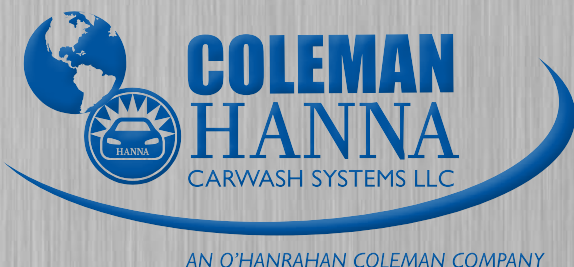




# Sweetwater Reclaim System

## *Service Manual*



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SWEETWATER RECLAIM SYSTEM

# System Maintenance and Installation

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WORLD LEADER IN CONVEYOR CAR WASH SYSTEMS  

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HANNA USER'S MANUAL

Material Safety Data Sheet  
**MSDS OZONE**

## Introduction

### *General*

This manual is intended to give you the information needed to install, start-up and maintain a Coleman Hanna Sweetwater reclaim system. The sections detail your Reclaim's System Description, Installation, Operation and Maintenance.

## Warnings, Cautions, and Notes

As you read the manual, these symbols will let you know to pay special attention to the CAUTION, WARNING, and NOTE messages. These help to identify important safety issues or other important items.



**CAUTION** Information that could prevent system damage or minor personal injury.



**WARNING** Information that can prevent injury or death.



**NOTE** Just an FYI. Useful or interesting information.

## System Description

This industrial filtration system is actually two systems in one. The primary system consists of a high efficiency pumping station with on board filtration. The second system is an ozone recirculation system. The Electronic Control Panel monitors and maintains both systems.

## Primary Filtration System

Consists of a high efficiency motor and pump used to pull the water from the storage tanks through the inlet filter and past the filter array. This pumping station provides pressure for your process water. A pressure control activates the pump whenever the output water pressure drops below 40 psi, it shuts off automatically when the demand ceases or the output pressure reaches 60 psi.

### Filtration

Primary filtration is achieved via the holding tanks where if installed properly, act as a grease trap and sedimentation area, as well as providing a contact chamber for the ozone to oxidize contaminants in the water. On board the system, water is pulled through a coarse filter similar to a strainer basket on a swimming pool. This first filter is removable and should be checked periodically for debris such as bugs, cigarette butts and other floating debris that could have passed through the tanking. From there the water is pulled through the pump and pushed through the filter element or elements. Several types of filters are used in this application depending on your system options.



Local ordinances often call for a **clarifier tank** prior to discharge to sewer. Grit chamber or grease trap are also terms used to describe this multi-stage chamber designed to catch grease, oil and sediment.

### Self-Purging Hydro Cyclone

Each HydroCyclone contains 16 internal centrifuges that spin, heavier than water particulates out of the effluent stream and collect them in a clear Polycarbonate bowl at the bottom of the HydroCyclone. This sediment is periodically purged via a backwash line to a sump.

### Bag filters

These filters are fabric felts and woven socks that collect the dirt and debris on the inside of the bag and need to be changed periodically. Filter bags are rated in nominal sizes, meaning the smallest particle able to be filtered. A 5-micron bag means the smallest particle able to be filtered is 5 microns, however, not all the pores in the bag are that small and some larger debris will get through. An advantage of filter bags is their ability to absorb certain substances like silicone or oils.



Filter bags should be used once then replaced. If re-used the stitching or welded seams may become weak and burst. Cleaning also enlarges the pore size. This will result in sand or other abrasives passing through the filter damaging expensive high-pressure pumps and other devices.

## *Ozone Re-Circulation*

Consists of another high efficiency motor and centrifugal pump assembly that takes the pre-filtered water and passes it through a centrifugal sand separator, to remove abrasive elements from the process water, then through a venturi that pulls ozone into the water stream as tiny bubbles. The bubble size is critical for optimum ozone

saturation and treatment of the water. This patented injector system provides a 99% transfer rate of ozone to the contact chamber when set properly (see system set-up) See Appendix D for Material Safety Data.



Ozone is a powerful oxidizing agent and is highly chemically reactive. Inhalation produces various degrees of respiratory effects from minor irritation to pulmonary edema (fluid in lungs) under high concentrations and long exposure. It can also cause eye irritation at levels above 2 ppm.

Shown at right is your SweetWater System. (Note the palletized design). The entire machine is enclosed with a stainless steel frame to prevent damage during shipping and to protect from accidental impacts in tight equipment rooms.

Input and output ports are on the right hand side of the unit. The Oxygen, Ozone, and Bio pumping system are all on-board. The VFD and Control panel are splashproof nema 4x.







**Chapter**

**2**

**Specifications:**

**65 GPM with 3 Hp primary pump and 1 MHC (multi hydro cyclone)**

DIMENSIONS: Max dimensions of stainless steel frame  
Width: 56"      Depth: 16"      Height: 66"

**Primary Filtration and Control Panel**

Electrical  
Input Power: 208/230/480 Volt, 3 phase @ 8.5 / 8 / 4 amp max  
Control Power: 115 vac, 4 amp max  
On/Off control: Touch screen control selectable On / Off / Auto  
Pump: 3 HP 65 GPM @ 40 – 60 psi  
Particle Separator: 16 Self Purging Vortex Filters in a fiberglass reinforced resin body  
Inlet Filtration: Oversize cleanable stainless steel filter basket .03125 openings  
Primary Filtration: Single MHC centrifugal filtration to 1 micron with a specific gravity >1  
Water Inlet: 3" FNPT  
Filtered Water Outlet: 2" FNPT  
Purge Outlet: 2" FNPT  
Backwash Cycle Time: Programmable from 2 to 9 seconds

**100 - 120 GPM System II with 5 Hp primary pump**

DIMENSIONS: Max dimensions of stainless steel frame  
Width: 66"      Depth: 16"      Height: 56"

**Primary Filtration and Control Panel**

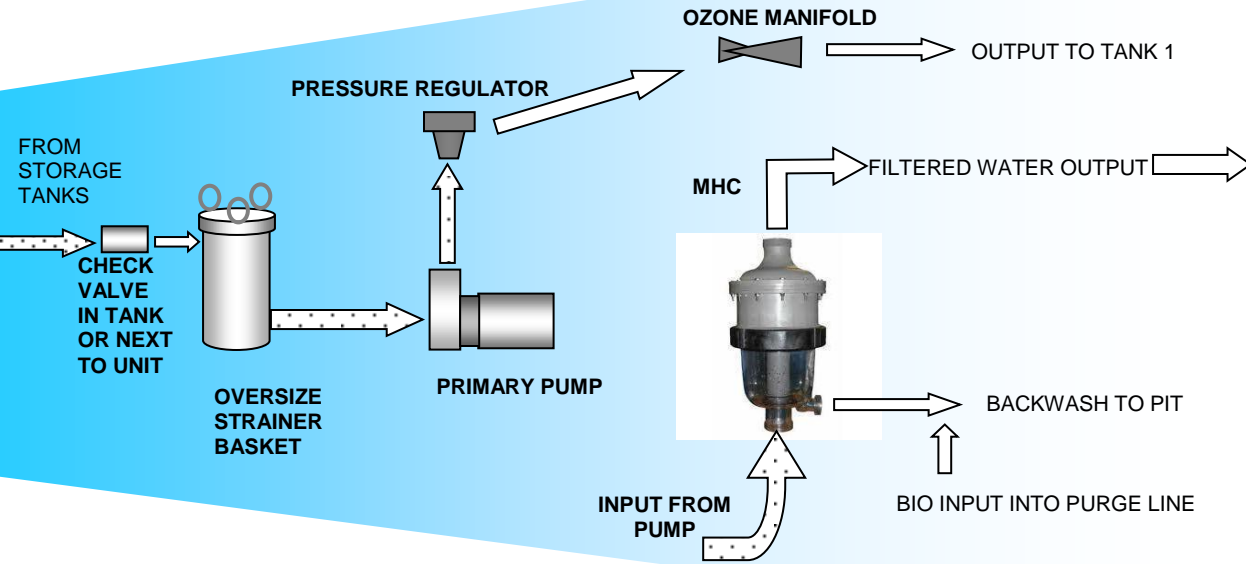
Electrical  
Input Power: 208/230/480 Volt, 3 phase @ 13.1 / 11.5 / 5.7 amp max  
Control Power: 115 vac, 4 amp max  
On/Off control: Touch screen control selectable On / Off / Auto  
Pump: 5 HP 125 GPM @ 40 – 62 psi  
Particle Separator: 16 Self Purging Vortex Filters in a fiberglass reinforced resin body  
Inlet Filtration: Oversize cleanable stainless steel filter basket .03125 openings  
Primary Filtration: Single or Dual MHC centrifugal filtration to 1 micron with a specific gravity >1  
Water Inlet: 3" FNPT  
Filtered Water Outlet: 2" FNPT  
Purge Outlet: 2" FNPT  
Backwash Cycle Time: Programmable from 2 to 9 seconds

Operating Temperature 35° to 104°F (2° to 40°C)

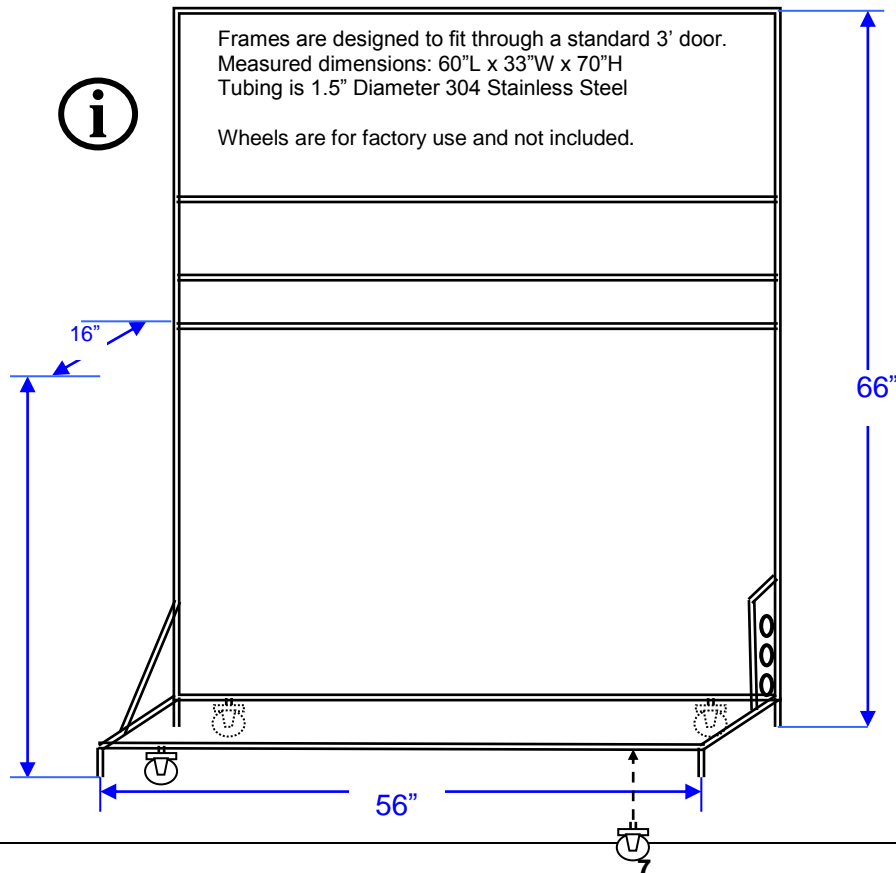
NOTE: particle spin out occurs when the particle is heavier than water, specific gravity >1.

