

# CONDUCTIVITY CONTROLLER/MONITOR

## MODELS CCM-57

**PLEASE READ THIS THROUGH COMPLETELY  
BEFORE ATTEMPTING TO INSTALL OR OPERATE  
THIS SYSTEM.**

### MECHANICAL INSTALLATION

All Monitor electronics are packaged inside drip/weather-proof housings. The physical dimensions of both small and large housings are suitable for panel, bench or surface mounting.

There are three basic guidelines to consider when selecting a Monitor's mounting location:

1. Select a site that limits the Monitor's exposure to excessive moisture and corrosive fumes.
2. For best results, position your control area as close as possible to the point(s) being controlled.

NOTE: The Conductivity monitors are not designed to operate with a Sensor cable length that exceeds 100' (30 meters).

3. If at all possible, mount the Monitor at eye level for viewing convenience.

### SURFACE MOUNTING WITH OPTIONAL MOUNTING PLATE

NOTE: A Surface Mounting Plate will be required when access to the far side of the mounting site is impractical. Surface mounting will require two (2) 1/4" x 20 mounting screws. (The mounting screws are packaged with the surface Mounting Plate assemblies) the user must supply four (4) additional screws or bolts. Their size is to be determined by the user.

1. Select your mounting location. Mark and drill the four (4) required mounting holes. For hole location, use the plate as a template. Install any lags or threads required.
2. Drill the corner holes in the Surface Mounting Plate according to the size of the screws or bolts selected.
3. Attach and securely fasten the Surface Mounting Plate to the Monitor using the 1/4" x 20 x 3/8" screws provided.
4. Mount the Surface Mounting Plate to the prepared site using the selected screws or bolts.

### SURFACE MOUNTING WITHOUT OPTIONAL MOUNTING PLATE

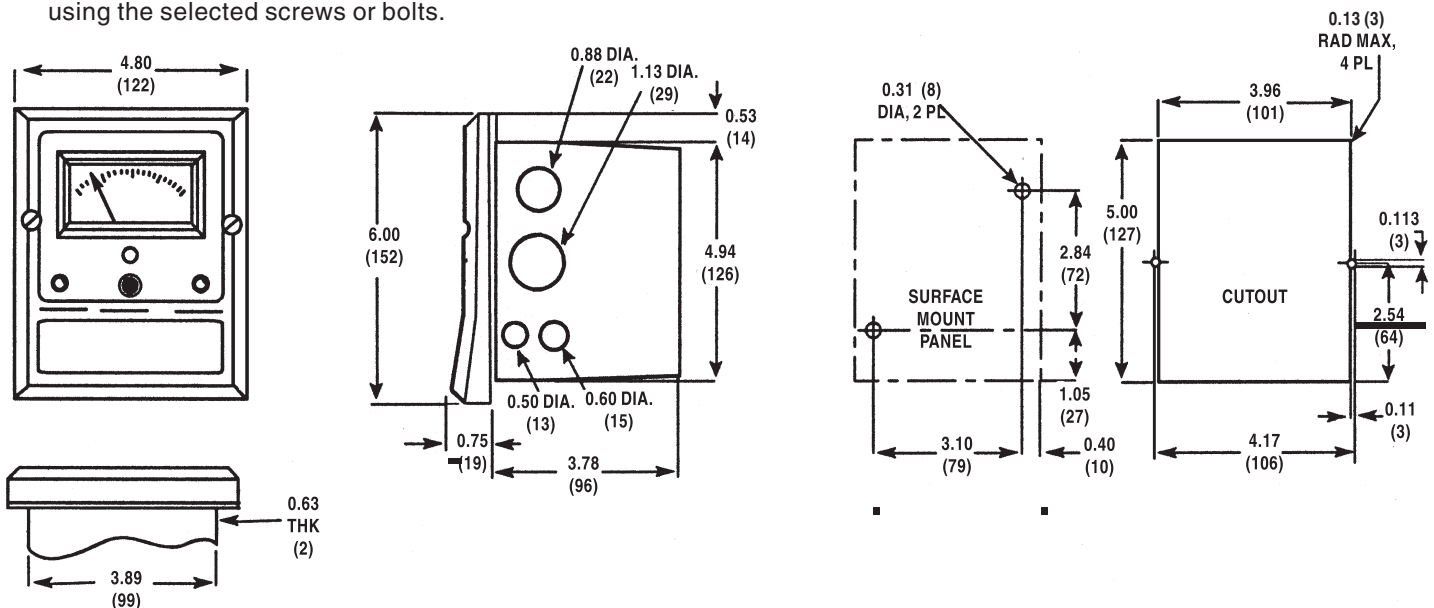
NOTE: Surface mounting will require two(2) 1/4" x 20 screws of a length equal to the thickness of the mounting site plus 3/8".

