AE-Series

Electric Actuators

INLINE

BALLVALVE.COM
Features and Benefits
- Permanently Lubricated Heavy Duty Aluminum Alloy
- Steel Gear Train
- NEMA 4, 4X Weatherproof Enclosure
- ISO 5211 Direct Mount Capabilities
- Manual Override (except on the M25)
- 1/2” NPT Conduit Entries (2)
- Adjustable Travel Stops
- Standard 25% Duty Cycle
- Thermal Overload Protection
- Standard 110V AC Single Phase
- 2 Limit Switches

Options
- 12V / 24V AC/DC, 220V AC
- 220V AC Three-Phase
- Reversing Motors
- Extended Duty Motors for Modulating Service
- Heater and Thermostat
- Extra Limit Switches (up to 2)
- Remote Control Indicators

Performance Chart

<table>
<thead>
<tr>
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<td>M10</td>
<td>310</td>
<td>15 s</td>
<td>10W</td>
<td>3600/min 3600/min</td>
<td>0.5A 3.0A 3.0A</td>
<td>0.6A 0.8A 1.4A</td>
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<td>M16</td>
<td>443</td>
<td>20 s</td>
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<td>70W</td>
<td>1800/min 1800/min</td>
<td>3.4A 5.0A 8.5A</td>
<td>3.0A 5.0A 13.0A</td>
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<td>M30</td>
<td>1328</td>
<td>22 s</td>
<td>70W</td>
<td>1800/min 1800/min</td>
<td>3.4A 5.0A 8.5A</td>
<td>3.0A 5.0A 13.0A</td>
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<td>6.0A 8.0A 30.0A</td>
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<td>M50</td>
<td>4420</td>
<td>22 s</td>
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<td>1800/min 1800/min</td>
<td>13.0A 8.5A 30.0A</td>
<td>6.5A 8.0A 30.0A</td>
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<td>M60</td>
<td>5735</td>
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<td>1800/min 1800/min</td>
<td>14.0A 8.5A 30.0A</td>
<td>7.5A 8.0A 30.0A</td>
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<td>10W</td>
<td>3600/min 3600/min</td>
<td>0.5A 1.5A 0.6A</td>
<td>0.3A 1.0A 0.5A</td>
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<td>797</td>
<td>15 s</td>
<td>40W</td>
<td>1720/min 1450/min</td>
<td>1.3A 3.0A 1.8A</td>
<td>0.5A 1.5A 0.9A</td>
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<td>1.0A 3.0A 1.8A</td>
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<td>22 s</td>
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<td>120W</td>
<td>1720/min 1420/min</td>
<td>1.3A 3.1A 3.6A</td>
<td>0.6A 1.5A 1.8A</td>
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<td>1.8A 3.0A 3.6A</td>
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Wiring Diagram
M-10 & M-16 12V/24V AC
Two Positions*

Wiring Diagram
M-10 & M-16 12V/24V DC
Two Positions*

*Note:
NFB -- Power Brake
O.L. -- Overload Protector
CS -- Selector Switch or Relay
LS -- Limit Switch
TS -- Torque Switch (option)

1. "N" or "+" connect to 1
2. "L" or "-" connect to 3 for OPEN
3. "L" or "-" connect to 3 for OPEN
4. "L" or "-" connect to 4 for CLOSE
5. Fully Open Lamp ON
6. Fully Close Lamp ON
7. "L" or "-" connect to 7 for HEATER (option)
Wiring Diagram
M-10 & M-16 110V/220V AC
Two Positions*

Power
110/220V
1-phase

N L
NFB

O.L.
CS

Fully closed indicator (lamp)

Fully open indicator (lamp)

NFB -- Power Brake
O.L. -- Overload Protector
CS -- Selector Switch or Relay
LS -- Limit Switch
TS -- Torque Switch (option)

Use less than 3A current for "A, B, C, E, F".

