

SC100

INSTRUCTION MANUAL



MOTOR PROTECTION ELECTRONICS

2464 Vulcan Road
Apopka, Florida 32703

Phone: (407) 299-3825
Website: www.mpelectronics.com

STATION CONTROLLER SC100

APPLICATIONS

- Simplex or Duplex Liquid Level Control
- Pump Down (Empty a Tank) or Pump Up (Fill a Tank)

STANDARD FEATURES

- 4 Digit, 7 Segment LED Level Display with Selectable Decimal Point Position
- All Setup Parameters Values may be viewed or changed from the front of the unit
- Level Input Source: Analog Level Input (4-20 mA from Pressure Transducer)
- Level Input Zero and Span Calibration Parameters for Field Calibration
- Provides +24VDC Power for Analog Level Input
- Two Pump Call Relay Outputs with Status Indication
- High and Low Level Alarm Relay Outputs with Status Indication
- 10 Second Power Up Delay (the first pump call is delayed by 10 seconds after a power interruption)
- Adjustable Lag Pump Delay for Pump Call Output
- Automatic Pump Alternation or Fixed Sequence: 1 - 2 or 2 - 1
- Level Simulation (Automatically ends after 60 seconds)
- Level Input Signal Conditioning Parameter (May be used to dampen out fluctuations in the Level Input Signal)
- Stores all Setup Parameter values in EEPROM (Does not require a backup battery)