NOTE: objects larger than 1 micron and lighter than water will need to be removed by other means like a bag or self-cleaning filter.

## Simplified Flow Diagram



## Frame Dimensions



## Chapter

# 3

## System Description

*Descriptions of main components*

### **INPUT CHECK VALVE:**

A swing type check valve is used to maintain prime in the primary pump by preventing the backflow of water to the storage tanks.



If this valve becomes stuck open or leaks, the resulting loss of prime may cause the primary pump to run dry resulting in pump damage.

### **STRAINER BASKET:**

The basket strainer is the pre-filter and prime storage reservoir. It prevents large debris from entering the pump. The filter is provided with a removable lid and stainless steel strainer basket to allow periodic inspection and cleaning. Inside the Oversize strainer is a perf basket with hole size from 1/32" to 1/16" depending on application

### **PRIMARY PUMP:**

A centrifugal pump providing 60 to 125 GPM of flow depending on the horse-power and inlet pipe size.

### **OZONE RECIRCULATION:**

Water is pulled through the input strainer by the primary pump and pushed through a pressure regulating valve into the ozone injection manifold. The suction pull from the venture is controlled via the ball valve plumbed in parallel on the ozone manifold

### **OZONE INJECTION MANIFOLD:**

A venturi-style injector manifold pulls the ozone into the water stream as billions of tiny bubbles. It is set at the optimum vacuum and pressure to result in the best ozone transfer.



Optimum settings for this manifold are preset during installation to approximately 10 psi as measured on the gauge at the sand separator, and to 5 LPM (liters per minute) ozone as measured on the ozone generator flow gauge. Improper settings may result in less efficient ozone transfer into the water stream.

### **MHC:**

The Multi-Hydro-Cyclone. This is also known as a centrifugal separator or a vortex particle separator. It creates a strong vortex of water forcing the heavy solids to the bottom where they are periodically purged into the pit. The lighter cleaner water flows pressurized through the top where it is sent out to the equipment. Each MHC contains 16 individual cyclonic separators to allow high flow and tolerance to back pressure that could be caused by secondary filtration.

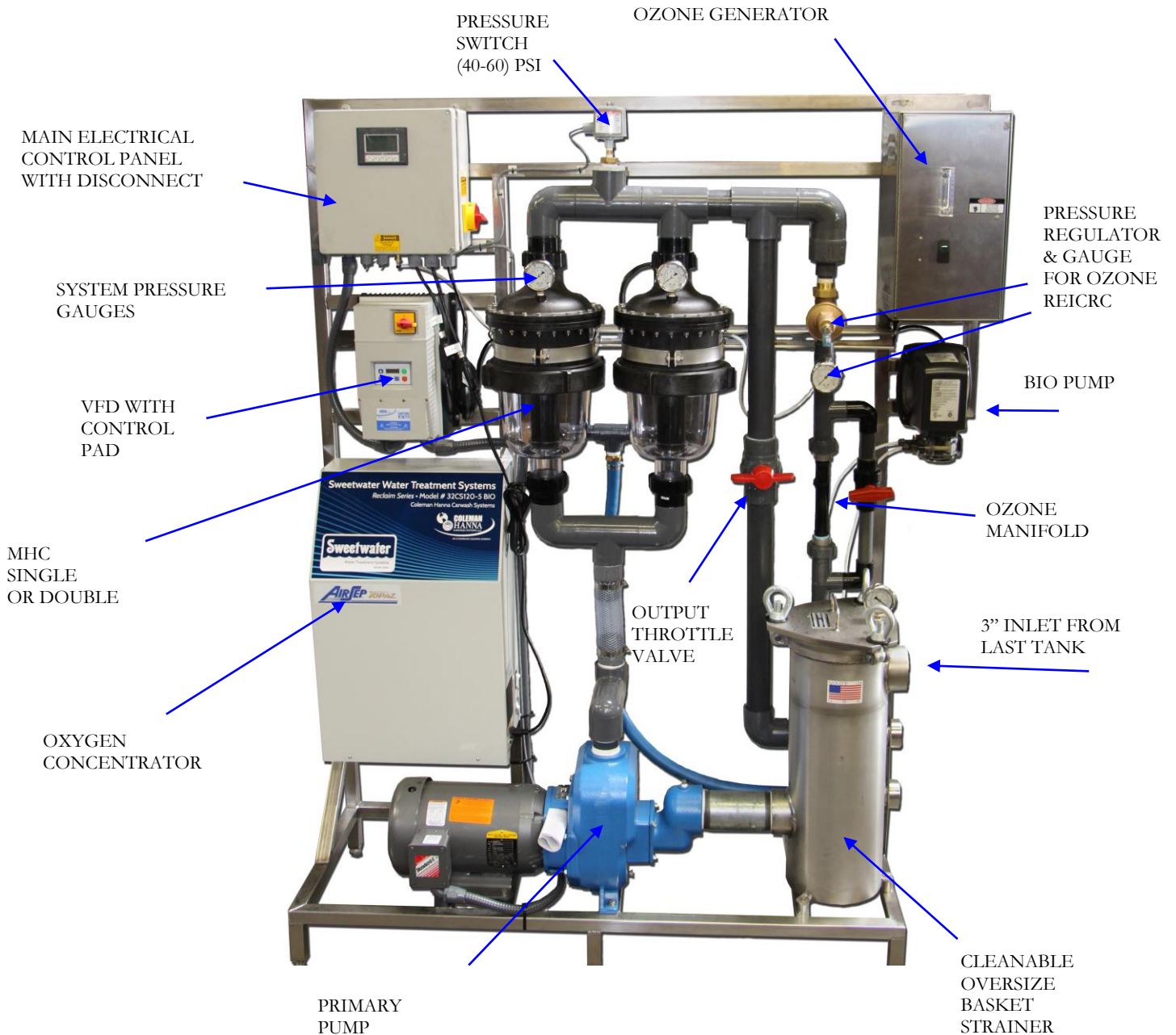
### **OPTIONAL BAG FILTER:**

The secondary filtration consists of a stainless steel housing containing a bag filter or a combination self-cleaning filter and bag filter or filters. These bag filters can be ordered in a multitude of micron sizes, the most common for commercial or industrial applications is 25 micron. The lowest is 5 micron and the largest 100 micron.



The MHC can be disassembled on the SweetWater unit. There is a band nut around the clear bowl which can be turned counter clockwise to loosen. The inputs and outputs are all unionized for quick change out if needed.

## Component Locations





**Chapter**

**4**

**Installation**

The RECLAIM system is enclosed in a stainless steel frame and should be mounted on a hard relatively level surface away from debris or standing water. The frame is made so that a standard hand truck can move the unit into position from the front, back or sides.

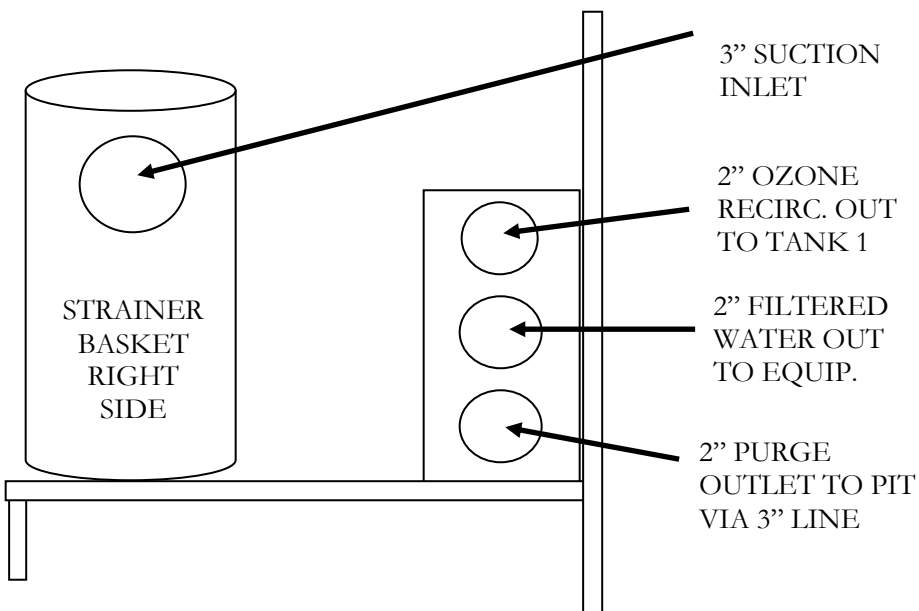
The system should be mounted in an equipment room where it will not be exposed to freezing conditions, spraying or standing water.

	Insure water cannot enter pump motor housing. If water is allowed to enter the electrical housing, a short circuit will result and the water could become electrified resulting in a hazardous condition!
	Freezing conditions will cause water in the system to expand and may damage pipes, pumps and valves voiding the warranty.

*Plumbing Connections*

**INLETS AND OUTLETS:**

The inlet to the system is made via a three inch suction line located on the right side of the system. **The suction line is typically plumbed with 3" PVC schedule 80 pipe.** The closer you are to the tanks the more efficient the pump. The outlets are also on the right side and are labeled below. The ozone recirculation line is typically PVC sch 40 pipe bushed down to 1 1/4".



Preferably a Spears flapper style 3" check valve can be used at the base of the suction line in the tank instead of the flapper check valve at the inlet. Verify arrow direction to water flow.

**Suction Piping:**

The suction pipe must be kept free of leaks. Avoid any fittings that could cause an air trap or leak. Avoid the use of unions or ball valves on the inlet to the system. The suction line must be at least 4 times the diameter of the pipe below the surface of the water in the tanks to prevent vortexing (sucking air from the surface of the water via a whirlpool). Example: if the pipe is 3" diameter it must be at least 12" under the surface of the water. Refer to your tanking drawings for placement. **Schedule 80 PVC is recommended for all suction lines.** The use of a quality PVC cleaner and cement is required. The check valve should be the highest point of the plumbing. High spots in the suction line prior to the check valve could result in unwanted air pockets. There should be two suction lines installed. One as a primary the other as a spare. They should both be terminated in the tank 12 – 14 inches above the bottom of the tank to prevent pulling up sediment that may gather in the tank. Install a 3" PVC SPEARS style flapper check valve at the end of each suction line remembering to keep the open end at least 12 to 14" above the bottom of the tank. Arrow of the check valve facing up, the direction of water flow.



All centrifugal pump will pull air before water. If there is any air leak in the suction line the unit will not prime or pull water up from underground tanks. The suction line is the most common cause of problems during installation.



Long suction runs and high lifts are not recommended.



The use of in tank foot valve and/or strainer is not required nor recommended. These tend to clog frequently and are difficult to clean and often overlooked causing problems. Your RECLAIM system has a dual check valve and easily accessible strainer system incorporated into the design.



Refer to Appendix A Sta-Rite "D" series Owner's Manual Figures 1 and 2.

**OUTLET TO EQUIPMENT:**

The outputs are 2" diameter Stainless Steel bungs or couplings welded onto the frame at the lower right. Use a 2" line for up to 120 GPM output. The usage of a smaller line will result in reduced flow. From top to bottom the outlets are.

