Electromagnetic metering pumps

Electromagnetic metering pumps with 100% watertight construction

The EK series electromagnetic metering pumps are constructed to be perfectly watertight. The EK series is the world’s first plastic resin electromagnetic metering pumps that are capable of being used outdoors. They can be used widely in various facilities and plants for water treatment, surface treatment and so forth.
Electromagnetic metering pumps with 100% watertight construction

The EK series electromagnetic metering pumps are constructed to be perfectly watertight. Conventional electromagnetic pumps are thought to be vulnerable to exposure to external liquids, which means that they are unsuitable for outdoor use. To address this weak point, we have done our best to make the controller unit and the drive unit fully watertight and moisture proof. As a result, the EK series is the world's first plastic resin electromagnetic metering pumps that are capable of being used outdoors. They can be used widely in various facilities and plants for water treatment, surface treatment and so forth.
Waterproof structure (equivalent to IP67)

By integrating a one-piece pump body, sealing portions are reduced in number to prevent liquids from entering due to sealing defects. A rubber gasket is provided between the pump head and the bracket to prevent water from entering through the periphery of the pump head. To keep the controller unit watertight, a plastic cover with gasket is provided as standard equipment. The adoption of membrane switches for the controller panel is another measure for the prevention of liquid penetration.

Moistureproof structure

The electronic parts and printed board have been molded with resin. This prevents dew condensation and short-circuiting caused by atmospheric gas.

High resolution

For discharge flow adjustment, a dual control system which controls the length of stroke and the number of strokes is employed. Since stroke by stroke adjustment is possible, the discharge rate can be controlled in a wide range from a minimal flow rate to a maximum discharge.

Controller

The controller has a CPU. Both the stop function and the external function are included as standard equipment. As the display for the number of strokes, a high-temperature resistant LCD is employed to allow long-term exposure to the direct rays of the sun.
High-tech combination of pump technology and electronics technology
**Pump unit**

**Pump head**
Four types, PVC, GFRPP, PVDF and Stainless steel 316 are available.

**Diaphragm**
A flat diaphragm with less dead volume. Made of EPDM covered by fluororesin, it is highly corrosion-resistant and remarkably durable.

**Valve**
A two-stage valve system, which has high checking ability, is used. There are two types of valve assemblies, i.e., for acid liquid and for alkaline liquid.

**Air vent valve**
The smaller flow rate types (to the EK-21) have air vent valves as standard equipment. Air in the pump chamber can be easily released simply by turning knob. Note: For SUS316 type, air vent valve is available for all pump sizes.

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**Controller unit**

**Controller**
A CPU is mounted to raise the resolution and promote functional diversity.

**Control panel**
An LCD suitable for use under high temperature is also weather-tight and easy for the operator to read. To protect the controller portion from external liquids, membrane switches are used.

**Stroke length adjusting dial**
The large adjusting dial is easy to operate. Dual control of the number of strokes as well as the length of stroke allows a wide range of discharge adjustment.

**Controller cover**
All the models have controller covers as standard equipment.

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**Drive unit**

**Solenoid**
A coil and a thermal protector, insert-molded by resin, ensure insulation. For the convenience in recycling, the resin portion and the metal portion are constructed to be easily separable.

**Pump body**
The body is in a PPE case; this material offers strong protection against ultraviolet rays and has high chemical resistance. All of the assembled portions are attached with rubber seals; its water-tightness is equivalent to IP67.
**Wet-end materials**

<table>
<thead>
<tr>
<th></th>
<th>VC</th>
<th>VH</th>
<th>PC</th>
<th>PH</th>
<th>TC</th>
<th>SH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pump head</td>
<td>PVC</td>
<td>PVC</td>
<td>GFPRP</td>
<td>GFPRP</td>
<td>PVDF</td>
</tr>
<tr>
<td>2</td>
<td>Valve</td>
<td>Alumina ceramic</td>
<td>Hastelloy C276</td>
<td>Alumina ceramic</td>
<td>Hastelloy C276</td>
<td>Alumina ceramic</td>
</tr>
<tr>
<td>3</td>
<td>Valve seat</td>
<td>FKM</td>
<td>EPDM</td>
<td>FKM</td>
<td>EPDM</td>
<td>FKM</td>
</tr>
<tr>
<td>4</td>
<td>Valve guide</td>
<td>PVC</td>
<td>PVC</td>
<td>GFPRP</td>
<td>GFPRP</td>
<td>PVDF</td>
</tr>
<tr>
<td>5</td>
<td>Valve gasket</td>
<td>PTFE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>O ring</td>
<td>FKM</td>
<td>EPDM</td>
<td>FKM</td>
<td>EPDM</td>
<td>FKM</td>
</tr>
<tr>
<td>7</td>
<td>Diaphragm</td>
<td>PTFE coated EPDM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Illustration shows PVC and GFPRP type.