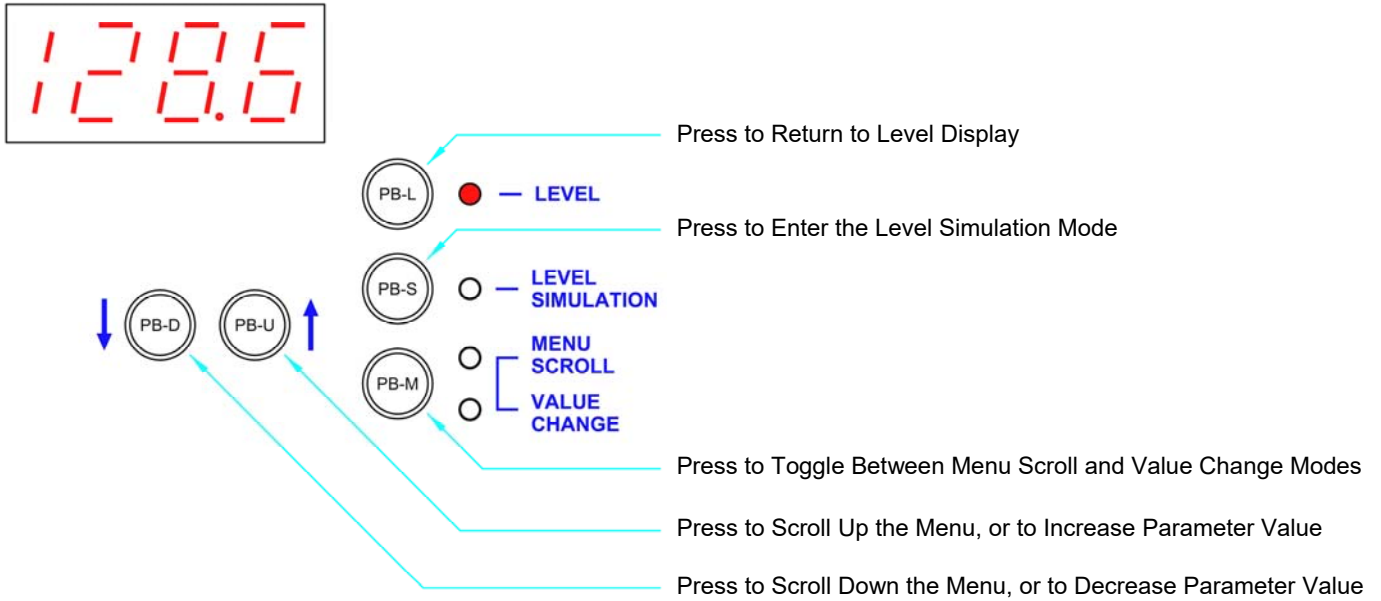
SPECIFICATIONS

- Supply Power: 120 VAC \pm 10%, 7.8 VA max
- Enclosure Dimensions: 6.10" x 7.70" x 2.78" (H x W x D)
- Enclosure Material: Aluminum
- Faceplate Color: White with Blue Lettering
- Agency Approval: UL 508, CAN/CSA UL FILE #: E101681
- Ambient Operating Temperature: -20°C to +65°C (-4°F to +149°F)
- Storage Temperature: -45°C to +85°C (-49°F to +185°F)
- 4 Digit, 7 Segment LED Display Range: 0 - 2310 (Selectable Decimal Point Position)
- Indicators: Red LED
- Relay Outputs: 10A Resistive @ 120 VAC
3.6A Inductive @ 120 VAC
- Analog Level Input: 4-20 mA, 147 Ω Load, Transient Protected
- Power for Analog Level Input: 24 VDC, Overload and Transient Protected

ORDERING INFORMATION

Part Number: SC100

OPERATOR INTERFACE FUNCTIONS



Note: To Prevent the Accidental Changing of a Parameter Value, there is a 4 second Delay Before a Parameter Value will Change.

(The PB-D or PB-U Push-Button must be Held Down for the Entire 4 second Delay.)

How to View a Setup Parameter Value

1. Press push-button PB-M until the Menu Scroll Mode indicator comes on.
2. Press push-button PB-D or PB-U as needed to arrive at the Parameter you wish to view.
3. Press push-button PB-M until the Value Change Mode indicator comes on.
4. The current value of the Parameter may then be viewed on the display.

How to Change a Setup Parameter Value

1. Press push-button PB-M until the Menu Scroll Mode indicator comes on.
2. Press push-button PB-D or PB-U as needed to arrive at the Parameter you wish to change.
3. Press push-button PB-M until the Value Change Mode indicator comes on.
4. The current value of the Parameter may then be viewed on the display.
5. Press and hold for 4 seconds, either push-button PB-D or PB-U, to change the Parameter to the desired new value.
6. Press push-button PB-M or PB-L to exit the Value Change Mode.

How to Simulate Levels

1. Press push-button PB-S.
Note: The Simulation starts from the actual level displayed prior to entering the Level Simulation mode.
2. Press push-button PB-D or PB-U as needed to change the simulated level.
3. To end the level simulation press push-button PB-L.
Note: If you do not exit the Level Simulation mode, normal operation will resume automatically 60 seconds after the last time the PB-U, PB-D, or PB-S push-buttons were pressed.

MENU - SYSTEM SETUP

Parameter	Default Value	Current Value	Setting Definitions
LoAL	2.0 feet		Low Level Alarm Range: 0.1 - 231.0
PoFF	3.0 feet		Pump Off Level Range: 0.2 - 231.0
1 Pon	6.0 feet		1st Pump On Level Range: 0.2 - 231.0
2 Pon	7.0 feet		2nd Pump On Level Range: 0.2 - 231.0
HIAL	10.0 feet		High Level Alarm Range: 0.5 - 231.0
			Note: Decimal Point Position for above Parameters is set by Parameter P - 21.
LAGd	5 sec.		Lag Delay Range: 1 - 100 seconds
ZERo	0.0 feet		Level Input Calibration - Zero Notes: 1. 4.0mA is Typically Applied to the Process Input while Setting the Zero. 2. Parameter ZERo Shows the Level Input, while allowing the Up & Down Push-buttons to Change the Internal Number used to Zero the Displayed Value. 3. Decimal Point Position is set by Parameter P - 21. See Page: 4.
SPAN	11.5 feet		Level Input Calibration - Span Range: 0.9 - 231.0 Notes: 1. 20mA is Typically Applied to the Process Input while Setting the Span. 2. Parameter SPAN Shows the Level Input, while allowing the Up & Down Push-buttons to Change the Internal Number used to Calculate the Displayed Value. 3. Decimal Point Position is set by Parameter P - 21. See Page: 4.
P - 13	2		Number of Pumps Present 1 = 1 Pump 2 = 2 Pumps
P - 19	1		Pump Up or Down Mode 1 = Pump Down - Empty a Tank 2 = Pump Up - Fill a Tank Note: When Parameter P - 19 is Changed New Default Pump On and Off Level Parameter Values will be loaded.
P - 20	0		Forced Lead Pump Position 0 = Normal Alternation 1 = Pump as 1 Lead 2 = Pump as 2 Lead
P - 21	1		Level Display Decimal Point Position 0 = No Decimal Point 1 = XXX.X 2 = XX.XX 3 = X.XXX
P - 22	240		Level Input Signal Conditioning Control Range: 1 - 254 10 = Very Slow 100 = Slow 240 = Normal 250 = Fast
P - 23	10 min.		Numerical Display Blanking Delay Range: 10 - 254 minutes Note: To disable the Numerical Display Blanking feature: Set Parameter P-23 = 255.
oPr	-		Operating Program Revision Number

High Level Alarm

- Upon a High Level Alarm, the indicator will come on, the relay will de-energize and the contacts will close.
- The High Level Alarm relay contacts will be closed when there is no power on the controller.