1. Ozone recirculation line            1 1/4" PVC sch 40
2. Filtered water output                2" PVC sch 40 or copper
3. Purge line                                2" out bushed to 3" PVC sch 40 or 80

**PURGE LINE:**

The purge line allows the dirty water from the sand separator and self-cleaning filter to exit the machine. It is a 2" bung located on the right hand side of the machine below the output line, (2" is the minimum line size to be used when plumbing this line, anything smaller will restrict the self-cleaning purge and result in poor performance). The underground portion of the purge line should be 3" PVC SCH 40 or 80. The use sweeps and 45° fittings, when attaching this line, will enable the best cleaning operation. The purge line should empty into the main sump, pit, or trough for easy cleaning and disposal of solids.



The purge line should not be elevated above fitting height. It should slope downward towards the drain. Any upward slope increases backpressure and decreases performance.

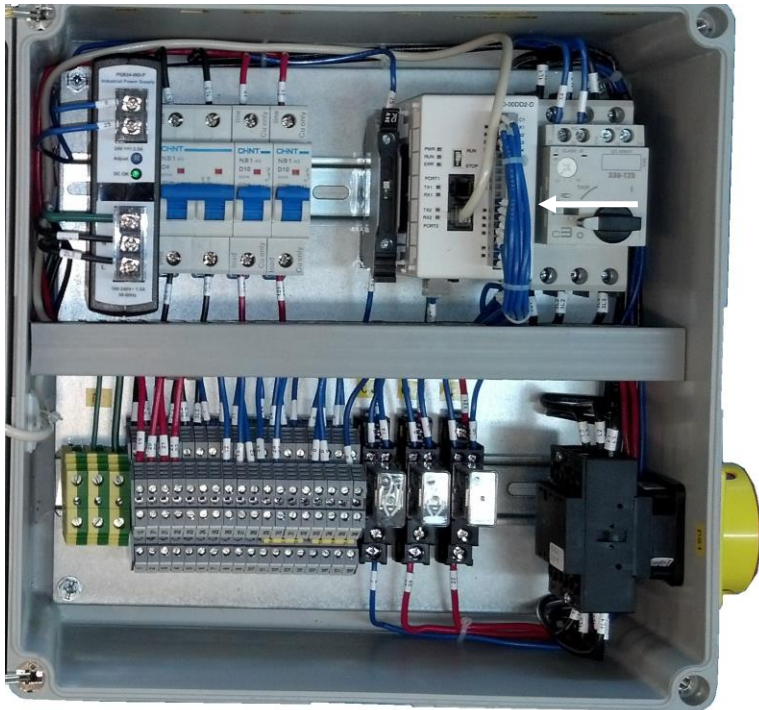
**OZONE RECIRCULATION LINE:**

A 1 ¼" SCH 40 PVC line is used to send ozonated water from the unit to tank 1 or as specified in your drawings. This line is under approximately 10 to 20 PSI and can be plumbed with SCH 40 PVC. It is recommended you keep the 1.25" diameter and do not size down throughout the pipe run.

### *Electrical Connections*

#### **3 phase:**

The Hoffman electrical enclosure contains the inputs for 208/240/480 **3-phase**, AC power, 20 amps minimum. See electrical drawings in appendix



MAIN SWITCH  
TURNS  
ON/OFF  
**ALL POWER**  
TO SYSTEM.



#### **110 VAC CONTROL POWER:**

The control system should be connected to 110 – 120 VAC ground fault protected line capable of at least 20 amps. Connection is via the terminal blocks as specified in the electrical drawings.

#### **COMPONENT POWER:**

Power to the oxygen concentrator, ozone generator and bio pump is provided via waterproof electrical connectors on the right side of the control panel. All power to every component is extinguished by turning the yellow and red OSHA kill switch to off.



All electrical connections should only be performed by a local licensed electrician.



Even with the main breaker in the off position, there is still 110 VAC applied to the control circuit. The Main Switch must be off to remove all power.



## Chapter

# 5

## System Operation

### *System Controls*

Your RECLAIM system is a self contained and controlled unit that requires very little attention. However, you should be aware of the controls and their function.

#### **PRIMARY 3-PHASE DISCONNECT:**

ON/OFF switch that disconnects the three-phase power to the overloads and contactors and motor starters.

#### **PRIMARY PUMP CONTROL:**

This is the HAND/OFF/AUTO function. HAND turns on the primary pump as long as the primary 3-phase disconnect is turned on. Used when priming the primary pump, or checking pump rotation. The self-cleaning operation is disabled when in HAND. OFF disables the primary pump overload/contactor/starter. AUTO enables the primary pump to operate on demand and enables the self-cleaning functionality of the primary filter.

#### **CONTROLLER FUNCTIONS AND PROGRAMMING:**

SEE APPENDIX

### *Alarms*

#### **ALARMS:**

All alarms are to be found on the alarms page (7). When a fault is indicated the screen will flash red and indicate an alarm.

Prime loss: System pressure is monitored via a pressure sensor that will open when the system pressure drops below 4 psi for an extended (programmable) period.

Motor trip: Indicates the motor starter has tripped due to some electrical event.

VFD alarm: Indicates the VFD has recognized a power or other problem and has turned itself off.

Low Level: Indicates the tank level is low. A float ball switch needs to be installed in the tank and wired to the control panel for this to work. See electrical drawing.

**Chapter**

**6**

**Start-Up**

**TANKING:**

Insure water tanks are free of debris and filled with clean water. This is especially important in new construction.



Garbage in the tanks can easily be sucked into the plumbing causing expensive repairs.



Recently a new construction, eager to start, failed to check the tanks. A plastic cup was pulled into the suction line blocking the flow of water to the RECLAIM system. The system ran dry and the owner had to pay for a new pump motor, and spent over \$400.00 having his plumbing snaked out to remove the cup. Luckily he was able to remove the blockage without having to dig up the new cement.

**VISUAL INSPECTION:**

- Water in tanks
- Plumbing Connected (refer to installation diagram)
  - Inlet
  - Outlet
  - Ozone Line
  - Purge Line
- External Ball valves (if any) in proper position
- Outlet ball valve cracked open at least 1/2 way.
- All switches to OFF
- Output for reclaim water turned on
  - This prevents air-lock during prime
  - This can be a hose bib tied to the reclaim line

**VERIFY MOTOR ROTATION:**

1. Make sure all switches are OFF
2. Turn ON main power (3-phase disconnect ON)
3. Find Arrow on primary pump face
4. Turn Primary Pump to ON for one second and check rotation
5. The motor should turn as indicated by arrow
6. Correct wiring if needed and check again
7. Repeat this process with the ozone recirculation pump



Proper rotation is Counter Clockwise  
Rotation arrow is indicated on Pump Casting

**PRIME THE PUMP:**

1. Make sure all switches are OFF
2. Turn ON main power (3-phase disconnect ON)

3. Remove hand bolts from basket strainer and fill with water
4. Replace the bolts (wing-nuts) hand tight
5. Turn Primary Pump to Hand (ON)
6. Check Pressure Input Pressure Gauge
  - a. It should read 45 psi with a 3 hp Primary Pump
  - b. It should read 60 – 65 psi with a 5 hp Primary Pump
7. After several seconds turn off the primary pump and repeat until the pressure gauges read the correct pressure
  - a. This will take several tries until the pump pulls water from the tanks
  - b. For more information on the Primary Pump see Appendix “A”
8. Once the system is primed (pressure gauges reading correct pressure) turn primary pump switch to AUTO
9. Turn Ozone pump to HAND (always on)
10. Go to ozone recirculation adjustment

**OUTPUT THROTTLE VALVE:**

1. Give a restriction to the flow for the purge cycle and to shut off flow from unit if needed.
2. Set the valve to your desired setting. It is not recommended to leave it 100% open if your reclaim water dumps into a holding tank with no restriction.
3. Shutting this valve will close off the output to your equipment.

**OZONE RECIRCULATION ADJUSTMENT:**

4. Verify pressure on the ozone pressure gauge (5-15 psi)
5. Set the pressure regulator to adjust this pressure.
6. Insure Oxygen Concentrator and Ozone Generator are switched ON
  - a. Oxygen conc. switch is on lower right side, up is ON
  - b. Ozone switch is on front of Ozone unit
7. Set Oxygen Concentrator flow meter to 10 psig (See Airsep Manual page 4-2)
8. Set Ozone Generator to MAX if equipped with variable supply.
9. Close or open injector manifold bypass valve until 5 LPM (liters per minute) is indicated on the ozone flow meter located on the ozone generator front panel
10. Re-check Oxygen concentrator flow meter is set approximately mid scale.

Online adjustment instructions can be found at:

<http://waterreclaim.com/resources/manuals-and-how-tos/ozone-manifold-adjustment>

**Chapter**  
**7**

# MAINTENANCE

## PERIODIC MAINTENANCE SCHEDULE

MAINTENANCE ITEM	WEEKLY	MONTHLY	YEARLY	2-YEAR	5-YEAR
Clean Strainer Basket*	●				
Clean O2 Air Filter*		●			
MHC separator clean			If needed		
Check recirc pressure		●			
Replace Venturi				●	
Rebuild Valves					●
Replace Pump Seal*					●

\* Or as needed

**INSURE SYSTEM IS OFF AND DEPRESSURIZED PRIOR TO ANY MAINTENANCE!**

**CLEAN STRAINER BASKET:**

Turn off primary and ozone pumps. Insure input and output pressure gauges read ZERO PSI. Remove the strainer basket lid by unscrewing the four wing nut bolts. Remove and clean the stainless steel strainer basket. Replace, and refill the strainer housing with water. Clean the o-ring and replace the lid and four wing nut bolts, hand tighten only. Do Not Over Tighten... Restart system by starting primary pump first (HAND position) until the gauge reads normal operating pressure then return the primary switch to AUTO. Turn on ozone recirculation system.



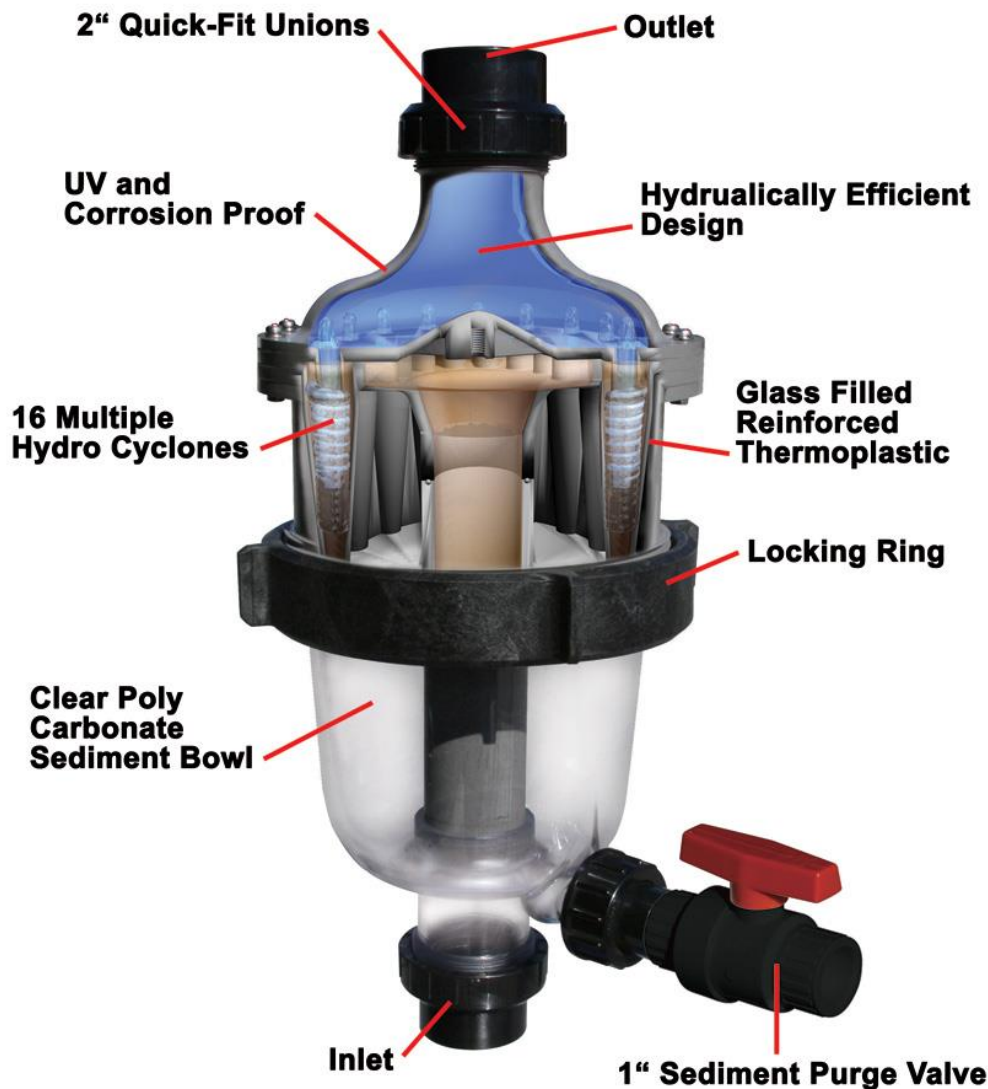
Whenever opening a filter housing, whether it be the strainer basket, primary filter, or filter bag housing, make sure the pressure gauges read **ZERO PSI**. A failure to release pressure may result in explosive decompression!

