



MVP CONTROL PANEL

Operation and Troubleshooting

Objectives

- Overview
- Basic Installation Recommendations
- Identify key components
- Understand the logic controller functions
- Navigate to and modify parameters
- Basic troubleshooting
- Advanced troubleshooting

Overview

MVP panels...

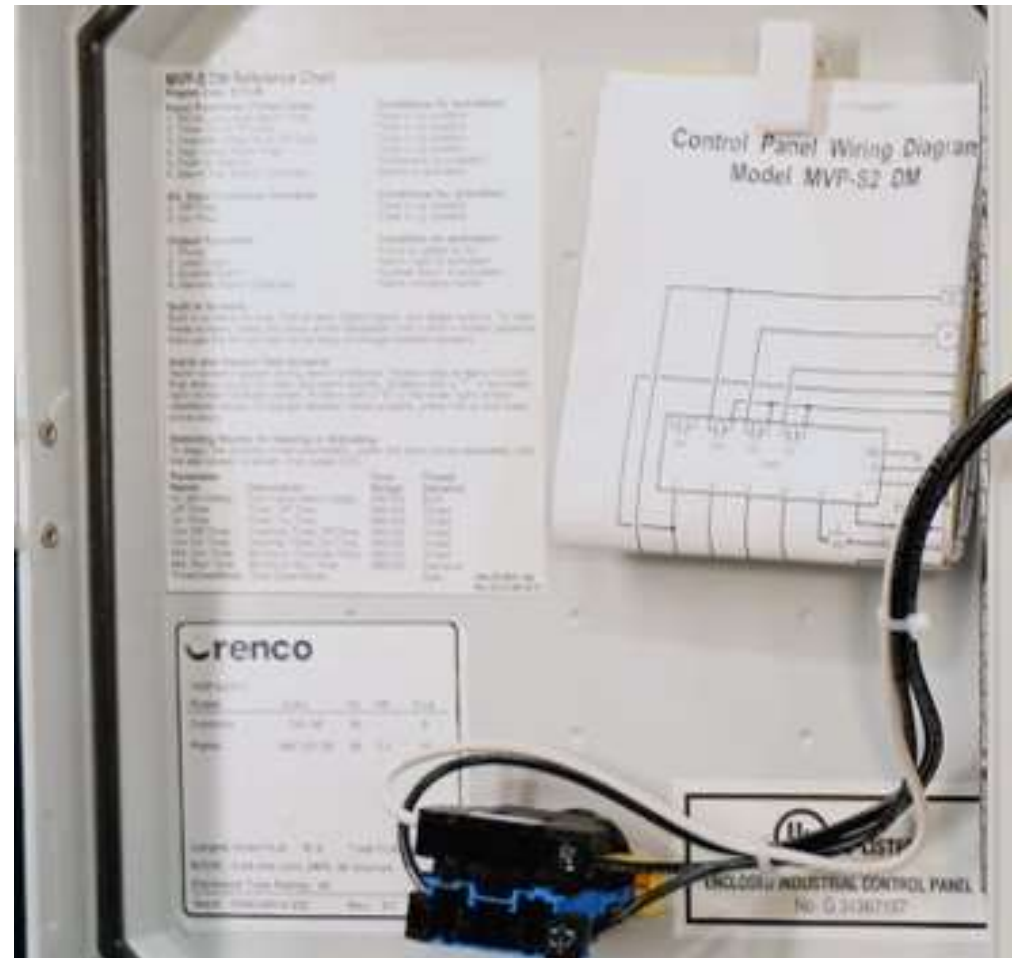
- Use a logic controller
- Can operate in either timed or demand dosed mode†
- Make troubleshooting easier
- Can be used in either 110V or 220V applications*

† DM panel models

* 220V panel models

Panel Information

- Panel wiring diagrams
- Panel model number
- UL number
- Electrical specifications
- Reference chart



Important Reminder

When working with control panels, or any electrical device, take all necessary precautions to avoid or mitigate electric shock.

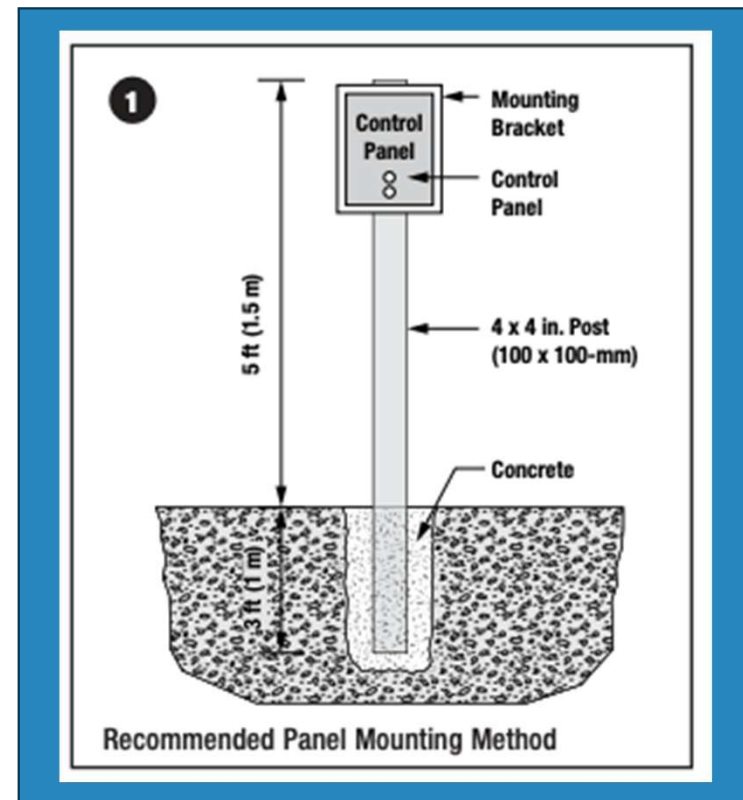
While panel components are designed to be “touch-safe”, be mindful and take appropriate precautions when working around electricity.

Wear proper protective gear

- Use appropriate tools
- Ensure circuit breakers are turned off when working with wiring

Panel Placement

Installation details can be found in document EIN-CP-GEN-1



Breaker Sizing

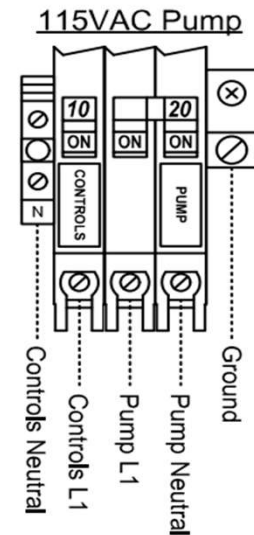
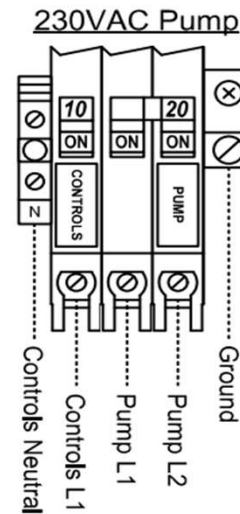
- Size breakers in the house based on local regulations
- General sizing guidelines are to size the breaker upstream to the size in the panel



