INSTRUCTION MANUAL	MANUAL # 0901180	VERSION: C2
	DATE: 2024-0320	

Control Guard ACCS

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CAUTION: Wear protective clothing and eyewear when dispensing chemicals or other materials. Observe safety handling instructions (MSDS) of chemical mfrs.

CAUTION: To avoid severe or fatal shock, always disconnect main power when servicing the unit.

CAUTION: When installing any equipment, ensure that all national and local safety, electrical, and plumbing codes are met.

SAFETY PRECAUTIONS

- Wear protective clothing and eye protection whenever operating this system.
- Wear protective clothing and eye wear when dispensing chemicals. Observe safe handling instructions (MSDS) provided on chemical container or as supplied by chemical manufacturer.
- To avoid severe or fatal shock, physical injury, always disconnect main power when servicing the unit.
- When installing any equipment, ensure that all national and local safety, electrical and plumbing codes are met.
- Do not submerge or place in direct path of spray/moisture.
- Only approved, factory authorized technicians to service unit.

SPECIFICATIONS

Cabinet Materials	Case / Cover: ABS UL94 V-0 Pump Faceplate: Lexan 9945A UL94 v-0
Case Ratings	IP-65 (Protected from total dust ingress, and low pressure water jets from any direction)
Dimensions	W 18” x H 10.5” x D 8” (46 cm x 27 cm x 20 cm)
Standard Power Supply	Input: 100 - 120 VAC 50/60 Hz (3.0 A) Input: 200 - 240 VAC 50/60 Hz (2.0 A) Output: 24 VDC (6.5 A)
High Current Power Supply	Input: 100 - 120 VAC 50/60 Hz (4.5 A) Input: 200 - 240 VAC 50/60 Hz (2.5 A) Output: 24 VDC (8.8 A)
Unit Weight	30 lbs (13.6 kg)
Pump Flow Rates (note 1)	3.38 - 38.9 oz/min (100 - 1150 ml/min)
Pump Duty Cycle (note 2)	50% (based on 10 min operating window)
Maximum Pump Run Time (note 2)	5 Minutes
Maximum Pump Lift / Suction	10 Feet (3 Meters)
Maximum Pump Head Pressure	30 PSI (2 Bar)
Certifications	CAN/CSA-C22.2 No. 61010-1-12 UL Std No. 61010-1 (3rd Edition) EN 61010-1: 2010 (3rd edition)

Specification Notes

(1) The pump flow rates shown in the specification table were established using water at ambient temperatures with zero discharge pressure. Pump settings from 20% to 100%.

(2) The duty cycle and maximum pump run time specified above can be exceeded, however in doing so the life of the squeeze tube, roller block and motor may be reduced.

Peristaltic Pump Accuracy

+/- 5% when not calibrated at use volume on up to 128oz
+/- 2% when calibrated at use volume on up to 128oz

Equipment Ratings

- Pollution degree, 2
- Installation category, II
- Altitude, 2000 meters (max)
- Humidity, 95% Rh (max)
- Electrical supply input 100 - 240 VAC 50/60 Hz(see specifications above)
- Mains supply voltage fluctuations up to ± 10%
- System is for indoor use only
- Maximum Ambient Temperature: 40 °C

INDICATION FOR USE

The Control Guard ACCS (Advanced Chemical Concentration System) is designed with ease of setup and use in mind. By utilizing flow meter technology, the ACCS measures high concentrations of caustic, acid, rinse water or other liquids with an extremely high degree of accuracy (+/- 2%) thereby ensuring precise chemical feed control. The Control Guard offers multiple 4-20 mA analog inputs which provide the flexibility of being utilized by any “Off the Shelf” probe whether it is pH, ORP, conductivity or other analytical measurements from a variety of popular manufacturers (Rosemount, Sensorex, etc.). These features can be maximized by employing the Control Guard’s distinctive data logging and reporting capabilities.

The Control Guard ACCS has the ability to operate up to 3 pumps of various designs including: Peristaltic, Air Operated Diaphragm (AOD) and Electric Diaphragm Pumps (EDP). These can be employed in any of 4 modes of operation (signal, relay, repeat cycle and probe - see full details below) either in conjunction or independently of one another. This allows for more complete and accurate control of your CIP process.

The improved user interface employs an enhanced 64X128 RGB backlit display that is combined with our easy to program 4 button control keypad which makes programming extremely user friendly and reduces the amount of set up time while providing critical process information with just a quick glance. With data management and subsequent reports playing a crucial role in today’s process environment the Control Guard ACCS enables Sanitation Managers to clearly address process parameters and status conditions with accurate reports as required by current regulatory requirements.

Modes of Operation

- Signal Mode - This mode of operation will run the pump to deliver a specific chemical dosage when triggered by an activation signal. The pump can be delayed, if required, for applications where the chemical delivery needs to happen at a later time from when the trigger signal is received. Lastly, the pump can be locked out for a specific time frame after delivery to prevent accidental repeat dosages.

- Relay Mode - This mode of operation will run the pump for as long as a trigger signal is applied. Use of this mode is intended for applications where the duration of the trigger signal is controlled by another source and the Control Guard is utilized as a slave pump. The chemical dosage is tracked by how long the pump has run for a specific time. The pump can stop briefly during the time that the dosage is being tracked. After the specified time has elapsed, the dosage is then logged into memory for reporting purposes.

- Repeat Cycle Mode - This mode of operation has two separate chemical dosages referred to as initial charge and recharge. When the trigger signal is first applied, the initial charge is activated. The system then counts down a recharge time after which the recharge volume will be dispensed. The recharge time and recharge volume continue to repeat activations until the trigger signal turns off.

- Probe Mode - This mode of operation utilizes a probe (inductive or analog input) to sense and maintain the chemical concentration based on a programmed value. When the probe detects that the concentration has fallen below the programmed setpoint, the pump will turn on to regain the setpoint. While the pump is running, the alarm delay is monitoring the time that it takes to get the solution back to the setpoint. If the setpoint cannot be reached within the alarm delay period, the alarm will sound to notify there is a problem. The feed limit setting controls whether the pump should continue to run, or stop, when the alarm is active. The pulse percent and pulse rate settings control how the pump will “pulse feed” when close to the setpoint value.

PRE-INSTALLATION SITE SURVEY

(1) Check all applicable plumbing and electrical codes before installation. This will help to ensure that the system is installed in safe and suitable manner.

(2) Get a wiring schematic of the equipment that the Control Guard will connect to.

(3) Check to make sure that all functions of the equipment are operating properly. This may include; PLCs, timers, water solenoids, water level switch, and pump motor.

(4) Check the proposed location for a 115, or 230 VAC power source (based on the model you will be using).

(5) Check voltage of all signals that will be used. Measure voltage between the signal and signal common with a voltmeter. Do not check signal voltage between signal and earth ground.

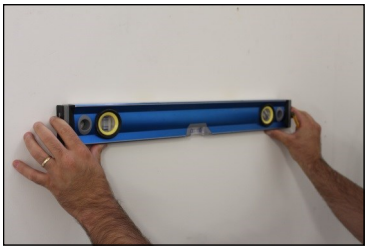
(6) Check mounting location for chemical injection fittings. Verify the port size with fittings you have for installation.

PRE-INSTALLATION CHECKLIST

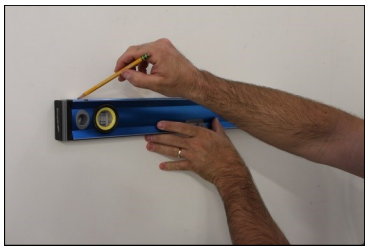
Before beginning the installation, make sure you have the tools and materials listed below:

- Flat and Phillips screwdrivers
- Drill and drill bits
- Wire cutters, wire strippers, and pliers
- Voltmeter (or multi-meter)
- Level
- Suitable wire for power / signals (check local codes)
- Dry wall inserts and mounting screws
- Electrical tape and wire nuts
- Braided vinyl hose
- Chemical test kit

INSTALLATION

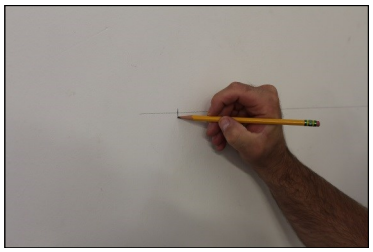


(1) Position level on wall at the desired mounting location.

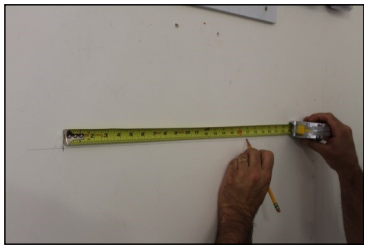


(2) Draw line across top of level approximately 20” long.

(3) Check that line is visible.

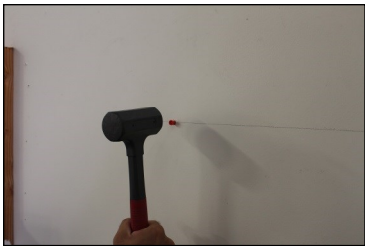


(4) Mark position of first hole for mounting screw.

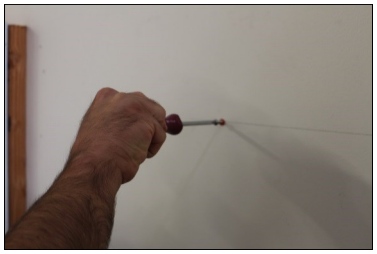


(5) Use a tape measure and mark second hole at 17”.

(6) Drill 3/16” holes in the two marked positions.



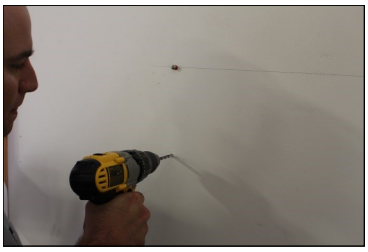
(7) Tap wall anchors into both holes.



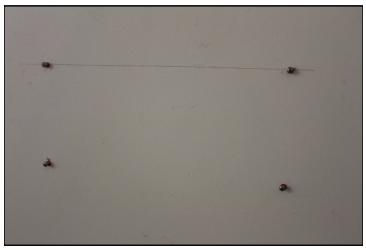
(8) Insert screws into anchors leaving 1/4” space.

(9) Hang unit on screws through the upper two keyholes.

(10) Mark position of lower two keyholes.



(11) Remove unit and drill holes for lower two positions.

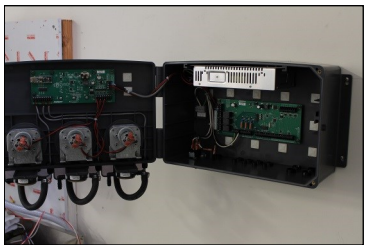


(12) Insert anchors / screws as done in steps 7 and 8.

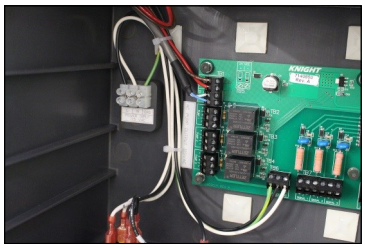
INSTALLATION

(13) Hang unit and tighten all four mounting screws.

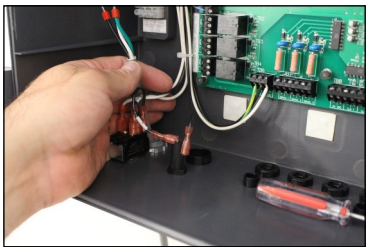
(14) Loosen two cover screws.



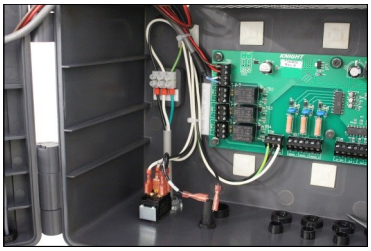
(15) Pull gently on cover latch (right side) to open unit.



(16) Note the location of main power terminal block.



(17) Feed main power wires through conduit fitting.



(18) See main power connection details below.

Main Power Connection

Connect 115 VAC or 240 VAC power source to main power connection in pump cabinet. Use suitable conduit for electrical wiring (per applicable wiring codes). A suitable ground conductor should be connected to the ground terminal in accordance with local electrical codes. The user/installer should provide a disconnect switch or circuit breaker close to the equipment and should be marked that it is for this equipment.

Note: Make sure that all conduit connections are water tight.

Inductive Probe Installation (optional)

NOTE: Use only a 200 mS inductive probe (Knight P/N 6536034) with this unit. Control will not operate properly above 200 mS.

(1) The probe should be mounted in the washer tank with the hole oriented vertically. Start by feeding the wire end through the mounting hole from the inside of the tank. Use a rubber washer on the threaded mounting stud. Secure with the mounting nut on the outside of the tank.

(2) After the plastic probe body has been firmly secured to the mounting hole with a rubber washer and nut, feed the wire lead through a strain relief on the bottom of the Control Guard unit.

(3) With the wire lead routed through the strain relief, attach the four wires to the circuit board per the wiring diagram. The wire colors must match the colors shown on the terminal strip.

Peristaltic Pump Connections

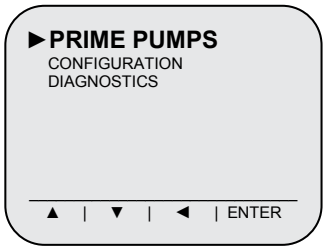
(1) Cut a suitable length of 3/8” ID braided tubing and connect between the discharge (right) side of the pump’s squeeze tube and the injection point. Use 3/8” ID barb fittings (supplied) and hose clamps to secure safely.

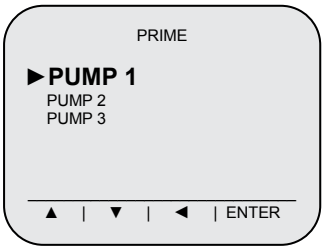
(2) Cut a suitable length of 3/8” ID braided tubing and connect between the suction (left) side of the pump’s squeeze tube and the chemical pickup tube. Use of barb fittings and hose clamps is recommended.

(3) Insert pickup tube into chemical container.

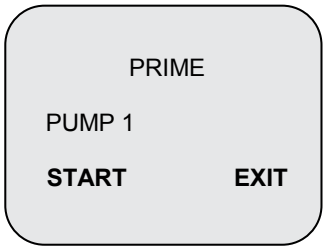
PRIMING PUMPS

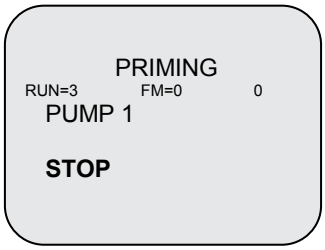
Use the ▲ and ▼ keys to highlight the pump you want to prime. Press the ENTER key.





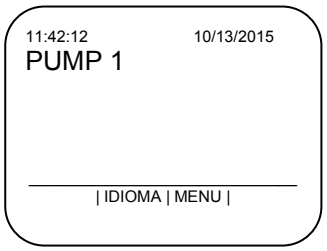
Use the keys directly below the START to turn the pump on and begin priming. When fully primed use the key directly below the STOP to turn the pump off. Repeat as necessary for other pumps.



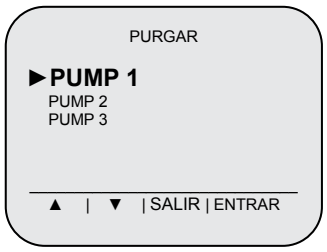


LANGUAGE SELECTION

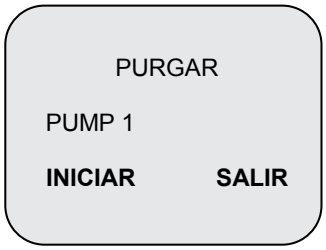
To change the main home screen and first menu language from English to Spanish press the key directly below “IDIOMA”

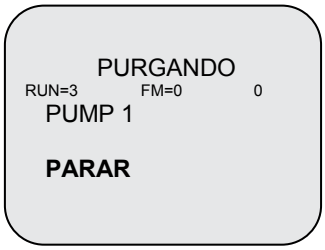


The first menu screen will also appear in Spanish for priming pumps. Use the ▲ and ▼ keys to highlight the pump you want to prime. Press the ENTER key.