Low Level Alarm

- Upon a Low Level Alarm, the indicator will come on, the relay will energize and the contacts will close.
- The Low Level Alarm relay contacts will be open when there is no power on the controller.
- A Low Level Alarm is delayed for 10 seconds after power is applied.

LEVEL INPUT (4-20mA Input) – CALIBRATION PROCEDURE

Notes:

1. Do not attempt to change the Span or Zero calibration using Parameters ZERo and SPAn without first applying the appropriate 4-20mA signal to the Analog Level Input during each step of the calibration procedure.
2. The rate of change of the displayed Level may be customized using Parameter P - 22.

LEVEL INPUT ZERO - Parameter ZERo

This Parameter is used to make the Level Display read zero with a Level Input of 4.0mA.

Calibration Procedure:

1. Apply a 4.0mA signal to the Analog Level Input.
(Alternate Procedure - Pull the pressure transducer out of the water, or disconnect the bubbler tube.)
2. Scroll in the menu to Parameter ZERo and press push-button PB-M to view the Level.
3. Press and hold down the “UP” or “DOWN” push-buttons as need to make the display read zero.
Note: It is slow to change at first.
4. Perform the procedure below to calibrate the Span.

LEVEL INPUT SPAN - Parameter SPAn

This Parameter is used to establish what the Level Display should show with a Level Input of 20mA.

Calibration Procedure:

1. Apply a 20mA signal to the Analog Level Input.
(Alternate Procedure – Subject the Transducer to a known condition (for example under 6.0 feet of water).)
2. Scroll in the menu to Parameter SPAn and press push-button PB-M to view the Level.
3. Press and hold down the “UP” or “DOWN” push-buttons as need to make the display read the span of the Pressure Transducer. Note: It is slow to change at first.
(Alternate Procedure – Use the Up / Down push-buttons to make the display read the same as the current level of liquid in the wet well (for example 6.0 feet of water).)