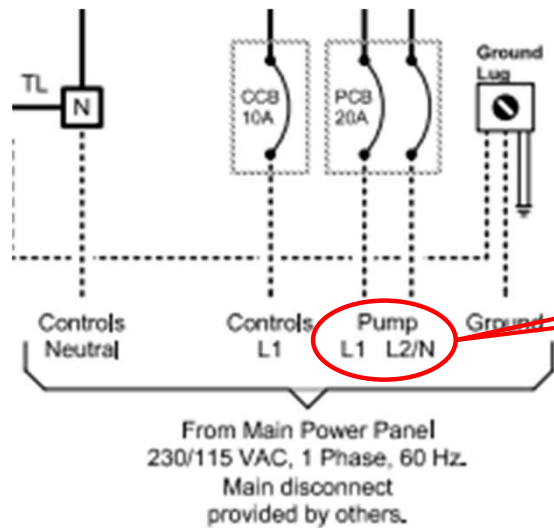
Main Supply Power Wiring

- 230V or 115V Options
- Match to pump voltage
- One Circuit or 2 circuits

Power Wiring Options

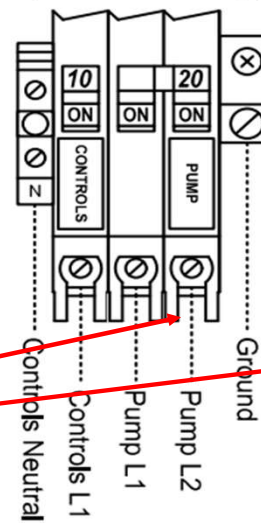


Control Power Termination

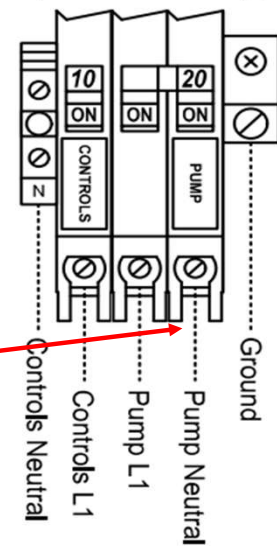


Power Wiring Options

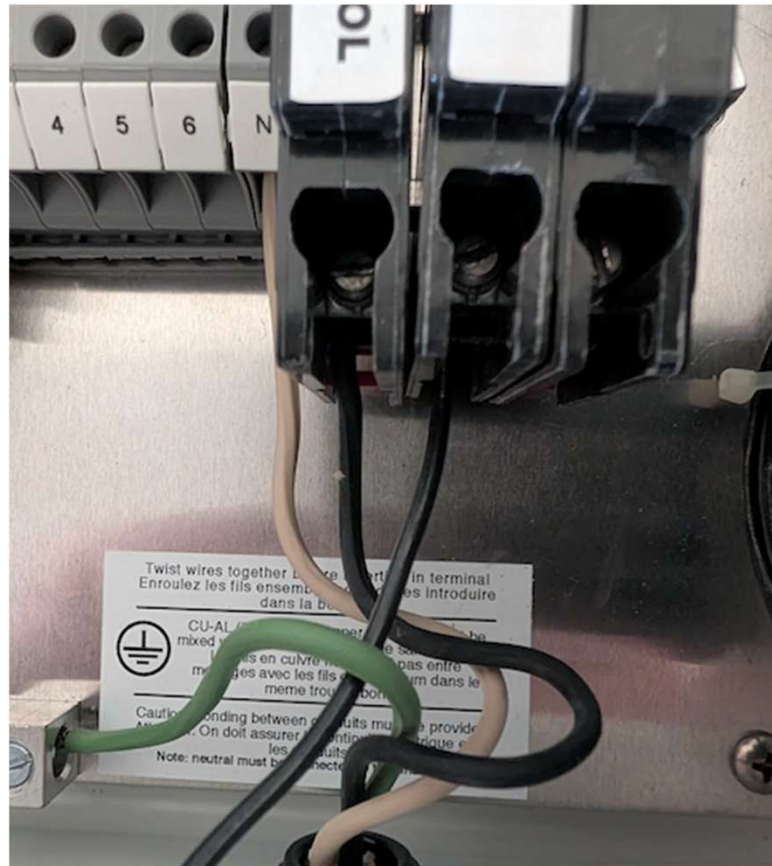
230VAC Pump



115VAC Pump



What's Missing?



Wire Sizing

Cable Selection Chart - Copper Cable Size - FWA

Pump Model Number	Horse-power	Actual Voltage	Power Factor (pf)	SFA Max. Amps	14 gauge	12 gauge	10 gauge	8 gauge
					Z_0^{**} $R = 3.1, X_L = 0.058$	Z_0^{**} $R = 2, X_L = 0.054$	Z_0^{**} $R = 1.2, X_L = 0.050$	Z_0^{**} $R = 0.78, X_L = 0.052$
100511	½	120	0.73	12.7	62	95	156	234
100512	½	240	0.73	6.3	248	382	628	945
100712	¾	240	0.74	8.3	186	286	471	709
101012	1	240	0.74	9.8	157	242	399	600
101512	1½	240	0.80	13.1	109	168	278	419

Reference NCH-PU-PU-3 for Specific sizing guidelines

Wiring Sizing

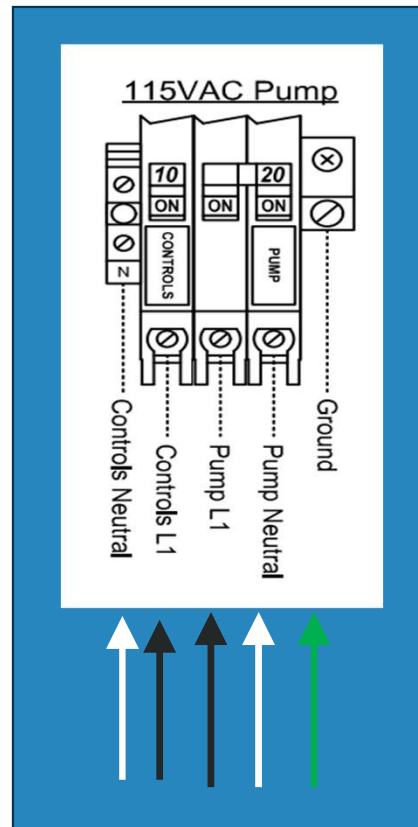
- Reference EIN-CP-GEN-1 for General sizing guidelines

Pump voltage, VAC	Motor size, hp (kW)	Breaker size, amp	Wire size, AWG (mm ²)	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)

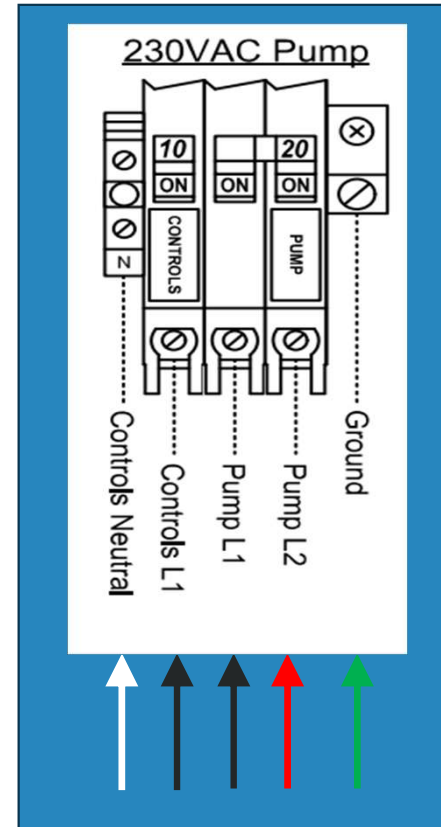
* Maximum distance from the sub-panel to the pump motor for the recommended wire size, based on a 3% maximum voltage drop from the sub-panel to load at the maximum recognized pump motor amps, and at 167° F (75° C).

115V or 230V?