**Pump identification**

- **Series name**: iwaki electromagnetic metering pump
- **Drive unit symbol**: Average power consumption / Length of stroke
  - B: 25W / 1mm
  - C: 22W / 1.25mm
- **Effective diameter of diaphragm**: 11: 10mm 16: 15mm 21: 20mm 31: 30mm 36: 35mm
- **Power cord terminal**: P: With plug
- **Power supply voltage symbol**
  - 100: AC100/110/115 single phase 50/60Hz
  - 200: AC220V/230V/240V single phase 50/60Hz
- **Controller unit type**: R: R type
- **Diameter of connecting tube (mm)**
  - 1: 4x9 2: 4x6 3: 6x8
  - 4: 8x13 5: 9x12
  - 6: 10x12 9: Rc1/4

**Specifications of pump**

| Model | VC, VH, PC, PH | B11 | B16 | B21 | B31 | C16 | C21 | C31 | C36 |
|-------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Capacity | L/hr | 2.4 | 3.9 | 6.9 | 12.6 | 4.8 | 8.7 | 16.2 | 25.2 |
|       | mL/min | 40 | 65 | 115 | 210 | 80 | 145 | 270 | 420 |
|       | mL/shot | 0.11 | 0.18 | 0.31 | 0.58 | 0.22 | 0.4 | 0.75 | 1.17 |
| TC, SH | L/hr | 2.4 | – | 6.9 | – | – | 8.1 | 16.2 | 24.0 |
|       | mL/min | 40 | – | 115 | – | – | 135 | 270 | 400 |
|       | mL/shot | 0.11 | – | 0.31 | – | – | 0.38 | 0.75 | 1.11 |
| Max. discharge pressure | MPa | 1.0 | 0.7 | 0.4 | 0.2 | 1.0 | 0.7 | 0.35 | 0.2 |
| Stroke length (effective adjustment range) | mm | 1 (40-100%) | 1.25 (30-100%) |
| Stroke rate | 1-3600rpm |
| Power supply (common to 50/60Hz) | AC100V / 110V / 115V or 220V / 230V / 240V single phase |
| Insulation type, etc. | E type insulation / with built-in thermal protector / with 2.0 m power cord |
| Average power consumption | W | 20 | 22 |
| Connection (Applicable tube diameter) | VC, VH | mm | 4x6, 4x9, 6x8 | 8x13, 9x12 | 4x6, 4x9, 6x8 | 8x13, 9x12 |
|       | PC, PH | mm | 4x6, 4x9 | 8x13, 9x12 | 4x6, 4x9 | 8x13, 9x12 |
|       | TC, SH | mm | 4x6 | – | 4x6 | – | 4x6 | 10x12 |
| Thread connection | SH | Rc1/4" | – | Rc1/4" | – | – | Rc1/4" |
| Mass | kg | 2.8 | 3.7 |

Note 1: The maximum discharges are values with clear water and under maximum discharge pressures. Under lower discharge pressures, larger amounts than the above are discharged.
Note 2: To prevent overfeeding, discharge pressure should be 0.12 MPa or higher. (For B31 and C36: 0.05 MPa or higher) If these levels are not reached, make sure to use a check valve (optional item).

