**Integrated Temperature Sensor Options**

1. Thermistor for Continuous Indication
   - Excellent Repeatability
   - Value: 10,000 ohms @ 77°F (25°C)
   - Tolerance: ±0.2°C from 32°F to 158°F (0°C to 70°C)
   - Operating Temperature: 302°F (150°C), Max.
   - Alpha @ 25°C: -4.59%/°C
   - Dissipation Constant: 1 mW/°C in Still Air
   - 8 mW/°C in Oil Bath

2. Thermostat for Switch Action
   - Settings from 150°F to 175°F
   - Open or close switch on increasing temperature

**Note**
Contact Dwyer Instruments for Additional Information.

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**Typical Wiring Diagram**

BLACK → RED → GREEN

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**MAINTENANCE/REPAIR**

Regular maintenance of the total system is recommended to assure sustained optimum performance. Devices are not field repairable and should be returned to the factory if recalibration or other service is required. After first obtaining a Returned Goods Authorization (RGA) number, send the unit freight prepaid to the following. Please include a clear description of the problem plus any application information available.

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**Dwyer Instruments, Inc.**
Attn: Repair Department
102 Highway 212
Michigan City, IN 46360

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**Important Points!**

- Product must be maintained and installed in strict accordance with the National Electrical Code and Dwyer product catalog and installation bulletin. Failure to observe this warning could result in serious injuries or damages.

- For hazardous area applications involving such things as (but not limited to) ignitable mixtures, combustible dust and flammable materials, use an appropriate explosion-proof enclosure or inherently safe Intrinsically Safe devices.

- The pressure and temperature limitations shown on the individual catalog pages and drawings for the specified flow switches must not be exceeded. These pressures and temperatures take into consideration possible system surge pressures/temperatures and their frequencies.

- Selection of materials for compatibility with the media is critical to the life and operation of Dwyer flow switches. Take care in the proper selection of materials of construction, particularly wetted materials.

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**Dwyer Instruments, Inc.**
P.O. Box 373, Michigan City, Indiana 46361, U.S.A.
Phone: 219/879-6000 Fax: 219/879-9067
E-mail: info@dwyer-inst.com
Phone: 888/699-4963

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**Series F7-MS, F7-MQ**
Multi-Station Level Switches

**Installation**
Multi-station level switches install vertically in tank top (mounting up) or in tank bottom (mounting down). Level switches will operate normally inclined up to 30°.

**Mounting Types**

*Note: Units greater than 72° overall length are supplied with collars with set screws (made of some material as stem and mounting). In place of float-stop rings. Collars are optional on units less than 72° overall length. Units requiring 316 SS float stops must be special-ordered with 316 SS collars instead of grip rings.

<table>
<thead>
<tr>
<th>Type</th>
<th>1/2&quot; NPT</th>
<th>3-1/2&quot; Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>1/2&quot; NPT</td>
<td>1-1/4&quot; SQ</td>
</tr>
<tr>
<td>Type 2</td>
<td>1-1/4&quot; NPT</td>
<td>1-1/4&quot; SQ</td>
</tr>
<tr>
<td>Type 3</td>
<td>2&quot; NPT</td>
<td>2-1/2&quot; NPT</td>
</tr>
<tr>
<td>Type 4</td>
<td>3&quot; 150# Flange</td>
<td>3&quot; 150# Flange</td>
</tr>
</tbody>
</table>

**Stem and Mounting Material**
- Brass or 316 Stainless Steel
- Flange: Carbon Steel or 316 SS Stem: 316 SS

**Max. Length (L0)**
- 30" for Vertical installation
- 60° for 60° installation
- 140° for 140° installation

**Mounting Position**
- Vertical ±10° inclination

*Float Stops (Size Note Above)*
- Brass Units: Beryllium Copper Grip Rings, Stainless Steel Units: S.S. ARAMCO Ph1-15 AG Grip Rings

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**Type 4 - External Mount**

Size: 2-3/4" NPT Ports (2X)
- Hosing Material: Brass or 316 Stainless Steel
- Stem & Mounting: Brass or 316 Stainless Steel
- Max. Length (L0): 120°
**Float Types**