LEVEL INPUT SPAN in Feet Of Water Versus TRANSDUCER CALIBRATION in PSI

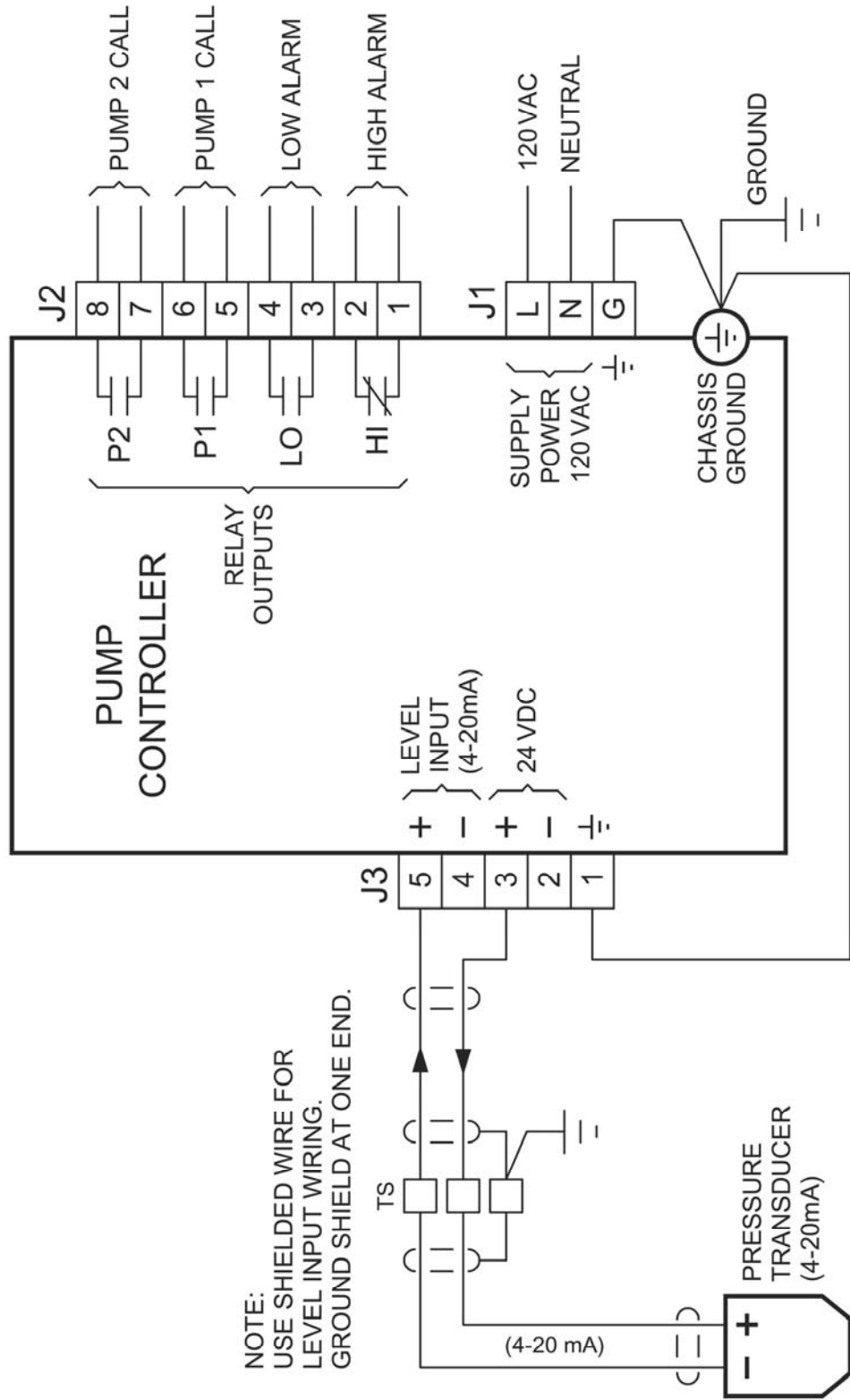
		Transducer Calibration						
		5.0psi @ 20mA	10psi @ 20mA	15psi @ 20mA	30psi @ 20mA	60psi @ 20mA	100psi @ 20mA	
Level Input Span	-	-	-	-	139 feet	231 feet	P - 21 = 0	
	11.5 feet	23.1 feet	34.6 feet	69.3 feet	139.0 feet	231.0 feet	P - 21 = 1	
	11.50 feet	23.10 feet	-	-	-	-	P - 21 = 2	

Notes:

