**Series 221**

**Flanged Chamber**

External Mount, Pressure to 1000 psig (69 bar) and Temperature to 475°F (246°C), Hermetically Sealed Switches

**Heavy duty flanged chamber** features removable float for ease of inspection and maintenance. The 221 Series also provides 1" NPT for standard external mounting. Socket weld hubs or flanges are optional. Rugged C1-75 construction is suitable for operation at 1000 psi (69 bar) at 100°F (38°C), and 850 psi (59 bar) at 475°F (246°C) with a minimum specific gravity of 0.75. Models can be ordered with various switches including SPST, SPDT, or DPDT with hermetically sealed snap action or mercury contacts. A full range of enclosures are available including general purpose, (weatherproof) (explosion-proof) (explosion-proof – vapor proof).

**Applications**

Oil refineries, chemical plants, power generating stations, pumping stations, heat transfer systems, sanitary/waste water facilities, drip legs, hydraulic systems, boilers.

**Specifications**

C1-60: Minimum specific gravity 0.60. Process pressure 600 psig (41 bar) at 100°F (38°C), 550 psig (38 bar) at 475°F (246°C).

C1-75: Minimum specific gravity 0.75. Process pressure 1000 psi (69 bar) at 100°F (38°C), 850 psi (59 bar) at 475°F (246°C).

Switch Type: Snap action or mercury switch.

**Electrical Rating:** See charts A and B.

**Wiring Connections:** G, WT or E enclosure, terminal block. EV enclosure, 18" (460 mm) leads.

**Process Connections:** 1" NPT standard (socket weld hubs or flanges optional). See chart C.

**Enclosures:** G, painted steel and aluminum. WT, painted steel, aluminum and neoprene. E, aluminum. EV, aluminum and neoprene.

**Wetted Parts:** Chamber, carbon steel. Trim 316SS, 303SS, 304SS and 403SS.

**Weight:** 221, 60 lb (27 kg); 223, 70 lb (32 kg); 224, 77 lb (35 kg).

**Suggested Specifications:**

Liquid level control shall be 221 (223) (224) Series with flanged carbon steel chamber, and removable float. Process connections shall be 1" NPT (socket weld hubs) (flanged). Control shall be suitable for operation at 600 psig (41 bar) at 100°F (38°C), and 550 psig (38 bar) at 475°F (246°C) with a minimum specific gravity of 0.60 (C1-60); or 1000 psi (69 bar) at 100°F (38°C), and 850 psi (59 bar) at 475°F (246°C) with a minimum specific gravity of 0.75 (C1-75). Circuit shall be (hermetically sealed) snap action (mercury) switch (SPST) (SPDT) (DPDT) with fixed deadband. Switch mechanism shall be gravity return and shall be activated by a stainless steel float. Enclosure shall be general purpose, (weatherproof) (explosion-proof) (explosion-proof – vapor proof).

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**MODEL CHART – SERIES 221**

### EXAMPLE

<table>
<thead>
<tr>
<th>221 WT</th>
<th>7810</th>
<th>T0</th>
<th>HF</th>
<th>C1</th>
<th>60</th>
</tr>
</thead>
</table>

221-WT/7810-C1-60. Liquid level control. Flanged carbon steel chamber. Weatherproof enclosure. SPDT snap switch, fixed deadband, automatic reset. Operating pressure 600 psig (41 bar) at 100°F (38°C), 550 psi (38 bar) at 475°F (246°C). Side/bottom process connections. 1° NPT hub. Minimum specific gravity 0.60.

### ENCLOSURE

<table>
<thead>
<tr>
<th>G</th>
<th>WT</th>
<th>E</th>
<th>EV</th>
</tr>
</thead>
</table>


### CIRCUITS

**CHART A & B – ELECTRICAL CIRCUITS AND RATINGS**

**OPTIONS**

**PROCESS WITH FLANGED CHAMBER**

- Single stage. Mercury switch. See Chart A.
- Two stage. Mercury switch. See Chart A.
- Single stage. Snap switch. See Chart B.
- Two stage. Snap switch. See Chart B.

**WITH FLANGED CHAMBER**

- Hermetically sealed snap switch. See Chart B.
- Single stage. High capacity DC snap switch. Use heat fins (HF) if process temperature exceeds 350°F (177°C). Do not exceed 450°F (226°C). See Chart B.
- Two stage. High capacity DC snap switch. Use heat fins (HF) if process temperature exceeds 350°F (177°C). Do not exceed 450°F (226°C). See Chart B.
- Single stage. High temperature snap switch. Continuous rating 800°F (425°C). See Chart B. 221-C1-60 type rated at 350 psig (25 bar); 221-C1-75 type rated at 550 psi (38 bar).
- Two stage. High temperature snap switch. Continuous rating 800°F (425°C). See Chart B. 221-C1-60 type rated at 350 psig (25 bar); 221-C1-75 type rated at 550 psi (38 bar).

