The ES Series electromagnetic metering pump offers precise chemical injection at an economical cost.

Manual or on/off control for simple addition applications.

Sophisticated engineering provides effective, reliable performance.

- **High speed operation**: Up to 360 strokes per minute results in high resolution chemical feed, with the elimination of slug-feed effects.

- **Double ball check valves**: The precision ball, seat and guide assembly ensure tight sealing to prevent loss of prime.

- **Compact size**: Ideal for OEM applications, ES pumps are small, quiet, and lightweight.

- **Long lasting diaphragm**: PTFE coated EPDM is molded onto a solid core. A retainer plate is used to prevent diaphragm deformation and flow rate variation at higher pressures.

**Solution for chemical handling applications**
### Wet-end part materials

<table>
<thead>
<tr>
<th>Material symbol</th>
<th>VC</th>
<th>VH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump head</td>
<td>PVC</td>
<td></td>
</tr>
<tr>
<td>Valve</td>
<td>Alumina ceramic</td>
<td>Hastelloy C276</td>
</tr>
<tr>
<td>Valve seat</td>
<td>FKM</td>
<td>EPDM</td>
</tr>
<tr>
<td>Valve guide</td>
<td>PVC</td>
<td></td>
</tr>
<tr>
<td>Gasket</td>
<td>PTFE</td>
<td></td>
</tr>
<tr>
<td>O-ring</td>
<td>FKM</td>
<td>EPDM</td>
</tr>
<tr>
<td>Diaphragm</td>
<td>PTFE coated EPDM</td>
<td></td>
</tr>
</tbody>
</table>

### Pump identification

- **Drive unit symbol**: B: 16W, C: 22W
- **Diaphragm effective diameter**: 11: 10mm, 16: 15mm, 21: 20mm, 31: 30mm, 36: 35mm
- **Hose connection (in mm)**: 3: 6 x 8, 4: 8 x 13, 5: 9 x 12
- **Power-supply voltage symbol**: VC, VH
- **End part material symbol**: VC, VH

### Specifications

**Model**

<table>
<thead>
<tr>
<th>Model</th>
<th>B11</th>
<th>B16</th>
<th>B21</th>
<th>B31</th>
<th>C16</th>
<th>C21</th>
<th>C31</th>
<th>C36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. capacity</td>
<td>2.28</td>
<td>3.9</td>
<td>5.7</td>
<td>12</td>
<td>4.8</td>
<td>7.8</td>
<td>16.2</td>
<td>24</td>
</tr>
<tr>
<td>mL/min</td>
<td>38</td>
<td>65</td>
<td>95</td>
<td>200</td>
<td>80</td>
<td>130</td>
<td>270</td>
<td>400</td>
</tr>
<tr>
<td>mL/shot</td>
<td>0.11</td>
<td>0.18</td>
<td>0.26</td>
<td>0.56</td>
<td>0.23</td>
<td>0.37</td>
<td>0.76</td>
<td>1.13</td>
</tr>
<tr>
<td>Max. discharge pressure</td>
<td>1.0</td>
<td>0.7</td>
<td>0.4</td>
<td>0.2</td>
<td>1.0</td>
<td>0.7</td>
<td>0.35</td>
<td>0.2</td>
</tr>
</tbody>
</table>

**Stroke rate**

- 0 - 360 rpm
- 0 - 335 rpm

**Power supply**

- AC220 - 240V, single phase, 50Hz

**Current (Input)**

- 0.5A
- 0.6A

**Insulation type, etc.**

- B type insulation and built-in thermal protector, with a 2.0m power cable, without plug

**Note:**
- The max. discharge value in the table above represents the performance measured with clean water at max. discharge pressure, ambient temperature, and rated voltage. Actual discharge may increase if operation is conducted at a lower pressure.
- Set the discharge pressure at 0.17 MPa or higher to prevent over-feeding trouble. (0.05 MPa or higher in the case of B31, C36)
- If the pressure is to be lower than these levels, make sure to use a check valve or a back pressure valve, which is supplied as an optional item.
- Range of liquid temperature: -40°C - 120°C
- Range of the ambient temperature: -10°C - 60°C
- Max. viscosity: Up to 50mPas if the viscosity exceeds 50mPas, please contact us.

**Dimensions in mm**


<table>
<thead>
<tr>
<th>Model</th>
<th>W</th>
<th>H</th>
<th>L</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f &amp; g</th>
<th>Tubing</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-B11</td>
<td>100</td>
<td>(184)</td>
<td>178</td>
<td>25</td>
<td>37</td>
<td>150</td>
<td>90</td>
<td>(26)</td>
<td>4</td>
<td>X 9, 6 X 8</td>
</tr>
<tr>
<td>ES-B16</td>
<td>100</td>
<td>(184)</td>
<td>178</td>
<td>25</td>
<td>37</td>
<td>150</td>
<td>90</td>
<td>(26)</td>
<td>4</td>
<td>X 9, 6 X 8</td>
</tr>
<tr>
<td>ES-B21</td>
<td>100</td>
<td>(184)</td>
<td>178</td>
<td>25</td>
<td>37</td>
<td>150</td>
<td>90</td>
<td>(26)</td>
<td>4</td>
<td>X 9, 6 X 8</td>
</tr>
<tr>
<td>ES-B31</td>
<td>(172)</td>
<td>159</td>
<td>27</td>
<td>16</td>
<td>(6)</td>
<td>8 X 13, 9 X 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ES-C16</td>
<td>(116)</td>
<td>194</td>
<td>27</td>
<td>37</td>
<td>160</td>
<td>100</td>
<td>36</td>
<td>4</td>
<td>X 9, 6 X 8</td>
<td></td>
</tr>
<tr>
<td>ES-C21</td>
<td>(116)</td>
<td>194</td>
<td>27</td>
<td>37</td>
<td>160</td>
<td>100</td>
<td>36</td>
<td>4</td>
<td>X 9, 6 X 8</td>
<td></td>
</tr>
<tr>
<td>ES-C31</td>
<td>(116)</td>
<td>194</td>
<td>27</td>
<td>37</td>
<td>160</td>
<td>100</td>
<td>36</td>
<td>4</td>
<td>X 9, 6 X 8</td>
<td></td>
</tr>
<tr>
<td>ES-C36</td>
<td>(116)</td>
<td>194</td>
<td>27</td>
<td>37</td>
<td>160</td>
<td>100</td>
<td>36</td>
<td>4</td>
<td>X 9, 6 X 8</td>
<td></td>
</tr>
</tbody>
</table>

### Optional accessory

**Check valve**

- This has the function of a non-return valve and prevents siphon and overfeed.
- CA: Available in PVC
- CB: In-line type to be connected in the middle of a hose; made of PVC.

**Material**

- Connection Inlet mm: 4x9, 6x8
- Outlet mm: R3/8 and R1/2
- Pressure MPa: 0.17 ± 0.04
- Fluid: PVC
- Body: Hastelloy C276
- Spring: FKM
- O-ring: EPDM

Note: Please contact us for the specifications of CB models.

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**EUROPE**

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  - FAX: 44 (0) 333 555 999

**ASIA / OCEANIA / NORTH AMERICA / SOUTH AMERICA**

- **IWAIEM America Inc.**
  - TEL: (852) 2630 6600
  - FAX: (852) 2630 6601

**Legal and safety related to export.**

- Our products and/or parts of products fall in the category of goods contained in control list of international regime for export control. Please be reminded that export control license may be required when products are exported due to export control regulations of countries.

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