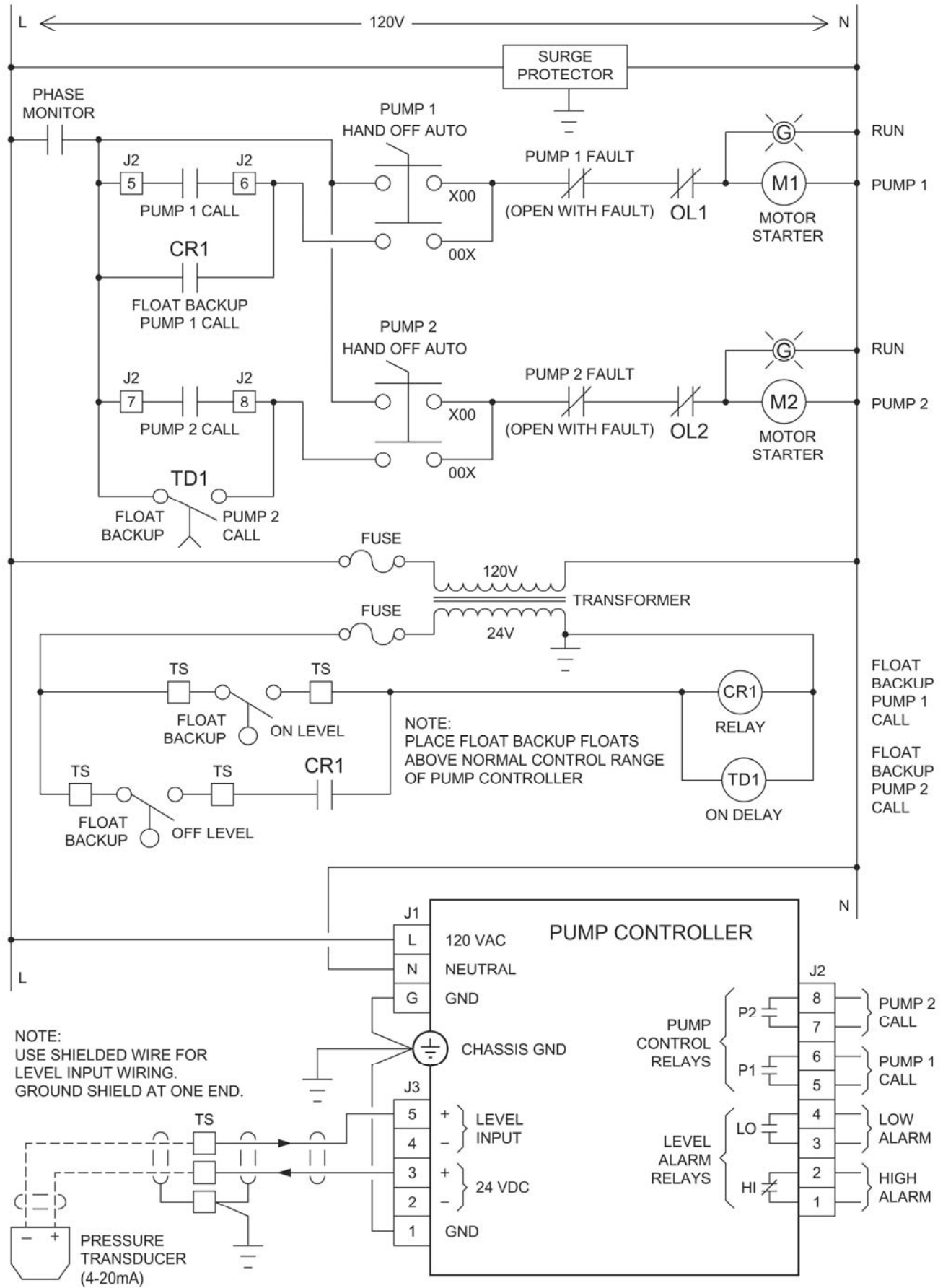
1. Parameter P - 21 is used to set the decimal point position.
2. To find the Span Setting for other transducers use the following equation:

$$\text{Pressure (psi)} \times 2.309 = \text{Level (feet of water)}$$

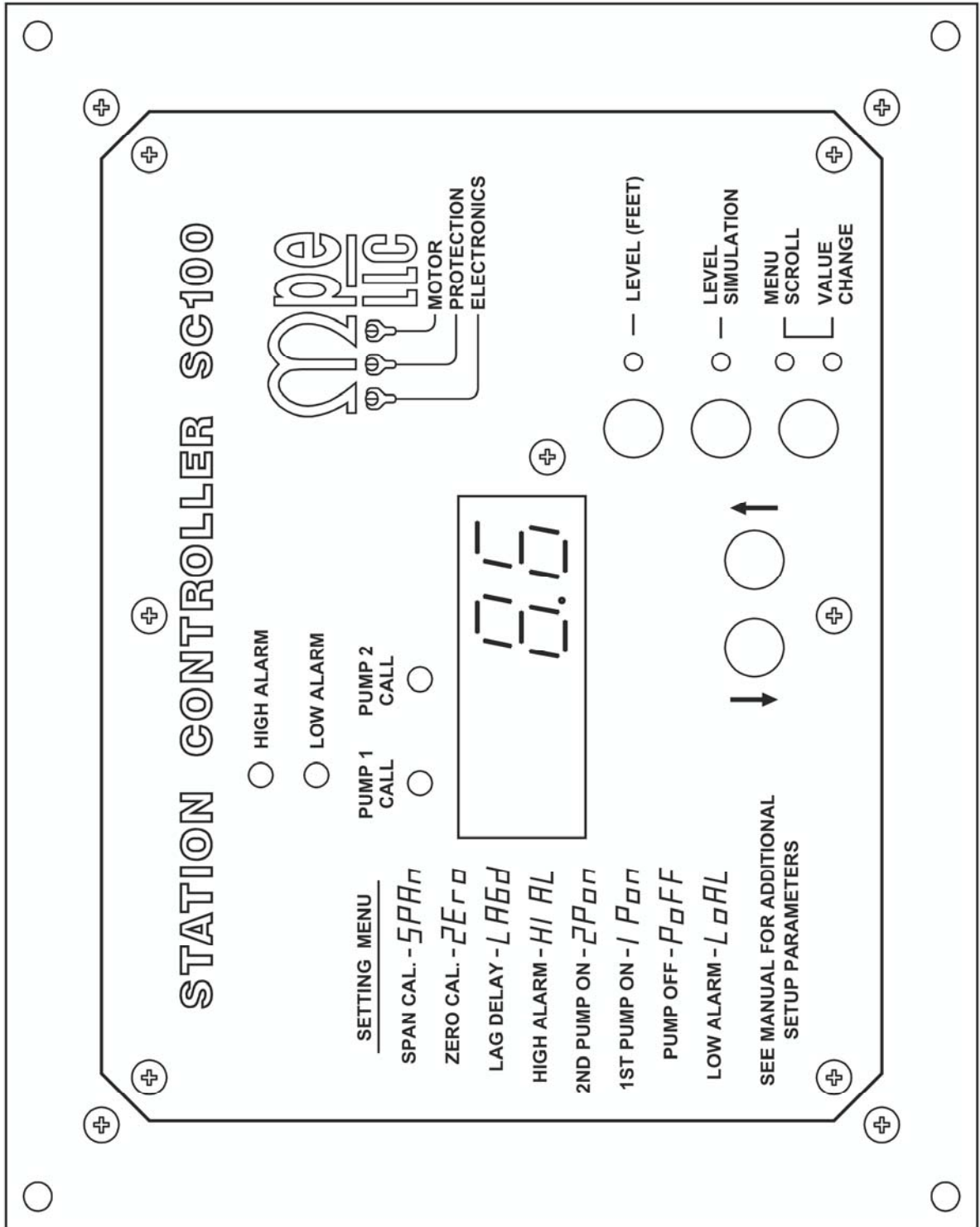
CONNECTION DIAGRAM



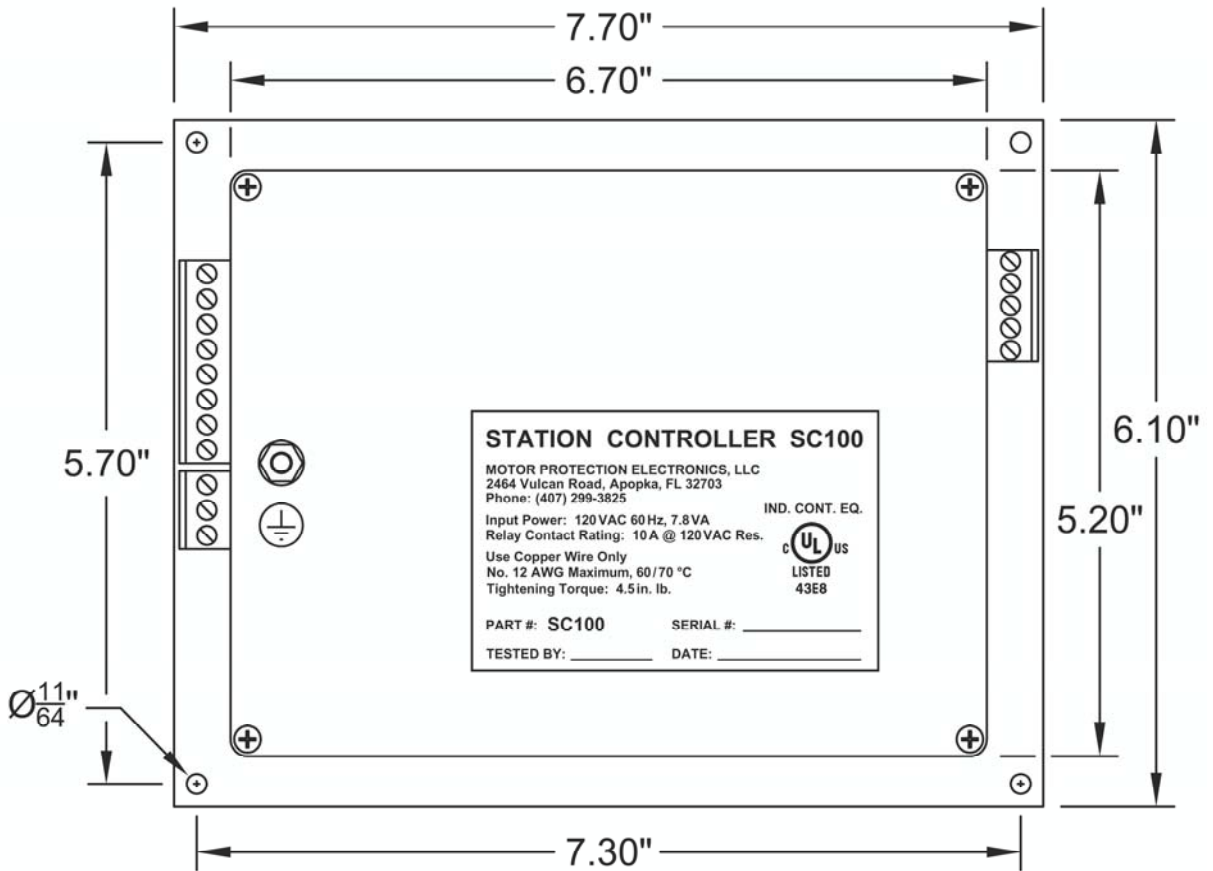
