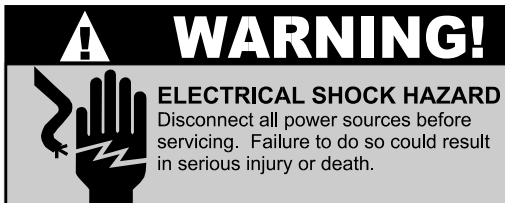


Subsurface Drip Control Panel

SJE-Rhombus®

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

The Subsurface Drip control panel is designed to control one single-phase pump (simplex) or two single-phase pumps (duplex), and two valves. The installer can program a PLC containing all the timer settings and monitoring information for the system. These changes are made with the touch pad and screen display on the PLC. The panels are designed to be used with four floats. They are: low level, timer on, override, and high water alarm.

Warranty void if panel is modified.

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

Low Level - Used as a redundant off to insure the water level can not be pumped below this float. The audible and visual alarm will activate.

Timer On - Activates a repeat cycle timer that starts in the Off mode.

Override Timer - Starts a different repeat cycle timer used to increase the dose cycle.

High Water Alarm - Activates the audible and visual alarm.

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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. Determine your normal operating level, as illustrated in **Figures 1 & 2**.
2. Mount float switches at appropriate levels as illustrated in **Figures 1 & 2**. Be sure that floats have free range of motion without touching each other or other equipment in the basin.
3. For mounting clamp installation: place the cord into the clamp as shown in **Figure 3**. Locate the clamp at the desired activation level and secure the clamp to the discharge pipe as shown in **Figure 3**.

NOTE: Do not install cord under hose clamp.

Installation Instructions

4. 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 SJE-Rhombus® for replacements.

Mounting the control panel

1. Determine mounting location for panel. If distance exceeds the length of the float switches or pump, splicing will be required. **You must use conduit sealant to prevent moisture or gases from entering the panel.**
2. Mount control panel using the mounting flanges furnished with control panel.
3. Determine conduit entrance locations on control panel. Check local codes and schematic for the number of power circuits required.

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.

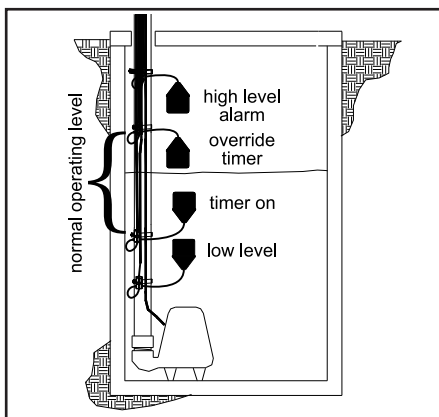
4. Drill proper size holes for type of connectors being used.
5. Attach cable connectors and/or conduit connectors to control panel.

FOR INSTALLATION REQUIRING A SPLICE, FOLLOW STEPS 6-10; FOR INSTALLATION WITHOUT A SPLICE, GO TO STEP 11.

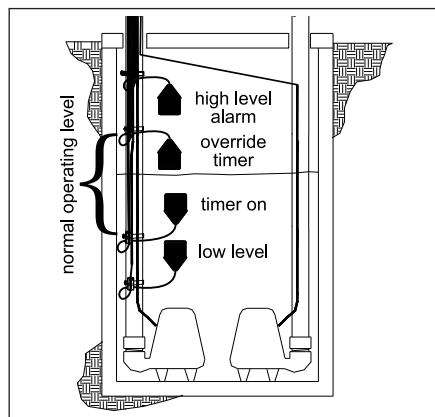
6. Determine location for mounting junction box(es) according to local code requirements.
7. Mount junction box to proper support according to local codes.
8. Run conduit to junction box(es). Drill proper size holes for the type of conduit used.
9. Identify and label each wire before pulling through conduit into control panel and junction box(es). Make wire splice connections at junction box(es).
10. Firmly tighten and seal all fittings on junction box(es).
11. If a junction box is not required, pull cables through conduit into control panel.
12. Connect pump wires and float switches to proper position on terminals. See schematic inside control panel for terminal connections.

NOTE: It is the recommendation of the factory to use separate pump and control/alarm power sources.

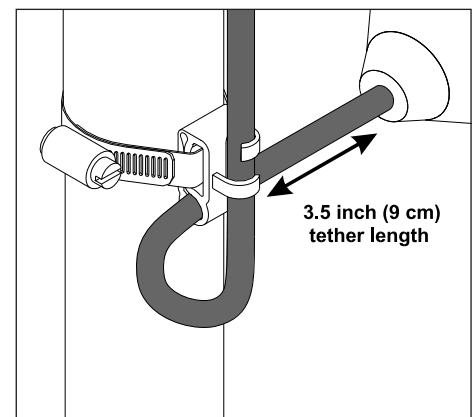
VERIFY CORRECT OPERATION OF CONTROL PANEL AFTER INSTALLATION IS COMPLETE.