1. Select mounting site location. Mark and drill the re-quired mounting holes. For hole drilling locations, see Figure 2-1.
2. Insert the 1/4" x 20 screws into the holes from the side opposite the mounting site.
3. Hold the Monitor in place while starting and tightening the mounting screws.

### PANEL MOUNTING

A panel mounting fastening kit is provided with all Conductivity Monitors. Panel mounting will require the use of the fastening kit's two (2) 4-40 mounting screws/nuts or two (2) #4 x 1/2" sheet metal screws. See Figure 2-1 for panel cutout dimensions.

1. Select your mounting location. Mark the appropriate panel cutout and complete the necessary panel cut.
2. Carefully unfasten and separate the Monitor's front panel from its enclosure.
3. Disconnect all panel cables(s)/wires from the Monitor's control board.
4. Slide the enclosure through the panel cutout until its flange contacts the panel.
5. Insert mounting screws through the flange mounting holes and tightly secure.
6. Reconnect all panel cable(s)/wires and re-secure the front panel.



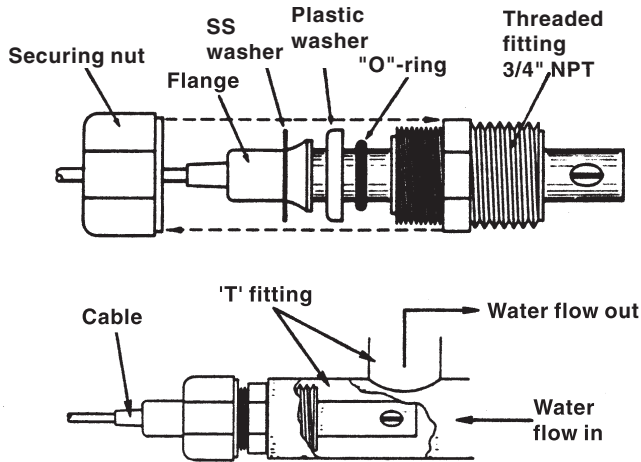
**FIGURE 2-1  
SURFACE AND PANEL MOUNTING DIAGRAMS (Not to scale)**

## SENSOR INSERTION/DIP MOUNT ASSEMBLIES

A Sensor mounting orientation must provide a continuous and adequate circulation flow to prevent the trapping of air bubbles within the Sensor's electrode area. Failure to do so will result in conditions that will prevent the Sensor from functioning properly.

### INSERTION MODE ASSEMBLY

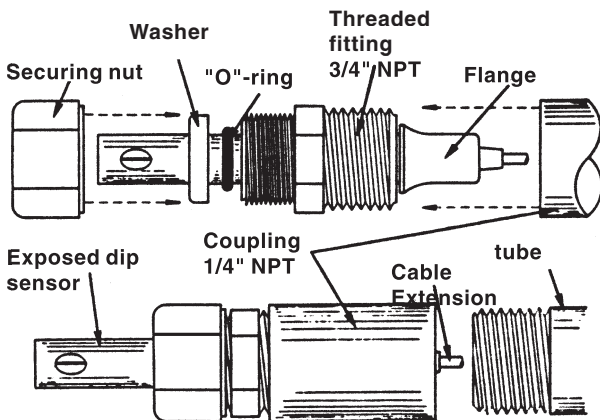
1. Verify that the Sensor's Fitting assembly is properly assembled as shown in Figure 2-2.
2. Insert the Sensor Fitting assembly into the "T" fitting as shown in Figure 2-2 and tightly secure.



