

# Orenco® Control and Alarm Panels

## General Installation and Wiring Instructions

Before beginning the installation, read these instructions thoroughly. Not performing the installation according to these instructions may void the limited warranty. Follow all applicable electrical codes. Contact your distributor or dealer if there is a difference between these instructions and any applicable regulations. Inspect your order for completeness and shipment damage; contact your distributor or dealer if something is missing or damaged.

### Step 1: Mount Panel

Mount the panel on a post or exterior wall within sight of the tank or basin.

**IMPORTANT:** *DO NOT* mount control panels on exterior walls other than garage or shop walls! The motor contactor makes a sound while engaging and disengaging that can be disruptive to residents.

### Step 2: Route Electrical Conduit or Direct-Bury Cables

Route and connect the electrical conduit or direct-bury cable between the splice box(es), control panel, and service entrance panel.

- Orenco recommends a minimum burial depth of 2 ft (0.6 m).
- Follow applicable codes governing conduit or cable bury.
- See instruction set EIN-CP-GEN-5 (included with the panel) for instructions on installing conduit hubs.

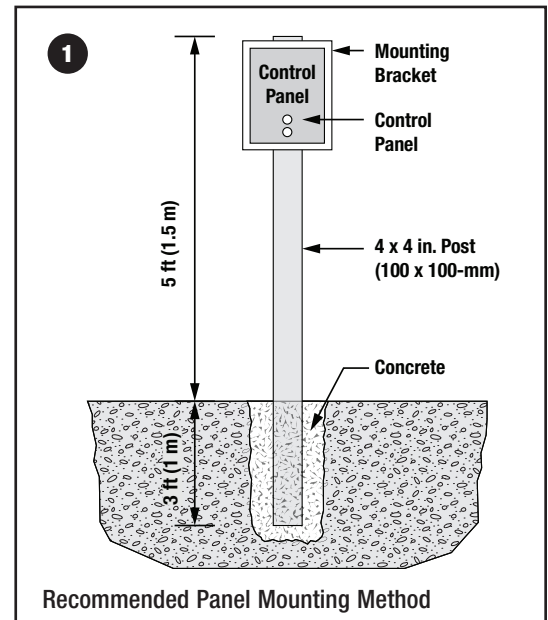
### Step 3: Route Wires

Route all wires and cords between the components, splice box(es), control panel(s), and service panels.

- Use the schematics and wiring diagrams included with the panel for specifics.
- Use only CU conductors, 60° C (140° F) minimum, rated for wet locations.
- Be sure to pull enough wire or cable into the splice box(es) (6-8 inches or 150-200 mm above the splice box) and panel to easily make connections.
- Use color-coded or labeled 14 AWG wires between the float switch cords and the panel.
- See Table 1 for wire sizes for wiring between the pump and panel.  
~ Undersized wires can drop voltage and negatively affect pump performance.

### Step 4. Make Splice Box Connections

**Step 4a:** Make sure that all circuit breakers are turned off in the control panel and the service entrance panel.



**Table 1. Recommended Pump Breaker and Wire Sizing**

Pump voltage, VAC	Motor size, hp (kW)	Breaker size, amp	Wire size, AWG (mm <sup>2</sup> )	Max. distance, ft (m)*
120	1/2 (0.37)	20	10 (5.26)	105 (32.0)
240	1/2 (0.37)	15	14 (2.08)	161 (49.0)
240	3/4 (0.55)	20	14 (2.08)	130 (39.6)
240	1 (0.75)	20	12 (3.31)	172 (52.4)
240	1-1/2 (1.12)	20	12 (3.31)	126 (38.4)

\* Maximum distance from the sub-panel to the pump motor for the recommended wire size, based on a 3% maximum voltage drop from the sub-panel to load at the maximum recognized pump motor amps, and at 167° F (75° C).

**Step 4. Make Splice Box Connections, cont.**

**Step 4b:** Make the wire connections in the splice box(es).

**IMPORTANT:** *All wire connections in the splice boxes must be watertight!*

- Use the schematics and wiring diagrams included with the panel for specifics.
- Orenco recommends waterproof wire nuts (included with Orenco splice boxes) for making splice box connections.
- See NIN-WN-1, *Splicing With Waterproof Wire Nuts* for wire nut size selection and installation instructions.

**Step 4c:** Install the supplied cord grip plugs in any unused cord grips.

**Step 4d:** Tighten all of the cord grips about 1/4 turn past hand-tight, or just until they don't move.

**IMPORTANT:** *DO NOT overtighten the cord grips! Overtightening the cord grips will damage wires and cords.*

**Step 4e:** Loop and secure extra wire and cord lengths inside of the riser or basin.

**Step 5. Make Control Panel and Service Panel Connections**

**Step 5a:** Ground the control panel and pump circuits.

**Step 5b:** Make all of the connections in the control panel.

**Note:** *Voltage for the controls in the panel is always 120 VAC; pump voltage may be 120 VAC or 240 VAC.*

- Orenco recommends separate circuits for pump controls and each pump motor.
- Use the following torque settings ...
  - ~ Circuit breakers, 14-10 AWG wire: 20 lb-in.
  - ~ Circuit breakers, 8 AWG wire: 25 lb-in.
  - ~ Circuit breakers, 6-4 AWG wire: 27 lb-in.
  - ~ Ground lugs: 45 lb-in.
  - ~ Terminal blocks: 15 lb-in.

**Step 5c:** Connect incoming power from the service entrance panel to the panel.

- This requires a licensed electrician.

**Step 5d:** Seal the conduit at the control panel and at the splice box(es) with UL-listed sealing foam, putty, or silicone sealant.

**IMPORTANT:** *Failing to seal the conduit at the splice box and at the control panel can result in moisture and corrosion inside of the control panel, which can lead to electrical failure.*

**Step 5e:** Turn on the circuit breakers in the panel and service entrance panel.

**Step 6. Test and Finish**

**Step 6a:** Perform all required operational tests of the system alarms and controls.

**Step 6b:** Close and secure all splice boxes and panels.