**Specifications of controller**

<table>
<thead>
<tr>
<th>Operational function</th>
<th>Function</th>
<th>MANUAL (Manual operation)</th>
<th>EXT (Operation by external signals)</th>
<th>STOP (Operation to be stopped by external signals)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching</td>
<td>Selection by operating keys (UP and DOWN keys)</td>
<td>START / STOP key (Membrane)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting</td>
<td>MANUAL: The number of strokes between 1 and 360 rpm</td>
<td>EXTERNAL: Digital input operation 1 : 1 (No pulse to be stored)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input</td>
<td>Pulse</td>
<td>No-voltage contact or open collector</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Highest SPM</td>
<td>360 rpm.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stop Level sensor: No-voltage contact or open collector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>External connection</td>
<td>Terminal connector connection (Original type)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Operating Conditions**

- Liquid temperature range: VC/VH: -60 to 80°C, PC/PH/TC/SH: -60 to 80°C (Without dew condensation)
- Ambient temperature range: VC/VH: -60 to 80°C, PC/PH/TC/SH: -60 to 80°C
Check valve CA /CB / CS
This has the function of a nonreturn valve and prevents siphon and overfeed.

CA : Available in PVC and CFRP.

CB : In-line type to be connected in the middle of a hose; made of PVC or CFRP.

CS : Made of stainless steel for SH type.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Connection</th>
<th>Set pressure MPa</th>
<th>Material</th>
<th>Applicable pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-1VC (1V)</td>
<td>4x6 4x9</td>
<td>0.17 0.04</td>
<td>PVC (CFRP)</td>
<td>EX-B11, B16, B21, C16, C21</td>
</tr>
<tr>
<td>CA-1VE (1E)</td>
<td>6x8</td>
<td>0.17 0.04</td>
<td>Hastelloy C276</td>
<td>EX-C31</td>
</tr>
<tr>
<td>CA-2VC (2V)</td>
<td>8x13 9x12</td>
<td>0.17 0.04</td>
<td>PVC (CFRP)</td>
<td>EX-B11, B16, B21, C16, C21</td>
</tr>
<tr>
<td>CA-2VE (2E)</td>
<td>9x13 8x13</td>
<td>0.17 0.04</td>
<td>Hastelloy C276</td>
<td>EX-B11, B16, B21, C16, C21</td>
</tr>
<tr>
<td>CA-2VC (2VL)</td>
<td>8x13 9x12</td>
<td>0.17 0.04</td>
<td>PVC (CFRP)</td>
<td>EX-B11, B16, B21, C16, C21</td>
</tr>
<tr>
<td>CA-2VEL (2EL)</td>
<td>9x13 8x13</td>
<td>0.17 0.04</td>
<td>Hastelloy C276</td>
<td>EX-B11, B16, B21, C16, C21</td>
</tr>
<tr>
<td>CB-1VC (1V)</td>
<td>4x6 4x9</td>
<td>0.17 0.04</td>
<td>PVC (CFRP)</td>
<td>EX-B11, B16, B21, C16, C21</td>
</tr>
<tr>
<td>CB-1VE (1E)</td>
<td>6x8</td>
<td>0.17 0.04</td>
<td>Hastelloy C276</td>
<td>EX-B31, C36</td>
</tr>
<tr>
<td>CB-2VC (2V)</td>
<td>8x13 9x12</td>
<td>0.17 0.04</td>
<td>PVC (CFRP)</td>
<td>EX-B11, B16, B21, C16, C21</td>
</tr>
<tr>
<td>CB-2VE (2E)</td>
<td>9x13 8x13</td>
<td>0.17 0.04</td>
<td>Hastelloy C276</td>
<td>EX-B11, B16, B21, C16, C21</td>
</tr>
<tr>
<td>CB-2VC (2VL)</td>
<td>8x13 9x12</td>
<td>0.17 0.04</td>
<td>PVC (CFRP)</td>
<td>EX-B11, B16, B21, C16, C21</td>
</tr>
<tr>
<td>CB-2VEL (2EL)</td>
<td>9x13 8x13</td>
<td>0.17 0.04</td>
<td>Hastelloy C276</td>
<td>EX-B11, B16, B21, C16, C21</td>
</tr>
<tr>
<td>CS-1S</td>
<td>Rct/1/4</td>
<td>0.2 0.03</td>
<td>SU304</td>
<td>EX-B11, B16, B21, C16, C21, C31</td>
</tr>
<tr>
<td>CS-1SL</td>
<td>Rct/1/4</td>
<td>0.05 0.03</td>
<td>EPDM</td>
<td>EX-B11, C31</td>
</tr>
</tbody>
</table>