**FIGURE 2-2  
INSERTION MODE ASSEMBLY**

### ALTERNATE DIP SENSOR ASSEMBLY

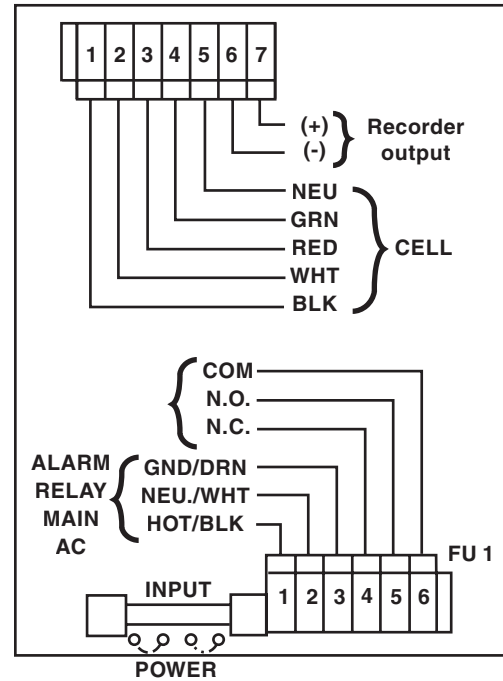
1. Verify that the Sensor's Fitting assembly is properly assembled as shown in Figure 2-3.
2. Insert and pull the Sensor's cable through the extension tube and then tightly attach extension tube to Sensor assembly as shown in Figure 2-3.



**FIGURE 2-3  
ALTERNATE DIP ASSEMBLY**

## ELECTRICAL INSTALLATION

The electrical installation procedures provided in this manual are common to all Conductivity Monitors. See Figure 2-1 for the hole dimensions of the enclosure's cable access holes. Unless otherwise instructed, refer to Figure 2-4 for the Monitor's terminal block(TB) connector wiring designations. NOTE: After removing an enclosure's access hole plug, it is suggested that the user mount a watertight restraint fixture prior to installing a cable.



**FIGURE 2-4  
INSTALLATION DIAGRAM**

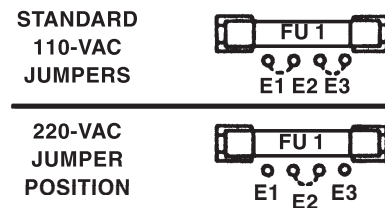
## MAIN AC POWER INSTALLATION

The following procedures are to be used to install a standard 115 VAC main power source. For the procedures to install the optional 220 VAC main power source, the user must first complete the conversion procedures. (See following section "220 VAC CONVERSION")

1. Verify that the facility's main AC power source is turned "OFF" or disconnected.
2. Carefully remove front panel, leaving the cable and wires connected.
3. Place the facility's AC power cord and user supplied watertight cable restraint into the enclosure's appropriate access hole.
4. Neatly connect cable wires to the Monitor's TB connectors, as shown in Figure 2-4.

### 220 VAC CONVERSION

1. Verify that the facility's main AC power source is turned "OFF" or disconnected.
2. Locate and remove the Control board jumpers E1 and E3. (See Figure 2-6)
3. Using one of the removed jumpers, insert it into jumper E2's connection holes as shown in Figure 2-6.



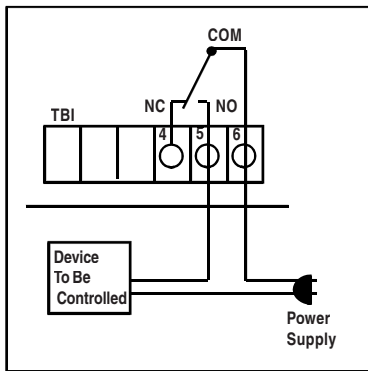
**FIGURE 2-6  
220 VAC CONVERSION JUMPER DIAGRAM**

## CONNECTING THE SENSOR CABLE

1. Place the Sensor's interface cable and user supplied watertight cable restraint into the enclosure's appropriate access hole.
2. Neatly connect the Sensor's cable wires to the Monitor's appropriate TB connectors. (See Figure 2-4)

## ALARM RELAY INSTALLATION

1. Place the user supplied Alarm relay interface cable and watertight cable restraint into the enclosure's appropriate access hole.
2. Neatly connect the Relay cable wires to the Monitor's TB connectors (See Figure 2-4) as explained below. All Conductivity Monitor/Controllers are equipped with a relay which is designed to energize/de-energize when the set point is crossed. (See "Set Point Adjustment Procedure") The relay energizes on increasing readings. Since various devices (alarms, solenoid valves, etc.) controlled by your instrument can operate on different voltages, the power the relay is to control must be connected by you. Any common AC or DC voltage may be used, provided the current load does not exceed 10 amps.