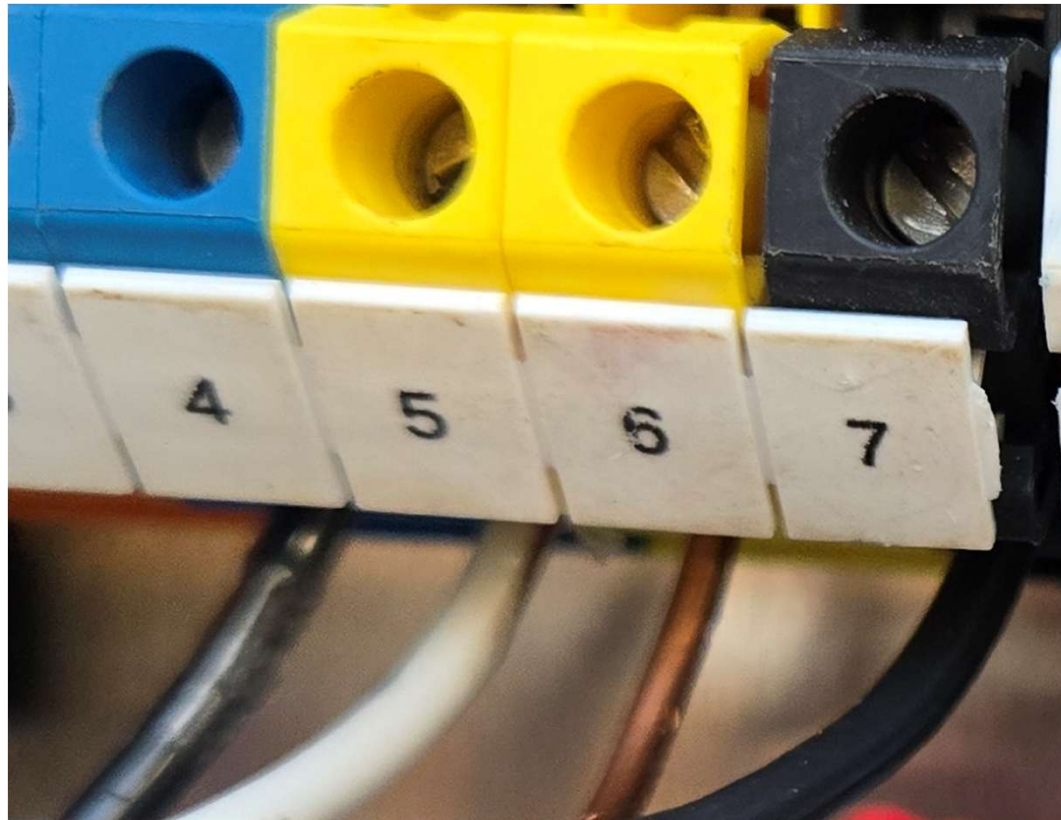
115V



230V



Verify Wiring to Splice Box



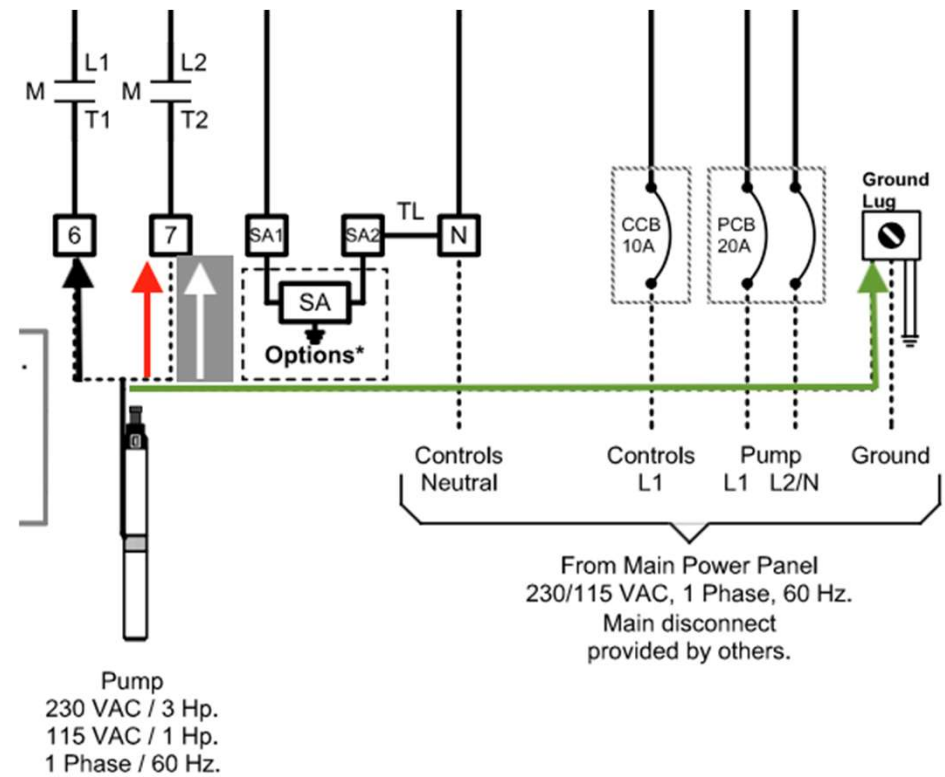
Verify Wiring to Splice Box

- There will be 2 #5 terminals, make sure there is a link between them



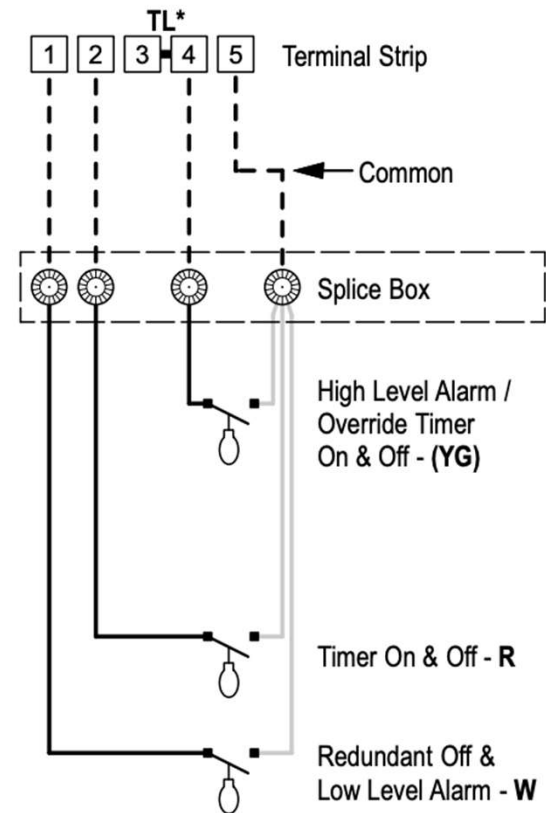
Pump Wiring

- Black leg goes to 6
- Red or white leg goes to 7
- Ground wire goes to ground lug



Timed Dose Float Wiring

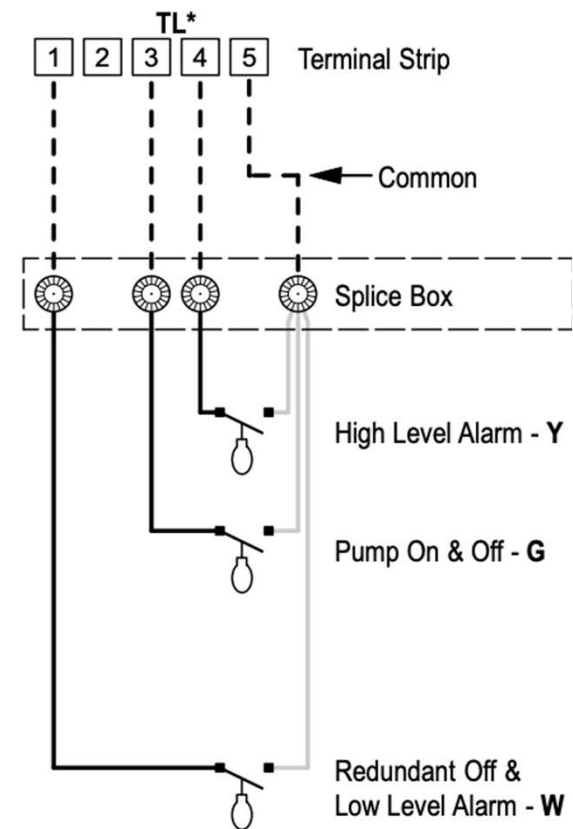
- Run 7 conductors to splice box
 - 4 float wires
 - 2 pump wires
 - 1 Pump Ground
- All Normally Open floats
- Use 4 floats or keep terminal link for Override Timer



Demand Dose Float Wiring

- Run 7 conductors to splice box
 - 4 float wires
 - 2 pump wires
 - 1 Pump Ground
- Remove Terminal Link from 3-4
- Change timed dose mode to “Off”

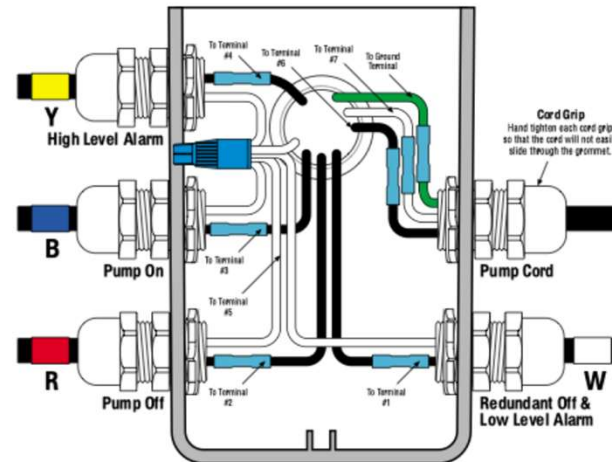
**Note: Minimum run time setting will start after off float drops.*



Splice Box



Splice Box Wiring Diagram



Key

- Black Wire
- White Wire
- Green Wire
- Waterproof Wire Nut
- Heat Shrink & Butt Connector *

* Refer to drawing EN-SB-SB-1 for splicing instructions.

Float Tag Colors

Y - Yellow

P - Purple

B - Blue

G - Green

R - Red

O - Orange

E - Grey

W - White

Note: Multi-function floats will have more than one marker

Attention: Failure to follow splicing instructions will void warranty

Control Panel Series

S R0

Float Function Color Code

YBRW

Splice Box Model

SB5

Drawing No.

