The ESR is a direct driven suction regulator that uses a linear actuating bi-polar stepper motor to move the piston. The stepper motor is actuated by a voltage pulse to energize each of the motor phases and move the piston in discrete 0.001 inch increments. When used as an EPR in individual supermarket display cases, the ESR, along with appropriate control electronics, provides state-of-the-art temperature control within less than ± 1°F of the desired setpoint temperature. The ESR is compatible with many control electronics widely available in the market today. Applications for the ESR include case control, line-up and rack mounted control, as well as transportation applications on refrigerated trucks, trailers and containers. ESRs are also acceptable for use as hot gas bypass and head pressure, liquid hold-back valves. An ESR may NOT be used as an expansion device.

**Features**

- No external sealing o-rings
- Removable external connector
- Excellent repeatability
- Corrosion resistant design
- Solenoid tight shut-off

**Specifications**

- Operating temperatures
  - Ambient: -40°F to +150°F
  - Refrigerant: -40°F to +280°F
- Maximum working pressure: 500 psi
- Linear actuating bi-polar stepper motor
- Direct drive with no hysteresis
- Step rate: 50 ± 10 steps per second
- Steps full travel: ~ 800 steps
- Voltage tolerance: ±10% and ±15% of rated voltage
- .001 inch of linear travel per step
- Resistance (each phase): 29 ohms ± 10% (12V) or 116 ohms ± 10% (24V)
- UL and Canadian Recognized, File # MP604
- TUV Bauart Mark Type Approval CE
- Two motors available. 24V or 12V alternating square wave (see stepper sequence table below)

**Nomenclature**

*Example: ESR-12 T7 S/T 12V NC*

<table>
<thead>
<tr>
<th>ESR</th>
<th>12</th>
<th>T</th>
<th>7</th>
<th>S/T</th>
<th>12V</th>
<th>NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Stepper Regulator</td>
<td>Port Diameter</td>
<td>Connection</td>
<td>Connection Size</td>
<td>Body Configuration</td>
<td>12 Volt</td>
<td>No External Connector</td>
</tr>
</tbody>
</table>

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<th>Electric Stepper Regulator Information</th>
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<th>12 Volt</th>
<th>No External Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESR-12</td>
<td>3/4&quot;</td>
<td>T = ODF</td>
<td>7 = 7/8&quot;</td>
<td>STRAIGHT-THRU</td>
<td>12 Volt</td>
<td></td>
</tr>
<tr>
<td>ESR-20</td>
<td>1 1/4&quot;</td>
<td>T = ODF</td>
<td>11 = 1 3/8&quot;</td>
<td>STRAIGHT-THRU</td>
<td>24 Volt</td>
<td></td>
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</tbody>
</table>

**Ordering Information for ESR**

<table>
<thead>
<tr>
<th>PCN*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>064773</td>
<td>ESR-12 T7 S/T 12V NC</td>
</tr>
<tr>
<td>064774</td>
<td>ESR-12 T7 S/T 24V NC</td>
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<tr>
<td>062566</td>
<td>ESR-20 T11 S/T 12V NC</td>
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<tr>
<td>062750</td>
<td>ESR-20 T11 S/T 24V NC</td>
</tr>
</tbody>
</table>

All capacities shown are at 40°F Evaporator Temperature and 2 psi pressure drop across the ESR, with the ESR full open 800 steps. For capacities at other evaporator temperatures and pressure drops, see extended capacity tables in tons on page 173. Contact applications engineering for sizing and selection of ESRs in hot gas or head pressure control applications.
MTB 1

MTB-1 Stepper Driver is an invaluable troubleshooting and diagnostic tool for use with any stepper valve application.

**Features**
- Operates all stepper products (ESR, ESV and ESVB)
- Easy to use
- Stepper check-out procedure directions on back of control
- 2x16 LCD display
- MTB-1 Included in carrying case with 1.5A, 24VAC transformer and valve connector cable

**Specifications**
- Plugs into standard 115VAC outlet
- Temperature range:
  - Storage Temperature: 14 to 158°F (-10 to 70°C)
  - Operating Temperature: 50 to 113°F (10 to 45°C)