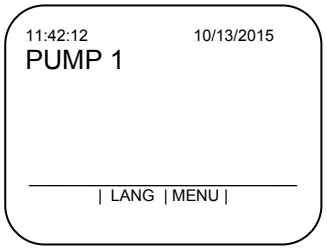


Use the keys directly below the START to turn the pump on and begin priming. When fully primed use the key directly below the STOP to turn the pump off. Repeat as necessary for other pumps.





To change back to English press the key directly below “LANG”.



SYSTEM PROGRAMMING

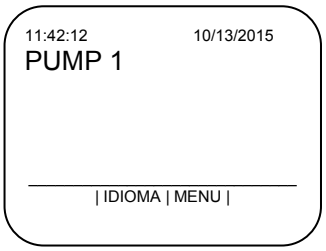
The system operates using a 4 button key design. The key functions are controlled via the firmware and are specific to each screen. The main 4 keys are MENU, UP, DOWN and ENTER. The ENTER key is used to move the cursor and select within the menu functions. The UP and DOWN arrows are used to change a value. Changed values will be saved upon exiting the current menu function. The screen has 4 colors to easily identify the system status.

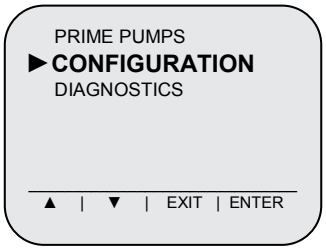
- BLUE - Run Mode
- PURPLE - Programming Mode
- GREEN - Performing a Function
- RED - Error Display

Accessing the Programming Menus

When power is first applied you will see the screen showing the CONTROL GUARD name along with USB and firmware versions. You will then see the main run screen which shows the status of any pump action.

Press the MENU button to access the settings menu. Press the ▼ key to highlight CONFIGURATION. Press the ENTER key.



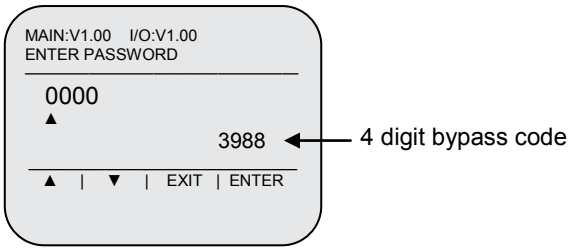


Password Protection

A private password protects the system settings and allows only authorized personnel to make programming changes.

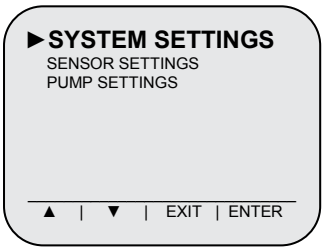
To enter a private password, press ENTER key to move the cursor, then UP or DOWN to change the value. Once you press ENTER after the last digit it will take you to the next screen. The default code is: 0000.

If the wrong password is entered it will take you back to the main run screen. If you have forgotten your password, you can call Knight and give them the 4 digit bypass code and they can give you a one-time password.



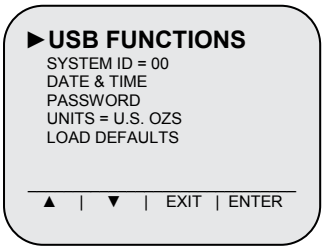
SYSTEM SETTINGS MENU

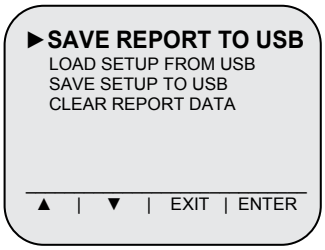
Use the ▲ and ▼ key to highlight SYSTEM SETTINGS, then press ENTER.



USB Functions

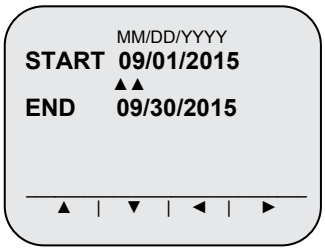
Use the USB FUNCTIONS to save reports, download a setup file created on the PC application to the machine, upload a setup file created on the machine to save in the PC application, or to clear report data.





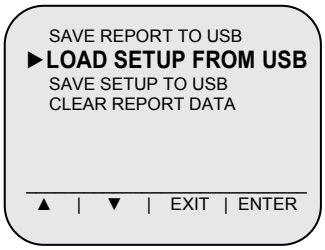
Saving Reports

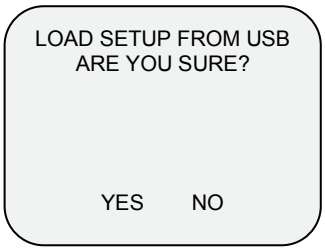
With SAVE REPORT TO USB highlighted press the enter key. You can then choose your start and end dates followed by pressing ENTER. The screen will change to light green while the report is being saved.



Loading Setup

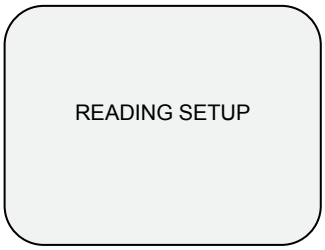
With LOAD SETUP FROM USB highlighted press the enter key. The screen will change to light green and ask if you are sure you want to load the setup file from the USB. Press the YES key to load the setup file. Press the NO key to cancel.





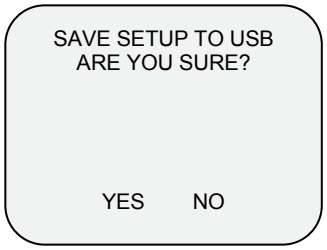
NOTE: The system will search the USB drive for the setup file with the matching SYSTEM ID. If the SYSTEM ID does not match you will get an error screen. See error screen messages on the following page for details.

If you pressed the YES key you will see the following screens during the download. Once completed the system will return to the main menu screen (purple).

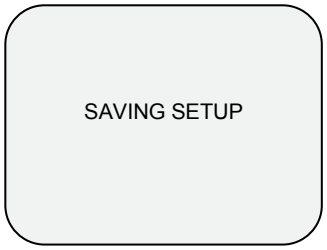


Saving Setup

With SAVE SETUP TO USB highlighted press the enter key. The screen will change to light green and ask if you are sure you want to save the setup file to the USB. Press the YES key to save the setup file. Press the NO key to cancel.

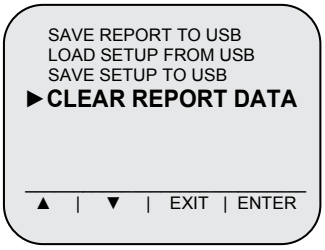


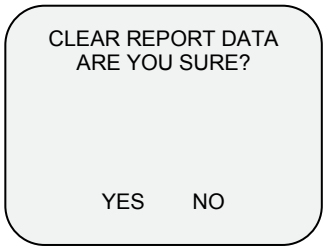
If you pressed the YES key you will see the following screen during the download. Once completed the system will return to the main menu screen (purple).



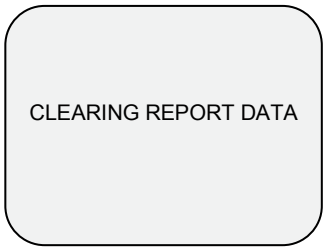
Clear Report Data

With CLEAR REPORT DATA highlighted press the enter key. The screen will change to light green and ask if you are sure you want to clear data. Press the YES key to clear. Press the NO key to cancel.



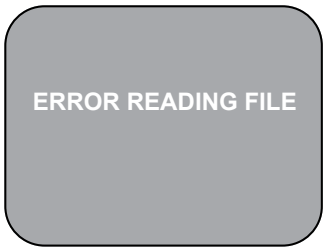


If you pressed the YES key you will see the following screen while clearing. Once completed the system will return to the main menu screen (purple).



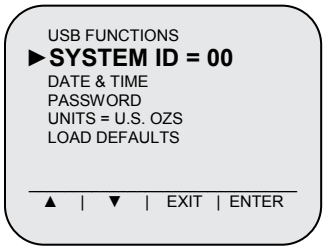
USB Errors

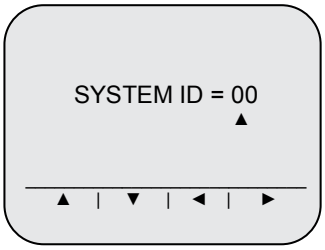
If no USB device is installed during the loading or saving of a setup file you will get a “ERROR READING FILE” screen when loading or an “ERROR WRITING FILE” screen in red. Press any key to get back to the main menu. Check to make sure you installed a USB device.



System ID

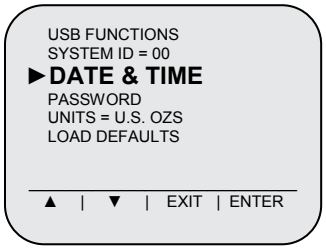
Use the ENTER key to move the cursor (▲) to the setting you want to change. Use the ▲ and ▼ keys to make changes. Once you get to the last setting press the ENTER key to save and exit to the main menu. Use the MENU key to exit without saving. See page 25 for details on System ID.

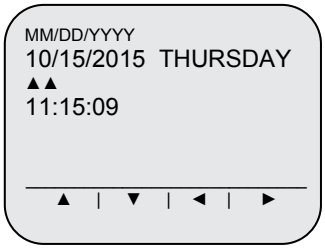




Date & Time

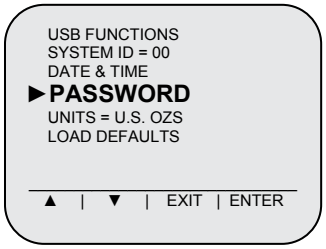
Use the ENTER key to move the cursor (▲▲) to the setting you want to change. Use the ▲ and ▼ keys to make changes. Once you get to the last setting press the ENTER key to save and exit to the main menu. Use the MENU key to exit without saving.

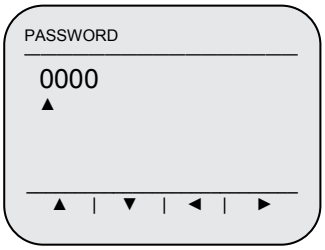




Password

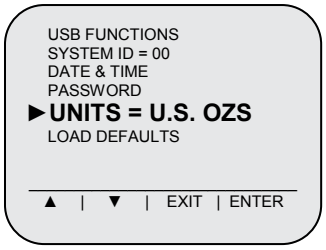
To change the private password, press ENTER key to move the cursor, then UP or DOWN to change the value. Once you press ENTER after the last digit it will take you to the next screen. The default code is: 0000. Use the MENU key to exit without saving.

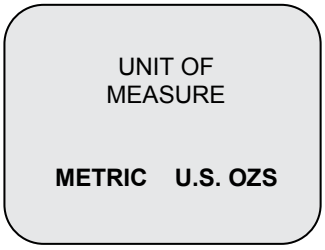




Units

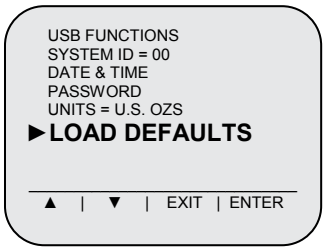
To select the units of measure use the keys directly below the “METRIC” or “U.S. OZS”. Once selected you will return to the settings screen.

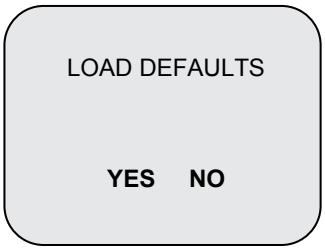




Load Defaults

To load default settings use the keys directly below the “YES” and “NO”. Once selected the system will restore all settings to their default values.

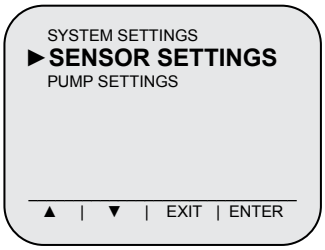


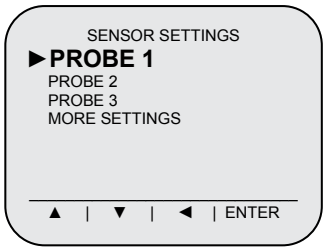


SENSOR SETTINGS MENU

Highlight SENSOR SETTINGS, then press ENTER. Use ▲ and ▼ to highlight the probe you wish to change, then press ENTER.

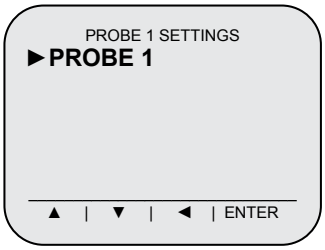
Choose the MORE SETTINGS option to skip the probe settings and go directly to analog inputs.

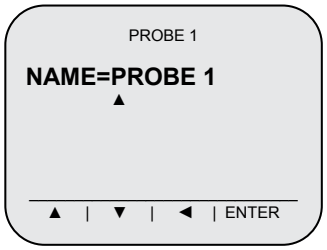




Probe Name

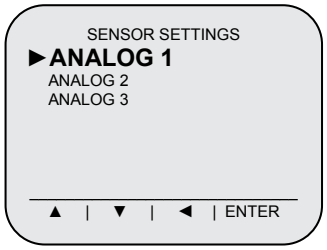
This setting allows you to change the name of each probe independently. You have a maximum of 12 characters. Use ▲ and ▼ to change the letters of the probe name, then press ENTER.





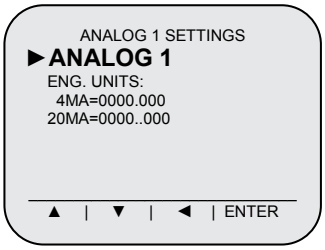
Analog Inputs

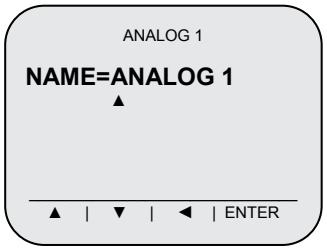
Use ▲ and ▼ to highlight the analog input you wish to change, then press ENTER.



Analog Name

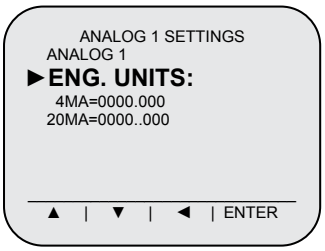
This setting allows you to change the name of each analog input independently. You have a maximum of 12 characters. Use ▲ and ▼ to change the letters of the input, then press ENTER.

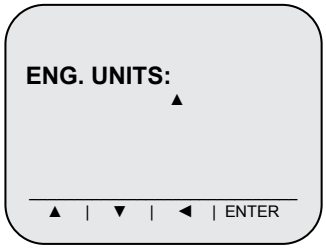




Engineering Units

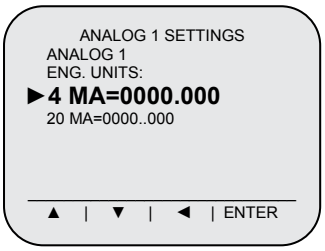
If using an analog sensor, you can specify what units that the device measures (pH for example). Use ▲ and ▼ to change the letters of the engineering units, then press ENTER.

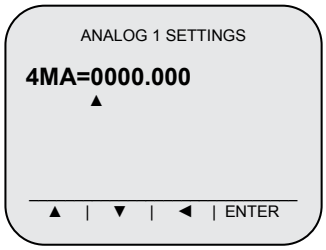




4mA

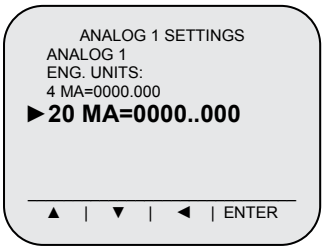
To change the 4mA setting use the ► and ◄ keys to move the cursor (▲) to the number you want to change. Use the ▲ key to change the number. Once you have reached the last number press the ► key one more time to save and exit back to the settings menu. Use the EXIT key to exit without saving.