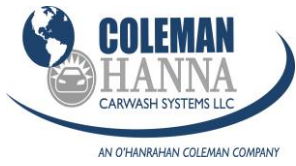
**CLEAN O2 AIR FILTER:**

The oxygen concentrator has a cleanable air filter. For optimum performance and long life we recommend you clean it once a month. It is located on the right hand side of the oxygen concentrator. Pull it out, clean it with light compressed air and return it dry back into the filter slots.

**MHC FILTER CLEAN:**

The primary filter cleans itself during normal operation. However, sludge or silt can accumulate over time. Normally this is washed out but a biofilm or water hardness accumulation may occur. If this is a factor the MHC can be removed disassembled and replaced by loosening the three unions holding the unit to the system. The MHC has a band nut that can be loosened by turning the band counter clockwise and tightened clockwise.





## **APPENDIX A**

### *Electrical Drawings*

### **INCLUDING**

- 208 V
- 230V
- 380V
- 480V

## **APPENDIX B**

### *Control Functions*

### **INCLUDING**

- Controls
- Alarms
- Timers
- Default Settings
- Button Functions



## APPENDIX C

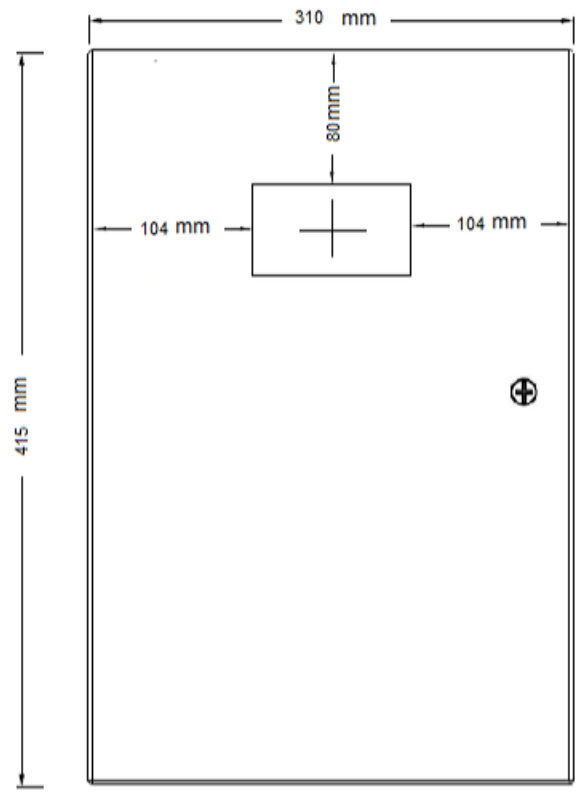
*Material Safety Data Sheet*

OZONE

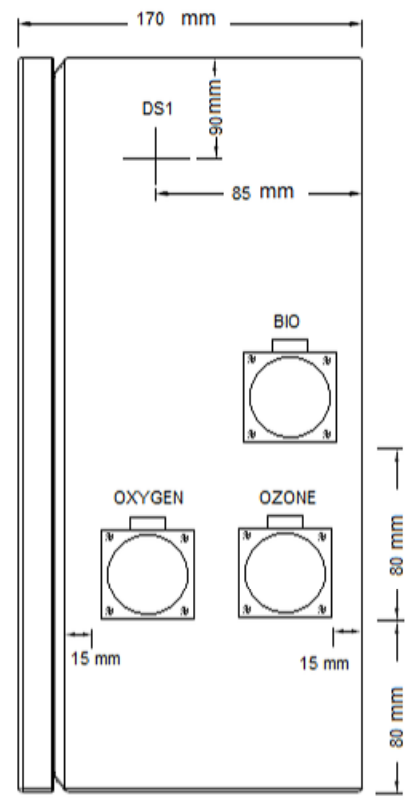


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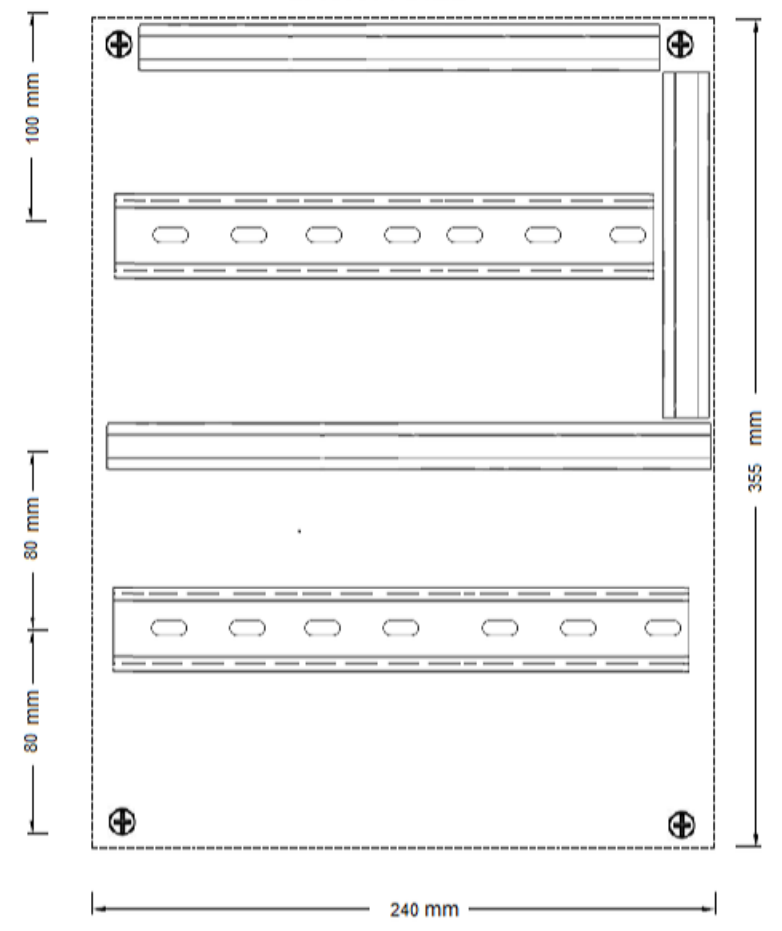
FRONT



