

# Three Phase Simplex SJE-Rhombus® Type 312

## Installation Instructions and Operation/Troubleshooting Manual



**This control panel must be installed and serviced by a licensed electrician in accordance with the National Electric Code NFPA-70, state and local electrical codes.**

All conduit running from the sump or tank to the control panel must be sealed with conduit sealant to prevent moisture or gases from entering the panel. NEMA 4X enclosures are for indoor or outdoor use, primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water and hose-directed water. **Cable connectors must be liquid-tight in NEMA 4X enclosures.**

### Installation

Standard Type 312 panels are designed to operate with three floats. These floats operate the pump stop, pump start, and high level alarm functions.

**NOTE: Options ordered may affect the number of floats and their functions. Please reference the schematic provided with the control panel for proper installation.**

**Warranty void if panel is modified.**

Call factory with servicing questions:  
**1-800-RHOMBUS**  
(1-800-746-6287)

#### Installation of Floats

**CAUTION:** If control switch cables are not wired and mounted in the correct order, the pump system will not function properly.

**WARNING:** Turn off all power before installing floats in pump chamber. Failure to do so could result in serious or fatal electrical shock.

1. Use float label kit to identify and label cables on both the float and stripped ends (stop, start, alarm, etc.). See schematic for float options.
2. Determine your normal operating level, as illustrated in **Figure 1**.
3. Mount float switches at appropriate levels as illustrated in **Figures 2-4**. Be sure that floats have free range of motion without touching each other or other equipment in the basin.

**If using the mounting clamp; follow steps 4-6.**

4. Place the cord into the clamp as shown in **Figure 2**.
5. Locate the clamp at the desired activation level and secure the clamp to the discharge pipe as shown in **Figure 2**.

**NOTE:** Do not install cord under hose clamp.

6. Tighten the hose clamp using a screwdriver. Over tightening may result in damage to the plastic clamp. Make sure the float cable is not allowed to touch the excess hose clamp band during operation.

**NOTE:** All hose clamp components are made of 18-8 stainless steel material. See your SJE-Rhombus® supplier for replacements.

Manufactured by:

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CONTROLS

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# Installation Instructions

## Mounting the Control Panel

1. Determine mounting location for panel. If distance exceeds the length of either the float switch cables or the pump power cables, splicing will be required. For outdoor or wet installation, we recommend the use of a SJE-Rhombus® liquid-tight junction box with liquid-tight connectors to make required connections. **You must use conduit sealant to prevent moisture or gases from entering the panel.**

2. Mount control panel with mounting devices furnished.

3. Determine conduit entrance locations on control panel.

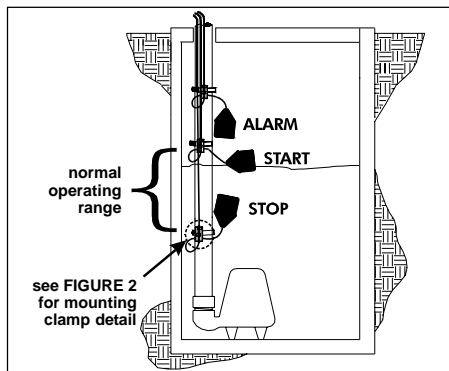
**NOTE:** Be sure the incoming power, voltage, amperage, and phase meet the requirements of the pump motor being installed. If in doubt, see the pump identification plate for electrical requirements.

4. Drill proper size holes for type of connectors being used.

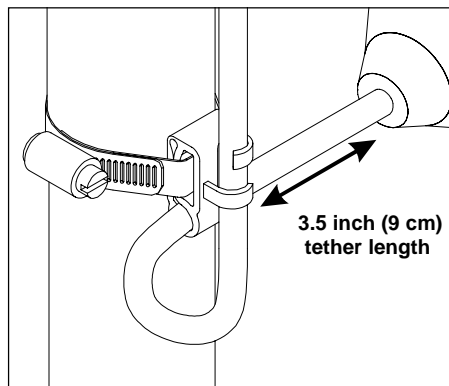
**NOTE:** If using conduit, be sure that it is of adequate size to pull the pump and switch cables through.