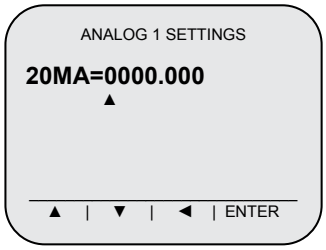




20mA

To change the 20 mA setting use the ► and ◄ keys to move the cursor (▲) to the number you want to change. Use the ▲ key to change the number. Once you have reached the last number press the ► key one more time to save and exit back to the settings menu. Use the EXIT key to exit without saving.





PUMP SETTINGS MENU

Use the ▲ and ▼ key to highlight PUMP SETTINGS, then press ENTER.

SYSTEM SETTINGS
SENSOR SETTINGS
►**PUMP SETTINGS**
▲ | ▼ | EXIT | ENTER

Prime Pumps

Use the ▲ and ▼ keys to highlight the pump you want to prime. Press the ENTER key.

►**PRIME PUMPS**
CALIBRATE PUMPS
PUMP 1
PUMP 2
PUMP 3
▲ | ▼ | ◄ | ENTER

PRIME
►**PUMP 1**
PUMP 2
PUMP 3
▲ | ▼ | ◄ | ENTER

Use the keys directly below the START to turn the pump on and begin priming. When fully primed use the key directly below the STOP to turn the pump off. Repeat as necessary for other pumps.

PRIME
PUMP 1
START **EXIT**

PRIMING
RUN=3 FM=0 0
PUMP 1
STOP

Calibrate Pumps

To calibrate the pumps use the keys directly below the pump you wish to calibrate to select.

Press the key directly below “START” to turn the pump on. Allow to run for at least 10 seconds while capturing output in measurement vessel. Press the key directly below “STOP” to turn the pump off. Once complete it will advance to the next screen.

PRIME PUMPS
►**CALIBRATE PUMPS**
PUMP 1
PUMP 2
PUMP 3
▲ | ▼ | ◄ | ENTER

CALIBRATE
►**PUMP 1**
PUMP 2
PUMP 3
▲ | ▼ | ◄ | ENTER

NOTE: you have a maximum pump calibration ON time of 2 minutes.

00000 MLU 00000MLP
CALIBRATE
PUMP 1
START **EXIT**

00000 MLU 00000MLP
CALIBRATING
RUN=3 FM=0 0
PUMP 1
STOP

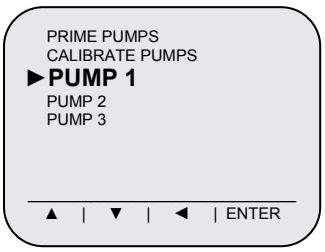
To enter the volume dispensed use the ENTER key to move the cursor (▲) to the number you want to change. Use the ▲ and ▼ keys to change the number. Once you have reached the last number press the ENTER key one more time to save and exit back to the settings menu. Use the MENU key to exit without saving. Repeat for other pumps.

PUMP 1
VOLUME=000.0
▲
▲ | ▼ | ◄ | ENTER

PUMP 1
060.0 OZS/MIN
00527 MLU
00000 MLP
| MENU | ENTER

Pump Settings

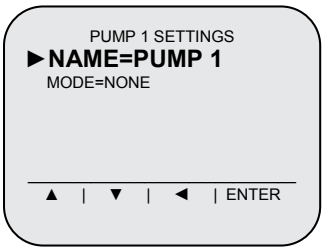
Use the ▲ and ▼ highlight the pump you wish to change, then press ENTER.

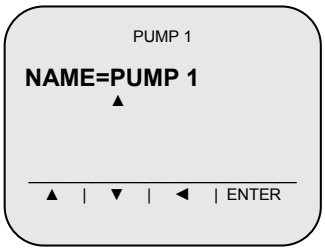


Pump Name

To change pump names use the ENTER key to move the cursor (▲) to the letter you want to change. Use the ▲ and ▼ keys to change the letter. Once you have reached the last letter press the ENTER key one more time to save and exit back to the settings menu. Use the MENU key to exit without saving.

NOTE: You have a maximum of 12 characters for each chemical name.

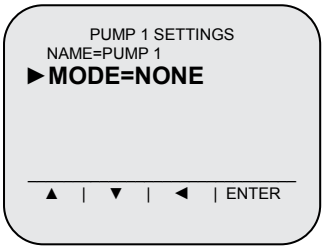


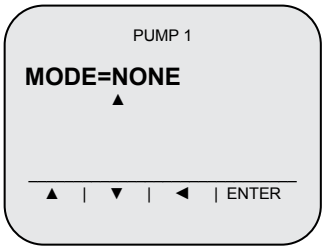


Pump Mode

None is the default value and must be changed to one of the four available modes for the pump to operate.

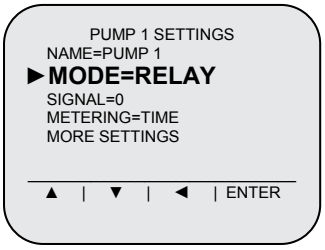
- Relay
- Signal
- Repeat Cycle
- Probe





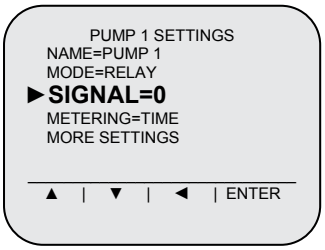
Relay Mode

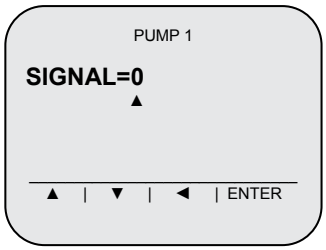
Use the ▲ and ▼ key to highlight RELAY, then press ENTER.



Signal

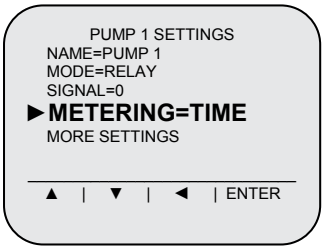
This setting tells the system which of the available signal inputs will be used to activate the pump.

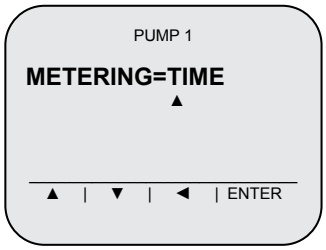




Metering

This setting is used to select between time or flow meter based metering of the chemicals. When time is selected, the system will run the pumps based on the flow rate calibrated for a specific amount of time. When flow meter is selected, the pump delivery will be monitored by the flow meter to ensure that the correct amount of chemical is dispensed.

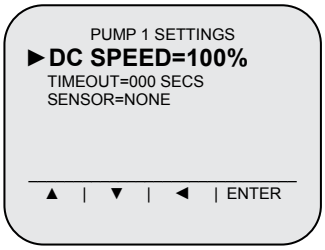


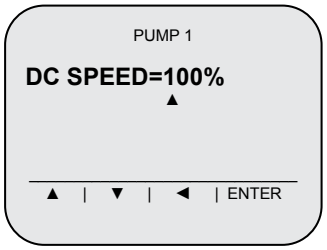


DC Speed

This setting allows you to control the speed of the pump to match the requirements of the application.

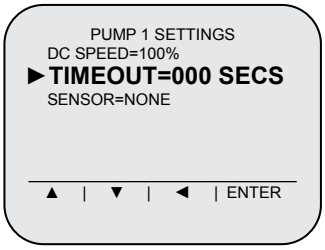
NOTE: This is only for the cover mounted peristaltic pumps.

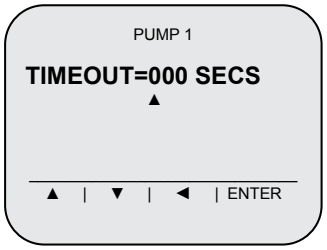




Timeout

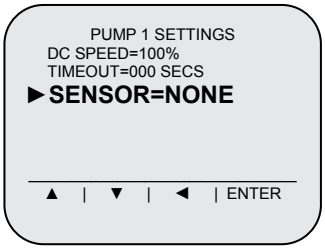
To change the timeout setting use the ► and ◄ keys to move the cursor (▲) to the number you want to change. Use the ▲ key to change the number. Once you have reached the last number press the ► key one more time to save and exit back to the settings menu. Use the EXIT key to exit without saving.

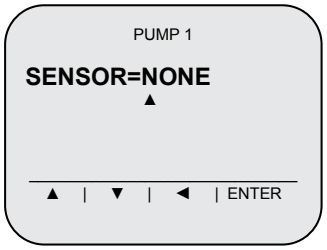




Sensor

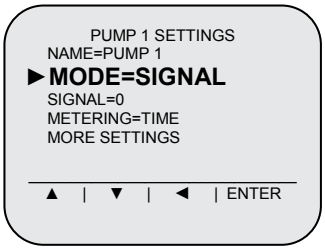
This setting tells the system which of the available sensor inputs will be used with the pump.





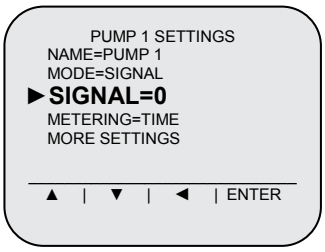
Signal Mode

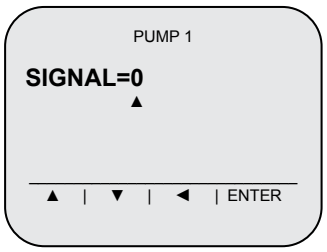
This mode of operation runs the pump to deliver a single dosage of chemical when triggered by an input signal.



Signal

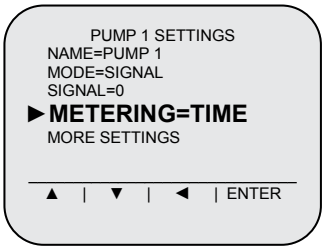
This setting tells the system which of the available signal inputs will be used to activate the pump.

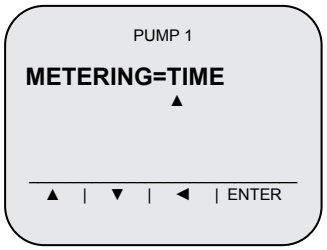




Metering

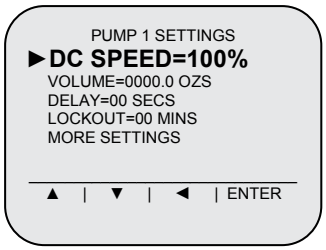
This setting is used to select between time or flow meter based metering of the chemicals. When time is selected, the system will run the pumps based on the flow rate calibrated for a specific amount of time. When flow meter is selected, the pump delivery will be monitored by the flow meter to ensure that the correct amount of chemical is dispensed.

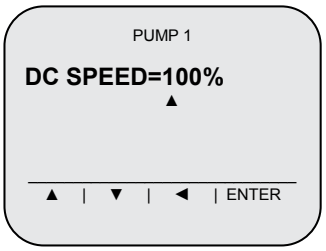




DC Speed

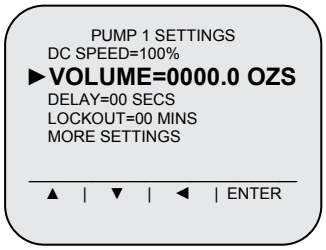
This setting allows you to control the speed of the pump to match the requirements of the application.

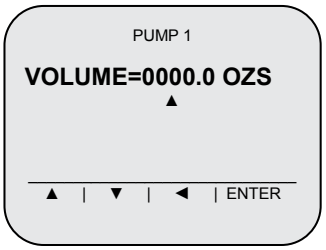




Volume

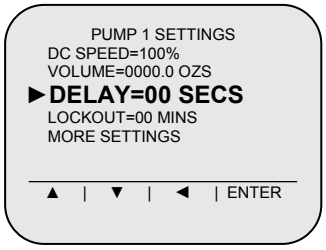
To change the volume setting use the ► and ◄ keys to move the cursor (▲) to the number you want to change. Use the ▲ key to change the number. Once you have reached the last number press the ► key one more time to save and exit back to the settings menu. Use the EXIT key to exit without saving.

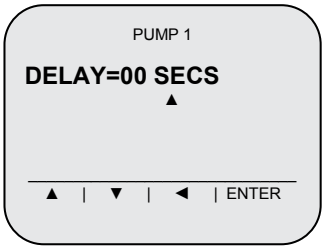




Delay

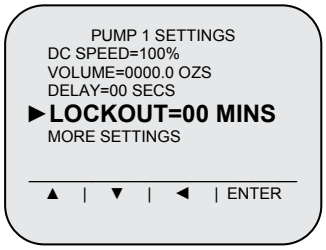
To change the delay setting use the ► and ◄ keys to move the cursor (▲) to the number you want to change. Use the ▲ key to change the number. Once you have reached the last number press the ► key one more time to save and exit back to the settings menu. Use the EXIT key to exit without saving.

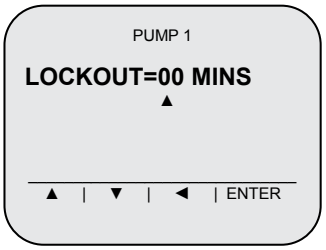




Lockout

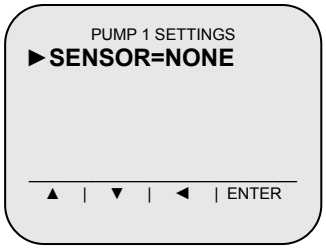
To change the lockout setting use the ► and ◄ keys to move the cursor (▲) to the number you want to change. Use the ▲ key to change the number. Once you have reached the last number press the ► key one more time to save and exit back to the settings menu. Use the EXIT key to exit without saving.

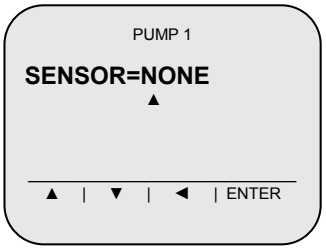




Sensor

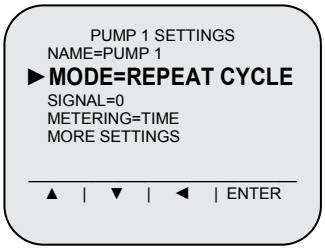
This setting tells the system which of the available sensor inputs will be used with the pump.





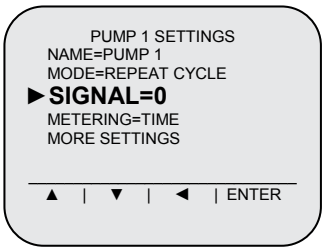
Repeat Cycle Mode

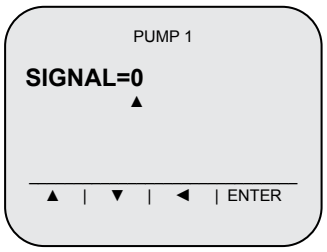
Use the ▲ and ▼ key to highlight REPEAT CYCLE, then press ENTER.



Signal

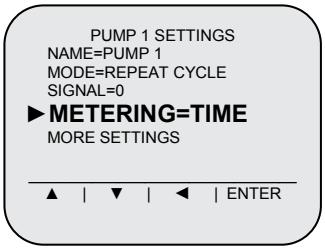
This setting tells the system which of the available signal inputs will be used to activate the pump.

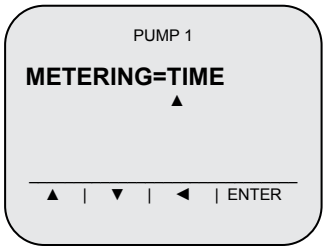




Metering

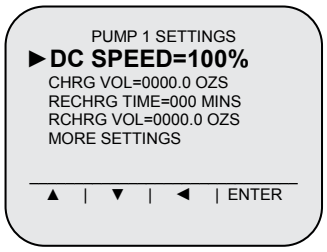
This setting is used to select between time or flow meter based metering of the chemicals. When time is selected, the system will run the pumps based on the flow rate calibrated for a specific amount of time. When flow meter is selected, the pump delivery will be monitored by the flow meter to ensure that the correct amount of chemical is dispensed.