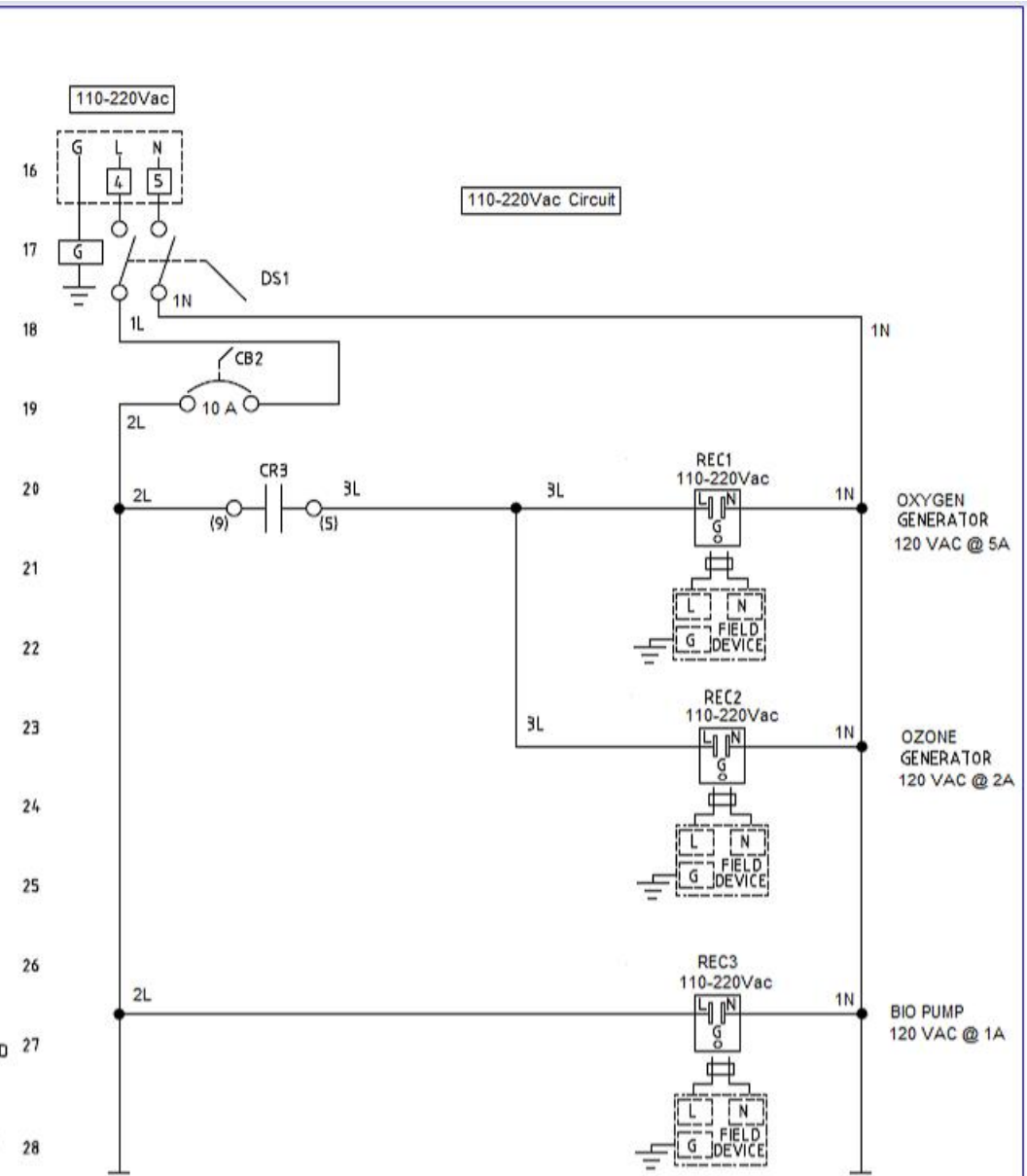
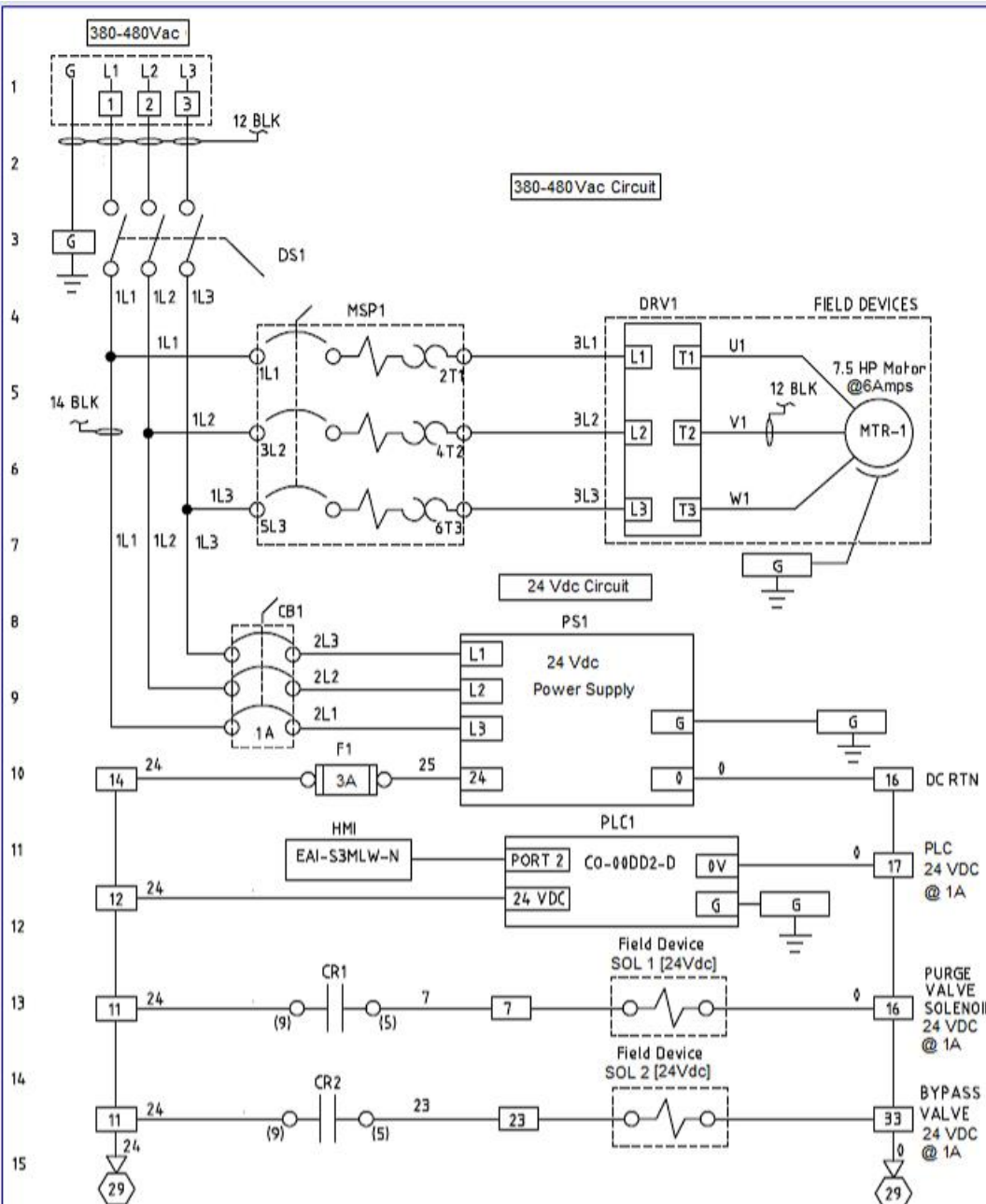
SIDE



