DESCRIPTION
Available with either single or dual switch control. Control action is provided by an expandable liquid acting on a bellows assembly. Bellows motion, created by volume changes of the liquid, actuates the switch contacts through a push rod.

HIGH LOAD CAPACITY
Current ratings up to 15 amps, 125-250 VAC are available.

FAST RESPONSE
The expandable liquid, which surrounds the bellows, is in direct contact with the temperature sensing outer shell providing a fast response for accurate temperature control.

ADJUSTABLE THERMOPERATURE RANGES
An adjustable screw allows simple temperature adjustment. The switch can be set at any temperature within the controller’s range. On dual switch units, each switch may be set individually, allowing independent action.

VARIETY OF TEMPERATURE RANGES
Both single and dual switch models are available with overlapping temperature ranges up to 300°F.

SPECIFICATIONS
Temperature Limits
Sensing Bulb
Minimum: -100°F (-75°C)
Maximum: Upper range limit
Snap Switch:
175°F (80°C) maximum

Differential
Approximately 3.5% of span

Pressure Limit
500 psi (3.45 MPa)

Pressure Effect
Set point decreases 1°F per 100 psi applied pressure

Corrosion Resistance
Certain gases or liquids (including water at elevated temperatures) could be corrosive and may also cause electrolytic action which could severely shorten the life of the controller. Where corrosion of electrolysis is suspect, plating the brass shell may increase controller life. See Special Feature S.R. 34A. Also, protective wells are available for some models. Because the rate of corrosion or electrolysis is influenced by many systems parameters, such as chemical makeup and temperature of the solution, consult the supplier of our chemicals for suggestions.

Current Rating
See Pages 2 and 3.

NOTE: Unless otherwise specified all ratings apply to noninductive loads, such as heaters or resistors. Tungsten filament lamps have an inrush of 10 to 15 time the steady state current. Do not exceed switch ratings at any time.

Junction Box Finish
Type 208, 227, 228: Baked Gray Enamel
Type 210, 211: Zinc Plate

AGENCY APPROVALS
Listed by Underwriters Laboratories (XAPX); U.L. File No. E18974.
Recognized under the Component Program of Underwriters Laboratories (XAPX2). File E18974.
Certified by Canadian Standards Association (Class 4813 02); CSA File No. LR7378.

Specifications subject to change without notice.

WARNING: Operation outside specifications could result in failure of the Fenwal product and other equipment with injury to people and property.
SERIES 20000 and 21000  Single Switch Controls

23-0201XX-000
Skeleton Frame, immersion fitting.
½ - 14 N.P.T.
23° PER TURN
Approximate weight is 5.5 ounces (154 grams)

23-0203XX-000
Skeleton Frame, Flange Mount.
23° PER TURN
Approximate weight is 5.5 ounces (154 grams)

23-0208XX-000
Junction Box. Cover not drip proof.
½ - 14 N.P.T. immersion fitting.
23° PER TURN
Approximate weight is 1 pound (336 grams)

23-0210XX-000
Junction Box. Flange Mount. Moisture-proof cover, external (sealed) adjustment shaft. Drip proof if installed with electric outlet at bottom. Airtight if electrical outlet is sealed.
280° PER TURN
(Shown with Mod. 30)
Meets NEMA 1, 2, 3, 4, 12
Approximate weight is 1 pound (336 grams)

23-0211XX-000
Junction Box. Same as 210 but with immersion fitting.
½ - 14 N.P.T.
280° PER TURN
(Shown with Mod. 30)
Meets NEMA 1, 2, 3, 4, 12
Approximate weight is 1 pound (336 grams)

<table>
<thead>
<tr>
<th>TEMPERATURE RANGE</th>
<th>CATALOG NUMBER</th>
<th>CURRENT RATING</th>
<th>AC CONTACTOR SIZE</th>
<th>APPLICABLE MODIFICATIONS (See Page 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 to 300°F</td>
<td>201, 203,</td>
<td>15.0A 125-250 VAC</td>
<td>2</td>
<td>1, 3 and 36</td>
</tr>
<tr>
<td>25 to 225°F</td>
<td>208</td>
<td>0.50A 125 VDC</td>
<td></td>
<td>1, 3, 30, 32, 34 and 36</td>
</tr>
<tr>
<td>50 to 300°F</td>
<td>210, 211</td>
<td>0.25A 250 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 250°F</td>
<td>10</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 to 300°F</td>
<td>201, 203,</td>
<td>15.0A 125-250 VAC</td>
<td>1</td>
<td>1, 3 and 36</td>
</tr>
<tr>
<td>25 to 225°F</td>
<td>208</td>
<td>0.50A 125 VDC</td>
<td></td>
<td>1, 3, 30, 32, 34 and 36</td>
</tr>
<tr>
<td>50 to 300°F</td>
<td>210, 211</td>
<td>0.25A 250 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 250°F</td>
<td>13</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**SERIES 22000** Dual Switch Controls

