail piece thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>15mm</td>
<td>165mm</td>
<td>85mm</td>
<td>115mm</td>
<td>G3/4 B</td>
<td>R1/2</td>
</tr>
<tr>
<td>20mm</td>
<td>195mm</td>
<td>85mm</td>
<td>115mm</td>
<td>G1 B</td>
<td>R3/4</td>
</tr>
<tr>
<td>25mm</td>
<td>225 mm</td>
<td>117 mm</td>
<td>143 mm</td>
<td>G1 1/4B</td>
<td>R1</td>
</tr>
</tbody>
</table>

2.3. Flow Parameters

<table>
<thead>
<tr>
<th>DN</th>
<th>Accuracy Class</th>
<th>Min Flow (Q_{\text{min}}) (L/h)</th>
<th>Transitional Flow (Q_t) (L/h)</th>
<th>Normal Flow (Q_p) (m^3/h)</th>
<th>Max Flow (Q_s) (m^3/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15mm</td>
<td>B</td>
<td>30 L/h</td>
<td>120 L/h</td>
<td>1.5 m^3/h</td>
<td>3 m^3/h</td>
</tr>
<tr>
<td>20mm</td>
<td>B</td>
<td>50 L/h</td>
<td>200 L/h</td>
<td>2.5 m^3/h</td>
<td>5 m^3/h</td>
</tr>
<tr>
<td>25mm</td>
<td>B</td>
<td>70 L/h</td>
<td>280 L/h</td>
<td>3.5 m^3/h</td>
<td>7 m^3/h</td>
</tr>
</tbody>
</table>
## 2.4. Mechanical Part Technical Parameters

<table>
<thead>
<tr>
<th>Item</th>
<th>Detailed Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Technical Standards</td>
<td>ISO4064.1-2005</td>
</tr>
<tr>
<td>Accuracy Class</td>
<td>B</td>
</tr>
<tr>
<td>Mechanical Configuration</td>
<td>Dry (Magnetic driven)</td>
</tr>
<tr>
<td>Single/Multi-Jet type</td>
<td>Multi-jet vane wheel</td>
</tr>
<tr>
<td>Water to be measured</td>
<td>Cold water</td>
</tr>
<tr>
<td>Water flow direction</td>
<td>Available, on the side of the water meter body</td>
</tr>
<tr>
<td>Water meter caliber</td>
<td>15mm, 20mm, 25mm that indicates on the side of the water meter body</td>
</tr>
<tr>
<td>Body material</td>
<td>Copper (≥57%)</td>
</tr>
<tr>
<td>Valve type</td>
<td>Electro motion ball valve</td>
</tr>
<tr>
<td>Mechanical Measuring Error</td>
<td>Q_{min}<del>Q_t: ±5%; Q_t</del>Q_s: ±2%</td>
</tr>
<tr>
<td>Working Pressure</td>
<td>1.0 Mpa</td>
</tr>
<tr>
<td>Pressure loss</td>
<td>≤0.1MPa</td>
</tr>
<tr>
<td>Working temperature</td>
<td>0.1℃~40℃</td>
</tr>
<tr>
<td>Waterproof Class</td>
<td>Water meter: IP 68</td>
</tr>
<tr>
<td>Installation method</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Working condition</td>
<td>Temperature: 0.1-50℃; Relative humidity&lt;93%</td>
</tr>
</tbody>
</table>
3. LCD Display Illustrations

![LCD Display Illustration]

1) ![on_icon] On: Valve opened
2) ![off_icon] Off: Valve closed
3) ![flash_icon] Flash display means the valve is being opened or closed.
4) 88888888: Present residual water quantity
5) 88888888: Accumulative water using quantity
6) 8 888: Water using quantity of a specific month
7) 05· 08: Date
8) ![normal_icon] means the battery is normal; Flashing of ![battery_icon] of battery is warning against power adequacy; warning display will turn to ![off_icon] and the valve will be closed on condition the warning lasts for one day.
9) ![battery_icon] Means battery inadequate.
10) ![magnet_icon] Strong magnet influence;
11) Pur: The meter will display "purchase water please" when residual water quantity is not enough; the sign "pur" will disappear once the meter finishes recharge.
12) CE: Card Error: Inserting direction incorrect.
13) Ed·Err: Card information errors (Note: 08 stands for error information code)
14) 88888888: Load water success; display of loaded water quantity
15) Normal Scroll-Displays
   ◆ 88888888 Display of cumulative water using quantity;
   ◆ 88888888 Display of residual water quantity;
16) Scroll-Display of Card-Inserting:
   ◆ 88888888: Full Display;
   ◆ 8 888: Scroll-display of monthly water using quantity (the month is
flash display);

◆ 05├→ 08: Date display;

◆ 05├→ 12: Display of water meter serial number (Ten digits displayed in two screens.)

4. Main Functions

4.1 Record & Display function

Except for reserving the former mechanical display, the LCD display is added to provide more direct display frame.

A. Record function

1) It can record cumulative water using quantity, residual water quantity and water purchase quantity, etc.
2) It can record the monthly water using quantity of latest 6 months.
3) It can record the times of magnetism disturbance.
4) Relative information can be written back to water selling management system via IC card.

B. Display Function

1) To display cumulative water using quantity, residual water quantity, water purchase quantity, the state of valve (open/closed), battery condition (indication of battery voltage low), magnetic disturbance and the warning display for the residual water quantity reaches the warning quantity.
2) The max electronic digital display is 999,999.9m³, and the min is 0.1m³.

4.2 Control Function

A. Water using control and warning

1) When the residual water quantity reaches the predefined warning quantity (the warning quantity is set by the water supply department), the LED on controller will flash and LCD indicates “pur” to remind user to buy water as soon as possible. When the credits in the meter reaches zero the water meter will close valve and stop water supply and it will not restart water supply until user deposits credits in.
2) Regarding battery-low inspection, magnetic disturbance and etc, the
LCD on controller will remind the user and record the magnetic disturbance.

B. Checking Function

3) “Cumulative quantity” and “residual quantity” can be checked anytime the meter operates. Inserting the card can check monthly water consumption of past six months, present date, meter’s ID number.

C. Anti-tamper & Anti-Attack Function

4) The water meter has the device of anti-magnetization. Once magnetic disturbance occurs, the water meter will record the event, and the magnetic disturbance times can be written back to water selling software via checking card for water supplying department to make analysis.

D. Battery voltage low Inspection

- Water meter has voltage inspection device, when the voltage is lower than warning voltage, the LED on the controller part will flash and LCD display battery inadequate, one day later the water meter will stop work, at this occasion the user shall replace the battery with a new one and to make the water meter restart.

E. Battery & Valve Self-Protection Function

- The water meter will open and close valve automatically and periodically to prevent the valve from scaling.

4.3 Using Functions

- Step prices: Realization of step-price via water selling management software.
- Card reissue function: “User card” could be used repeatedly, if the card is missing or broken, the user can go to the water selling department to apply for a new card.
- Self-inspection function: water meter has the function of self-inspection, for example: LCD self-inspection, card reading and recording self-inspection function, etc.
- Meter replacing function: when the water meter needed to be replaced, the previous data of an old meter could be read through the meter-replacing card and then insert the meter-replacing card to a new water meter after that the information in the old meter will be transferred to the new water meter.
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