Siphon preventing valve BVC
Made of PVC or GRP consisting of non-metallic parts.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Connection</th>
<th>Set pressure MPa</th>
<th>Material</th>
<th>Applicable pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>BVC-1</td>
<td>4x6 6x8</td>
<td>0.2 or 0.05</td>
<td>PVC</td>
<td>-</td>
</tr>
<tr>
<td>BVC-1S</td>
<td>8x13 9x12</td>
<td>0.2</td>
<td>-</td>
<td>PVC</td>
</tr>
</tbody>
</table>

Air vent valve AV
For EK-B31, C31 and C36.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Tube connection</th>
<th>Material</th>
<th>Applicable pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV-LVC</td>
<td>8x13mm</td>
<td>PVC, FRM</td>
<td>EX-B31, C31, C36-C1</td>
</tr>
<tr>
<td>AV-LVM</td>
<td>9x12mm</td>
<td>PVC, EPDM</td>
<td>EX-B31, C31, C36-VH</td>
</tr>
<tr>
<td>AV-LPC</td>
<td>8x13mm</td>
<td>GFRPP, FRM</td>
<td>EX-B31, C31, C36-PC</td>
</tr>
<tr>
<td>AV-LPH</td>
<td>8x13mm</td>
<td>GFRPP, EPDM</td>
<td>EX-B31, C31, C36-PH</td>
</tr>
</tbody>
</table>

Multi-function valve MFV
This valve has the multi-function of air vent, pressure release inside pipe, and back pressure valve.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Tube connection</th>
<th>Set pressure</th>
<th>Material</th>
<th>Applicable pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFV-SVC</td>
<td>4x6mm 6x9mm</td>
<td>0.2</td>
<td>PVC / FRM / PTFE</td>
<td>EX-B11, B16, B21, C16, C21</td>
</tr>
<tr>
<td>MFV-SVH</td>
<td>4x6mm 6x9mm</td>
<td>0.2</td>
<td>PVC / EPDM / PTFE</td>
<td>GFRPP / FRM / PTFE</td>
</tr>
<tr>
<td>MFV-SPC</td>
<td>4x6mm 6x9mm</td>
<td>0.2</td>
<td>PVC / FRM / PTFE</td>
<td>GFRPP / EPDM / PTFE</td>
</tr>
<tr>
<td>MFV-SVH</td>
<td>4x6mm 6x9mm</td>
<td>0.2</td>
<td>PVC / FRM / PTFE</td>
<td>GFRPP / EPDM / PTFE</td>
</tr>
</tbody>
</table>

Foot valve FS / FSP
Foot valve with a strainer. Made of PVC or GFRP.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Tube connection</th>
<th>Material</th>
<th>Applicable pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSV</td>
<td>4x6mm 6x9mm</td>
<td>PVC / FRM / Alumina ceramic</td>
<td>-</td>
</tr>
<tr>
<td>FSE</td>
<td>6x9mm 7x12</td>
<td>PVC / EPDM / HastelloyC276</td>
<td>-</td>
</tr>
<tr>
<td>FSVP</td>
<td>9x13mm 8x12</td>
<td>GFRPP / FRM / Alumina ceramic</td>
<td>-</td>
</tr>
<tr>
<td>FSPE</td>
<td>9x13mm 8x12</td>
<td>GFRPP / EPDM / HastelloyC276</td>
<td>-</td>
</tr>
</tbody>
</table>

Chemical tank CT
Light and strong polyethylene round tank. 25L, 50L, and 100L models are available.

Chemical tank CT-U120N
Square polyethylene tank with a pump located below. This tank can be used safely, as it is free from gas-lock problems.

Capacity : 110L
Dimensions in mm

Note: Above dimensions are PVC, GRFPP and PVOF type. Please contact Iwaki for dimensions of SUS316 type.

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FAX: 3 7903 4900
FAX: 6316 3221
FAX: 21 6906612
FAX: 2 8227 8818
FAX: 2 6906 612
FAX: 2 6906 612
FAX: 9333 567

Caution for safety use: Before use of pump, read instruction manual carefully to use the product correctly.
Actual pumps may differ from the photos. Specifications and dimensions are subject to change without prior notice. For further details please contact us.

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