EDW-SB-S-12



814 AIRWAY AVENUE
SUTHERLIN, OREGON
97479-9012

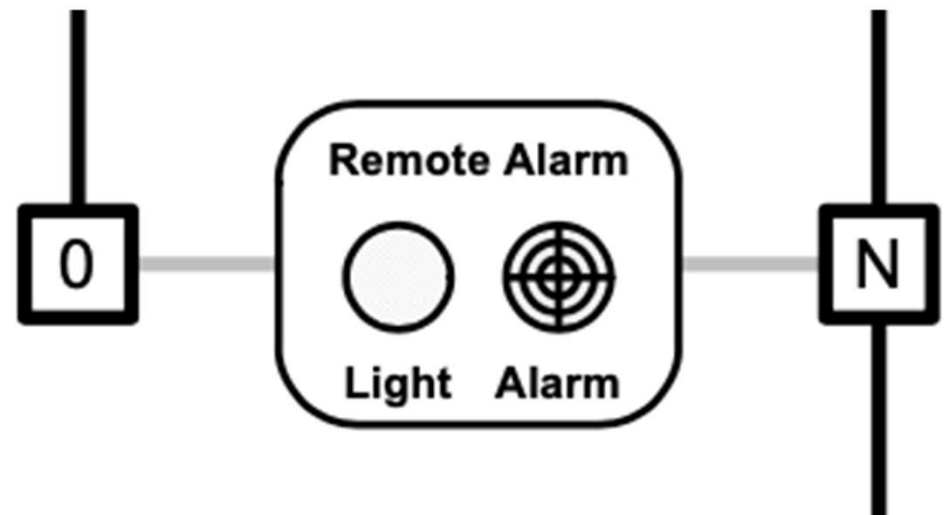
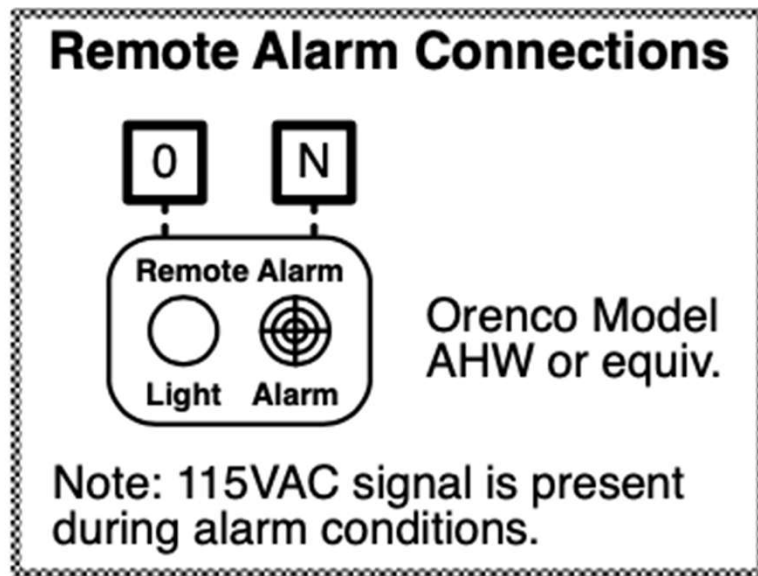
TELEPHONE:
(541) 459-4449

FACSIMILE:
(541) 459-2884

EDW-SB-S-12
Rev 1.2 09/08/08

Wiring Remote Alarm

Check wiring diagram for terminals



Key Components

- Terminal Blocks & Alarm
- Motor Contactor
- Circuit Breakers
- Hand-Off-Auto Switch
- Siemens LOGO! Logic Controller



Logic Controller Functions

- Visual Indicators of Input & Output
- Timers for Pump & Float Operations
- Run-time, Alarm & Cycle Counters

Important Screens to Know



Key Screens

Float Status

- 1 = Bottom Float
- 4 = Top Float
-

Timed Dose Mode

- On = Timer Controlled
- Off = Float Controlled (On Demand)



Key Screens

Date & Time

- Not Necessary for Functionality
- Left – Right Arrows to Scroll to Additional Screens
- ESC – Access menu screen to edit program values



Key Screens



I: = Input

- Reverse Highlighted Box Indicates Input "on"
- Same Data as Float Status Screen