BACK PANEL



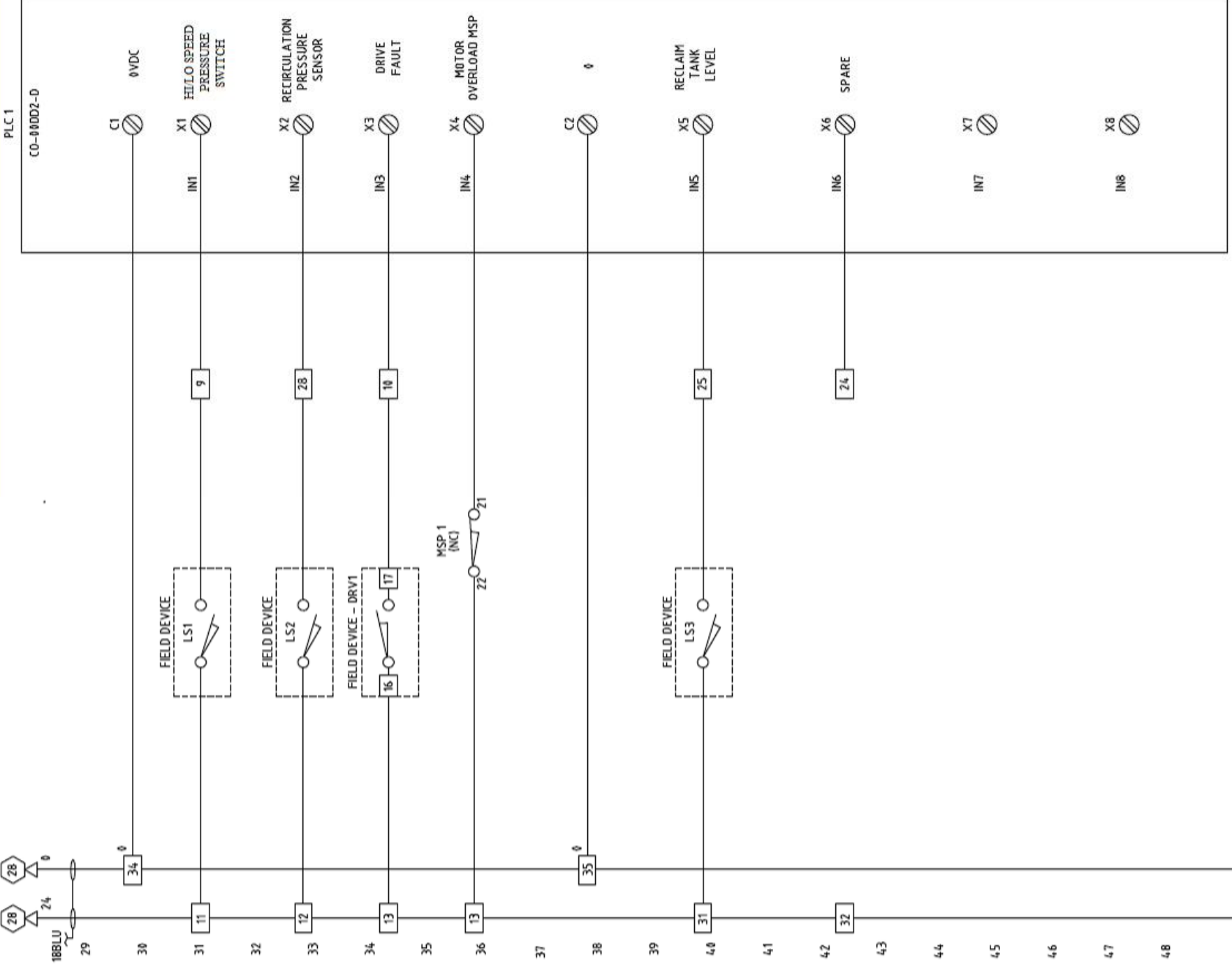
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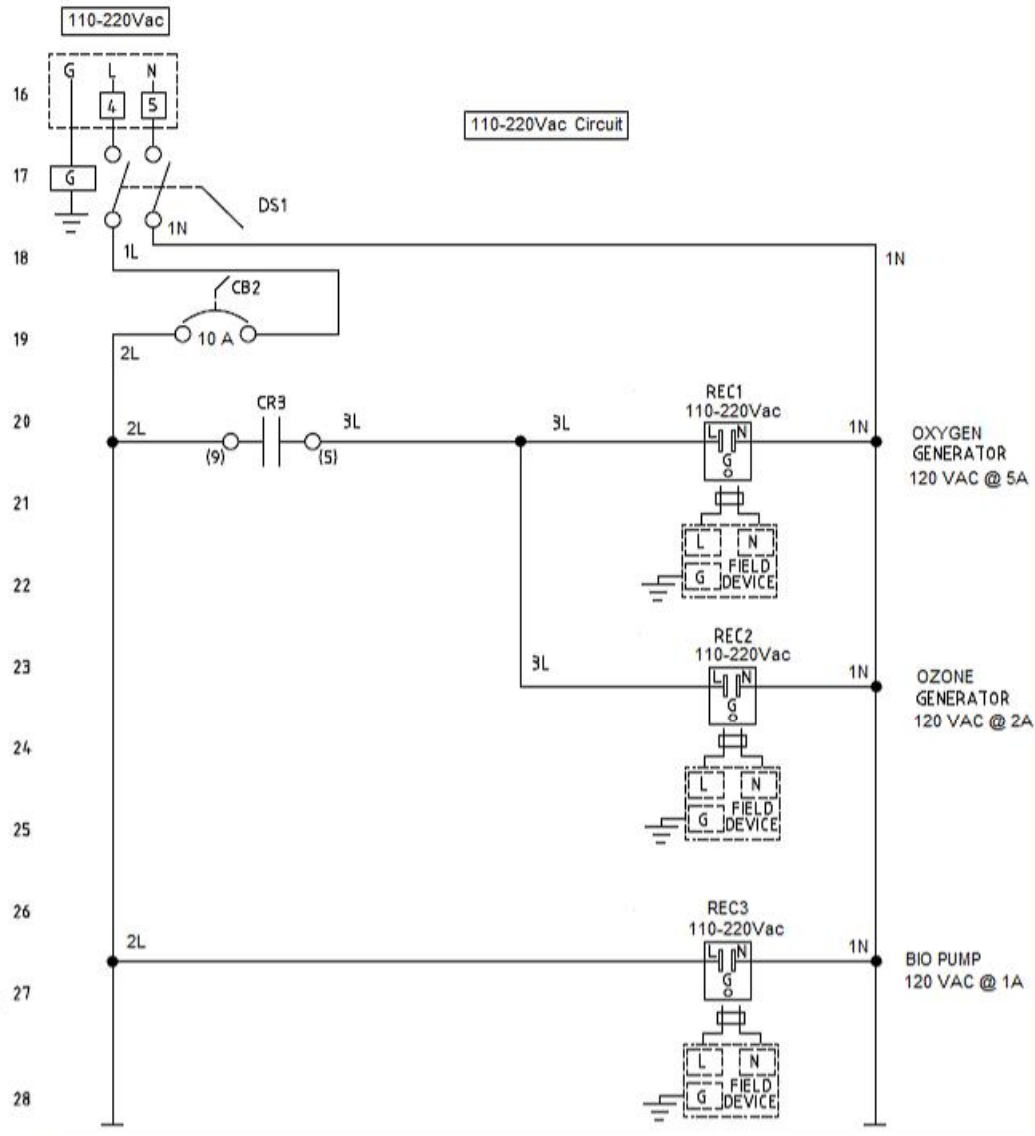
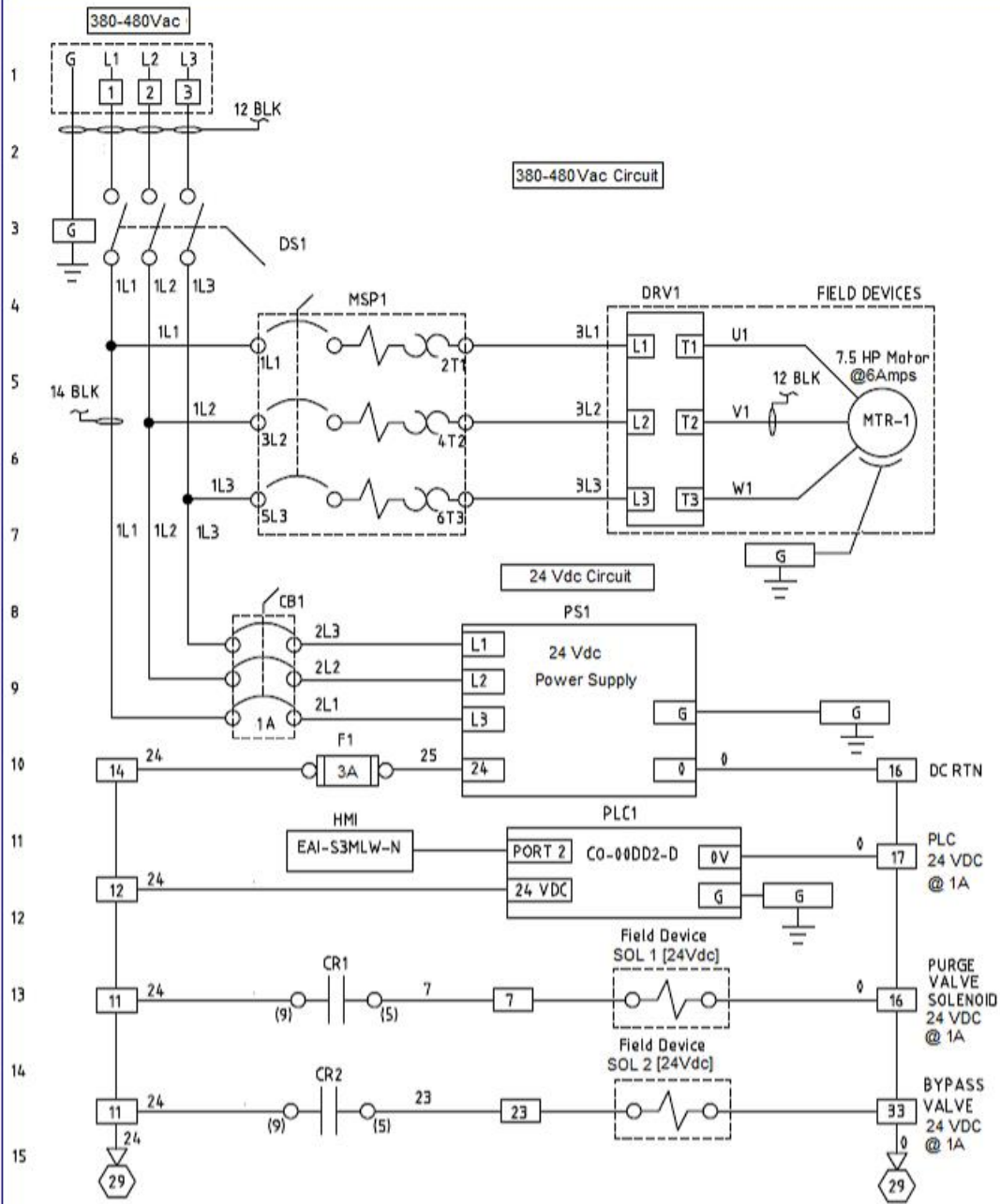
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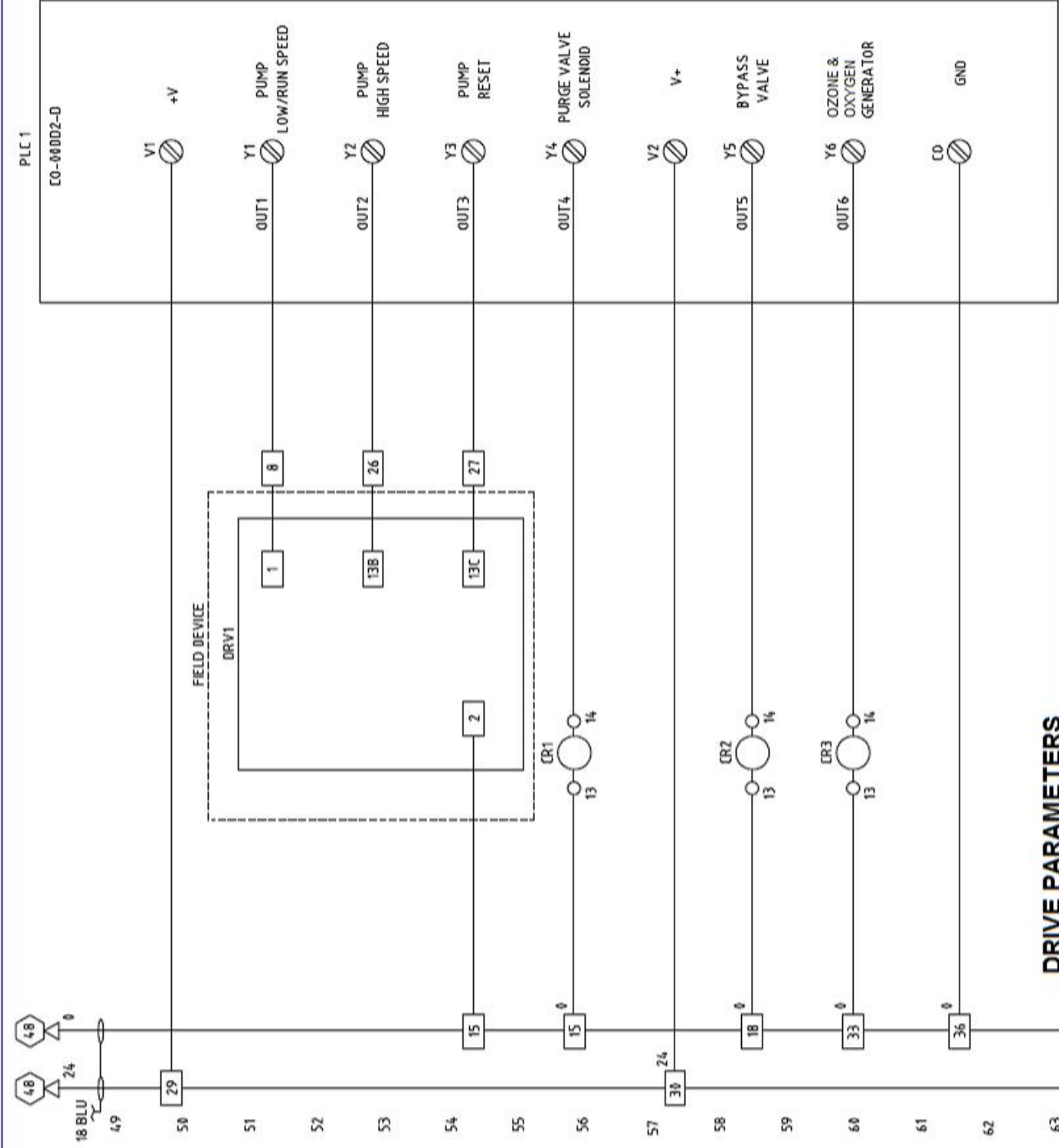
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						Drawing Name:	
						Main Power Source	
						Drawing Number:	
						OPA-REC-CSS-INT-003-P1	
Rev.	Note	Date	Name	Prev.	Hist.	All Rights Reserved	Page 1 of 1



**DRIVE PARAMETERS**

- P100 = 1 START CONTROL SOURCE (terminal strip)
- P101 = 3 PRESET #1 (P131 value)
- P103 = 67 Motor speed limit
- P104 = 2 ACCELERATION TIME a
- P105 = 2 DECELERATION TIME a
- P122 = 3 TB-13B INPUT FUNCTION (PRESET 1)
- P123 = 20 TB-13C INPUT (CLEAR FAULT) FUNCTION
- P125 = 2 Acceleration time b (not used)
- P126 = 2 Acceleration time b (not used)
- P131 = 47 PRESET **LOW SPEED** #1 47HZ
- P132 = 65 PRESET **HIGH SPEED** #2 65HZ
- P140 = 3 RELAY OUTPUT (FAULT)
- P199 = 3(60Hz...USA) or 4 (50Hz...EU)
- P300 = 1 VARIABLE V/Hz TORQUE CONTROL FOR PUMPS

(Application Notes)		(DWG Scale)	(Plot Scale)	Dimensions	(Weight)
OPA Consulting Services, Inc.					
Drawing Name: Outputs OUT1 - OUT6					
Rev.	Note	Date	Name	Prev. Hst.	DIN A4
			Eng.		
			Check.		
			Drawn		
Drawing Number: OPA-REC-CSS-INT-003-P3					
Page 1 of 1					

Control pages SweetWater reclaim system

To use each function press the button underneath.



Page 1 **START PAGE** version info

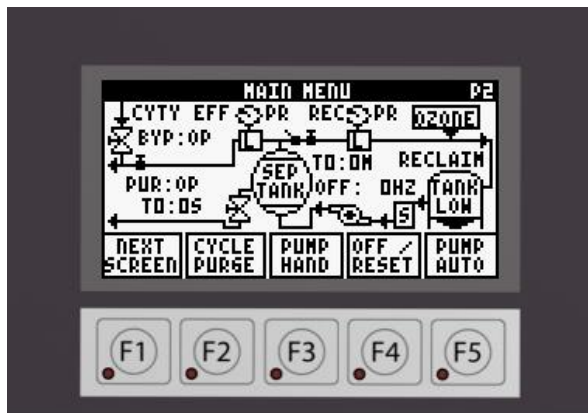
F1 = go to Page 2

F2 = Select or increment selection

F3 = Pump Hand (turns pump on full speed)

F4 = Turn Off motor and reset PLC

F5 = Pump Auto (pump speeds up and down as needed and all functions are automated)  
THIS IS THE NORMAL RUNNING POSITION



Page 2 **MAIN MENU**

Main run screen showing flow and controls.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Backwash or purge function to manually flush the clear filter bowls.**

Energizes the 24v backwash purge valve via relay CR (control relay) 1

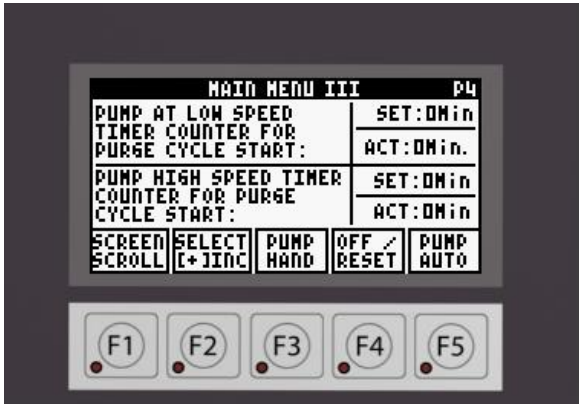


Page 3 **TIMERS** MAIN MENU II

Pressure sensor and runtime information

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Selects & sets timers for start-up pressure sensor and operating pressure sensor debounce**



Page 4 **PURGE CYCLE INTERVAL**

Shows how long the pump will run in low speed before backwash/purge. Timed in minutes. Shows set time and accumulated time.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = Takes you to the set timer page

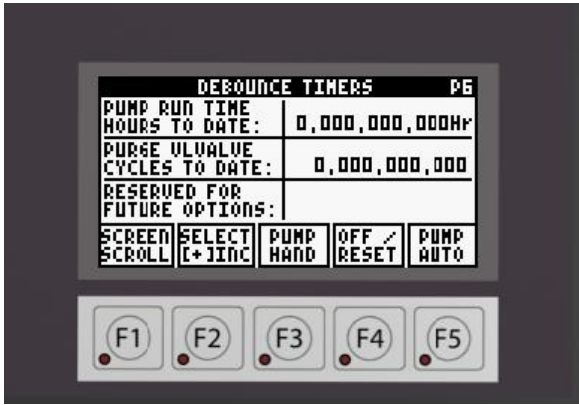


Page 5 **OZONE CONTROL**

Turns ozone unit on or off

Functions F1, F3, F4, and F5 are available from all pages.