### BOARD DETAIL

A typical example is shown above. The relay contacts are shown in the de-energized position. When energized (above set point), the Common (COM) will disconnect from the Normally Closed (NC) contact and connect to the Normally Open (NO) contact. Devices may be operated using either the Normally Open contact or normally closed contact; or both relay contacts may be used to activate two devices of the same voltage.

## OPERATING PROCEDURES

### SWITCH AND INDICATOR CONTROLS

The front panel illustrations, switch and indicator operational descriptions have been provided to assist the user in identifying and operating the Conductivity Monitors.

#### RED "ABOVE SET POINT" LED INDICATOR

The red LED indicator light is ON only when the water's conductivity reading is ABOVE the Monitor's set point adjustment.

#### GREEN "BELOW SET POINT" LED INDICATOR

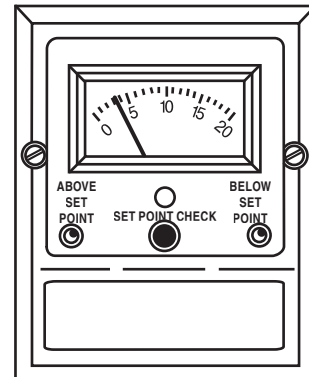
The green LED indicator light is ON only when the water's conductivity reading is BELOW the Monitor's set point adjustment.

#### "SET POINT CHECK" SWITCH

When the "SET POINT CHECK" switch is depressed, the internal set point reading is immediately displayed on the front panel display.

## SETUP PROCEDURES

These Setup procedures cover (1) setting the alarm circuit set point(s), and (2) converting the alarm circuit to trigger on a decreasing reading.



## DECREASING SET POINT CONVERSION

The alarm circuit on all Conductivity Monitors are configured to trigger the alarm relay as the conductivity (or ppm) reading increases. If the user's application requires it, the alarm circuit may be easily reconfigured to trigger the alarm relay as the conductivity reading decreases. Refer to Figure 4-1 for the locations of the jumpers referred to on this section.

NOTE: These instructions describe the general procedures for converting the Monitor without reference to jumper numbers or orientation. Refer to Figure 3-2 for the specifics on your monitor.

1. Turn OFF or disconnect the Monitor's main AC power.
2. Locate the jumper block for the alarm to be configured.
3. Make a note of the current orientation of the jumpers.
4. Remove both jumpers. This is easily done by hand. Take care not to crush the jumpers if using pliers.
5. Rotate the jumpers ¼ turn and reinstall them on their posts.

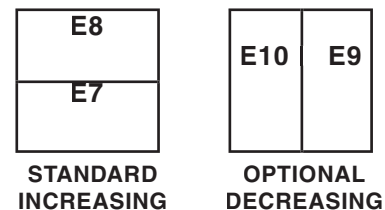


FIGURE 3-2  
DECREASING JUMPER CONVERSION

## SET POINT ADJUSTMENT

1. Being careful not to strain the cable, unfasten and remove the Monitor's front panel.
2. While depressing the "SET POINT CHECK" switch, turn the Monitor's Set Point trimmer adjustment screw (See Figure 4-1) until the desired set point value is indicated on the meter display.  
NOTE: The Monitor's set point setting is based upon the user's particular water purity specifications.
3. After successfully completing Step 2, remount the front panel and tightly secure both retaining screws.

## CHECK-OUT PROCEDURES

The following check-out procedures are used to verify that a Conductivity Monitor is operating properly. It is assumed that the Monitor is powered ON, that it is connected to a Sensor, and that the Sensor is immersed in water within the range that the Monitor will be required to read. Refer to Figure 4-1 for the locations of the components referred to in this section.

