OPERATING CHARACTERISTICS
The displacers are suspended on a cable from the armature of a magnetic head control with a spring partially supporting their weight. As the displacers become submerged in a rising liquid, their weight decreases, allowing the spring to move the cable and armature upward, thereby actuating the mercury switches or snap action switches.

The displacers are secured on the cable by clamps. Operating levels can be adjusted by loosening the clamps and moving the displacers up or down the cable as required. The buoyancy produced by the submerging of each displacer is not sufficient to allow the spring to raise the armature*; a second displacer must be partially submerged before any operation occurs on a rise. On a drop, however, the cable will not move to its full down position until the level falls to approximately the mid point of the lowest displacer. By spacing the displacers and calibrating the spring, adjustable level operation and various stage operations can be provided.

*Exception—Type 195-4: Lower stage operates on and off as liquid level moves within length of lower displacer.
Type A-196 operates on and off as liquid level moves within length of a single displacer.

CONSTRUCTION—all types. Standard displacers are porcelain (also available of other materials). Stops 316SS. Cable (10 ft.) 316 stainless steel (longer lengths available). All enclosures equipped with 3/4" NPT conduit connection. Terminal block for electrical connections. Standard Flange: 4" 1594 C1—other sizes and materials available.

INSTALLATION INSTRUCTIONS

MOUNTING
All types must be mounted with switch mechanism in a level position. Flange must be positioned so that control is mounted level.

Check for obstructions in tank or vessel—be sure that no rods, projections or other obstacles interfere with free operation of the displacers.

No guides are necessary unless excessive turbulence occurs, in which case, a guide pipe could be used. The inner diameter of the pipe or tube should be at least one half to one inch larger than the diameter of the displacers and should have a vent above the high level of the liquid—bottom end to be open.

PROCEDURE FOR INSTALLING
CONTROL HEAD AND DISPLACERS

NOTE: DO NOT TAMPER WITH SETTINGS OF SPRING ASSEMBLY. IT HAS BEEN FACTORY SET FOR THE SPECIFIC GRAVITY SPECIFIED ON YOUR ORDER.

Disassemble equipment as follows:
a. Remove spring clip located near bottom end of the threaded connection protruding from control case. Pull out on spring clip which releases armature rod, and spring assembly.
b. Insert control head thru flange and tighten securely by means of the threaded con-
connection. Use a wrench only on the hex surface under control base.
c. Reassemble armature rod with spring assembly into bottom opening of the threaded pipe connection and secure with spring clip. NOTE—on Two Stage models be sure washer is inside tube before inserting spring clip. To facilitate insertion of washer
and spring clip turn control upside down on a firm surface.
d. Attach cable and displacers to armature by means of the threaded clamp attached to the cable.
e. Insert complete assembly and flange into the tank or vessel and fasten flange.

WIRING
Wire in accordance with local electrical codes or follow equipment manufacturers instructions.

CAUTION: Do not loosen or move switch mechanisms or control adjustment will be altered. Do not tamper with switch wires. Position of these wires is essential to proper operation. Tampering with these wires will void warranty.

(Continued opposite side)
SINGLE STAGE OPERATION

SINGLE STAGE CONTROLS WILL OPERATE AT ANY SPECIFIC GRAVITY AND TEMPERATURE LISTED IN TABLES WITH STANDARD FACTORY SETTING.

SERIES A190—SINGLE STAGE
—Fixed Differentials

<table>
<thead>
<tr>
<th>100°F</th>
<th>200°F</th>
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<tbody>
<tr>
<td>.5</td>
<td>121.5</td>
</tr>
<tr>
<td>.8</td>
<td>121</td>
</tr>
<tr>
<td>.7</td>
<td>122</td>
</tr>
<tr>
<td>.9</td>
<td>93</td>
</tr>
<tr>
<td>1.0</td>
<td>123</td>
</tr>
<tr>
<td>1.1</td>
<td>123</td>
</tr>
<tr>
<td>1.2</td>
<td>123</td>
</tr>
</tbody>
</table>

Minimum differential (c) can be reduced, approximately 1" by removing the cable clamp from between the displacers and turning the lower displacer so the flat side is up. If a narrower differential is needed, use a Type A190 control.

TWO STAGE OPERATION

ALL TWO STAGE TYPES ARE FACTORY SET FOR A GIVEN SPECIFIC GRAVITY AND TEMPERATURE FOR EACH APPLICATION.

SERIES 195-4—TWO STAGE
—Fixed Differentials—
Adjustable Spread Between Stages
Minimum Specific Gravity 0.8—
Maximum Temperature 200°

<table>
<thead>
<tr>
<th>195-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>9&quot;</td>
</tr>
</tbody>
</table>

On specific gravities below .65 control is not recommended where temperatures vary appreciably.

SERIES 195-5—TWO STAGE—Adjustable Differential Each Stage. High Trip Point for Lower Stage Common with Low Trip Point for Upper Stage.
Minimum Specific Gravity 0.5—
—Maximum Temperature 200°

<table>
<thead>
<tr>
<th>195-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>15-1/2&quot;</td>
</tr>
</tbody>
</table>

Minimum Specific Gravity 0.5
—Maximum Temperature 2000°

SINGLE STAGE CIRCUIT SPECIFICATIONS AND ELEC. RATING

MERCURY SWITCH TYPES
10 amp; 120 volts, 5 amp; 240 volts
Available 440 volts 3 amp; AC—

CIRCUIT ARRANGEMENT CIRCUIT RESPONSE TO LEVEL CHANGES SPEC. NO.
SP-ST Close on level DROP 4620
SP-ST Close on level RISE 4621
SP-DT One circuit closes other circuit opens 4615
DP-ST Close on level DROP 4614
DP-ST Close on level RISE 4613

ENCLOSED METAL CONTACT SNAP-ACTION SWITCHES
12 Amp; 120 volts; 10 Amp; 240 volts AC
D.C. 0.5 Amp; 125 volts; 0.25 Amp; 250 volts

CIRCUITS
SINGLE STAGE
Spec. No. 7810 (1) SP-DT Switch
Spec. No. 7806 (2) SP-DT Switches

TWO STAGE CIRCUIT SPECIFICATIONS AND ELEC. RATING

MERCURY SWITCH TYPES
10 Amp; 120 volts 5 Amp; 240 volts
AC or DC

CIRCUIT ARRANGEMENT CIRCUIT RESPONSE TO LEVEL CHANGES LOWER STAGE UPPER STAGE
SP-ST Open on level DROP 4625 4625
SP-ST Open on level RISE 4621 4621
SP-DT One circuit closes other circuit opens 4619 4619
DP-DT Close on level RISE 4614 4614

ENCLOSED METAL CONTACT SNAP-ACTION SWITCHES
12 Amp; 120 volts; 10 Amp; 240 volts AC
D.C. 0.5 Amp; 125 volts; 0.25 Amp; 250 volts

CIRCUITS
Spec. No. 7806 (2 SP-DT each Stage)
Spec. No. 7810 (SP-DT each Stage)