F2 = Selects ozone on or off, removes hot lead power via internal control panel relay. Ozone has power when relay LED is on.

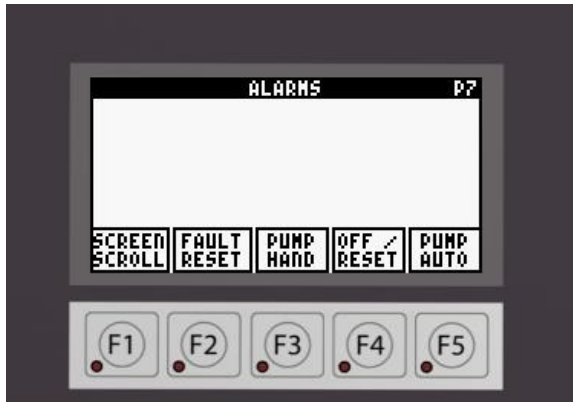


Page 6 **TIMERS**

Pump hour meter and purge cycle count.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = Selects hours or cycles to reset if pump or valve is changed.

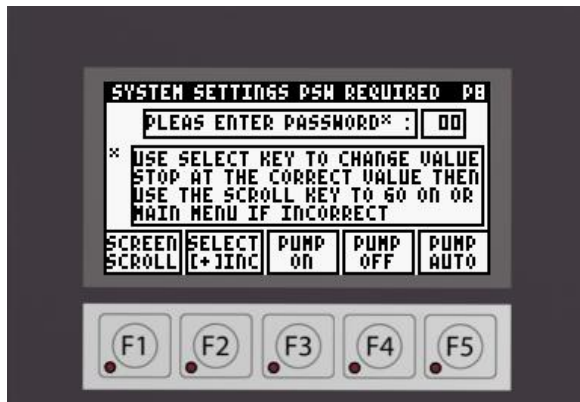


Page 7 **ALARMS**

Lets you know what the alarm is so you can fix it then reset the alarm.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Selects alarm and resets**

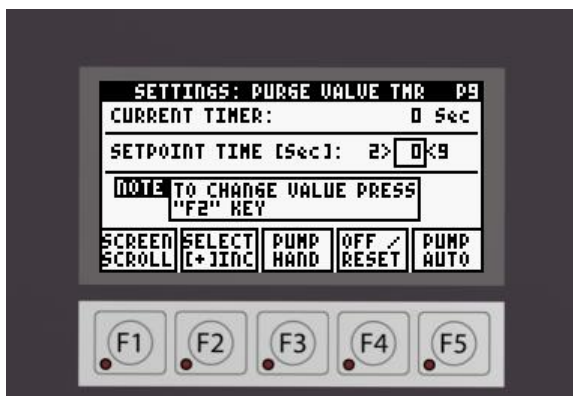


Page 8 **PASSWORD**

Password can be changed.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Allows you to enter the password to change mission critical settings. Please contact factory before messing with it...**



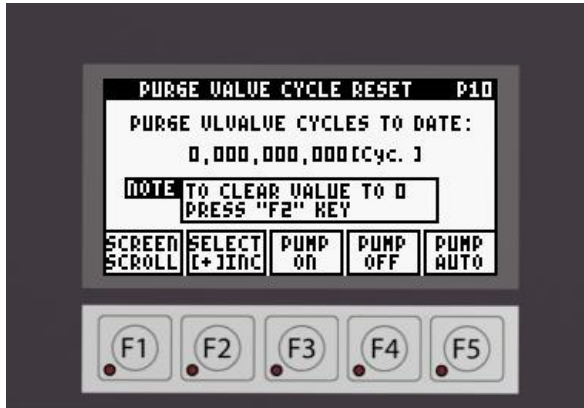
Page 9 **PURGE VALVE TIMER**

Sets how long the backwash valve is open. Pump speed set to high during purge cycle.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Selects time between 2 and 9 seconds.**



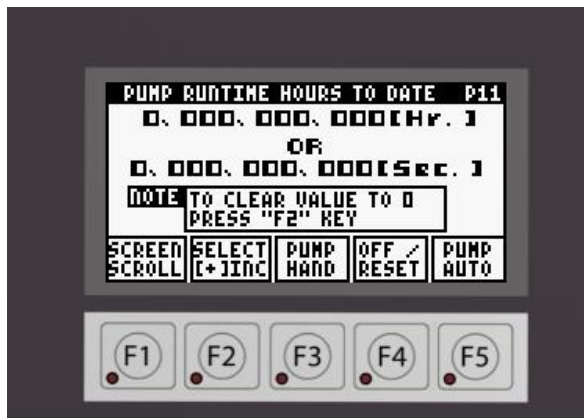


Page 10 **PURGE CYCLE COUNT**

Counts number of valve cycles.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Resets counter**

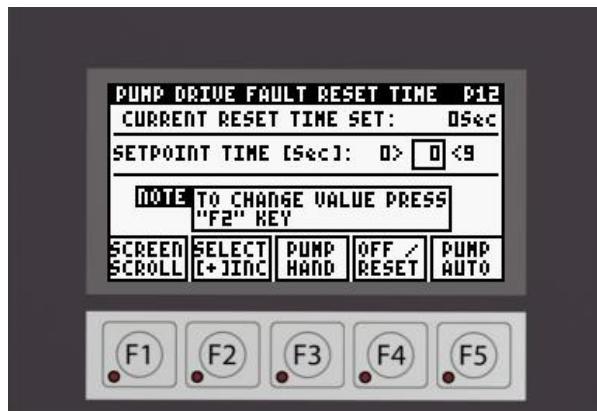


Page 11 **PUMP HOUR TIMER**

Counts run time on pump

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Resets time counter**

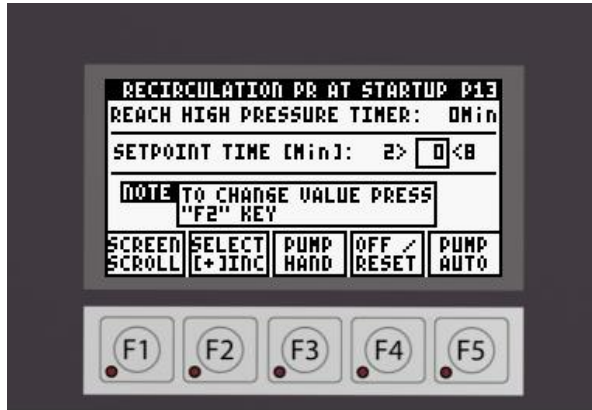


Page 12 **VFD DRIVE RESET TIME**

Sets time that drive will attempt reset after fault. Usually caused by loss of power or voltage spike. Restores operation if within that time period

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Sets time interval between 0 and 9 sec.**

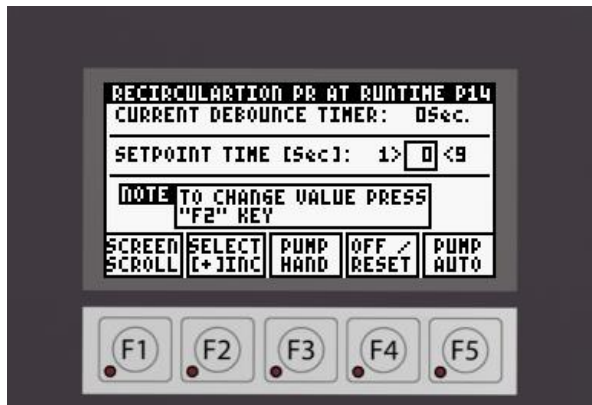


Page 13 **SYSTEM PRESSURE TIMER**

If Pressure Sensor detects pressure loss a shut-down timer will start. Prevents pump damage due to prime loss.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Sets time limit between 2 and 8 min.**

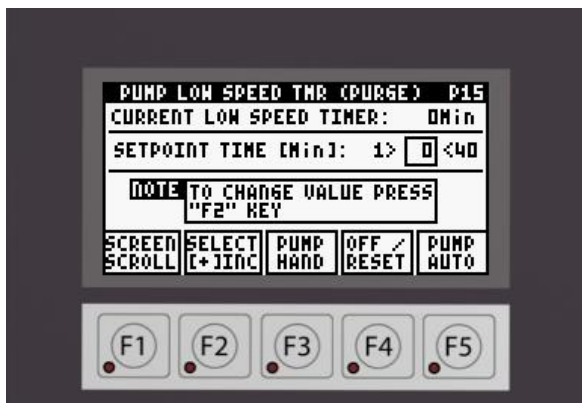


Page 14 **PRESS. SWITCH DEBOUNCE**

A Mechanical pressure switch can bounce on and off quickly causing harm to the motor and drive. This timer lets the switch settle before allowing the input to register.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Sets time interval between 1 and 9 sec.**

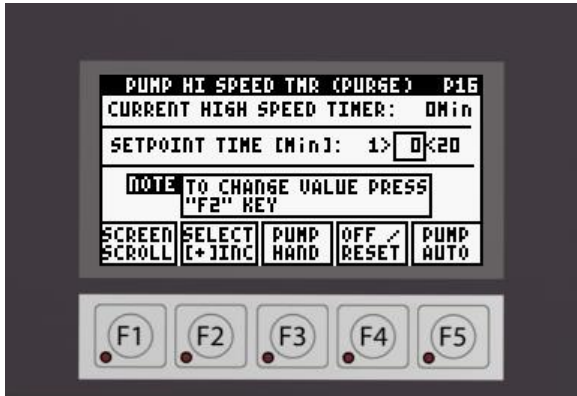


Page 15 **LOW SPEED TIMER PURGE**

The system accumulates dirt during high and low speed operation. This timer sets then counts minutes of LOW speed run timer before purge.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Sets time interval between 1 and 40 min.**