Note:
(1) "N" or "+" 7 connect to 2 for OPEN
(2) "L" or "-" connect to 2 for CLOSE
(3) "L" or "-" 7 connect to 3 for OPEN
(4) "L" or "-" 7 connect to 4 for CLOSE
(5) Fully Open Lamp ON
(6) Fully Close Lamp ON
(7) "L" or "-" connect to 7 for HEATER (option)

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Wiring Diagram
M-20 ~ M-60 110V/220V AC
Two Positions*

Power
110/220V
1-phase

N L
NFB

O.L.
CS

Fully closed indicator (lamp)

Fully open indicator (lamp)

Use less than 5A current for "A, B, C, E, F".

Note:
(1) Input Signal : 4-20mA, 1-5V, 2-10V
(2) Output Signal : 4-20mA, 2-10V, 0-100%
(3) Use less than 3A current for "A,B,C,E,F".

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Wiring Diagram
M-10 & M-16 110V/220V AC
Modulating Service

Power
110/220V AC

Signal Input
(Shielding wire may be used)

Do not exceed 30m

Potentiometer

Signal Output

Heater (option)

Modulating Control Box
(Electronic Control Box)

Note:
(1) Input Signal : 4-20mA, 1-5V, 2-10V
(2) Output Signal : 4-20mA, 2-10V, 0-100%
(3) Use less than 3A current for "A,B,C,E,F".
**Wiring Diagram**

**M-10 & M-16 12V/24V AC/DC**

Modulating Service

- **Power**
  - AC or DC

- **Signal Input**
  - (Shielding wire may be used)
  - Do not exceed 30m

- **Potentiometer**
- **Signal Output**

- **Heater (option)**
- Modulating Control Box
  - (Electronic Board)

- **Note:**
  1. Input Signal:
     - 4-20mA
     - 1-5V
     - 2-10V
  2. Output Signal:
     - 4-20mA
     - 0-100%
  3. Use less than 3A current for "A,B,C,E,F"

---

**Wiring Diagram**

**M-20 ~ M-60 24V DC**

Modulating Service

- **Power**
  - 12V/24V DC

- **Signa Input**
  - (Shielding wire may be used)
  - Do not exceed 30m

- **Potentiometer**
- **Signal Output**

- **Heater (option)**
- Modulating Control Box
  - (Electronic Board)

- **Note:**
  1. Input Signal:
     - 4-20mA
     - 1-5V
     - 2-10V
  2. Output Signal:
     - 4-20mA
     - 0-100%
  3. Use less than 5A current for "A,B,C,D,E,F"

---

**Wiring Diagram**

**M-20 ~ M-60 24V AC**

Modulating Service

- **Power**
  - 24V AC

- **Signal Input**
  - (Shielding wire may be used)
  - Do not exceed 30m

- **Potentiometer**
- **Signal Output**

- **Heater (option)**
- Modulating Controller
  - (Electronic Board)

- **Note:**
  1. Input Signal:
     - 4-20mA
     - 1-5V
     - 2-10V
  2. Output Signal:
     - 4-20mA
     - 0-100%
  3. Use less than 5A current for "A,B,C,D,E,F"

---

**Wiring Diagram**

**M-20 ~ M-60 110V/220V AC**

Modulating Service

- **Power**
  - 110/220V AC

- **Signal Input**
  - (Shielding wire may be used)
  - Do not exceed 30m

- **Potentiometer**
- **Signal Output**

- **Heater (option)**
- Modulating Controller
  - (Electronic Board)

- **Note:**
  1. Input Signal:
     - 4-20mA
     - 1-5V
     - 2-10V
  2. Output Signal:
     - 4-20mA
     - 0-100%
  3. Use less than 5A current for switches "A,B,C,D,E,F"
Modulating Control Board