**FIGURE 1 - Simplex
Four float system**



**FIGURE 2 - Duplex
Four float system**



**FIGURE 3 -
Mounting Clamp Detail**

PLC Instructions

Setting the PLC Parameters

1. Determine the appropriate settings for the system being operated.
2. Configure the PLC using the keypad, display screen, and programming key.
3. The following parameters must be programmed into the PLC.

Timer Off	Block# 01	T: Sets the off time for the repeat cycle timer. (mm:ss) Factory set to 60 min.
Timer On	Block# 02	T: Sets the on time for the repeat cycle timer. (mm:ss) Factory set to 4 min.
Override Timer Off	Block# 03	T: Sets the off time for the override repeat cycle timer. (mm:ss) Factory set to 30 min.
Override Timer On	Block# 04	T: Sets the on time for the override repeat cycle timer. (mm:ss) Factory set to 4 min.
Spin Filter Flush Valve Timer	Block# 05	T: Sets the on time the spin filter valve will be open before each dose with the pump on. (mm:ss) Factory set to 1 min.
Flush Valve Timer	Block# 06	T: Sets the on time the flush valve will be open at the end of each dose with the pump on. (ss:ss) Factory set to 15 sec.
Flush Valve Drain Timer	Block# 07	T: Sets the on time the flush valve will be open at the end of each dose with the pump off. (mm:ss) Factory set to 1 min.
Flush Counter	Block# 08	Ctn: Sets the number of pump cycles before the PLC will hold the flush valve open during the next dose for each zone present. Factory set to 10.
System Zone Counter	Block# 09	Ctn: Sets the total number of zones in the system. Factory set to 1.

4. If any parameters need to be changed, follow the instructions under **Programming the PLC (General Instructions)**.

Viewing the Monitoring Information

1. To view the monitoring information on the PLC, go to the Set Param portion of the PLC program as described in the PLC General Instructions.
2. The following parameters are for viewing only.

NOTE: Do not adjust any of these settings.

Alarm Counter	Block# 10	Cnt: Shows the total number of times the alarm has been triggered.
Override Counter	Block# 11	Cnt: Shows the total number of times the override float has closed.
Power Fail Counter	Block# 12	Cnt: Shows the total number of times the power has been disconnected to the panel.
Pump 1 Cycle Counter	Block# 13	Cnt: Shows the total number of pump on/off cycles.
Pump 2 Cycle Counter	Block# 14	Cnt: Shows the total number of pump on/off cycles.
Pump 1 Elapsed Time Meter	Block# 15	Cnt: Shows the total run time for the pump in minutes.
Pump 2 Elapsed Time Meter	Block# 16	Cnt: Shows the total run time for the pump in minutes.

3. All monitoring parameters have the Lim setting set to 999,999. This setting is used to reset the counters when the counter has reached the maximum number of counts.

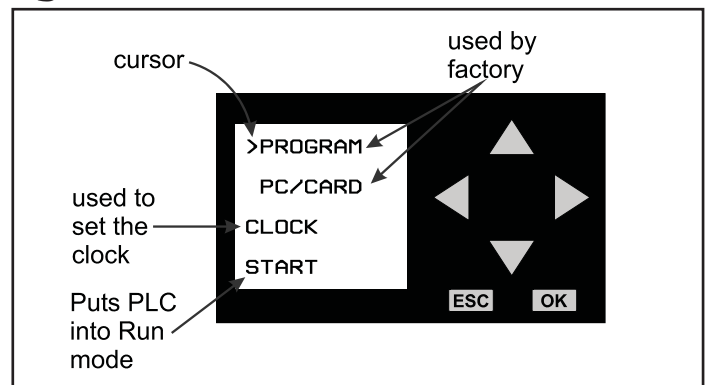
NOTE: Do not change these settings.

Programming the PLC (General Instructions)

1. Power must be applied to the control circuit and all floats installed according to the installation instructions.
2. If any parameter must be changed, refer to the following instructions:

NOTE: PLC must be in Run mode for automatic system operation. If the PLC is not in Run mode, the PLC will appear as shown in **Figure C**.

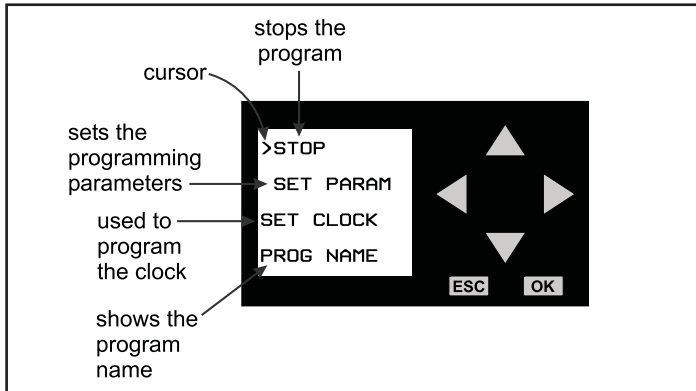
Figure c



PLC Instructions

- Using the up and down keys, navigate through the screens by moving the cursor. Move the cursor down to "Start" and press OK. The clock will be displayed.
- If the parameters must be changed, press the ESC key. The PLC will then show the screen shown in **Figure D**.