5. Attach cable connectors and/or conduit connectors to control panel.

**FOR INSTALLATION WITHOUT A SPLICE, GO TO STEP 10; FOR INSTALLATION REQUIRING A SPLICE, FOLLOW STEPS 6-9.**



**FIGURE 1 - Three float simplex - pump down installation**



**FIGURE 2 - Mounting clamp detail**

6. Determine location for mounting junction box according to state and local code requirements. Mount junction box to proper support.
7. Run conduit to junction box. Drill proper size holes for the type of conduit used. Attach connectors to junction box.
8. Identify and label each wire before pulling through conduit into control panel and junction box. Make wire splice connections at junction box.
9. Firmly tighten all fittings on junction box.
10. If a junction box is not required, pull cables through conduit into control panel.
11. Set motor protective switch:
  - a) set the dial to match motor full load amps
  - b) turn dial on motor protective switch to the ON position

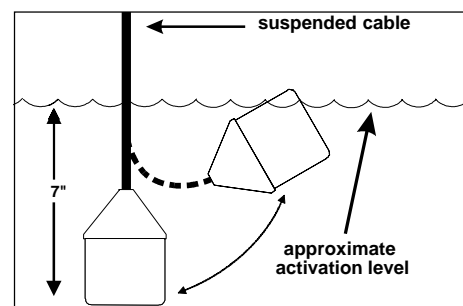
**NOTE:** Resetting the dial with power applied to the motor protective switch could start the motor.

12. Connect pump wires directly to the motor contactor terminal positions T1, T2, and T3.

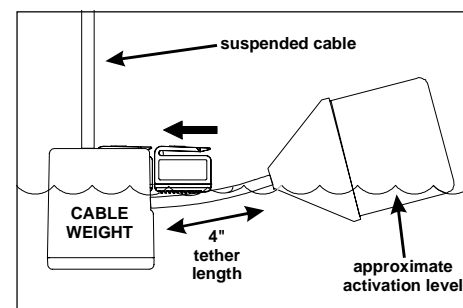
**NOTE:** Three phase motors will run in either direction. Check pump motor before installation for proper rotation. To correct rotation, change pump cable connections on any two terminals T1-T2-T3.

13. Connect "power-in" conductors to proper locations: 208/240/480 on 3 position terminal block. **Install tagged factory wire to appropriate transformer primary voltage tap.**

**VERIFY CORRECT OPERATION OF CONTROL PANEL AFTER INSTALLATION IS COMPLETE.**



**FIGURE 3 - Internally weighted float**



**FIGURE 4 - Float with cable weight**

# Operations

SJE-Rhombus® Type 312 control panels are designed to operate in a three float system as standard. When all floats are in the open or OFF position, the panel is inactive. As the liquid level changes and closes the stop float, the panel remains inactive until the start float also closes. At this point the pump will start, assuming the HOA switch is in the AUTOMATIC mode and the power is ON. The pump will remain ON until both the stop and start floats open (return to the OFF position). If the liquid level travels beyond both the stop and start floats and reaches the alarm float, the audio/visual alarm will be activated. The alarm horn can be silenced by pressing the silence switch.

## Alarm System (Horn and Indicator)

When an alarm condition occurs, a red light and a horn will be activated. If the test/normal/silence switch is moved to the silence position, the horn will be silenced. When the alarm condition is cleared, the alarm system is reset. The alarm system can be tested by moving the test/normal/silence switch to the test position.

## HOA Switch

A hand-off-automatic switch is provided for the pump. In the hand mode, the pump will turn on unless other safety features are employed. In the automatic mode, the pump will turn on from commands by the float switches.

## Motor Protective Switch

A motor protective switch is supplied for the pump to provide an adjustable overload, branch circuit protection and disconnect. The overload must be set in the field. To set the overload, dial the amp scale to the pump's full load amps (FLA). If the FLA's are unknown, use a calibrated amp meter to measure the pump amperage draw under loaded conditions. An auxiliary contact is wired in series with the magnetic contactor coil so that on an overload trip, the magnetic contactor will be disabled. In the event of an overload trip, the motor protective switch must be reset by first turning the handle counterclockwise to the OFF position and then turning the handle 90° clockwise to the ON position.

## Pump Run Light

The run light will be ON in either the hand or the automatic mode when the pump is called to run.

## Control Power Light

Light will illuminate when the control circuit has power

## Alarm Power Light

Light will illuminate when the alarm circuit has power

## Alarm Fuse

Provides alarm circuit protection and provides a means of disconnecting alarm circuit power

## Control Fuse

Provides control circuit protection and provides a means of disconnecting control circuit power

## Dry Auxiliary Contacts (optional)

**Normally open** - Contacts are open under normal conditions and closed when alarm condition is present.

**Normally closed** - Contacts are closed under normal conditions and open when alarm condition is present.

Both types automatically reset once alarm condition is cleared.