<table>
<thead>
<tr>
<th>Float Material</th>
<th>Buna N</th>
<th>316 Stainless Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatible Mounting Type</td>
<td>2</td>
<td>1, 3, 4, 5</td>
</tr>
<tr>
<td>Float Dimensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part Number</td>
<td>20032</td>
<td>10558</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>Water: To 180°F (82.2°C) QL: -40°F to +230°F (-40°C to 110°C)</td>
<td>-40°F to +300°F (-40°C to +148.9°C)</td>
</tr>
<tr>
<td>Min. Media Specific Gravity</td>
<td>.75</td>
<td>.55</td>
</tr>
</tbody>
</table>

**Pressure Ratings Chart**

<table>
<thead>
<tr>
<th>PSI, Max.</th>
<th>1, 2, 3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting Type</td>
<td>20032</td>
<td>10558</td>
<td>14569</td>
</tr>
<tr>
<td>150</td>
<td>150</td>
<td>316 S.S. 150</td>
<td></td>
</tr>
</tbody>
</table>

**Electrical Specifications**

**Switch (N.O. or N.C.):**
- SPST: 20 VA or 100 VA
- SPDT: 20 VA

**Load Wires:** #22 AWG, 24" L., Polymeric

**Typical Wiring Diagrams**

For clarity, only two actuation levels are shown in each group diagram.

**Actuation Level Dimensions**

*Actuation level distances and L1 (overall unit length) are measured from inner surface of mounting plug or flange

**Length Overall L1 = L2 + Dimension B. See mounting types for maximum length values.

**Switch Ratings - Maximum Resistive Load**

<table>
<thead>
<tr>
<th>VA</th>
<th>Volts</th>
<th>Amps AC</th>
<th>Amps DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0-50</td>
<td>2</td>
<td>.1</td>
</tr>
<tr>
<td>General Use</td>
<td>120</td>
<td>.08</td>
<td>N.A.</td>
</tr>
<tr>
<td>100</td>
<td>N.A.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-30</td>
<td>.4</td>
<td>.3</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>120</td>
<td>.17</td>
<td>.13</td>
</tr>
<tr>
<td>Pilot Duty</td>
<td>240</td>
<td>.08</td>
<td>.06</td>
</tr>
<tr>
<td>50</td>
<td>General Use</td>
<td>120</td>
<td>.4</td>
</tr>
<tr>
<td>240</td>
<td>2</td>
<td>.2</td>
<td></td>
</tr>
<tr>
<td>100*</td>
<td>120</td>
<td>8**</td>
<td>N.A.</td>
</tr>
<tr>
<td>240</td>
<td>.4</td>
<td>N.A.</td>
<td></td>
</tr>
</tbody>
</table>

* Level switch units with 50 VA and 100 VA switches are not UL recognized or CSA approved

**Limited to 50,000 operations**

Switch actuation levels are determined following the guidelines below:

All units 72°F or less length overall with stainless steel or Buna N floats. Also Types 5 units over 72°F length overall with Buna N floats:

A = 1-1/2" minimum distance to highest level (2", Type 5 only)
B = 2" minimum distance from end of unit to lowest level
C = 3" minimum distance between levels
D = 1/4" minimum distance between actuation levels (Note: One float for two levels can be used only when low level is N.C. dry and high level is N.O. dry.)

Types 1, 3, 4 and 5 units with stainless steel float PN 15666:

A = 1-5/8" minimum distance to highest level (2", Type 5 only)
B = 2-1/2" minimum distance from end of unit to lowest level
C = 4" minimum distance between levels
D = 1/4" minimum distance between actuation levels (Note: One float for two levels can be used only when low level is N.C. dry and high level is N.O. dry.)

**Notes:**

1. A, B, and C dimensions are based on liquid specific gravity of 1.0.
2. One float for two levels can be used only when 20VA switch is used.
3. Actuation levels are calibrated on descending fluid level, with water as the calibrating fluid, unless otherwise specified.
4. Tolerance on actuation levels is ±1/8".