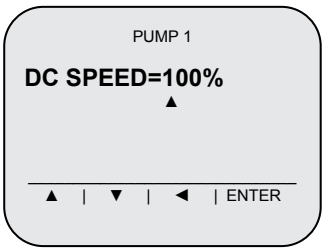




DC Speed

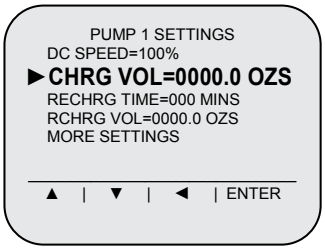
This setting allows you to control the speed of the pump to match the requirements of the application.

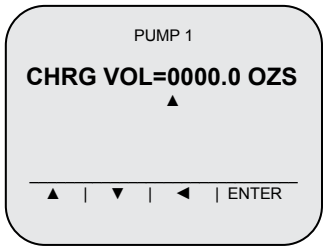




Charge Volume

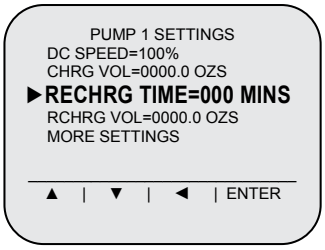
With CHARGE VOL selected, press the ENTER key. To change the charge volume setting use the ► and ◄ keys to move the cursor (▲) to the number you want to change. Use the key to change the number. Once you have reached the last number press the ► key one more time to save and exit back to the settings menu. Use the EXIT key to exit without saving.

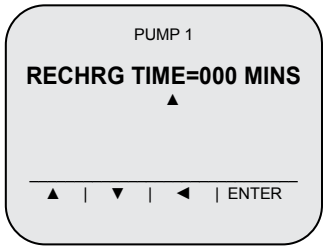




Recharge Time

To change the recharge time use the ► and ◄ keys to move the cursor (▲) to the number you want to change. Use the ▲ key to change the number. Once you have reached the last number press the ► key one more time to save and exit back to the settings menu. Use the EXIT key to exit without saving.

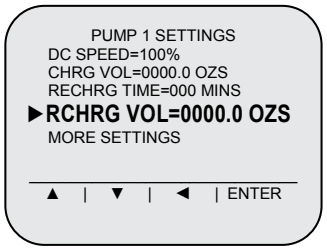


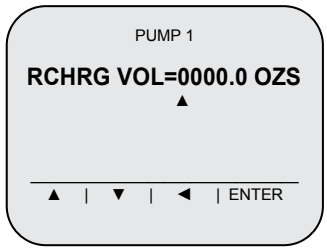


Recharge Volume

With RECHARGE VOL selected press the ENTER key. To change the recharge setting use the ► and ◄ keys to move the cursor (▲) to the number you want to change. Use the ▲ key to change the number. Once you have reached the last number press the ► key one more time to save and exit back to the settings menu. Use the EXIT key to exit without saving.

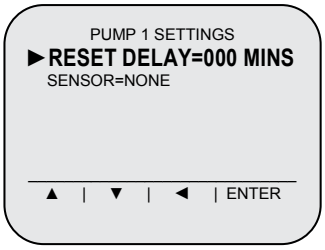
NOTE: Each pump can have independent recharge settings for each chemical.

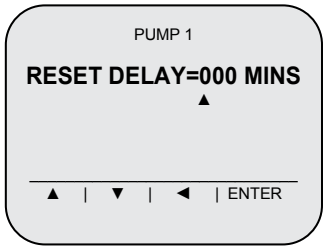




Reset Delay

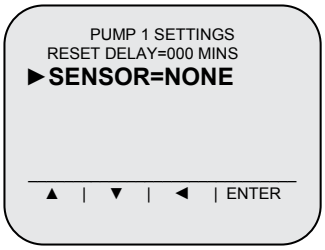
This setting allows the signal to turn off for a specified time and continue normal operation if the signal turns back on within this timeframe. If the signal turns off for longer than this setting, then the system will restart the operation cycle with a new initial charge and ongoing recharges.

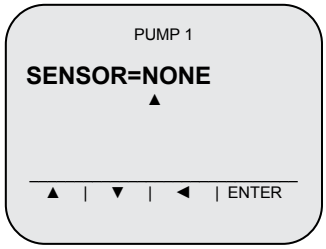




Sensor

This setting tells the system which of the available sensor inputs will be used with the pump.





Probe Mode

Use the ▲ and ▼ key to highlight PROBE, then press ENTER.

```
PUMP 1 SETTINGS
NAME=PUMP 1
►MODE=PROBE
SIGNAL=0
METERING=TIME
MORE SETTINGS

▲ | ▼ | ◄ | ENTER
```

Signal

This setting tells the system which of the available signal inputs will be used to activate the pump.

```
PUMP 1 SETTINGS
NAME=PUMP 1
MODE=PROBE
►SIGNAL=0
METERING=TIME
MORE SETTINGS

▲ | ▼ | ◄ | ENTER
```

```
PUMP 1

SIGNAL=0
▲

▲ | ▼ | ◄ | ENTER
```

Metering

This setting is used to select between time or flow meter based metering of the chemicals. When time is selected, the system will run the pumps based on the flow rate calibrated for a specific amount of time. When flow meter is selected, the pump delivery will be monitored by the flow meter to ensure that the correct amount of chemical is dispensed.

```
PUMP 1 SETTINGS
NAME=PUMP 1
MODE=PROBE
SIGNAL=0
►METERING=TIME
MORE SETTINGS

▲ | ▼ | ◄ | ENTER
```

```
PUMP 1

METERING=TIME
▲

▲ | ▼ | ◄ | ENTER
```

DC Speed

This setting allows you to control the speed of the pump to match the requirements of the application.

```
PUMP 1 SETTINGS
►DC SPEED=100%
SENSOR=NONE
SETPOINT=0000.000MS
PROBE MODE=RISING
MORE SETTINGS

▲ | ▼ | ◄ | ENTER
```

```
PUMP 1

DC SPEED=100%
▲

▲ | ▼ | ◄ | ENTER
```

Sensor

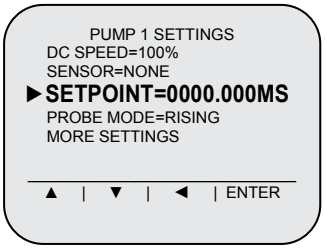
This setting tells the system which of the available sensor inputs will be used with the pump.

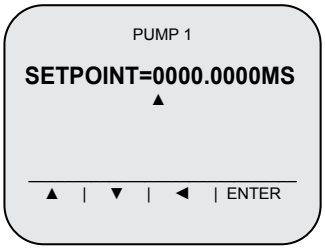
```
PUMP 1 SETTINGS
DC SPEED=100%
►SENSOR=NONE
SETPOINT=0000.000MS
PROBE MODE=RISING
MORE SETTINGS

▲ | ▼ | ◄ | ENTER
```

```
PUMP 1

SENSOR=NONE
▲

▲ | ▼ | ◄ | ENTER
```

Setpoint

To change the concentration setpoint use the ► and ◄ keys to move the cursor (▲) to the number you want to change. Use the ▲ key to change the number. Once you have reached the last number press the ► key one more time to save and exit back to the settings menu. Use the EXIT key to exit without saving.

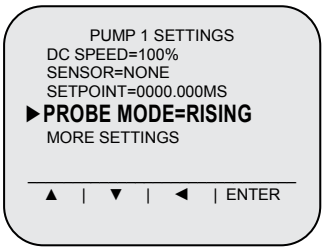


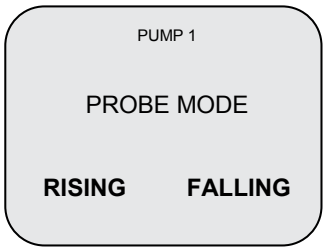


Probe Mode

Sets the pump to turn on so that it will either “Rise” up to the setpoint (then turn off) or turn on to “Fall” down to the setpoint (then turn off).

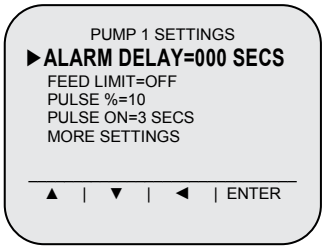
Use the key directly below RISING or below FALLING to make your choice. Then press ENTER to continue.

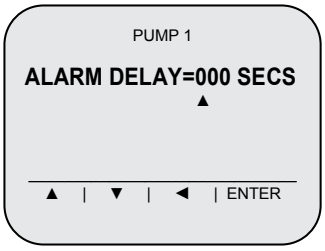




Alarm Delay

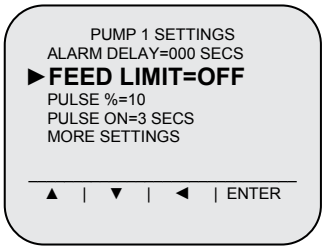
To change the alarm delay use the ► and ◄ keys to move the cursor (▲) to the number you want to change. Use the ▲ key to change the number. Once you have reached the last number press the ► key one more time to save and exit back to the settings menu. Use the EXIT key to exit without saving.

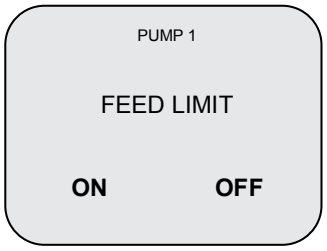




Feed Limit

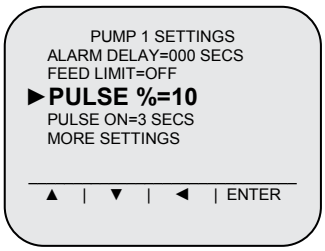
Use the key directly below ON to turn the feature on (or below OFF to turn the feature off). Then press ENTER to continue.

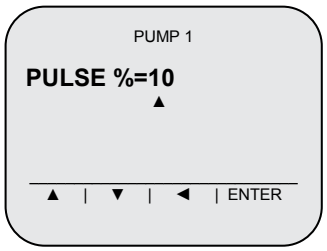




Pulse %

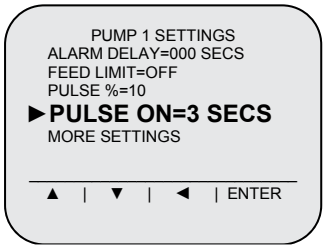
This setting tells the system when to begin pulse feeding; specifically at what percent of the setpoint you have established.

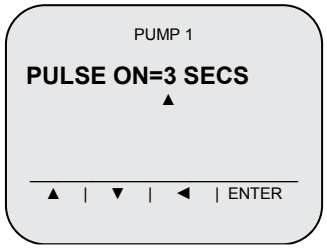




Pulse On

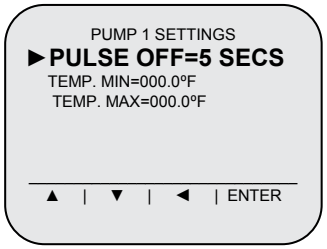
This setting controls how long the pump will be ON during the pulse feed stage of operation.

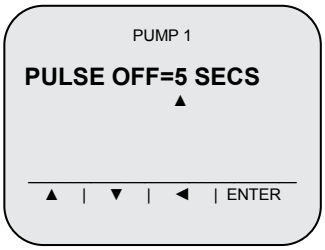




Pulse Off

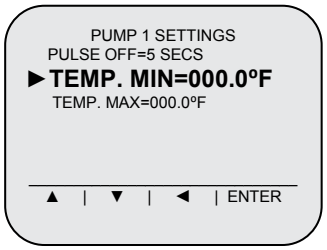
This setting controls how long the pump will be OFF during the pulse feed stage of operation.

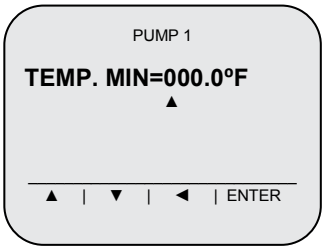




Temp Min

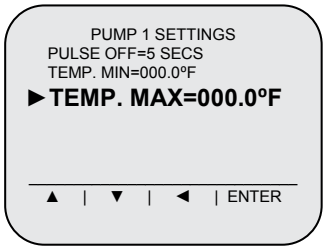
Specify the minimum operating temperature. If the temperature falls below this value, a warning will be displayed on the front panel and the error will be recorded into the report memory.

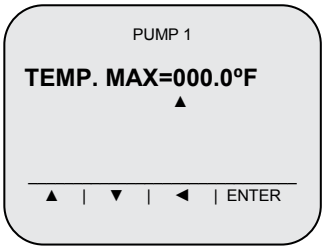




Temp Max

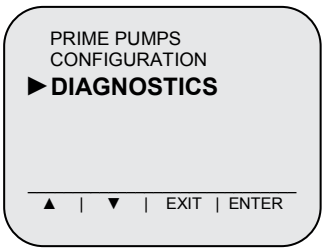
Specify the maximum operating temperature. If the temperature rises above this value, a warning will be displayed on the front panel and the error will be recorded into the report memory.





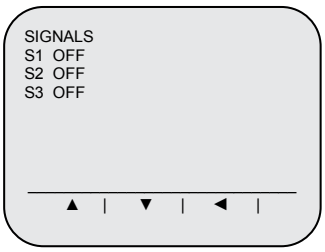
DIAGNOSTICS

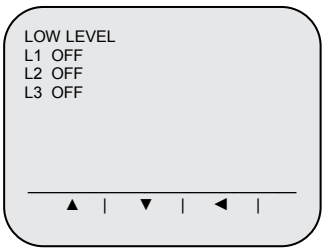
Use the ▲ and ▼ key to highlight DIAGNOSTICS, then press ENTER.



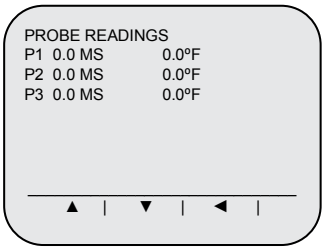
Use the ▲ and ▼ key to browse through the four diagnostic display screens listed below.

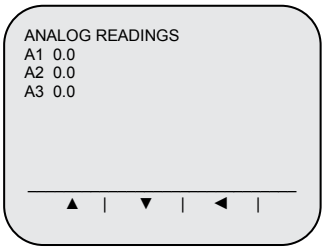
- Signal Inputs
- Low Level Inputs
- Probe Readings
- Analog Readings





When finished, press the ◄ key to return to normal pump operation.





OPERATION ERROR SCREENS

Missing Calibration Error

If any of the pumps are not calibrated prior to operation you will get a “CALIBRATE PUMP” error screen in red showing which pump is missing the calibration. Press any key to continue. Go into the main menu and calibrate pumps.

PUMP NAME
CALIBRATE PUMP

Flow Meter Error

The screen will show which pump has a flow meter error. You can disable the flow meter to allow the pump to operate in time mode while the problem is being rectified.

PUMP NAME
FLOW METER ERROR

DISABLE FLOW
METER?

Probe Error

This display indicates that one of the probes connected to the system is not recognized. Check wiring from the probe to the main control board.

PROBE ERROR

Low Level Error

When a chemical container is low (or empty) this message will indicate which pump is affected.

LOW LEVEL

Temperature Error

This display will show if the temperature is out of range (low or high) for any chemical that temperature monitoring is enabled.

TEMPERATURE

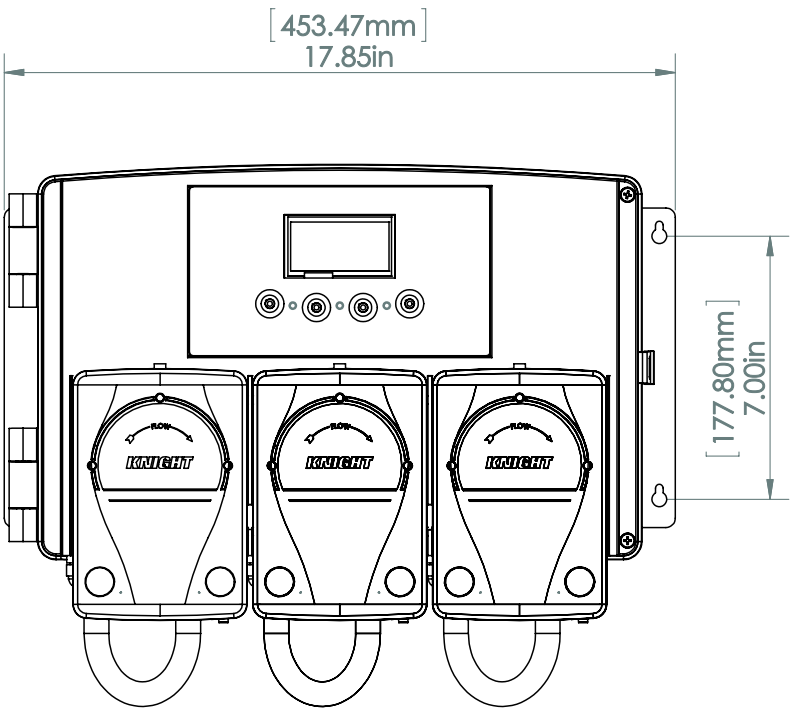
I/O Communication Error

If the I/O board is not detected during advanced system operation you will get an “I/O COMMUNICATION ERROR” screen in red.