Input Signal
4~20mA
1~5V DC
2~10V DC

Comparison Part
Control Part
Driving Part
Control Object
AC Motor

Output Signal
4~20mA
2~10V DC

Feedback Signal

Modulating Control Board for M10, M16

ATTENTION: TURN POWER OFF BEFORE CHANGING THE FOLLOWING SETTINGS:

S1,2: INPUT SIGNAL SELECT
"4~20mA" set 1-ON / 2-OFF
"1~5V" set 1-OFF / 2-OFF
"2~10V" set 1-OFF / 2-ON

S3,4,5: OUTPUT SIGNAL SELECT
"2-10V" set 3-ON / 4-OFF / 5-ON
"4-20mA" set 3-OFF / 4-ON / 5-OFF

S6: Valve is fully-open when the input signal is 4mA, 2V or 1V and valve is fully-closed when the input signal is 20mA, 10V or 5V, set 6-ON
Valve is fully-closed when the input signal is 4mA, 2V or 1V and valve is fully-open when the input signal is 20mA, 10V or 5V, set 6-OFF

S7,8: POSITION SELECT (when the feedback signal fails)
"valve fully-closed" set 7-OFF / 8-ON
"valve fully-open" set 7-ON / 8-OFF
"valve stops" set 7-ON / 8-ON

SW1~0: Sensitivity Switch
Sensitivity Switch is preset to "3" at the factory

The 0~90° rotation can be divided into incremental movements as follows:

<table>
<thead>
<tr>
<th>Setting</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>0</th>
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</thead>
<tbody>
<tr>
<td># of incremental movements</td>
<td>80</td>
<td>73</td>
<td>66</td>
<td>59</td>
<td>52</td>
<td>45</td>
<td>38</td>
<td>31</td>
<td>24</td>
<td>17</td>
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</tbody>
</table>

SUPPLIED VOLTAGE: 24V DC/AC, 110V/220V AC 1-PH
WORKING TEMP.: -14°F ~ +140°F
### Ordering Information

<table>
<thead>
<tr>
<th>Series</th>
<th>Model</th>
<th>Current</th>
<th>Enclosure</th>
<th>Duty</th>
<th>Cycle Time</th>
<th>Option</th>
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<tbody>
<tr>
<td>AE - Actuator Electric</td>
<td>M10</td>
<td>A - 24V AC</td>
<td>4 - NEMA 4, 4X</td>
<td>0 - None</td>
<td>8</td>
<td>0 - None</td>
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<tr>
<td></td>
<td>M16</td>
<td>B - 110V AC</td>
<td></td>
<td></td>
<td>25</td>
<td>T - Thermometer</td>
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<td></td>
<td>M20</td>
<td>C - 220V AC</td>
<td></td>
<td></td>
<td>12</td>
<td>H - Heater</td>
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<td></td>
<td>M25</td>
<td>D - 12V DC</td>
<td></td>
<td>25 - 25%</td>
<td>15</td>
<td>S1 - 1 extra switch</td>
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<td>M30</td>
<td>E - 24V DC</td>
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<td>75 - 75%</td>
<td>20</td>
<td>S2 - 2 extra switches</td>
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<td></td>
<td>22</td>
<td>3 - Three-Phase*</td>
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<td>M50</td>
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<td>24</td>
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<td></td>
<td>M60</td>
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<td>Modulating Control Boards **</td>
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<td></td>
<td>M1 - 4<del>20mA in, 2</del>10V out</td>
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<td></td>
<td></td>
<td>M2 - 4<del>20mA in, 4</del>20mA out</td>
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<td></td>
<td></td>
<td>M3 - 1<del>5V in, 2</del>10V out</td>
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<td>M4 - 1<del>5V in, 4</del>20mA out</td>
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<td>M5 - 2<del>10V in, 2</del>10V out</td>
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<td>M6 - 2<del>10V in, 4</del>20mA out</td>
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*Three-Phase available on M20 through M60 only  
**Modulating control boards used with 75% duty cycle only

Due to continuous product development, information may change without notice.