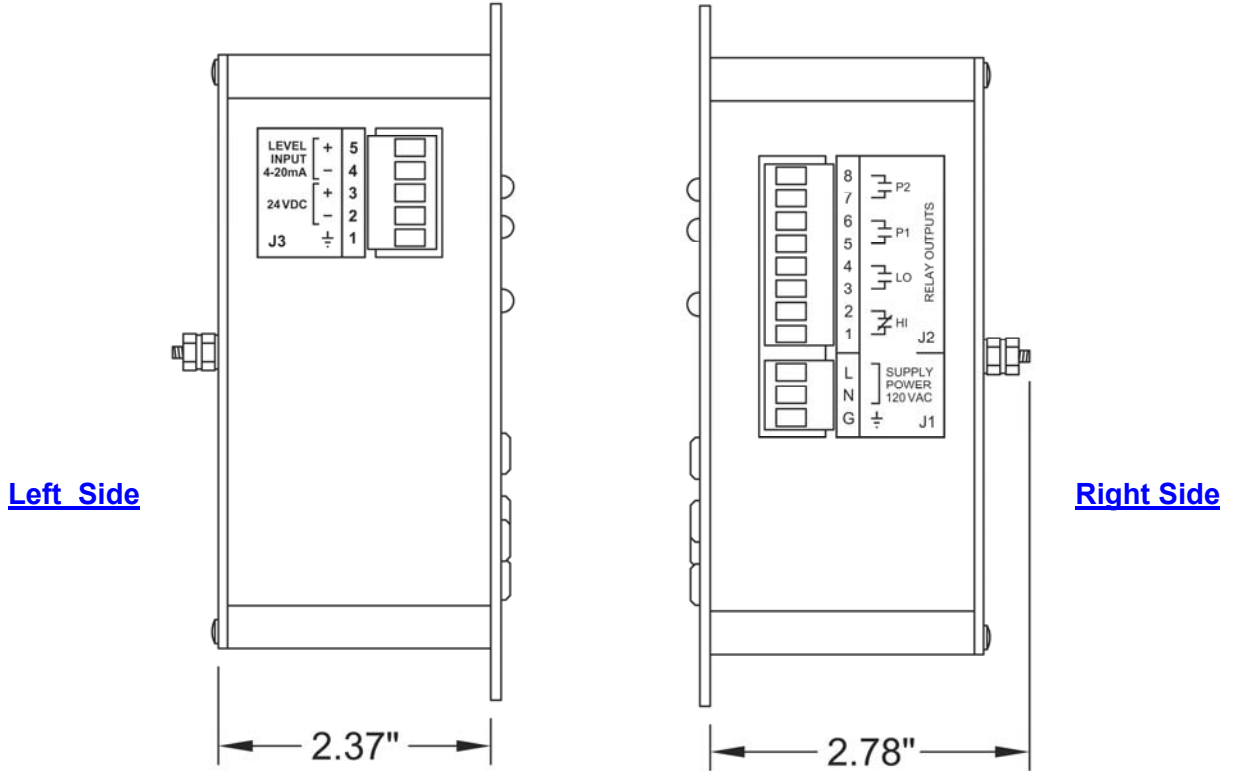
CONTROL SCHEMATIC EXAMPLE - Duplex with 24V Float Backup



OPERATOR INTERFACE



ENCLOSURE MECHANICAL LAYOUT



Rear View

PANEL CUTOUT