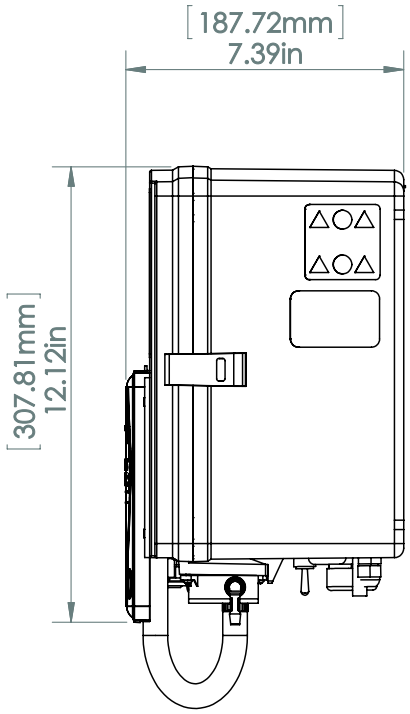
I/O
COMMUNICATION
ERROR

SYSTEM DIMENSIONS

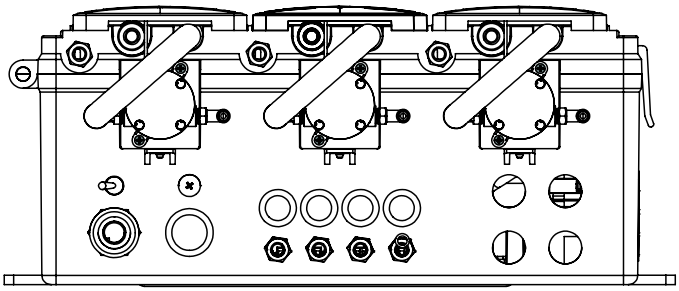
Main Cabinet (all models)



FRONT VIEW



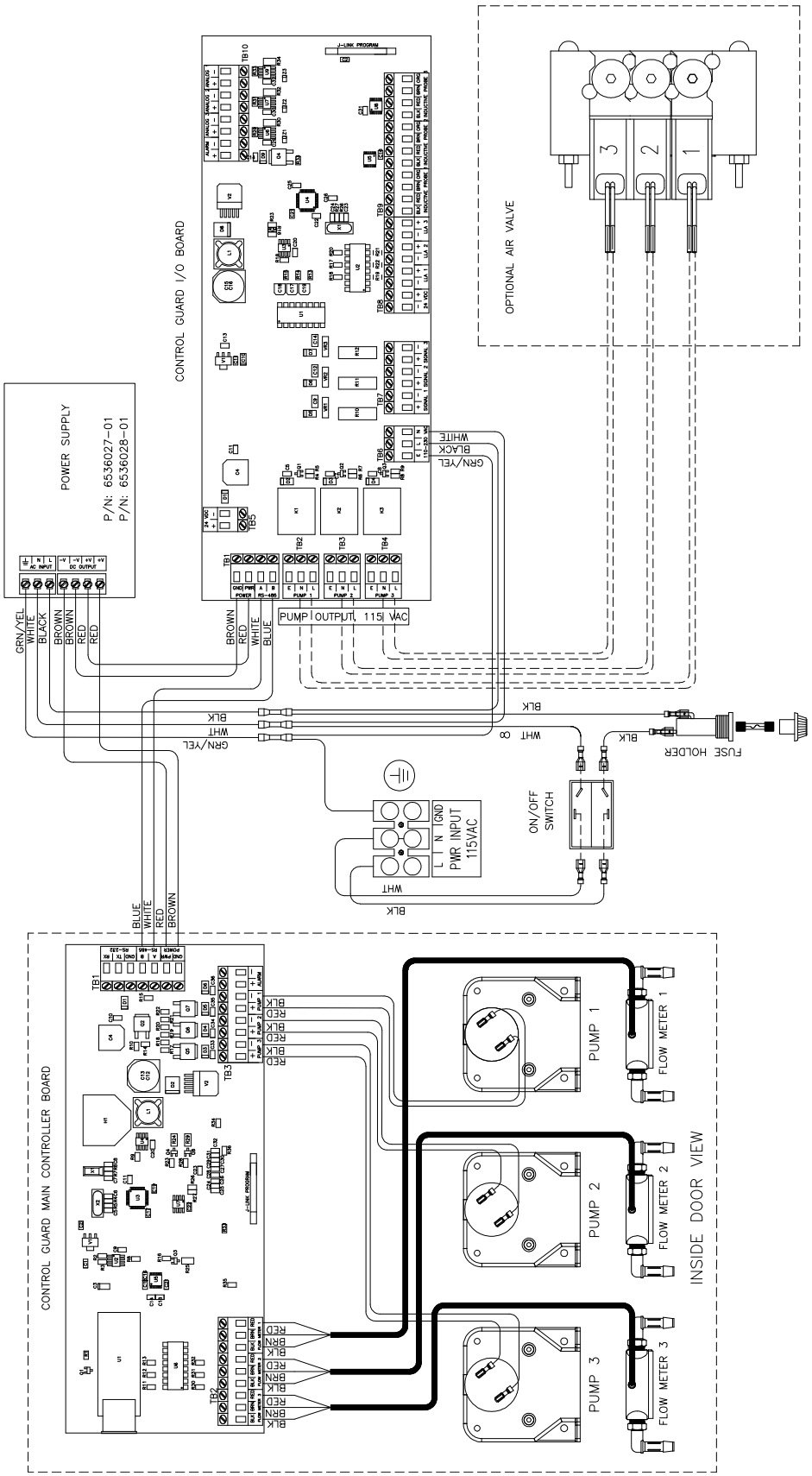
SIDE VIEW



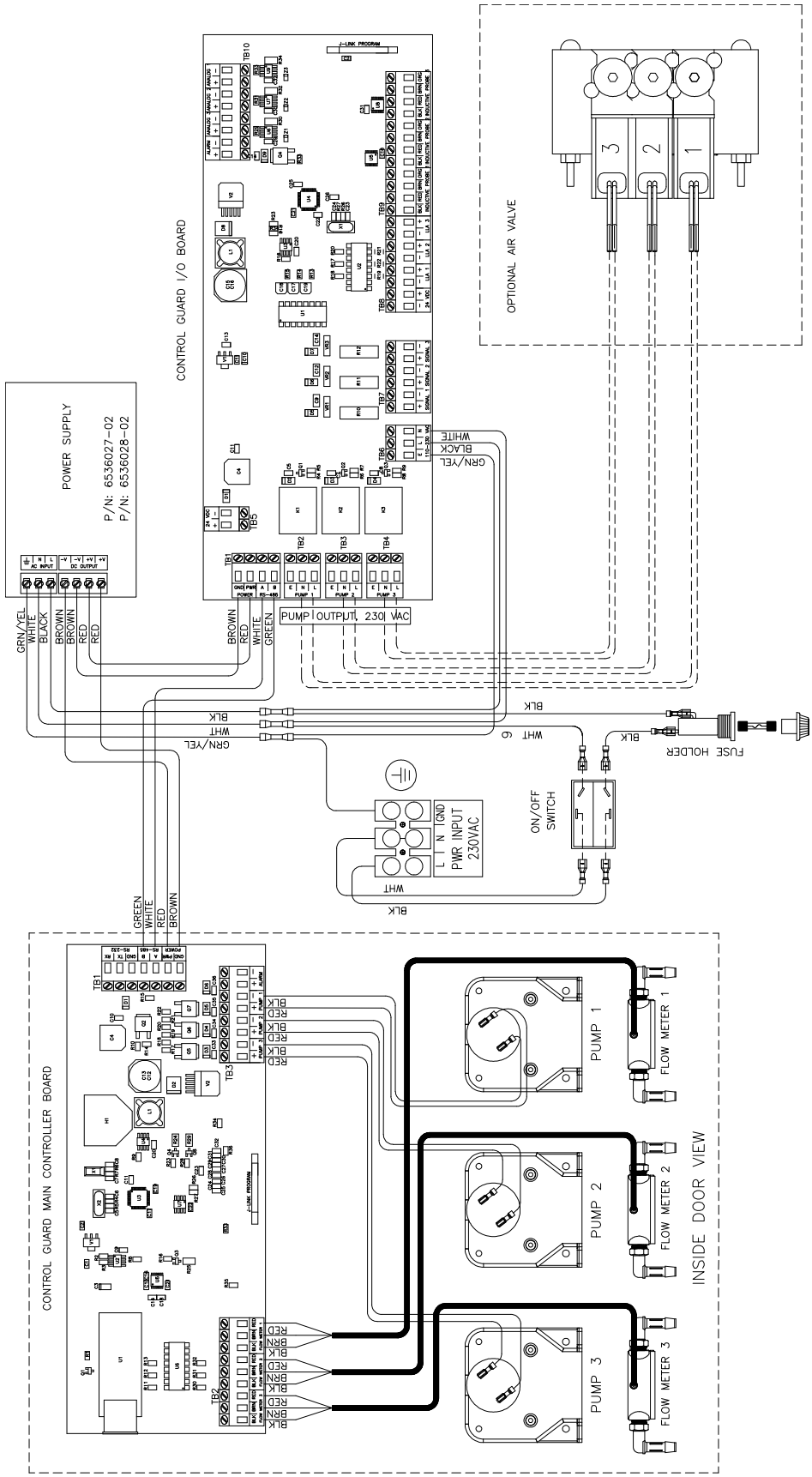
BOTTOM VIEW

NOTE: The keyhole mounting holes are 17" apart

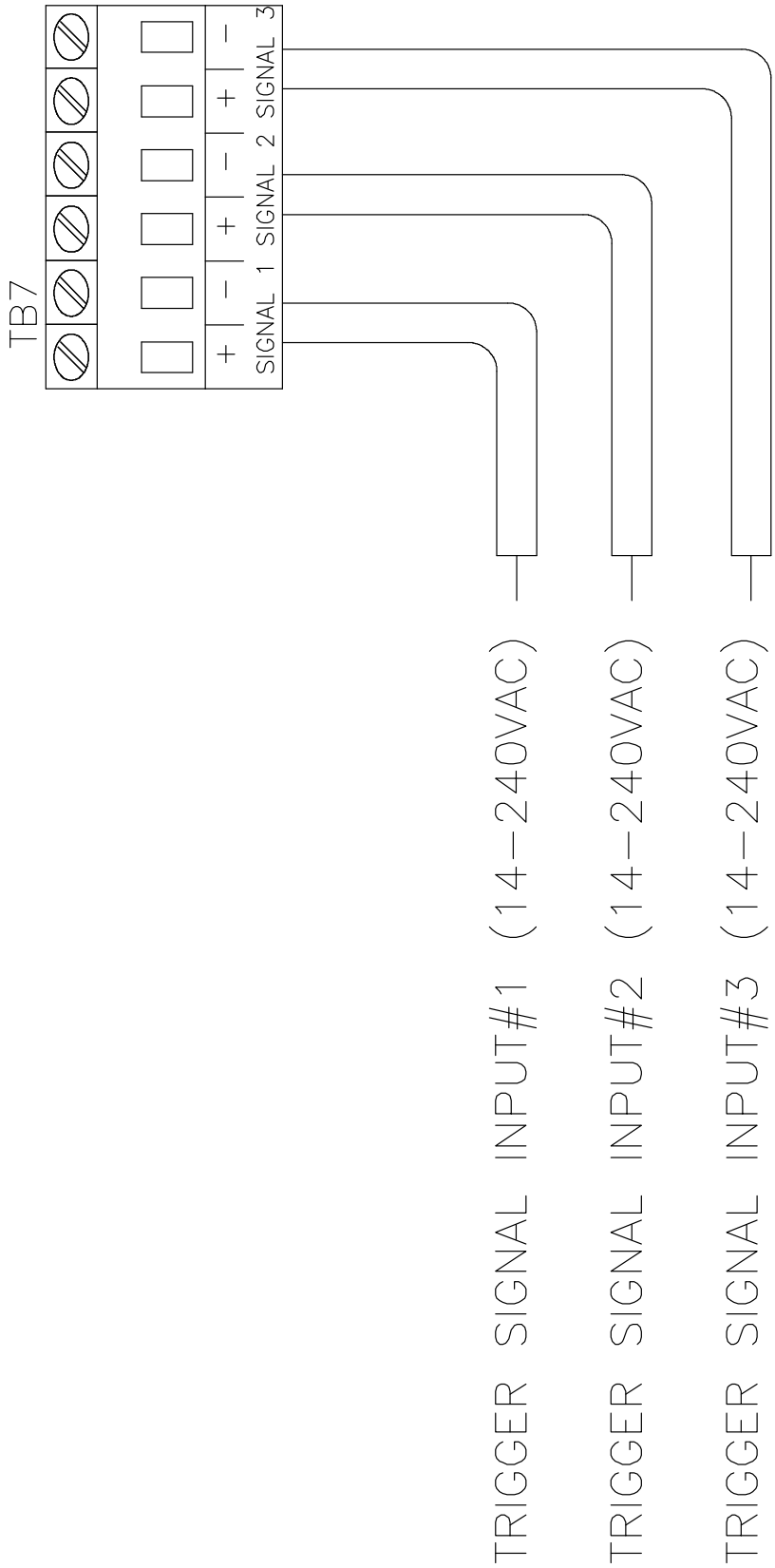
WIRING DIAGRAM (115VAC)



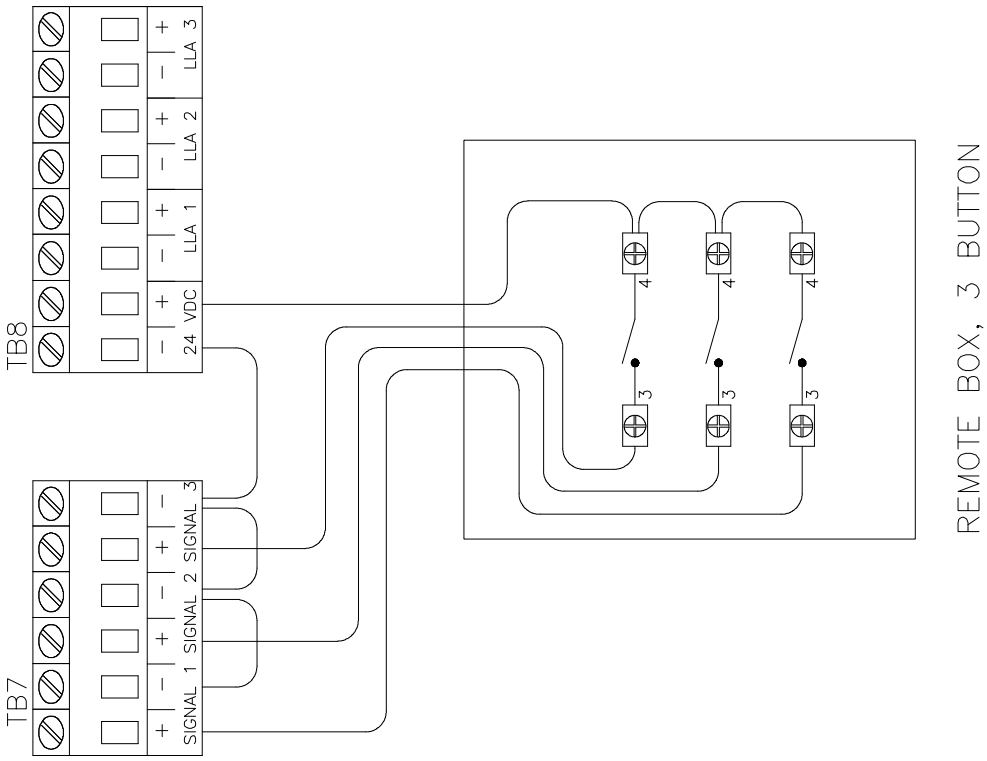
WIRING DIAGRAM (230VAC)

