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 one 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 193-5: Each stage operates on and off as liquid level moves within length of one 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” 125# 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 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 SETTING 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 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: 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.

(Continued opposite side)
TYPE 193-1
The bottom stage operates on a level rise to the second displacer from the bottom. The center stage operates on a level rise to the third displacer from the bottom. Both bottom and center stages operate simultaneously when the level falls to the bottom displacer. The Top Stage operates as the level moves between the top and third displacer.

TYPE 193-4
The top stage operates as the level moves between the top and third displacer. The center stage operates as the level falls to the second displacer. The bottom stage operates as the level falls to the bottom displacer. Both the bottom and center stages operate simultaneously as the level rises to the third displacer.

TYPE 193-5
Each stage operates within the length of one displacer. Differential of each stage is fixed but displacers are adjustable.

TYPE 193-6
The bottom stage operates as the level moves between the bottom and second displacer. The center stage operates as the level moves between the second and third displacer. The top stage operates as the level moves between the top and third displacer.

ELECTRICAL ARRANGEMENT — Each stage has a standard circuit designated of either 7810 or 4815.

7810 INCORPORATES 1 SP-DT SNAP-ACTION SWITCH RATED:
12 Amps., 120V AC — 5.0 Amps., 240V AC

4815 INCORPORATES 2 SP-DT MERCURY SWITCHES RATED:
10 Amps., 120V AC or DC — (440V Available on special order).

<table>
<thead>
<tr>
<th>CIRCUIT SPECIFICATIONS AND ELECTRICAL RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>MERCURY SWITCH TYPES</td>
</tr>
<tr>
<td>AC or DC</td>
</tr>
<tr>
<td>10 Amp., 120 Volts</td>
</tr>
<tr>
<td>5 Amp., 240 Volts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CIRCUIT ARRANGEMENT</th>
<th>CIRCUIT RESPONSE TO LIQUID LEVEL CHANGES</th>
<th>LOWER STAGE</th>
<th>CENTER STAGE</th>
<th>UPPER STAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP-DT</td>
<td>One circuit OPENS as other circuit CLOSES</td>
<td>No. 4815</td>
<td>-15</td>
<td>-15</td>
</tr>
</tbody>
</table>

ENCLOSED METAL CONTACT SNAP-ACTION SWITCHES
12 Amp., 120 volts; 10 Amp., 240 Volts AC.
1/2 hp. 120/240 volts AC.
D.C. 0.5 Amp., 125 volts; 0.25 Amp., 250 volts.

<table>
<thead>
<tr>
<th>LOWER STAGE</th>
<th>CENTER STAGE</th>
<th>UPPER STAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 7810</td>
<td>-10</td>
<td>-10</td>
</tr>
</tbody>
</table>

NOTE:
Minimum differential can be reduced to 2" by removing a stop and placing flat end of displacers together.

THE MERCOID CORPORATION 4207 BELMONT AVE. CHICAGO, ILLINOIS 60641

"MERCOID" UNITED STATES OF AMERICA—CANADA—MARCA REGISTRADA ARGENTINA, CHILE, HONDURAS, MEXICO, PERU, URUGUAY & VENEZUELA—MARCHIO REGISTRATO ITALY—MARQUE DEPOSEE FRANCE

Bulletin IN-533 9/15/80