### FLANGED CHAMBER

**CONSTRUCTION**

| 221 | C1 | 60 |

Refer to Chart C for pressure/temperature ratings.

Carbon steel chamber.

Minimum specific gravity 0.60. Side/bottom process connections. 1° NPT hub.

Minimum specific gravity 0.75. Side/bottom process connections. 1° NPT hub.

### OPTIONS

| HF | H2 | 12 |

High temperature fins should be considered if ambient temperature is extremely high or if process temperature exceeds 500°F (260°C) for extended periods.

1° socket weld hub instead of 1° NPT.

Breather and drain for E type enclosure. Recommended for high humidity or outdoor service.

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**CHARTS A & B - ELECTRICAL CIRCUITS AND RATINGS**

### SWITCH ACTION

<table>
<thead>
<tr>
<th>221 WT</th>
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221-WT/7810-C1-60. Liquid level control. Flanged carbon steel chamber. Weatherproof enclosure. SPDT snap switch, fixed deadband, automatic reset. Operating pressure 600 psig (41 bar) at 100°F (38°C), 550 psi (38 bar) at 475°F (246°C). Side/bottom process connections. 1° NPT hub. Minimum specific gravity 0.60.

### OPTIONS

**PROCESS WITH FLANGED CHAMBER**

- Single stage. Mercury switch. See Chart A.
- Two stage. Mercury switch. See Chart A.
- Single stage. Snap switch. See Chart B.
- Two stage. Snap switch. See Chart B.

**WITH FLANGED CHAMBER**

- Hermetically sealed snap switch. See Chart B.
- Single stage. High capacity DC snap switch. Use heat fins (HF) if process temperature exceeds 350°F (177°C). Do not exceed 450°F (226°C). See Chart B.
- Two stage. High capacity DC snap switch. Use heat fins (HF) if process temperature exceeds 350°F (177°C). Do not exceed 450°F (226°C). See Chart B.
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- Two stage. High temperature snap switch. Continuous rating 800°F (425°C). See Chart B. 221-C1-60 type rated at 350 psig (25 bar); 221-C1-75 type rated at 550 psi (38 bar).

### SWITCH TYPE

**CHART B**

**SNAP ACTION CONTACTS**

- Single stage. High capacity DC snap switch. Use heat fins (HF) if process temperature exceeds 350°F (177°C). Do not exceed 450°F (226°C). See Chart B.
- Single stage. High temperature snap switch. Continuous rating 800°F (425°C). See Chart B. 221-C1-60 type rated at 350 psig (25 bar); 221-C1-75 type rated at 550 psi (38 bar).
- Two stage. High temperature snap switch. Continuous rating 800°F (425°C). See Chart B. 221-C1-60 type rated at 350 psig (25 bar); 221-C1-75 type rated at 550 psi (38 bar).

**CHART C**

**SERIES**

<table>
<thead>
<tr>
<th>221</th>
<th>1° NPT</th>
<th>0.6</th>
</tr>
</thead>
</table>

600 psi | 41 bar | 550 psi | 38 bar

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**MINIMUM SPECIFIC GRAVITY**

<table>
<thead>
<tr>
<th>38°C</th>
<th>100°F</th>
</tr>
</thead>
</table>

1.000 psi | 69 bar

- 221-WT/7810-C1-60. Liquid level control. Flanged carbon steel chamber. Weatherproof enclosure. SPDT snap switch, fixed deadband, automatic reset. Operating pressure 600 psig (41 bar) at 100°F (38°C), 550 psi (38 bar) at 475°F (246°C). Side/bottom process connections. 1° NPT hub. Minimum specific gravity 0.60.

**PRESSURE RATING AT 246°F (473°C)**

<table>
<thead>
<tr>
<th>246°C</th>
<th>473°F</th>
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**FLANGE CLASS**

<table>
<thead>
<tr>
<th>221</th>
<th>1° NPT</th>
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</thead>
</table>

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**ORDER CODE**

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CALL TO ORDER: U.S. Phone 219 879-8000 • U.K. Phone (+44) (0)1494-461707 • Asia Pacific Phone 61 2 4272-2055