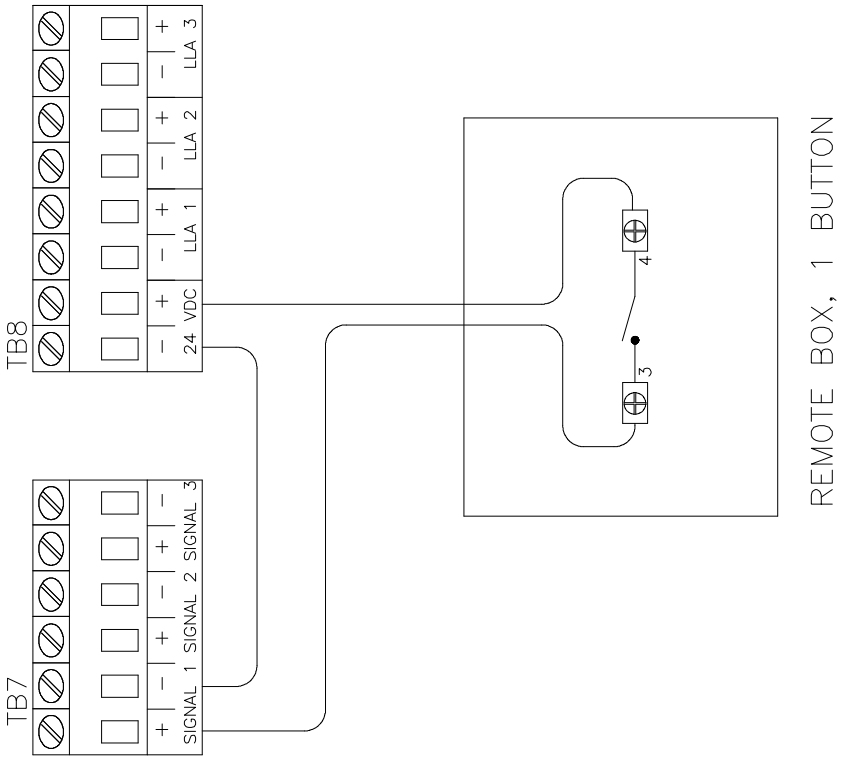


WIRING DIAGRAM FOR CONNECTING SIGNAL INPUTS

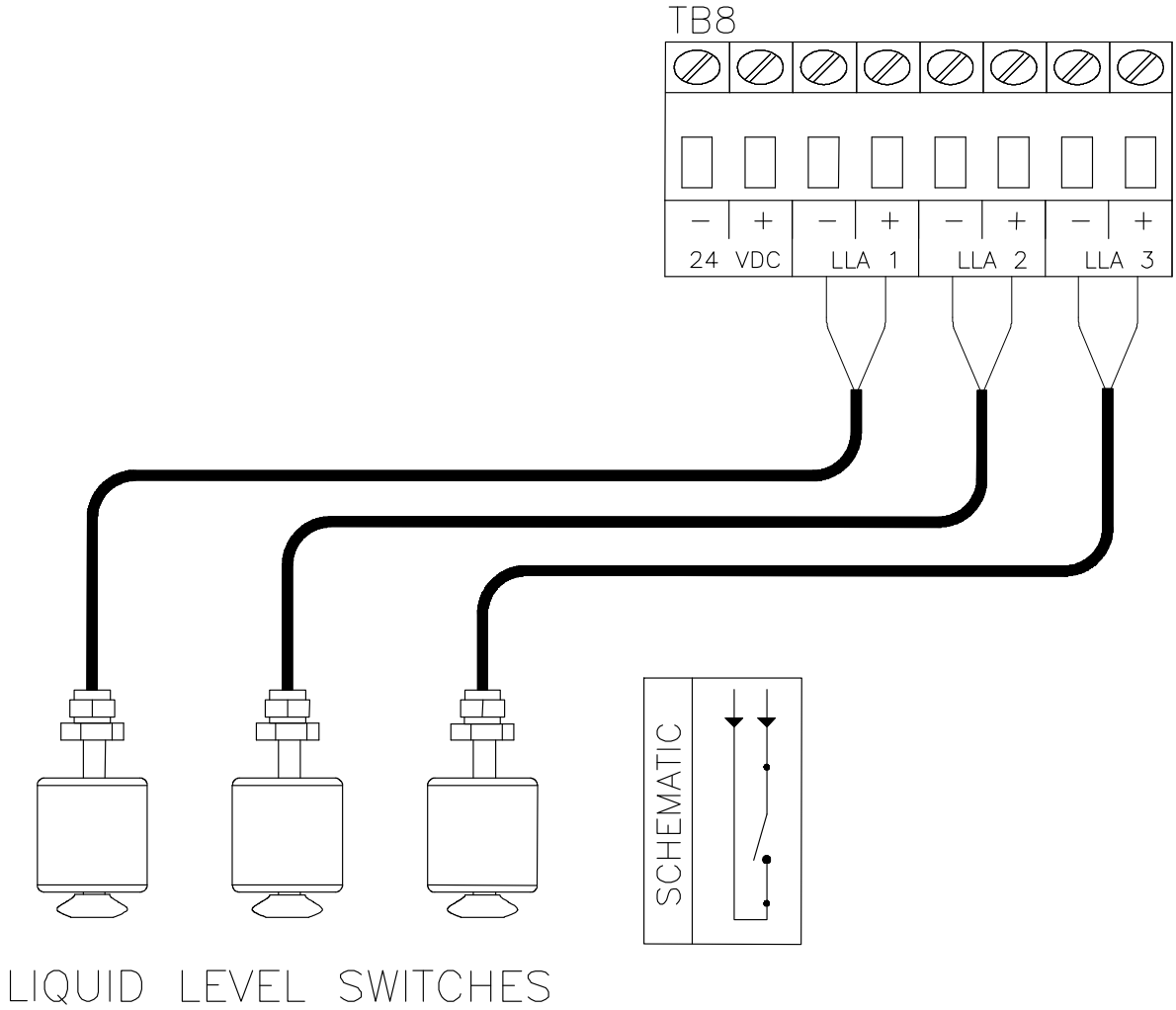


WIRING DIAGRAM FOR CONNECTING REMOTE INPUT SIGNALS



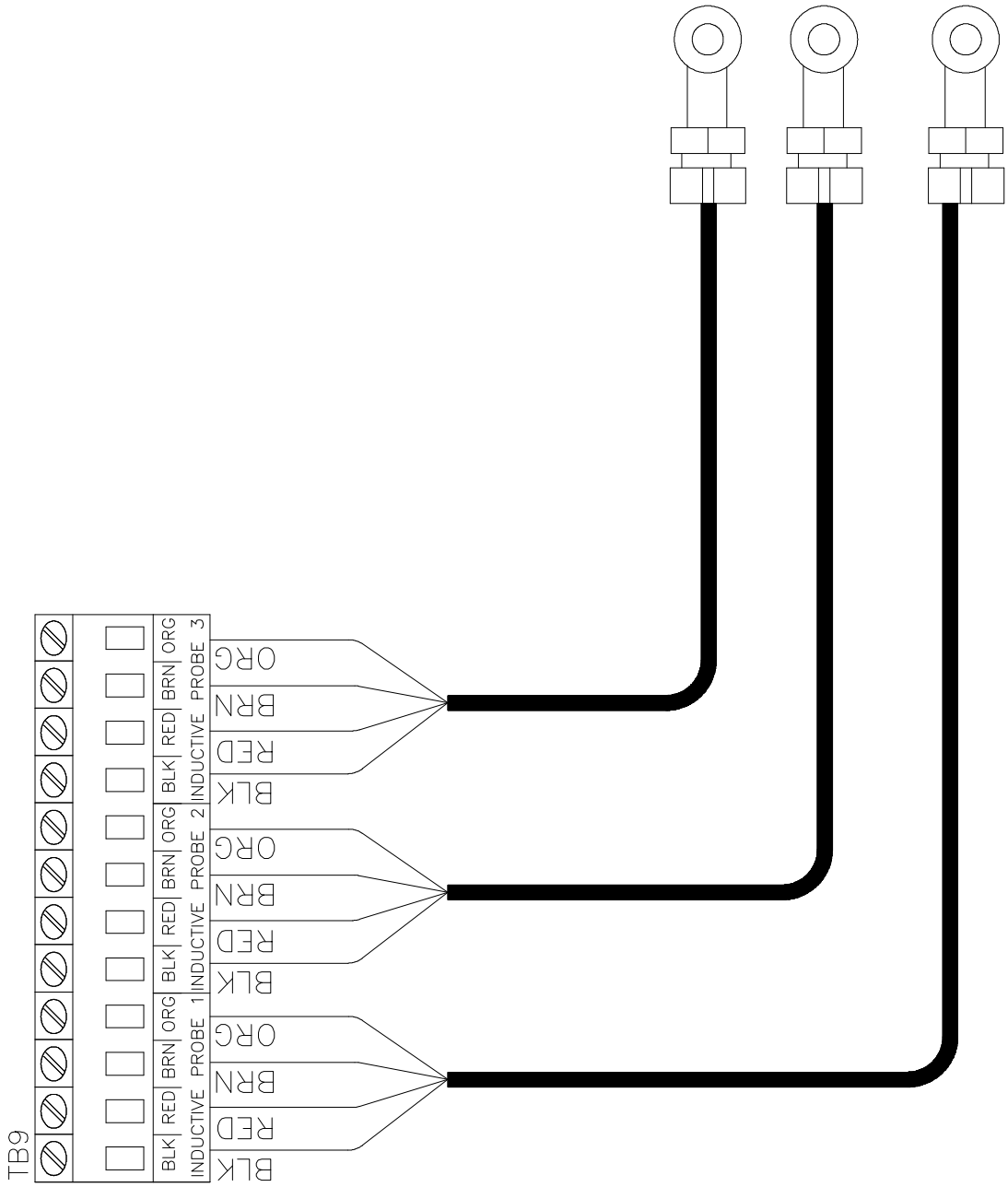


WIRING DIAGRAM FOR CONNECTING A LOW LEVEL SWITCH

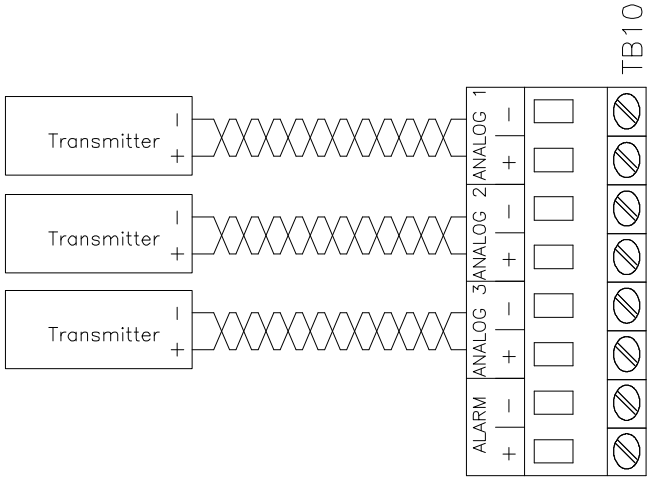


Note: the low level inputs are for dry contacts (no voltage)

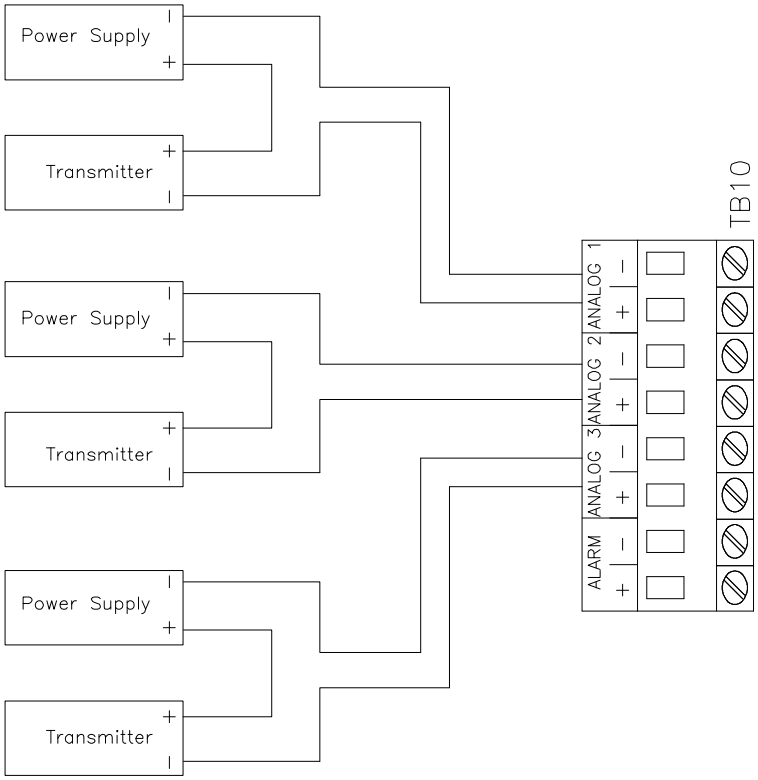
WIRING DIAGRAM FOR CONNECTING KNIGHT INDUCTIVE PROBES (PN 6536033)