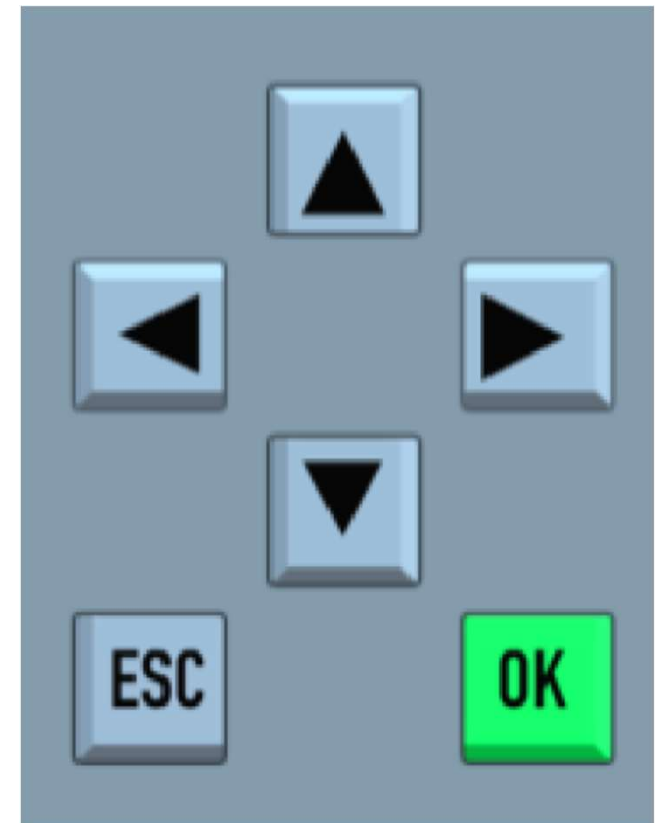
Q: = Output

- Same Format
- Pump, Alarm Light, Audible Alarm

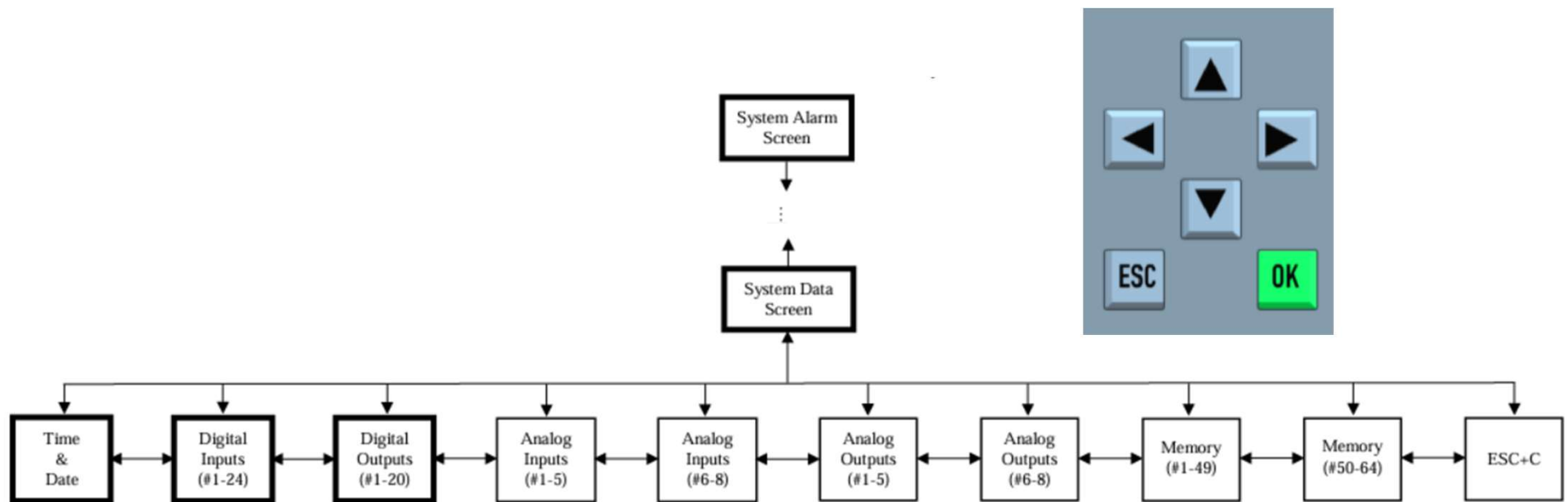
Screen Navigation

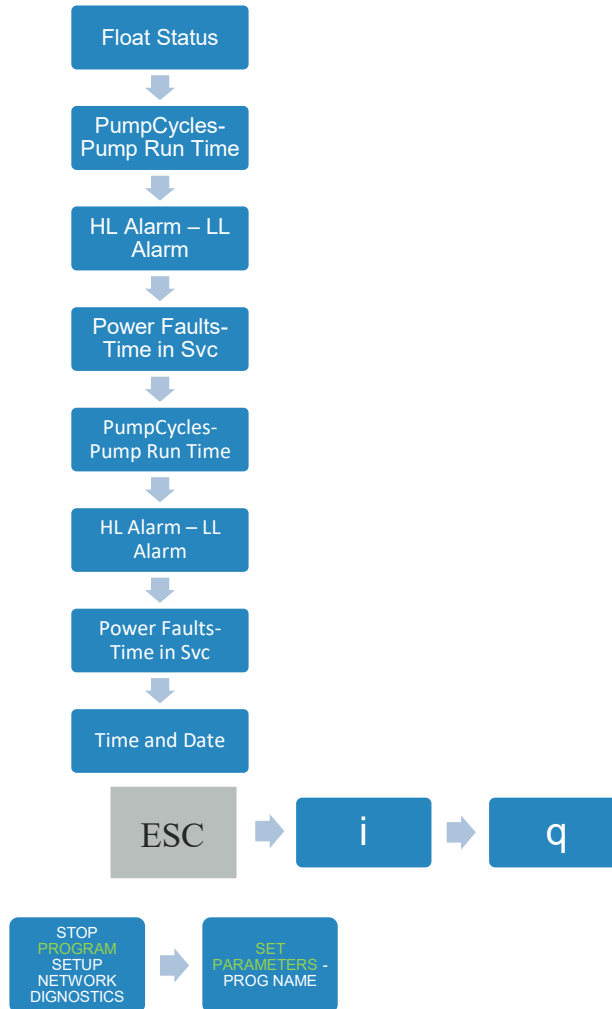
Navigating the Screens Button Functions

- “OK” key
- “ESC” key
- ▲ / ▼ keys
- ◀ / ▶ keys



Screen Navigation Tree





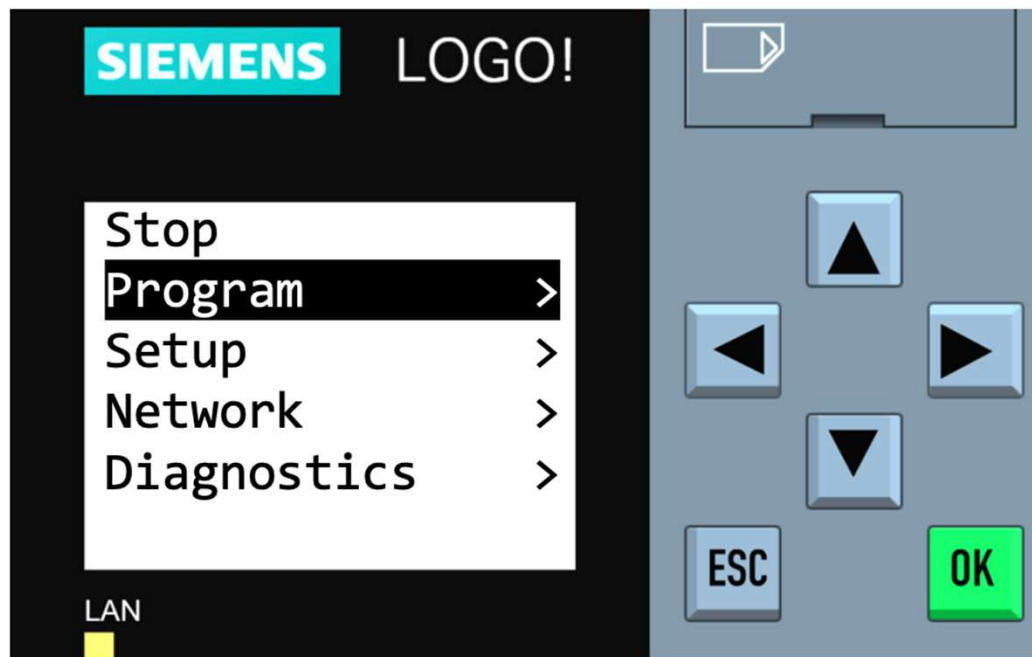
Changing Parameters

Navigating the Screens

- Start at the Float status screen.
- Push the  key repeatedly until you get to the Date and Time screen.
- Press the ESC key.

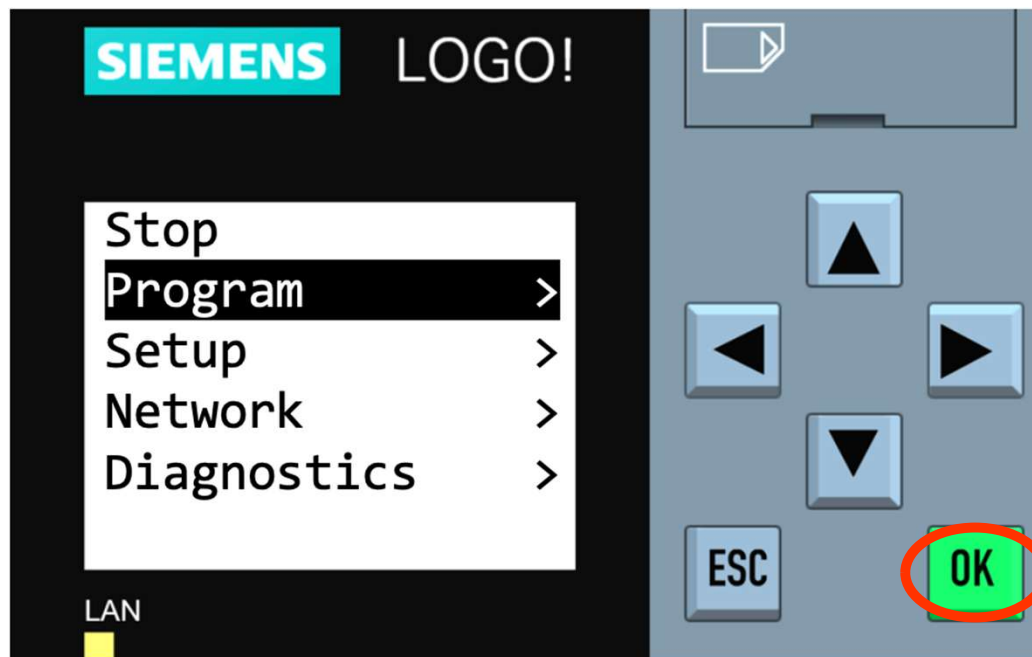


Changing Parameters



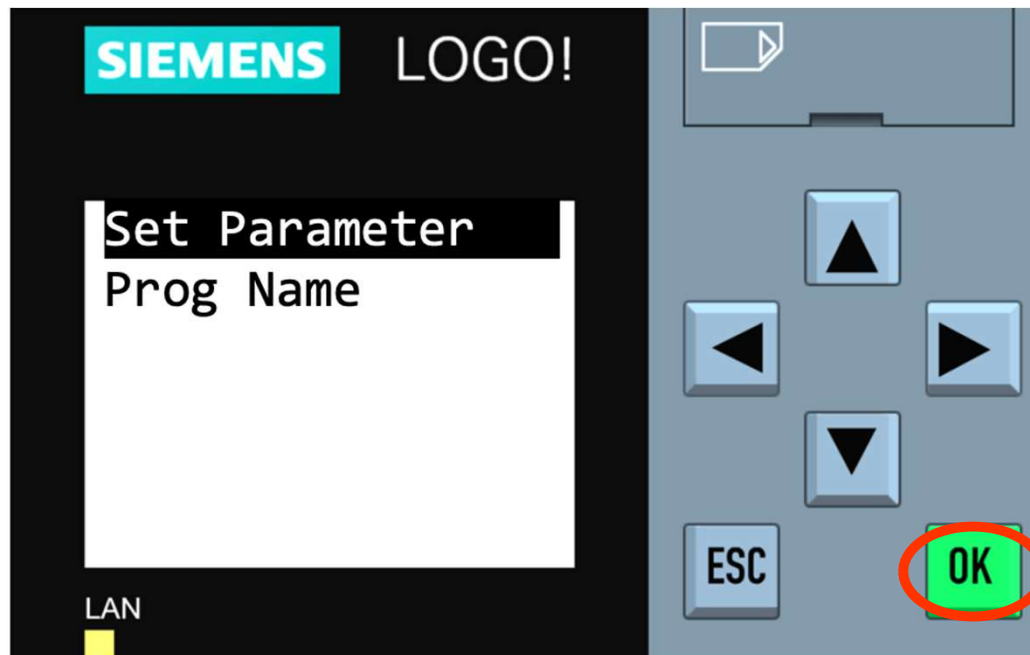
IMPORTANT: Do not choose the Stop option. Selecting STOP will cause you to erase the programming and disable the panel functions and operation.

