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Contents

Company Profile

Products

AMR System & Case
1. Name: Shinhan Precision Co., Ltd.
2. Location: Incheon, Republic of Korea
3. Site: www.spic.co.kr
4. Tel: +82-32-865-0411,
   Fax: +82-32-865-0410
5. Established Data: 1996.06.
6. Products: Water Meter (Cold, Hot)
   Gas Meter
   Electricity Meter,
   Calorie Meter,
   AMR, AMI System
Company

“Specialized Company in Metrology and Metering”

- Water Meter (Cold, Hot)
- Electricity Meter
- Gas Meter
- Calorie Meter

AMR System
Water Meter

- Vane wheel type digital meter
- Real time leakage sensing, indicates leakage alarm in LCD or communication
- Battery Operation, 8 years
- Fine accuracy and 8 time sensing per rotation
- Reduce slip to the zero

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>Length L (mm)</th>
<th>Height H (mm)</th>
<th>Width W (mm)</th>
<th>Connecting Thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>165</td>
<td>112</td>
<td>88</td>
<td>G ¾</td>
</tr>
<tr>
<td>20</td>
<td>190</td>
<td>121</td>
<td>98</td>
<td>G 1</td>
</tr>
<tr>
<td>25</td>
<td>225</td>
<td>125</td>
<td>98</td>
<td>G 1¼</td>
</tr>
</tbody>
</table>
Water Meter

Digital Waltmann

- Waltmann type digital meter
- Magnetic sensor can read 8 time per rotation, fine accuracy
- Remote reading indicator
- Ultra low power consumption
- 8-years operation by internal battery

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>Length L (mm)</th>
<th>Height H (mm)</th>
<th>Flange S (mm)</th>
<th>Flange Bolt</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>206/225</td>
<td>250</td>
<td>200</td>
<td>19</td>
</tr>
<tr>
<td>100</td>
<td>241/250</td>
<td>260</td>
<td>220</td>
<td>19</td>
</tr>
<tr>
<td>150</td>
<td>300</td>
<td>340</td>
<td>285</td>
<td>23</td>
</tr>
<tr>
<td>200</td>
<td>350</td>
<td>384</td>
<td>340</td>
<td>23</td>
</tr>
<tr>
<td>250</td>
<td>450</td>
<td>419</td>
<td>395</td>
<td>23</td>
</tr>
<tr>
<td>300</td>
<td>500</td>
<td>434</td>
<td>445</td>
<td>23</td>
</tr>
</tbody>
</table>
Water Meter

Unified Multi Jet, Dry

- Unified vane wheel multi jet dry dial type
- High accuracy especially in the low flow range
- Stable accuracy in the wide range of pressure
- Long durability and high sensitivity using special engineering plastic
- Strong from the freeze burst
Water Meter

- Digital Vane Wheel

- Multi Jet Mechanical Type

- Multi Jet Digital Type

- Magnetic Sensor

- No Moving Part In Gear Set
  - Sensitivity ↑, Trouble with foreign substance ↓

- Make and Give more Information
Water Meter

Digital Vane Wheel

Dry Dial type Body

PCB with Magnetic Sensor

Vane wheel digital meter
## Water Meter

<table>
<thead>
<tr>
<th>Picture And Structure</th>
<th>Reed Switch</th>
<th>Digital Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image]</td>
<td>[Image]</td>
<td>[Image]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Reed Switch</th>
<th>Digital Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>■ Weak in mechanical shock</td>
<td>- Reed switch could be broken</td>
<td>■ Battery needed for communication</td>
</tr>
<tr>
<td>■ Difference in register and AMR module</td>
<td>- Risk in signal loss from noise of line</td>
<td>■ Exact same number in register and AMR</td>
</tr>
<tr>
<td></td>
<td>- Sensitivity change due to mechanical stress</td>
<td>- Meters response the values at the moment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Additional information could be checked</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(leakage, overload etc.)</td>
</tr>
</tbody>
</table>
Automatic Meter Reading System

**System summary**

- Unlike traditional method where a meter reader visits each household and read meters, automatic data collecting allows wireless transfer of records to a meter reader who is within effective distance.

- Two types of automatic meter readings are possible:
  ① On-Site AMR: Meter reading by visit (handheld)
  ② Off-Site AMR: Long distance data receiving

- Two-way communication allows automatic shut-off or prepaid

**Effect of AMRs**

- Cost reduction & Improved efficiency
- Privacy & Crime prevention
- Various services & easy management
- Data analysis
- Solving difficulties in meter reading
Automatic Meter Reading System

Types of AMR

- Visual reading
  - Low cost
  - Requires construction for wired device

- PDA meter reading
  - Short distance wireless reading

- Wireless meter reading
  - Minimize in construction expanse and complaint
5-1. PDA AMR System (Short distance wireless communication type)

PDA AMR system is a on-site meter reading method where a meter reader carries a PDA (handheld computer) and receives data from outdoor indicator. These data is collected at central server. (Remote controllable by two-way communication)
5 - 2. CDMA AMR System (Long distance wireless communication method)

- Transfer of usage from meter to outdoor indicator
- Using wireless network (424HMz) each data is transferred from outdoor indicator to repeater
- Repeater sends data to collector, which ultimately transfers data to headquarter server using wireless CDMA network
- CDMA ARM System allows automatic control (supply and shut-off) for each household at central system
5 – 3. M2M AMR System (Long distance communication method)

- High quality telecommunication service without interference from commercial freq. (mobile communication network)
- Wide area wireless telecommunication service with high power wave (terminal output: 1W)
- Economical choice from low cost on modem and communication service fee
- Optimal solution for wireless AMR from low power consumption, compact, direct connection with meter
- M2M System allows automatic control (supply and shut-off) for each household at central system
5-4. Wired AMR System (Wired communication for apartment building)

- 3-kinds, 5-kinds meter
- Pulse output meter reading
- Digital communication meter reading
- TCU, DCU, I/F Unit
- System software
Automatic Meter Reading System

- Integrated Automatic meter (hot water, water, calorie, gas, electricity) reading for remodeling of apartment house
- Various network types: Indoor wired, mixed (wired/wireless), wireless
- Collect and display 5 kinds of readings at integrated indicator and send to main server (real-time)
- Reliable system through wireless network management
- High quality wireless communication network by providing private frequency (channel)

Development in the process

- Hot water
- Water
- Calorie
- Gas
- Electricity

300MHz (wireless synchronization)
Case: AMR System

Improvement in Revenue Water Ratio

<table>
<thead>
<tr>
<th>Area</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seosan</td>
<td>20% up</td>
</tr>
<tr>
<td>Goryeong</td>
<td>10% up</td>
</tr>
<tr>
<td>Jecheon</td>
<td>8% up</td>
</tr>
<tr>
<td>Geochang</td>
<td>8% up</td>
</tr>
</tbody>
</table>

Advantage in AMR System with Digital Water Meter

- Leak Water ↓, Revenue Water↑
- Revenue Enlargement in charge
- Interworking with Block Monitoring System
- Automatically Computerized Data Collecting
- Using SWM Data in Social Service
# Bangladesh Data Monitoring System

## Real-Time Metering Status

<table>
<thead>
<tr>
<th>Total</th>
<th>Telecommunication Status</th>
<th>Meter Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Caution</td>
</tr>
<tr>
<td>13</td>
<td>12</td>
<td>0</td>
</tr>
</tbody>
</table>

### Hourly usage (sample)
Thank you!

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E-mail: spic@spic.co.kr