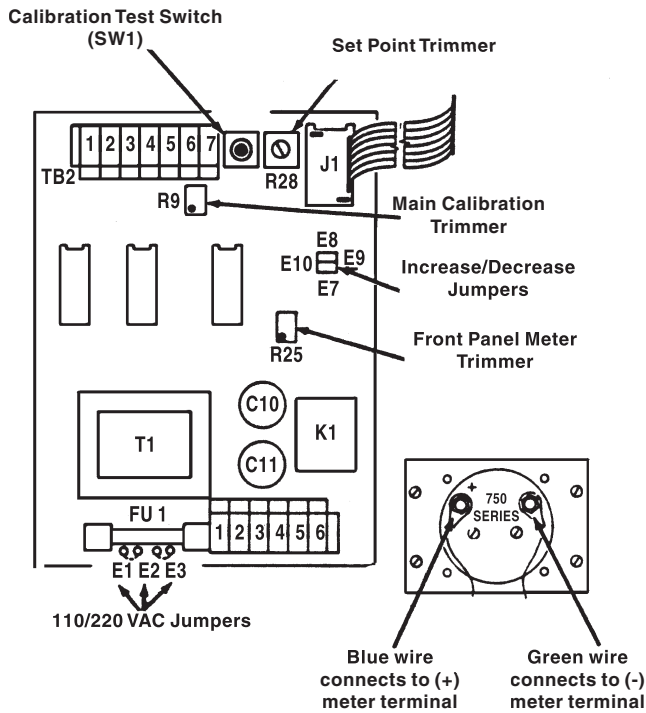
NOTE: A small screwdriver will be required.

1. Make a note of the reading on the Monitor's display.
2. Being careful not to strain the connecting cable, unfasten and remove the Monitor's front panel.
3. While holding the Calibration Test switch (SW1) to its TEST position, verify that the front panel meter is indicating a full scale reading.
4. Press and hold the "SET POINT CHECK" switch on the front panel. Using the small screwdriver, adjust the Set Point trimmer adjustment screw on the circuit board to sweep the display from zero to full scale. Listen for the alarm relay to click on and off as the alarm set point moves past the water reading.
5. Adjust the alarm to the desired set point. Release the "SET POINT CHECK" switch.

## PRIMARY COMPONENT IDENTIFICATION

As identified in Section 3, the Conductivity Monitors' switch and indicator components are mounted directly to the front panel.

The Conductivity Monitors' Control boards are contained within and mounted to the back of the enclosure.



**FIGURE 4-1  
PRIMARY COMPONENT IDENTIFICATION**

## METER MECHANICAL ZERO PROCEDURES

1. Turn OFF or disconnect the Monitor's main AC power.
2. Note the position of the meter needle. If it has come to rest pointing at the zero mark on the scale, turn the Monitor back ON and continue on to next Section.
3. Locate the small (approx. ¼"), black plastic button directly below the center of the meter. Use a small screwdriver or fingernail to gently pry it loose and remove it from the access hole.
4. Insert a small standard screwdriver into the access hole and carefully locate the slot in the mechanical adjustment plug.
5. Turn the adjustment plug slightly until the needle rests on zero.
6. Insert the small plastic button into the access hole.
7. Turn ON or reconnect the Monitor's main AC power.

## CIRCUIT CALIBRATION PROCEDURES

All Conductivity Monitors/controllers are factory calibrated prior to shipping and are ready to install without further calibration. Calibration should be checked occasionally with the internal Calibration Test switch (SW1) to ensure continued accuracy. The following procedures are provided in the event that re-calibration becomes necessary. The only equipment required are a small screwdriver and an accurate multimeter. Calibration should be accomplished by a qualified technician.

Refer to Figure 4-1 to locate the components described in this section.

**CAUTION! When performing calibration procedures, the technician must take extreme care to avoid contacting the fuse or control circuitry other than trimmer calibration screws. Failure to do so could result in damage to the equipment and/or property.**

1. Connect a voltmeter (0-10 VDC) to the Recorder output terminals TB2-6 & 7 with the positive (+) lead on TB2-7.
2. Press and hold the Calibration Test switch (SW1). The voltmeter should indicate +10 volts. If not, set to +10 volts with the Main Calibration trimmer (R9).
3. With the Calibration Test switch (SW1) still depressed, set the Front Panel Meter trimmer (R25) for a full scale indication on the panel meter.

## PREVENTIVE CARE

SERFILCO recommends that the following Preventive Care procedures be observed.

1. Try to prevent exposure to excessive heat and moisture.
2. The Monitor's main AC power source must be protected against excessive voltage "spikes".
3. Take care not to damage the Monitor during handling. NOTE: Daily, weekly or monthly maintenance schedules are based upon the frequency of use and the severity of the Monitor's environment and operating conditions.
4. Repeat the Monitor's Check-Out procedures to verify satisfactory operation and/or isolate possible troubleshooting systems.
5. Check all cable connections to ensure that they are free of moisture and contamination.
6. Inspect and replace damaged component boards and cable assemblies.
7. Periodically remove and clean and inspect the Conductivity Sensor.