## Seal Failure Circuit and Indicator Light (Optional)

The seal fail circuit has resistance sensitivity and will sense the presence of water in the pump seal chamber. Upon installation, turn the sensitivity dial on the seal fail module to the point where the light turns on, then dial back slowly until the light turns off. If water enters the seal chamber at this point, the seal chamber circuit will sense a change in resistance. After a short time delay, the indicator light will turn on. When the condition is cleared, the relay will de-energize and the indicator light will turn off. The seal fail relay has a sensitivity adjustment so that false readings may be tuned out.

## Thermal Cutout (Optional)

The thermal cutout circuit is wired in series with the magnetic contactor coil. If the pump's thermal switch opens on high temperature, the magnetic contactor will turn off and stop the pump. When the thermal switch cools and closes, the magnetic contactor will turn on if the pump is called to run.

**NOTE:** Some options ordered may not be included in this manual.

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**For information regarding the  
operations of options not listed here  
or servicing questions,  
please call a SJE-Rhombus  
customer service technician at  
1-800-RHOMBUS  
(1-800-746-6287)**

**Warranty void if panel is modified.**

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# Troubleshooting



## Alarm Horn

Moving the alarm test/normal/silence switch to the test position or activating the alarm float should turn on the alarm horn. If the horn does not sound replace with horn of same type.

## Alarm Light

Moving the alarm test/normal/silence switch to the test position or activating the alarm float should turn on the alarm light. If the light does not activate, replace with bulb of same type.

## Float Controls

Check the floats during their entire range of operation. Clean, adjust, or replace floats.

**Checking the float resistance** - The float resistance can be measured to determine if the float is operating correctly or is defective. Use the following procedure to measure the float resistance:

1. Isolate the float by disconnecting one or both of the float leads from the float terminals.
2. Place one ohmmeter lead on one of the float wires, and the other ohmmeter lead on the other float wire.

3. Place the ohmmeter dial to read ohms and place on the R X 1 scale. With the float in the "off" position, the scale should read infinity (high resistance). Replace the float if you do not get this reading. With the float in the ON position, the scale should read nearly zero (very low resistance). Replace the float if you do not get this reading.

**NOTE:** Readings may vary depending on the length of wire and accuracy of the measuring device.

## Fuses

Check the continuity of the fuse. With power OFF, pull the fuse out of the fuse block. With the ohmmeter on the R X 1 scale, measure resistance. A reading of infinity indicates a blown fuse and must be replaced. Replace fuse with same type, voltage and amp rating.

## Indicator Lights

If defective, replace all indicator pilot lights with same type.

## Magnetic Contactor

**Contacts** - Check the contacts for severely burnt or welded contacts. The contactor arm should move freely.

**Coil** - Measure the coil by disconnecting one of the coil leads. Measure the coil resistance by setting the ohmmeter on the R X 1 scale. A defective coil will read zero or infinity, indicating a short or opened coil respectively. Replace defective contactor with same type.

**NOTE:** Readings may vary depending on accuracy of the measuring device.

## Motor Protective Switch

Test by inserting a paper clip or other small device into the test hole and push to the left. The relay should trip.

## SJE-Rhombus® Three-Year Limited Warranty

**SJE-RHOMBUS®** warrants to the original consumer that this product shall be free of manufacturing defects for three years after the date of consumer purchase. During that time period and subject to the conditions set forth below, **SJE-RHOMBUS®** will repair or replace, for the original consumer, any component which proves to be defective due to defective materials or workmanship of **SJE-RHOMBUS®**.

**ELECTRICAL WIRING AND SERVICING OF THIS PRODUCT MUST BE PERFORMED BY A LICENSED ELECTRICIAN.**

**THIS WARRANTY DOES NOT APPLY:** (A) to damage due to lightning or conditions beyond the control of **SJE-RHOMBUS®**; (B) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with printed instructions provided; (C) to failures resulting from abuse, misuse, accident, or negligence; (D) to units which are not installed in accordance with applicable local codes, ordinances, or accepted trade practices, and (E) to units repaired and/or modified without prior authorization from **SJE-RHOMBUS®**.

*Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.*

**TO OBTAIN WARRANTY SERVICE:** The consumer shall assume all responsibility and expense for removal, reinstallation, and freight. Any item to be repaired or replaced under this warranty must be returned to **SJE-RHOMBUS®**, or such place as designated by **SJE-RHOMBUS®**.

**ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS ARE LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. SJE-RHOMBUS® SHALL NOT, IN ANY MANNER, BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES AS A RESULT OF A BREACH OF THIS WRITTEN WARRANTY OR ANY IMPLIED WARRANTY.**