Changing Parameters



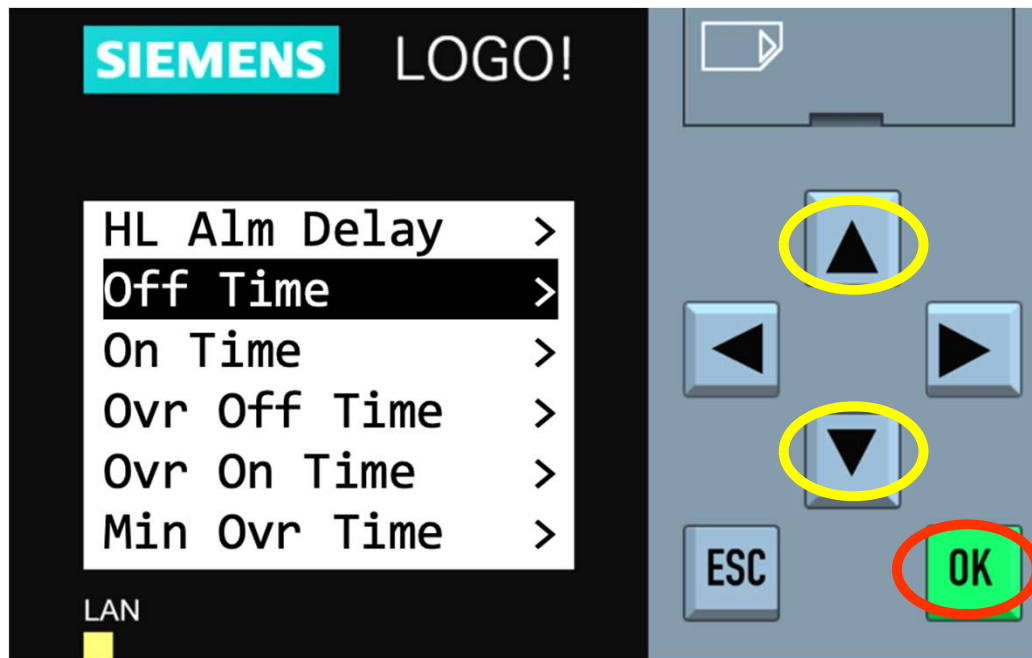
To proceed to the next screen, push the OK key

Changing Parameters



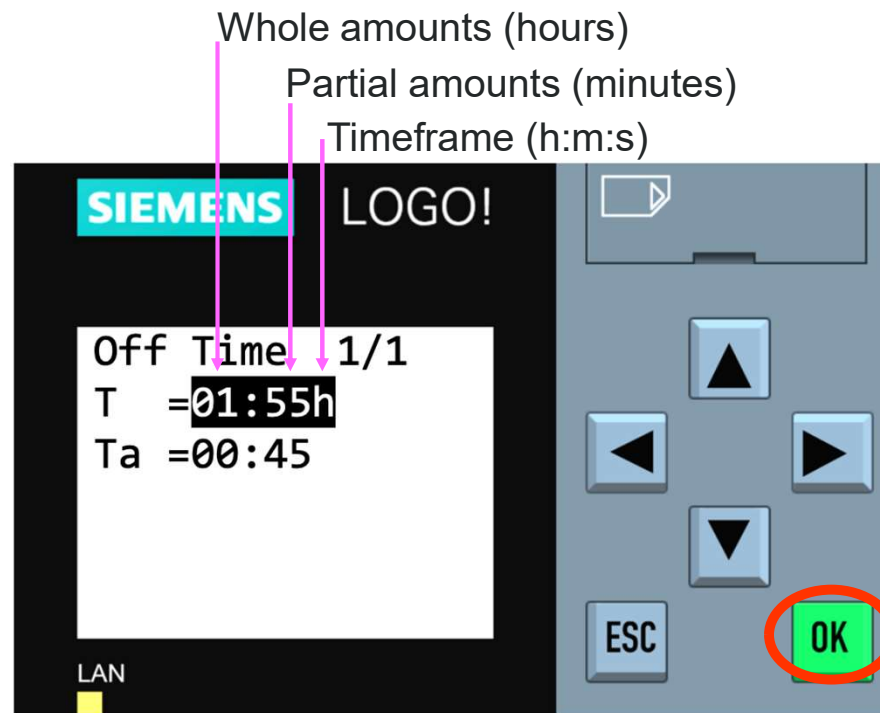
Press the OK key once more to get to the list of parameters.

Changing Parameters



In the parameters screen, use the  /  keys to scroll through the list. Press the OK key to choose the highlighted parameter.

Adjusting the Off Time



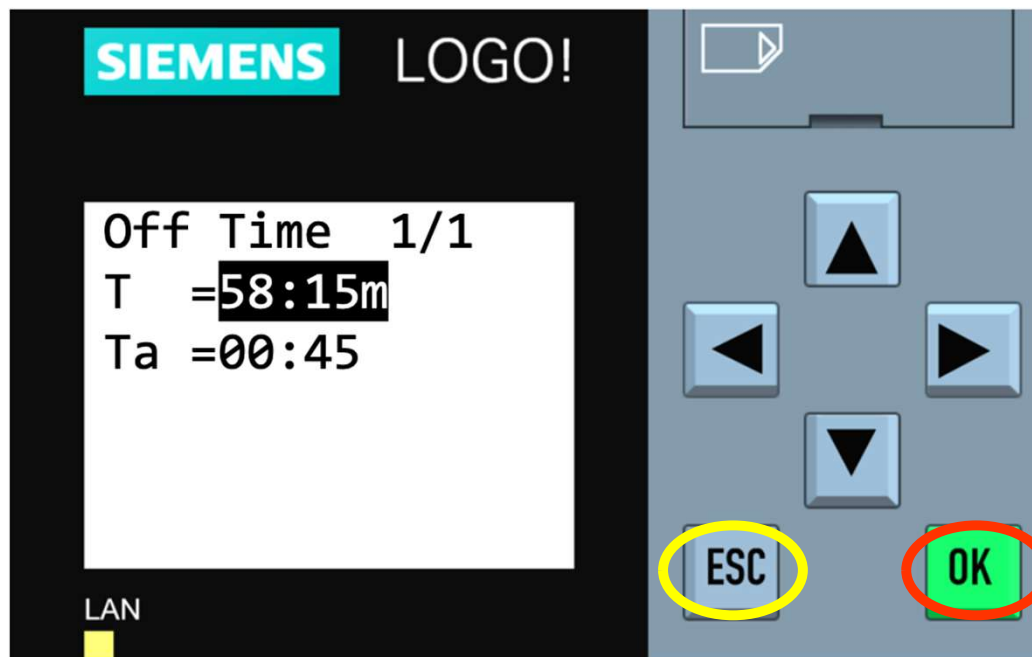
The “T” line should be highlighted. Press the “OK” key to change the parameter.

Changing the Time Denomination



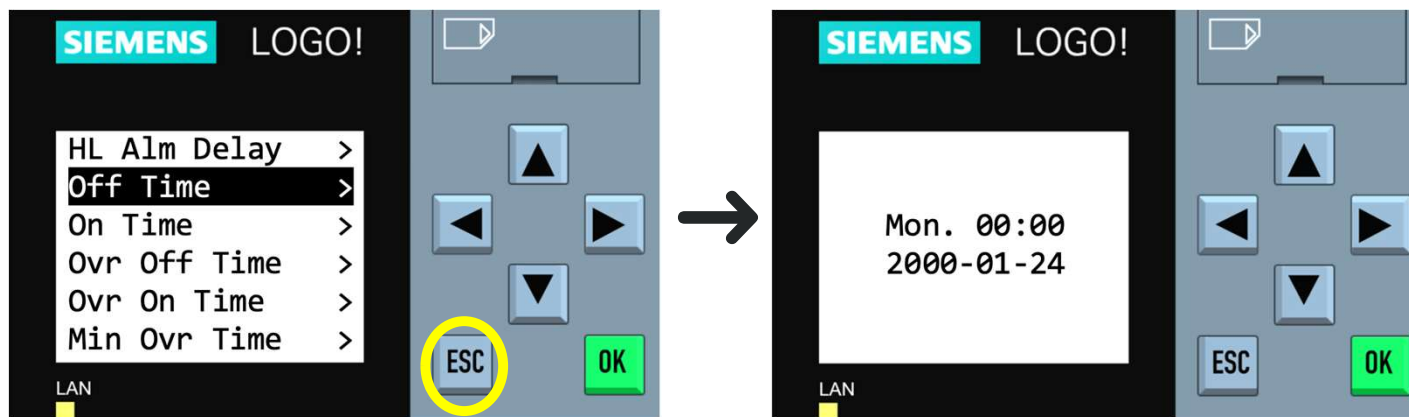
Press ◀ / ▶ to change the position of the blinking cursor and press ▲ / ▼ to change the value in that position.