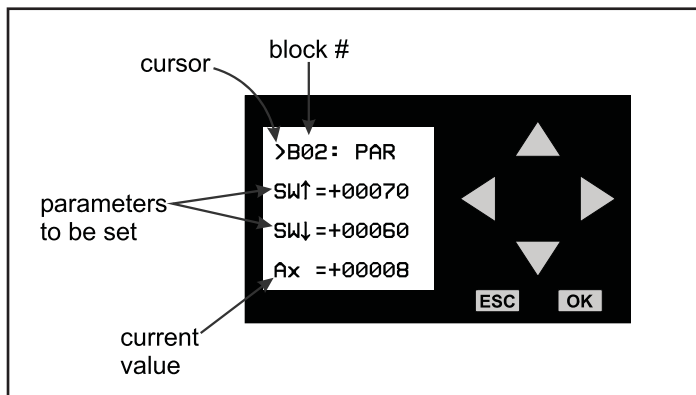
Figure D



Select "Set Param" using the up and down arrow keys. Press OK.

Once in the Set Parameters mode a screen similar to **Figure E** will appear.

Figure E



To change the block #, move the cursor to the current block # and use the up/down arrow keys to select the desired block #. Once the correct block # is shown, press OK.

The cursor will move to the parameters that can be changed. Use the right/left arrow keys to move the cursor to the digit to be changed. Use the up/down arrow keys to change the number.

To change the next parameter, press the right arrow key until the cursor moves to the appropriate location. Once the parameters are changed, press OK.

Use the up/down arrow key to return to the block #. If needed, choose another block number and follow the same instructions to change the parameters.

Once all parameters are set to the desired values, press ESC. The screen shown in Figure D will reappear.

To set the clock (if required), move the cursor to "Set Clock" Use the up/down and left/right arrow keys to change the time. Press ESC to exit the "Set Clock" mode.

When finished setting the parameters, press ESC to return to the normal operating screen. The clock will be displayed.

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

Warranty void if panel is modified.

Operations

The Subsurface Drip control panel is designed to control one single-phase pump (simplex) or two single-phase pumps (duplex), and two valves. The installer can program a PLC to contain all the timer settings and monitoring information for the system. These changes are made with the touch pad and screen displays on the PLC.

Float Switches

Four float switches are used to monitor the water height in the tank. The water height will determine what function the control panel will perform.

PLC/Control

The control panel contains a PLC used for all the timing sequences required. Motor contactors are used for pump operation. Circuit breakers are provided for the pump circuits and fuses for the control and valve circuits.

High Level Alarm Float

This float activates the alarm audible and visual alarm when lifted. The audible alarm may be silenced with the external test/normal/silence switch. This switch will also test the audible and visual alarm.

Override Float

This float activates the override repeat cycle timer. The timer will cycle the pump at a faster rate. This timer will start in the off mode. A complete dose will occur when the on time is activated even if the float drops.

Timer On Float

This float activates the repeat cycle timer. The timer will control pump cycles beginning in the off mode.

Low Level Float

This float turns off the pump(s) when lowered. The float will override all timers to insure the pump will not run when the water level drops below the float. The audio/visual alarm will also be activated.

Pump & Valve Operation:

The pump dosing cycles will be controlled by the timers. During high flow conditions, the pump(s) will be controlled by the override timer.

When the timers call for a dose, the following operation will occur:

1. The pump will turn on and the spin filter valve will be activated for the programmed time.
2. The spin filter valve will then close and the pump will continue to run for the timer on or the override timer on time.
3. The pump will continue to run and the flush valve will be activated for the programmed time.
4. The pump will then be turned off and the flush valve will remain on for the programmed drain time.
5. The flush valve will then close for the programmed off time.

After the programmed number of pump cycles, the flush valve will remain activated during a dose on time for each zone. This will occur until each zone has been fully flushed.

Manual Operation

Internal to the panel there are valve and pump Hand/Off/Auto (HOA) switches for manual control of these devices.

- (H) - manually runs the device
- (O) - turns the device off.
- (A) - sets the device to Auto Mode for PLC control.

Duplex Models Only:

Pump Operation

The pumps in a duplex system will be alternated at each dose. Only one pump will run at a time.

NOTE: When both pumps are placed in the Off mode, they must be reset by first placing them in the Hand mode before placing them in the Auto mode.

SJE-Rhombus® Five-Year Limited Warranty

SJE-RHOMBUS® warrants to the original consumer that this product shall be free of manufacturing defects for five 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.

NOTES: _____

NOTICE!

Products returned must be cleaned, sanitized, or decontaminated as necessary prior to shipment to ensure that employees will not be exposed to health hazards in handling said material. All applicable laws and regulations shall apply.