**INDEPENDENTLY ADJUSTABLE**

**23-0227XX-000**
- Cover not drip proof.
- Junction Box.
- For air or metal block.
- 23° PER TURN
- Approximate weight is 1 pound (336 grams)

**INDEPENDENTLY ADJUSTABLE**

**23-0228XX-000**
- Cover not drip proof.
- Junction Box.
- 1/2 - 14 N.P.T.
- Immersion fitting.
- 23° PER TURN
- Approximate weight is 1 pound (336 grams)

---

<table>
<thead>
<tr>
<th>SNAP SWITCH TYPE AND DIFFERENTIAL</th>
<th>CATALOG NUMBER</th>
<th>CURRENT RATING</th>
<th>AC CONTACTOR SIZE</th>
<th>APPLICABLE MODIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch No. 1</td>
<td>Switch No. 2</td>
<td>TEMPERATURE RANGE</td>
<td>BASE NO.</td>
<td>SUFFIX NO.</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----------------</td>
<td>-----------------</td>
<td>--------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Standard Double Throw ± 2°F</td>
<td>101 to 300°F</td>
<td>227, 228</td>
<td>227, 228</td>
<td>00</td>
</tr>
<tr>
<td>25 to 225°F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narrow Differential Double Throw ± 1°F</td>
<td>100 to 300°F</td>
<td>03</td>
<td>227, 228</td>
<td>13</td>
</tr>
<tr>
<td>25 to 225°F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard D.T.</td>
<td>100 to 300°F</td>
<td>01</td>
<td>227, 228</td>
<td>11</td>
</tr>
<tr>
<td>Narrow Differential D.T. ± 1°F</td>
<td>25 to 225°F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard D.T.</td>
<td>100 to 300°F</td>
<td>04</td>
<td>227, 228</td>
<td>14</td>
</tr>
<tr>
<td>D.T. ± 2°F</td>
<td>25 to 225°F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

†Switch No. 1 is nearest electrical outlet hole.
MODIFICATIONS

(1) SPECIAL MARKING, 23-990010-XXX
Special marking may be rubber stamped in indelible ink on a location specified by the user. Amount of marking is limited to the space available. Specify location of marking desired.

(2) FACTORY TEMPERATURE SETTING
23-990030-006
The controller may be preset at Fenwal to any temperature within its listed range to a minimum of 32°F (0°C). A factory preset temperature provides increased accuracy of the switch setting. Specify the temperature setting and which contact (NO or NC) is to be open or close on temperature rise or fall. Unless otherwise specified, the normally closed contact will be set to open on a temperature rise at the desired temperature. Factory setting tolerance is ± 3°F on Series 20000 and 22000 Controllers and ± 5°F on Series 21000 Controllers. Unless this modification is specified, units are preset at approximately 75°F (25°C).

(30) CALIBRATE DIAL AND KNOB, 23-990300-00X
A calibrated dial and knob may be added to any Series 210 or 211 controller.

-000 (30) With temperature range of 50 to 300°F
-002 (30B) With temperature range of 0 to 250°F
-005 (30E) With temperature range of -20 to +120°C.

(32) MOISTURE RESISTANT FITTINGS
23-99032-00X
A moisture resistant electrical connector may be added to any Series 210 or 211 controller

<table>
<thead>
<tr>
<th>Mod. No.</th>
<th>Cable, Cord or Conduit Dia. (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-001 (32A)</td>
<td>1/8 to 1/4</td>
</tr>
<tr>
<td>-002 (32B)</td>
<td>1/4 to 3/8</td>
</tr>
<tr>
<td>-003 (32C)</td>
<td>3/8 to 1/2</td>
</tr>
<tr>
<td>-005 (32E)</td>
<td>11/16</td>
</tr>
</tbody>
</table>

(34) NONCALIBRATED DIAL AND KNOB
23-990340-000
A noncalibrated dial and knob with nonsignificant numerals may be added to any Series 210 or 211 controller.

(36) HEAT EXCHANGER FINS, 23-990360-000
Heat exchanger fins may be added to any controller for use in air sensing applications where faster response is required.

SPECIAL FEATURE

(34A) PLATING, 23-980340-001
To overcome certain corrosive conditions, the brass shell of any controller may be plated with tin, zinc, or nickel. Specify SF 34A and plating material.

PROTECTIVE WELLS

Type 321 Stainless Steel low pressure hex head wells are available for series 203, 210, and 227 controllers. Specify Catalog Number 34-011208-000.

HOW TO ORDER

1. Select catalog base number from chart on Pages 2 and 3.
2. Select desired temperature range and specify by adding suffix to catalog number specified in Step 1.
3. When ordering Modifications or Special Feature, add MOD. or S.F. number after the catalog number.

Example: Catalog Number 23-020310-000 plus MOD 23-990030-006 set at 120°F with NC contacts opening on temperature rise.

To order a protective well, specify Catalog Number 34-011208-000.