Confirm and Save Changes



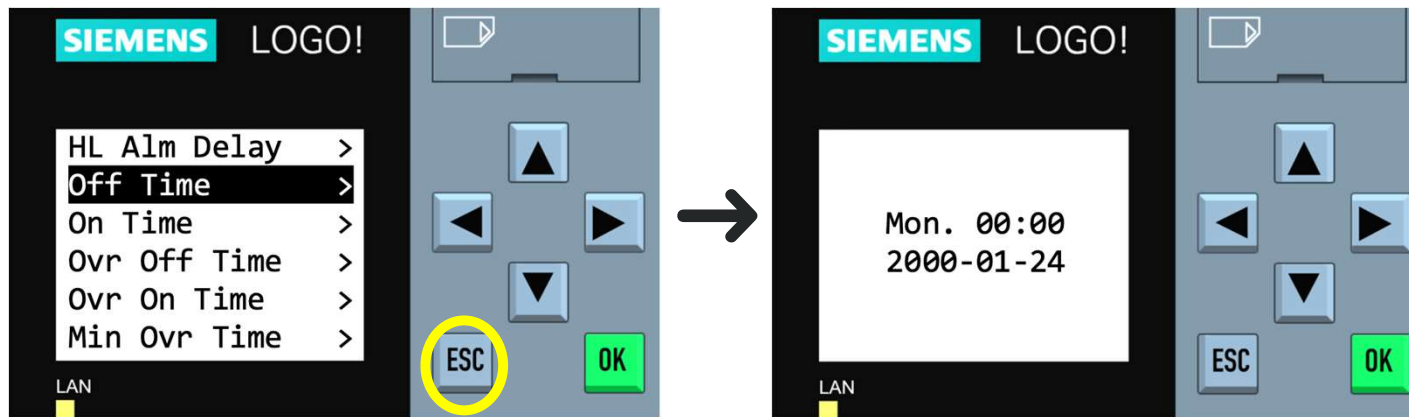
Input the desired value, press the OK key to set it. Then press the ESC key to return to the list of parameters.

Navigate Back to Time & Date Screen



Repeat this process for all parameters needing to be changed. When finished, push the ESC key repeatedly to return to the Date and Time screen.

Changing Dose Mode



Demand Mode:

▼ to the Time Dose Parameter. "Ok" changes screen to "Time Dose Mode Switch = ON"

Push "Ok", On will be highlighted. Toggle ▲ / ▼ to change. Select "Ok" to save. Press "ESC" to return to the Time/Date Screen

Critical Logic Settings Do's and Don'ts

- Do not set timer to 00:00 S/M/H
- Set normal On and Off timers
- Set Timer Override On and Off timers
- Set Time Dose Mode appropriately
- Minimum pump run time applies after Off Float drops.
- The off timer runs first
- Alarm delay creates an alarm activation delay

Basic Troubleshooting

Alarms

- The light on the front of the panel door is on.
 - Solid: High-level alarm
 - Blinking: Low-level alarm
- The Push-to-Silence button quiets the alarm.
- Verify float status on the LOGO! unit

Basic Troubleshooting High-Level Alarm

- Check liquid level in tank
- Does the pump run in *Manual*?
- Check pump circuit breakers
- Check *Pump Circuit*
- Check float signal
- Check timer mode

Basic Troubleshooting Low-Level Alarms

- Check Liquid Level
- Check float signal
- Is HOA switch set to Manual?
- Check timer mode

Basic Troubleshooting Bad Floats

- Verify float operation in Float Status screen
- If the indicator is not highlighted, check for:
 - Loose wires/connections in the splice box or terminal block
 - Check power at the float connection

Data Logs Totalized v. Resettable

- Screens with "T" = Totalized Values
- Screens with "R" = Resettable Values
 - Accumulated values from last reset
 - Hold Silence Button for 10 seconds to reset
 - Operating instructions identify resettable screens

Blank LOGO! Screen

1. Confirm supply breaker is on
2. Confirm power control breaker is on and transferring power
3. Verify jumper connects SA2 to N
4. Check voltage between L1 to N on the LOGO



Pump Not Running

1. Is the system in time dose or demand dose
2. Verify if Hand-Off-Auto switch will manually run the pump
3. Verify RO float is up and signaling the LOGO



Floats Not Registering

1. Use the I: (input screen) to check for float signal
2. Use a jumper wire to simulate floats
3. Use jumper wire on LOGO to eliminate panel wiring.



Advanced Troubleshooting

Contactor Coil Circuit Work in Manual?

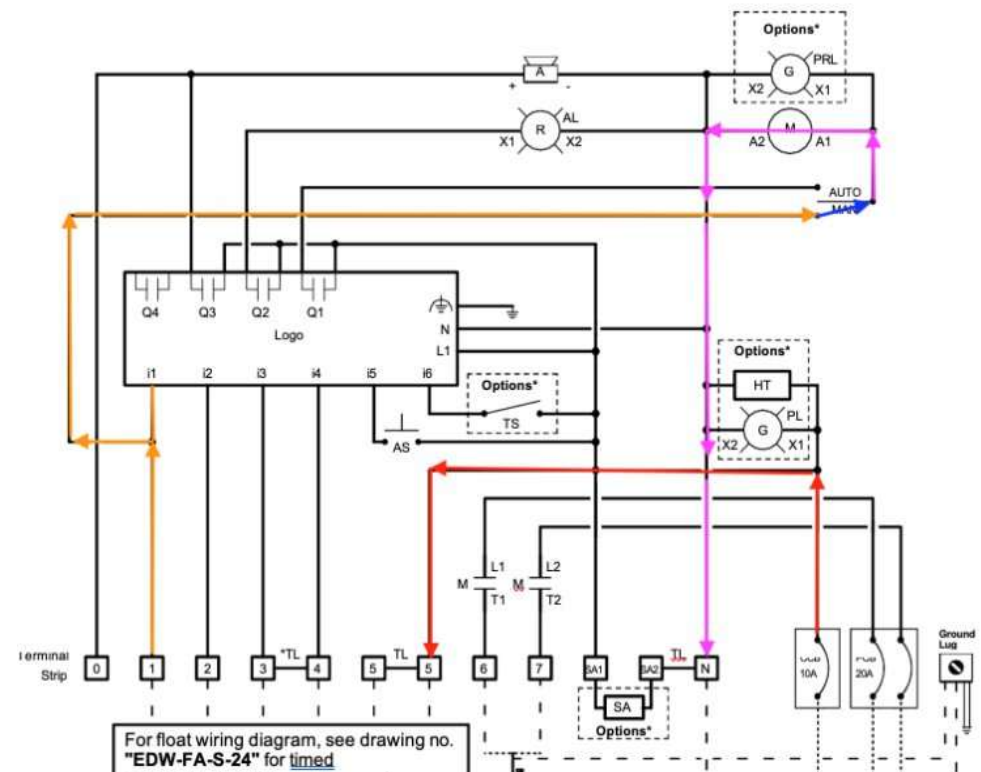
- No
 - Contactor Coil Circuit
- Yes - and pump does not run
 - Pump Power Circuit
- Yes – and Pump Does not run in Auto
 - Digital Inputs
 - Program Settings/Logic
 - Outputs

Contactor Coil Circuit

In Manual:

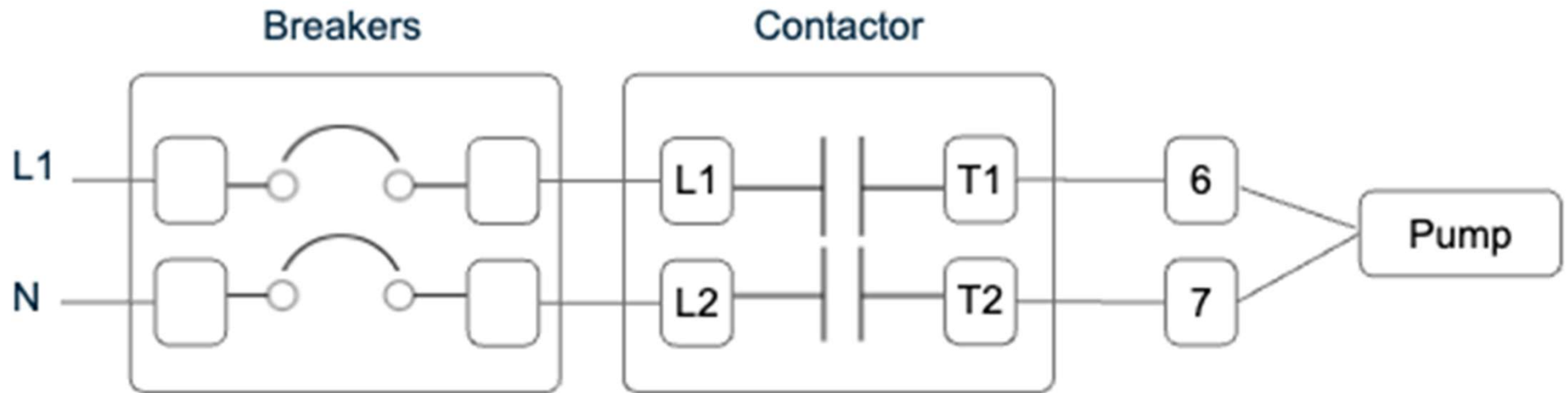
- 1) voltage at the breakers to N
- 2) voltage at N to ground
- 3) Voltage at Terminal 5 to N
- 4) Voltage at Terminal 1 to N
- 5) HOA (top and Middle) pin to N
- 6) Motor contactor A1 to N
- 7) L1 at breaker to A2

All Should be 120 Volts



Voltage on Terminal #1 provides source voltage for the coil

Pump Power Circuit



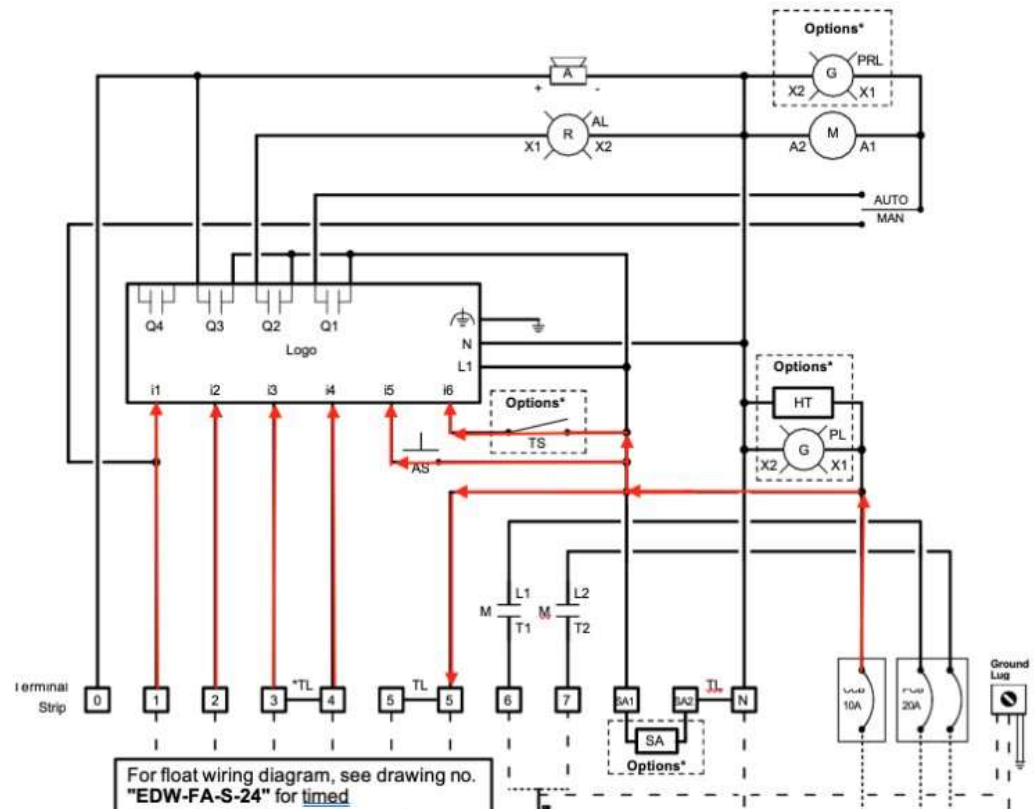
Pump Power Circuit Testing

- Place in manual
- Contactor need to be engaged
- Measure voltages
 - Pump connection
 - Contactor
 - Breakers



Control Inputs

- I1 - Audible Alarm Circuit – Low Level Alarm (LLA)
- I2 - Timer On/Off Circuit
- I3 - Timer/Override Timer On/Off Circuit
- I4 - Audible Alarm Circuit – High Level Alarm (HLA)
- I5 – Push to Silence



Check for voltage from the breaker to the LOGO

Input Testing

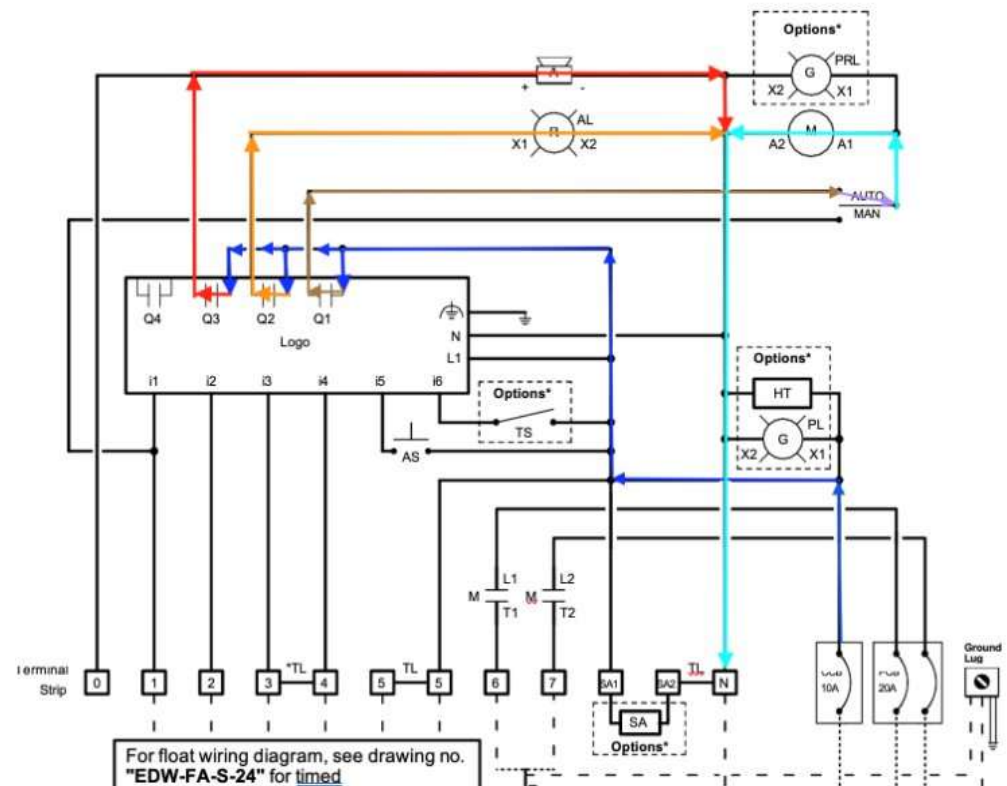
- I1 - Audible Alarm Circuit – Low Level Alarm (LLA)
- I2 - Timer On/Off Circuit
- I3 - Timer/Override Timer On/Off Circuit
- I4 - Audible Alarm Circuit – High Level Alarm(HLA)
- I5 – Push to Silence

Program Settings Logic

- Refer to operation instructions
- Check timer settings
 - Cannot be 00:00 S/M/H
 - It can be difficult to see which timer set you are running in
 - If it does not change, adjust the other
- Verify time dose mode
- Minimum pump run time applies after Off Float drops.
- The off timer runs first

Control Outputs

- Q1 – Pump On/Off
- Q2 – Alarm Light On/Off
- Q3 – Audible Alarm On/Off



Testing

- Q1 – Pump On/Off
 - Shorten off time by adjusting timer units
- Q2 – Alarm Light On/Off
 - Initiate alarm
- Q3 – Audible Alarm On/Off
 - Initiate alarm, then push the “Push to Silence” on the panel door.

Questions?