WIRING DIAGRAM FOR CONNECTING A 4-20MA DEVICE

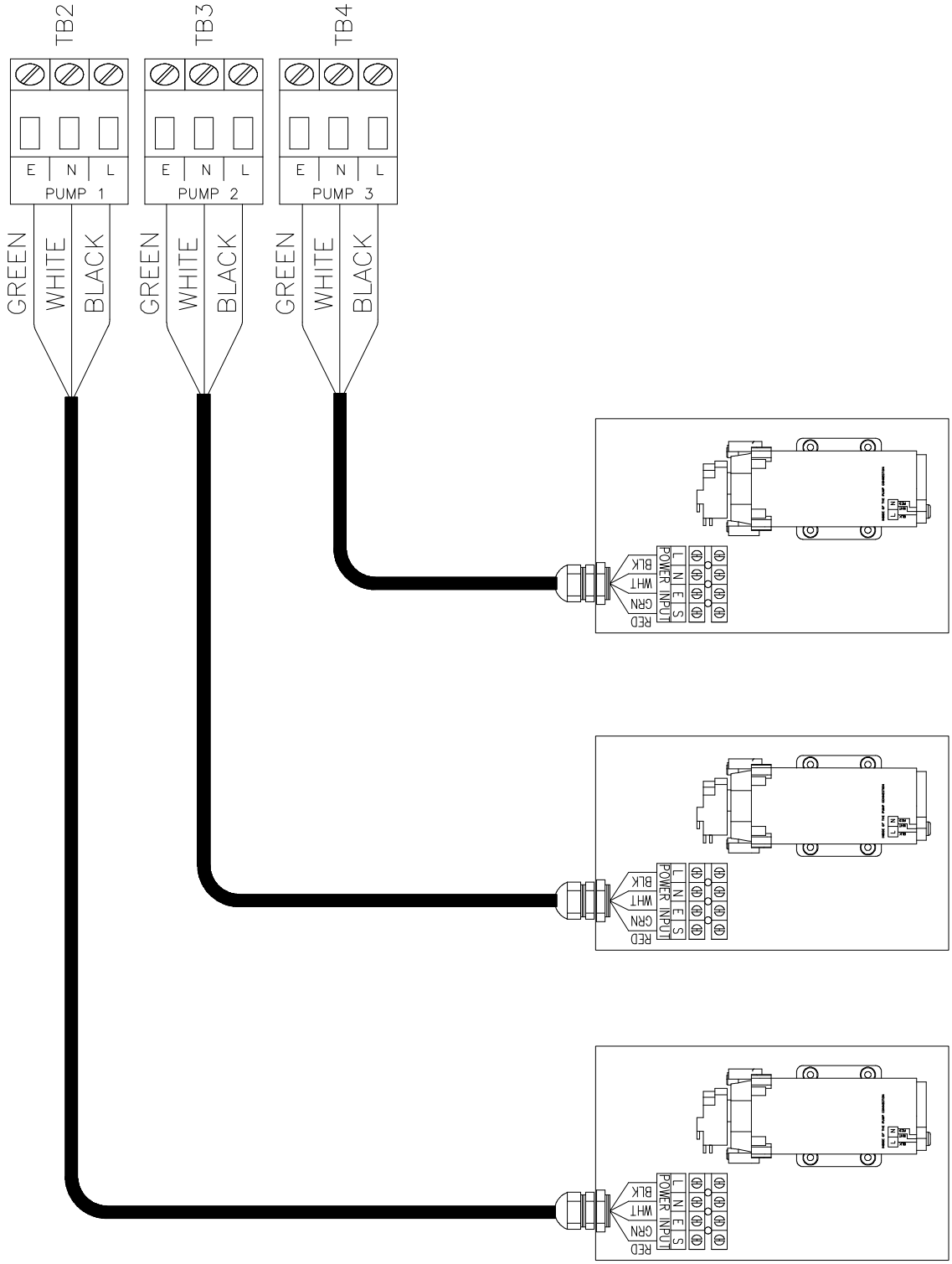


ACTIVE TRANSMITTER

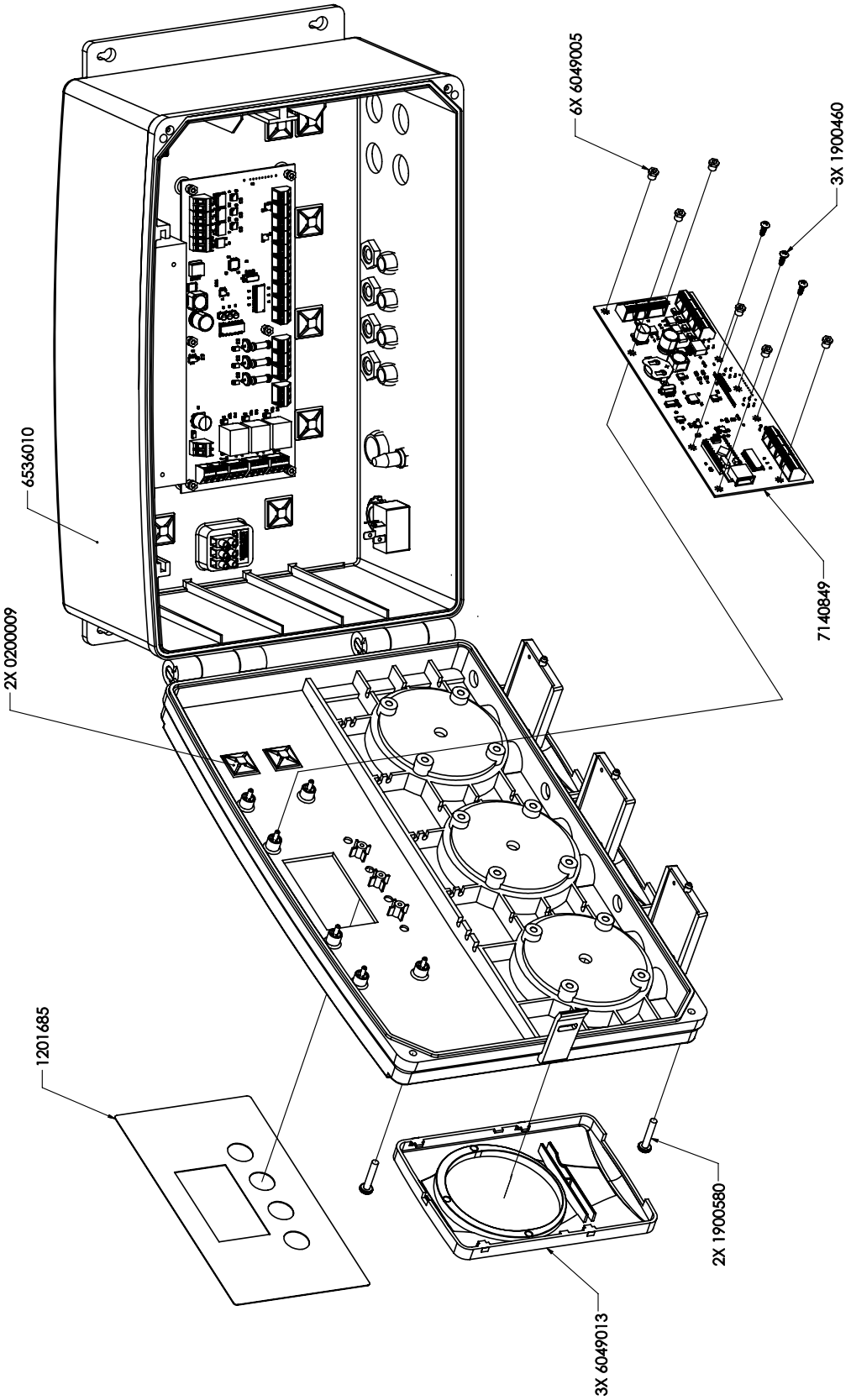


PASSIVE TRANSMITTER

WIRING DIAGRAM FOR CONNECTING ELECTRIC PUMP/VALVE (KNIGHT EDP PUMP DETAILED)

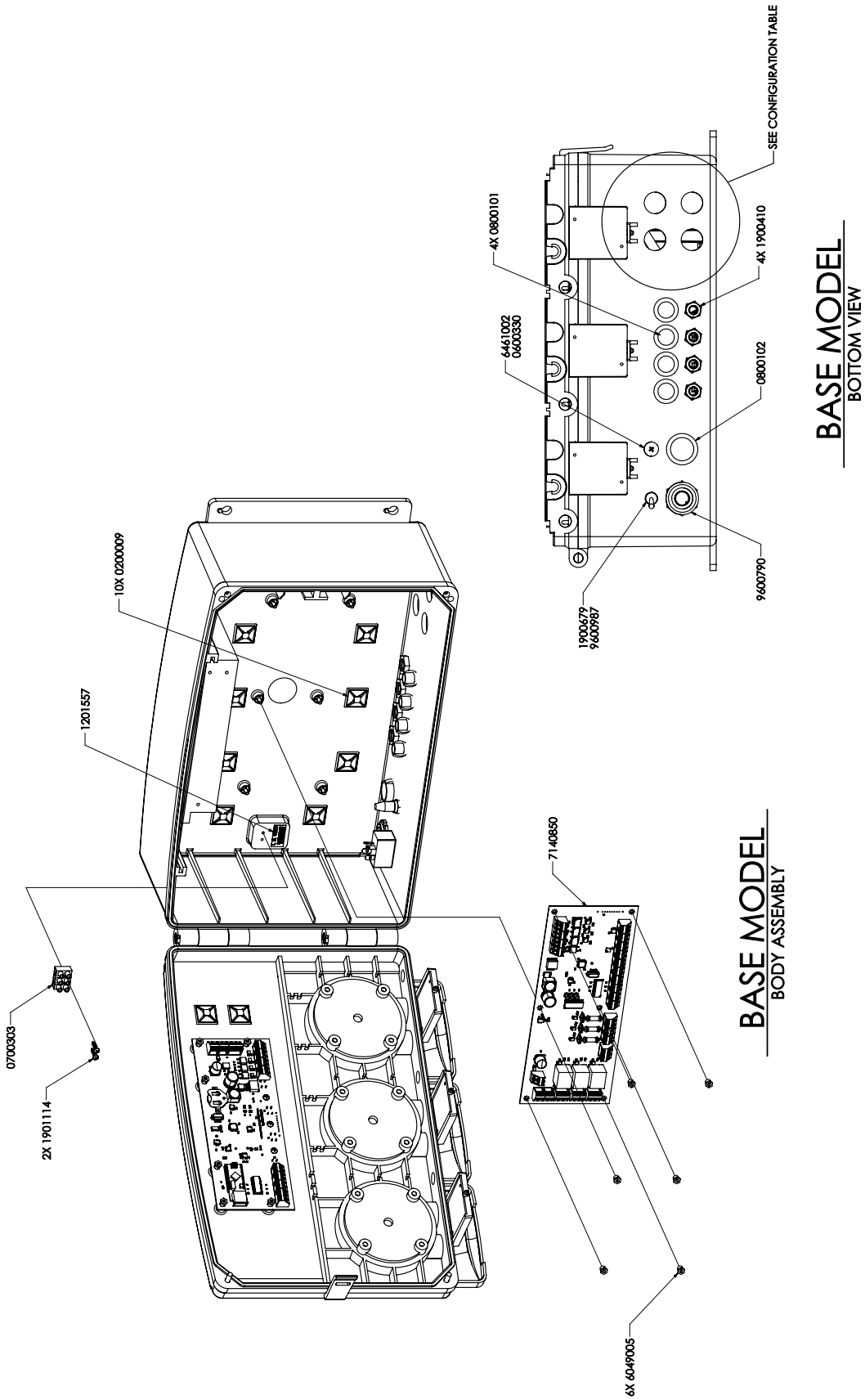


EXPLODED VIEWS

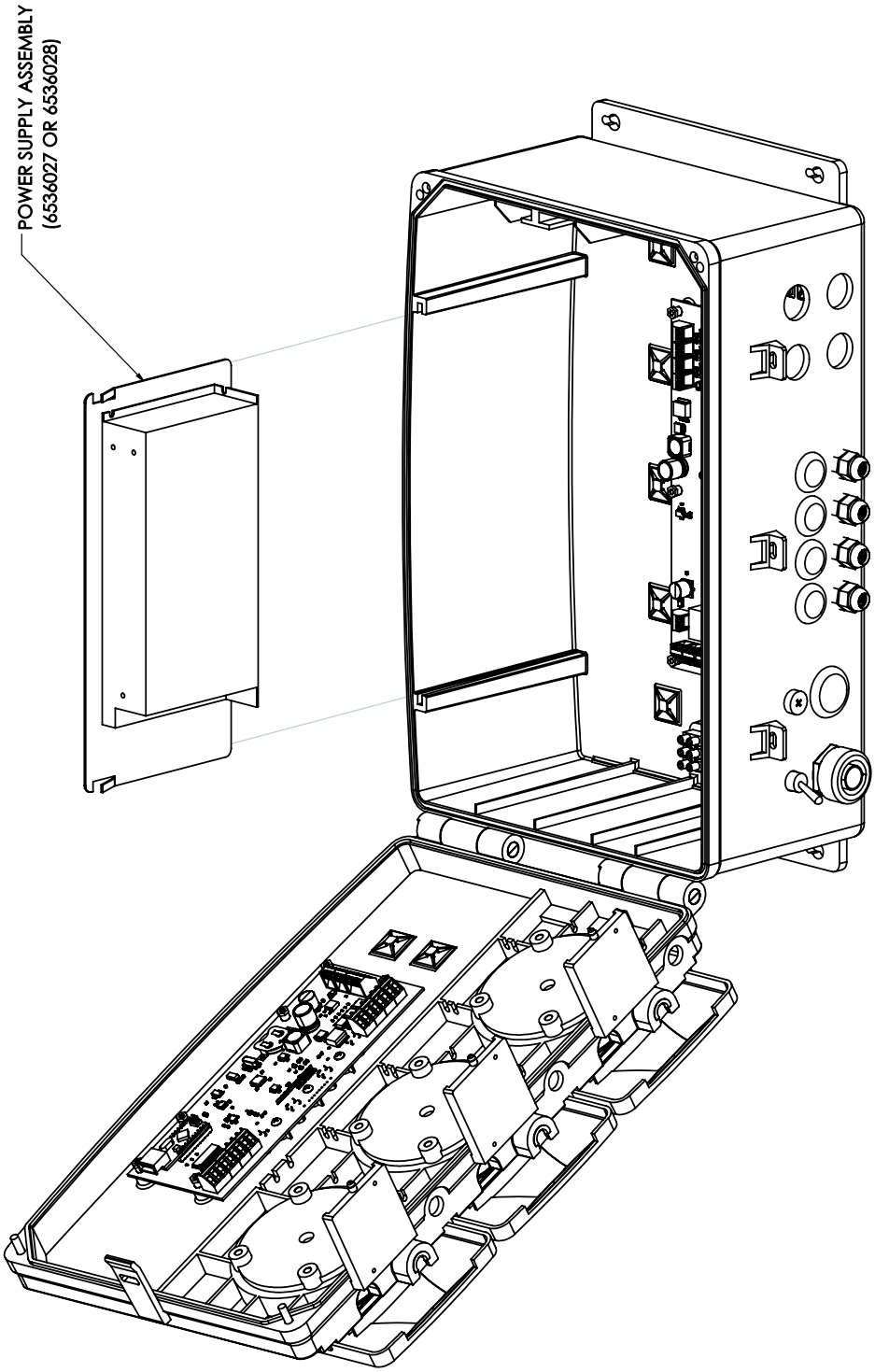


BASE MODEL
DOOR ASSEMBLY

EXPLODED VIEWS

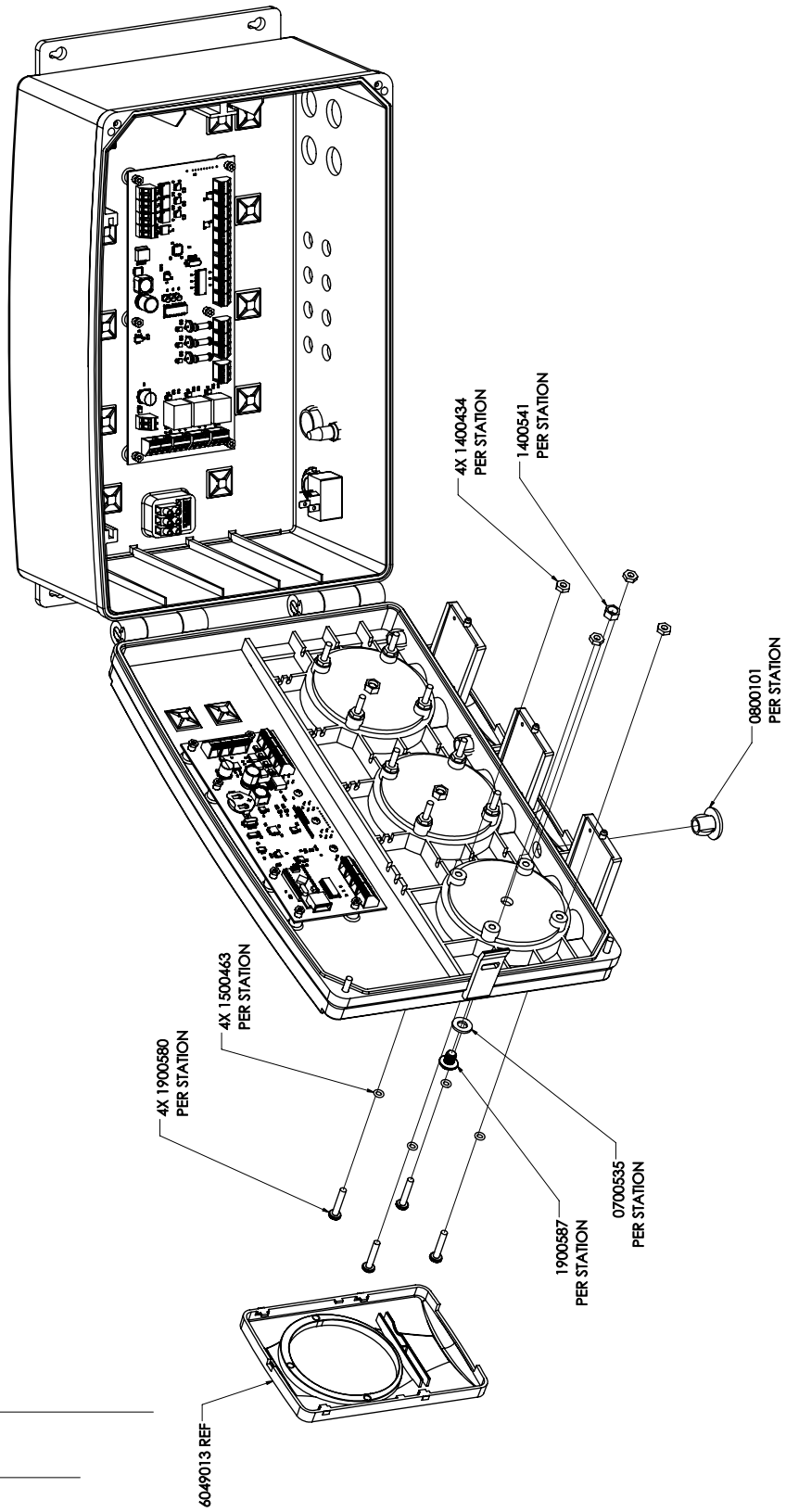


EXPLODED VIEWS



POWER SUPPLY
BOTTOM VIEW

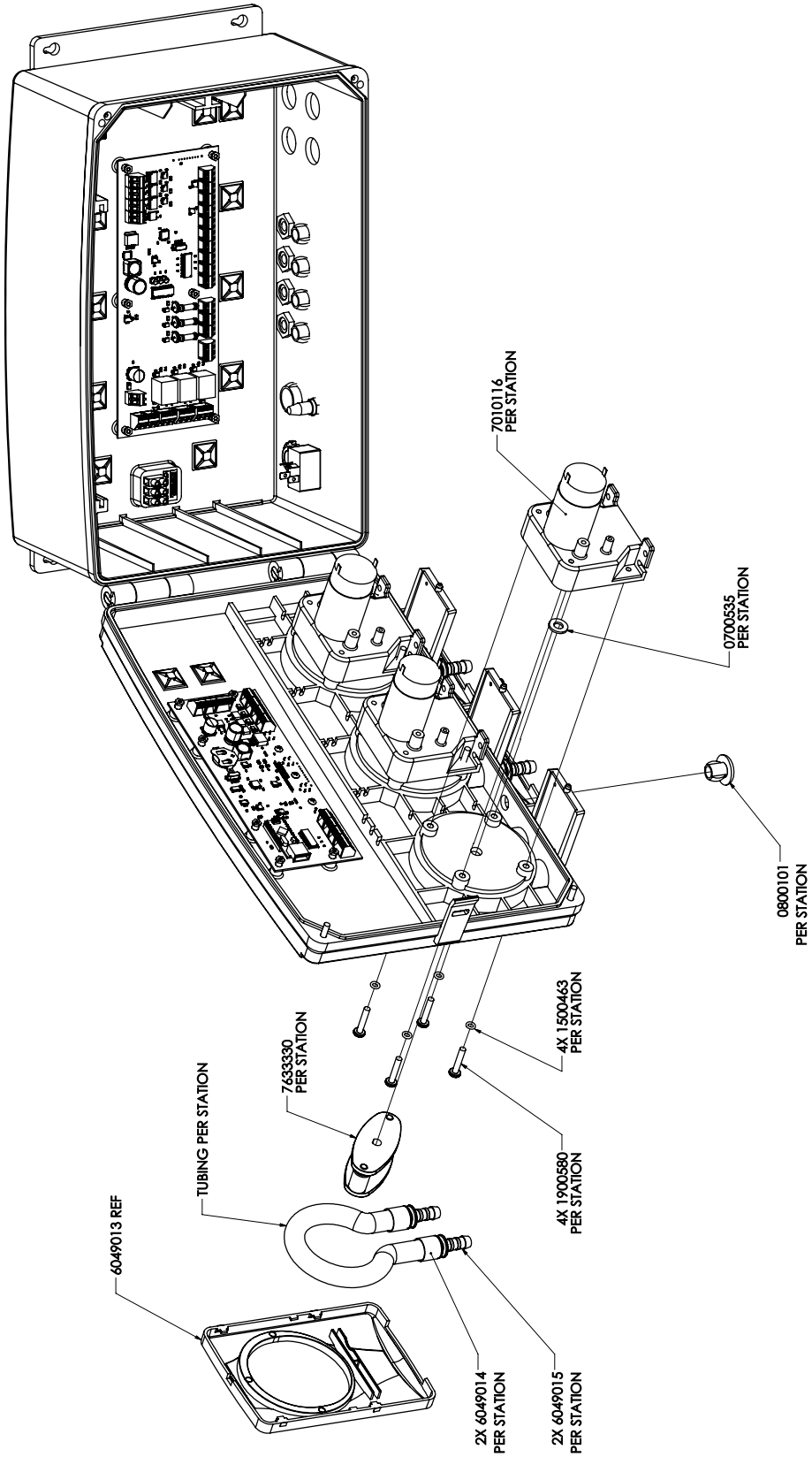
EXPLODED VIEWS



EMPTY PUMP STATION

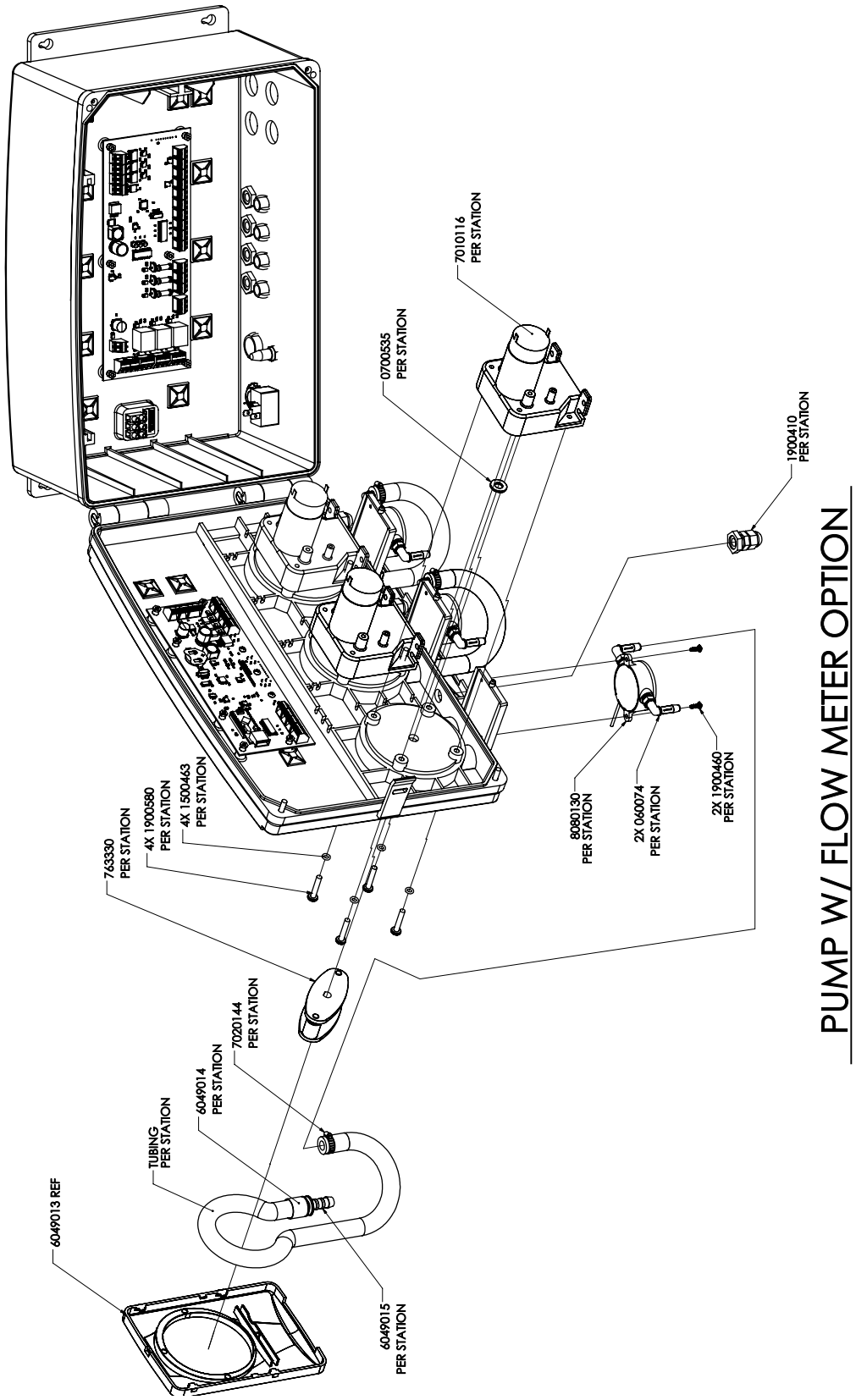
PUMP "ZERO" KIT

EXPLODED VIEWS



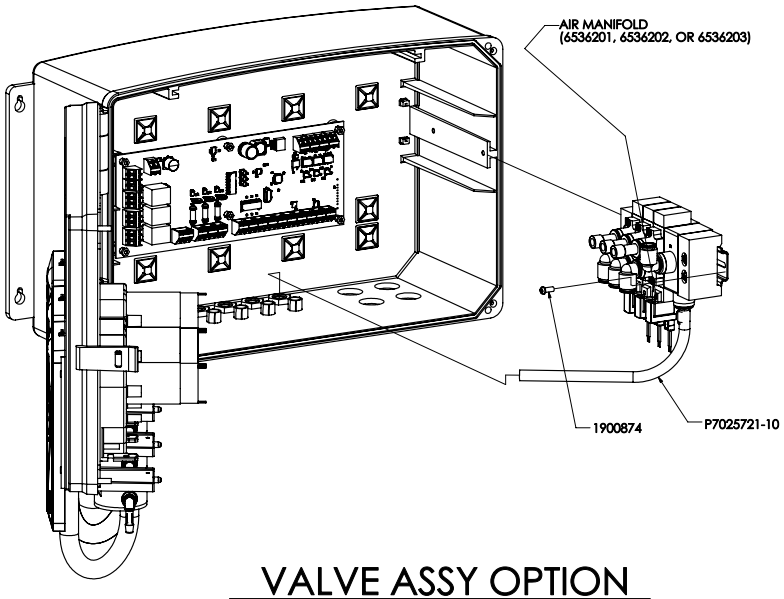
PUMP ONLY OPTION

EXPLODED VIEWS

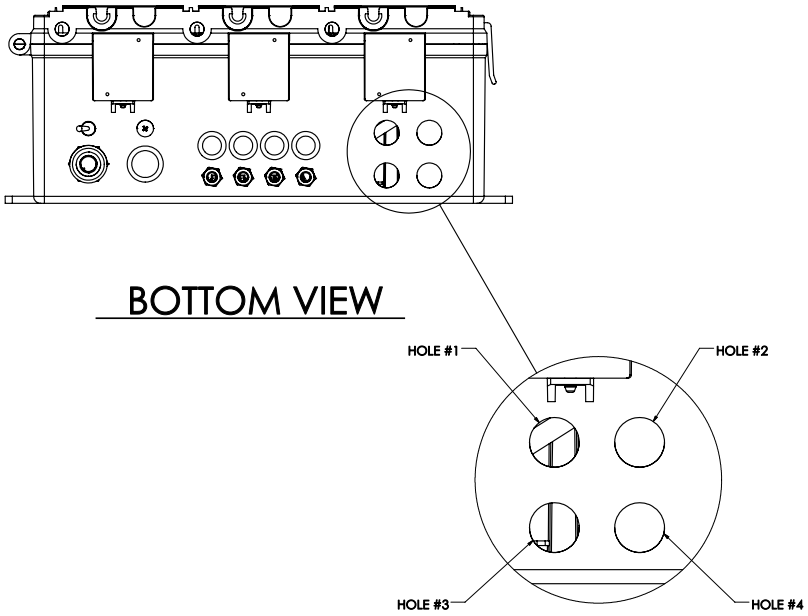


PUMP W/ FLOW METER OPTION

EXPLODED VIEWS



VALVE ASSY OPTION



BOTTOM VIEW

ASSEMBLY CONFIGURATION TABLE				
	HOLE #1	HOLE #2	HOLE #3	HOLE #4
6536013 (VALVE ZERO) (KIT)	0800102	0800102	0800102	0800102
6536201 (VALVE ASSY)	0800102	0800102	1900400, 1900401, 1900402	1900400, 1900401, 1900402
6536202 (VALVE ASSY)	0800102	1900400, 1900401, 1900402	1900400, 1900401, 1900402	1900400, 1900401, 1900402
6536203 (VALVE ASSY)	1900400, 1900401, 1900402	1900400, 1900401, 1900402	1900400, 1900401, 1900402	1900400, 1900401, 1900402

TROUBLESHOOTING

Symptom	Indication	Things to Check
No Power	Blank (black) display	Verify main supply voltage Verify power cord plugged into outlet Verify main power to main terminal block both before and after the fuse Verify 5A fuse not blown
Calibration error	Red display with error message	Calibrate pump per steps in programming section
Flow-meter error	Red display with error message	Chemical container empty Air in chemical lines Debris in flow meter Loose flow meter wires
Probe error	Red display with error message	Loose probe wires Defective probe
Low level error	Red display with error message	Chemical container empty Loose wires on float switch Float on switch is stuck / jammed
Temperature error	Red display with error message	Solution tank is too hot or too cold Defective probe
I/O communication error	Red display with error message	Loose wires between main control and I/O boards Defective main control board Defective I/O board

KNIGHT

EC – Declaration of Conformity

We declare that the product listed below, to which this Declaration of Conformity relates, is in conformity with the Standards and other Normative Documents listed below:

Equipment Description: ***Advanced Chemical Concentration System***
Type/Model Number: ***CONTROL GUARD ACCS™***

Low Voltage Directive *- 2006/95/EC (and former Directive 73/23/EEC)*
Standards to which Conformity is Declared:

Electrical Safety — *IEC/EN 61010-1:2010 (Third Edition) - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements.*

For Information: — *The "Electrical Safety Test" took place at the CSA International, Irvine, CA, U.S.A*

Electromagnetic Compatibility
EMC Directive - 2004/108/EC and former Directive 89/336/EEC as amended by 92/31/EEC and 93/68/EEC)
Standards to which Conformity is Declared:

EMC Emissions:
CISPR 11: Industrial, scientific and medical (ISM) radio-frequency
EN 55011: Equipment - Radio disturbance characteristics - Limits and methods of measurement

EN 61000-3-2: Limits for harmonic current emissions
EN 61000-3-3: Limitation of voltage changes, voltage fluctuations and flicker in public

EMC Immunity:
EN 61326-1: 2006 Electrical Equipment Measurement,Control & Laboratory Use (Normal Environment)
EN 61000-4-2: Electrostatic discharge immunity test
EN 61000-4-3: Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4: Electrical fast transient/burst immunity test
EN 61000-4-5: Surge immunity test
EN 61000-4-6: Immunity to conducted disturbances, induced by diofrequency fields
EN 61000-4-11: Voltage dips, short interruptions and voltage variations immunity test

For Information: — *The "Electromagnetic Test" took place at the Northwest EMC, Irvine, CA, U.S.A*

Certification Marking: CE

We declared that the equipment specified above conforms to the referenced EU Directives and Harmonized Standards."

*Signature:*_____ *Date:* 05/25/2016

Name: Joah Bridwell *Title:* Engineering Manager

DISCLAIMER

Knight LLC does not accept responsibility for the mishandling, misuse, or non-performance of the described items when used for purposes other than those specified in the instructions. For hazardous materials information consult label, MSDS, or Knight LLC. Knight products are not for use in potentially explosive environments. Any use of our equipment in such an environment is at the risk of the user, Knight does not accept any liability in such circumstances.

FOOTNOTE

The information and specifications included in this publication were in effect at the time of approval for printing. Knight LLC reserves the right, however, to discontinue or change specifications or design at any time without notice and without incurring any obligation whatsoever.

WARRANTY

For complete product terms and conditions scan the QR code below or enter the following URL into your browser:
http://cfstech.info/t-and-c

SCAN

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