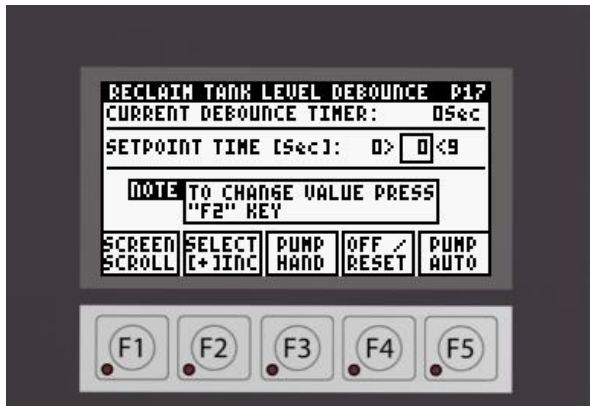


Page 16 **HI SPEED TIMER PURGE**

The system accumulates dirt during high and low speed operation. This timer sets then counts minutes of HIGH speed run timer before purge.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Sets time interval between 1 and 20 min.**

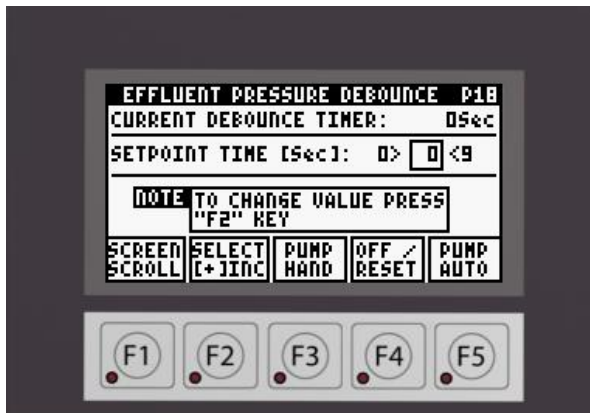


Page 17 **TANK LEVEL DEBOUNCE**

If a float switch to detect tank level is used this debounce timer can be set to prevent false readings.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Sets time interval between 0 and 9 sec.**

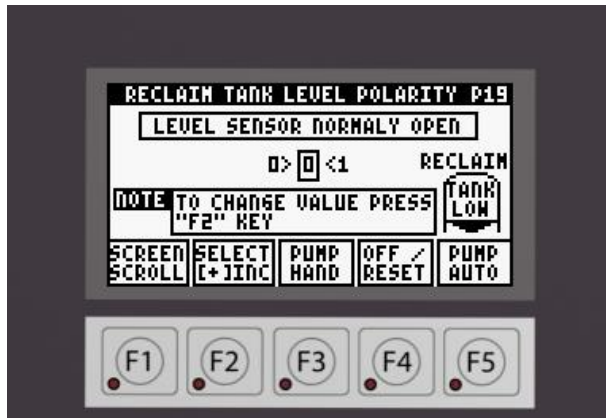


Page 18 **PRESSURE SENSOR DEBOUNCE**

The pressure sensor (not to be confused with the pressure switch) tells the system if there is water pressure from the pump and is there to prevent it from running dry.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Sets time interval between 0 and 9 sec.**

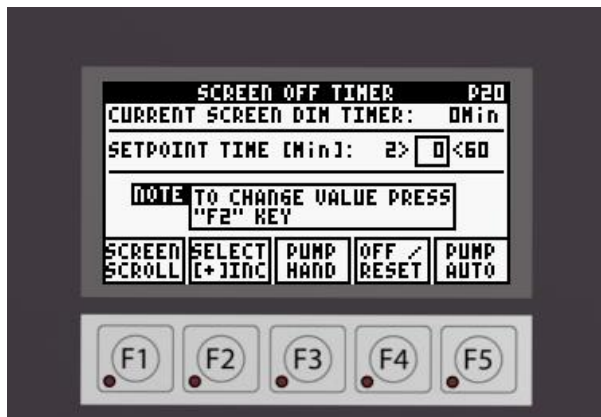


Page 19 **TANK FLOAT NO/NC**

Because sometimes the wrong float gets installed. You can change from Normally Open to Normally Closed, a.k.a. pump up or pump down style float.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Changes from N/O to N/C and back**



Page 20 **BACKLIGHT TIMER**

Power saving feature dims screen when not in use. Adjustable timer because you don't want it dimming if you're using it...

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Sets timer from 2 to 60 min.**



Page 21 **FACTORY RESET**

Resets back to default values that work under most conditions. Gets you back to square one.

Functions F1, F3, F4, and F5 are available from all pages.

F2 = **Resets all settings. Make sure you write down the settings you want because they will go back to factory default.**



## MATERIAL SAFETY DATA SHEET

## ozone

Effective Date: 06/01/13

Product: Ozone

---

**Synonyms:** Triatomic oxygen**CAS No:** 10028-15-6**Molecular Weight:** 48.0**Chemical Formula:** O<sub>3</sub>

---

**2. Composition/Information on Ingredients**

Ingredient	CAS No	Percent	Hazardous
Ozone gas	10028-15-6	1 - 15	Yes

---

**3. Hazards Identification****Emergency Overview**

Highly reactive, can react on contact with organic substances, especially strong reducing agents.

Ozone is a powerful oxidizing agent and oxidation with ozone evolves more heat and usually starts at a lower temperature than oxidation with oxygen. It reacts with non-saturated organic compounds to produce ozonides, which are unstable and may decompose with explosive violence. Ozone is an unstable gas which, at normal temperatures, decomposes to biatomic oxygen. At elevated temperatures and in the presence of certain catalysts such as hydrogen, iron, copper and chromium, this decomposition may be explosive.

**Potential Health Effects**

## Ozone MSDS

**Inhalation:** Causes dryness of the mouth, coughing, and irritates the nose, throat, and chest. May cause difficulty in breathing, headache, and fatigue. The characteristic sharp, irritating odor is readily detectable at low concentrations (0.01 to 0.05 ppm).

**Skin:** Absorption through intact skin is not expected.

**Eye Contact:** Ozone is an irritant to the eyes causing pain, lacrimation, and general inflammation.

**Ingestion:** Not a route of exposure.

**Aggravation of Pre-existing Conditions:** Ozone may increase sensitivity to bronchoconstrictors including allergens.

---

### 4. First Aid Measures

**Inhalation:** Remove to fresh air; if breathing is difficult a trained person should administer oxygen. If respiration stops, give mouth-to-mouth resuscitation. Get medical attention.

**Ingestion:** Not an expected route of exposure.

**Skin Contact:** Wash skin thoroughly with soap and water.

**Eye Contact:** Immediately flush eyes with large amounts of water for at least 15 minutes, while forcibly holding eyelids apart to ensure flushing of the entire eye surface. If irritation, pain, or other symptoms persist seek medical attention.

**Acute:** May cause irritation of skin, eyes, and mucous membranes of the respiratory tract. Drowsiness, dizziness, headache, and fatigue have been associated with exposure.

**Chronic:** Long term health effects are not expected from exposures to ozone. A partial tolerance appears to develop with repeated exposures.

---

### 5. Fire Fighting Measures

**Flash Point:** N/D

**Auto Ignition Temperature:** N/D

**Flammable Limits in Air, % by Volume - Upper:** N/D, **Lower:** N/D

## Ozone MSDS

**Extinguishing Media:** Use extinguishing media suitable for surrounding fires.

**Unusual Fire and Explosion Hazard:** None expected. Since ozone is highly unstable and decomposes under all conditions and is not encountered except at very small levels in the immediate vicinity where formed.

---

### 6. Accidental Release Measures

1. Evacuate danger area.
  2. Consult an expert.
  3. Ventilation: If ozone is a liquid or solid, allow material to evaporate and provide sufficient ventilation to dilute and disperse small amounts into the outside atmosphere.
  4. Dispose of waste in accordance with Federal, State, and local regulations. (Reportable quantity = 1 pound.)
- 

### 7. Handling and Storage

Unstable gas (liquid or solid phases are even more unstable).

Ozone should be contained within a chemically compatible piping system.

Ozone is a powerful oxidizing agent and oxidation with ozone evolves more heat and usually starts at a lower temperature than oxidation with oxygen. It reacts with non-saturated organic compounds to produce ozonides, which are unstable and may decompose with explosive violence. Ozone is an unstable gas which, at normal temperatures, decomposes to biatomic oxygen. At elevated temperatures and in the presence of certain catalysts such as hydrogen, iron, copper and chromium, this decomposition may be explosive.

---

### 8. Exposure Controls/Personal Protection

#### Exposure Guidelines

**OSHA PEL:** 0.1 ppm PEL/TLV

**Ventilation Requirements:** General exhaust recommended. Avoid working with ozone generating equipment in enclosed spaces.

## Ozone MSDS

### Specific Personal Protective Equipment

**Respiratory:** Respirators may be used when engineering and work practice controls are not technically feasible, when such controls are in the process of being installed, or when they fail and need to be supplemented. Respirators may also be used for operations which require entry into tanks or closed vessels, and in emergency situations.

Only appropriate respirators shall be provided and used when the use of respirators is the only means of controlling exposure for routine operations, or during an emergency. (Refer to Table 1 of ANSUI/ASTM E591-77 for appropriate respirator selection.)

Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

**Eye:** Not necessary

**Gloves:** Not necessary

**Other Clothing and Equipment:** Not necessary.

---

## 9. Physical and Chemical Properties

**Appearance:** Black particulate solid, pellet, or powder.

**Specific Gravity (H<sub>2</sub>O = 1):** 2.144 g/L

**Molecular Weight:** 48.00

**Boiling Point:** -111.9°C

**Melting Point:** -192.7°C

**Vapor Pressure:** N/A

**Evaporation Rate (BuAc = 1):** N/A

**Vapor Density (Air = 1):** 1.7

**Solubility in H<sub>2</sub>O, % by Weight:** 0.49

**Appearance and Odor:** Colorless to bluish gas with a characteristic pungent odor.

---



# Ozone MSDS

## 10. Stability and Reactivity

**Stability:** Ozone spontaneously decomposes under all ordinary conditions, so that it is not encountered except in the immediate vicinity of where it was formed. The decomposition is speeded by solid surfaces and by many chemical substances.

**Hazardous Decomposition Products:** Reactive singlet oxygen.

**Hazardous Polymerization:** Will not occur.

**Incompatibilities:** Ozone is a powerful oxidizing agent and reacts with all oxidizable materials, both organic and inorganic. Some reactions are highly explosive. Alkenes, benzene and other aromatic compounds, rubber, dicyanogen, bromine diethyl ether, dinitrogen tetroxide, nitrogen trichloride, hydrogen bromide, and tetrafluorohydrazine.

**Conditions to Avoid:** Incompatibles.

---

## 11. Toxicological Information

Ozone is extremely irritating to the upper and lower respiratory tract. The characteristic odor is readily detectable at low concentrations (0.02 ppm to 0.05 ppm). Ozone produces local irritation of the eyes and mucous membranes and may cause pulmonary edema at high exposure. Systematically, ozone has been reported to mimic the effects of ionizing radiation, and may cause damage to chromosomal structures. A partial tolerance appears to develop with repeated exposures. Although most effects are acute, the possibility of chronic lung impairment should be considered, based upon animal experimentation.

---

## 12. Ecological Information

**Environmental Fate:** No information found.

**Environmental Toxicity:** No information found.

---

## 13. Disposal Considerations

Do not dispose of ozone off gas to atmosphere without properly designed off gas destruct unit. State and local disposal regulations may differ from federal disposal regulations.

---

## Ozone MSDS

### 14. Transport Information

**Proper Shipping Name:** N/A

**Hazard Class:** N/A

**Identification Number:** N/A

**Packing Group:** N/A

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### 15. Regulatory Information

**SARA TITLE III:** N/A

**TSCA:** The ingredients of this product are on the TSCA Inventory List.

**OSHA:** Nonhazardous according to definitions of health hazard and physical hazard provided in the Hazard Communication Standard (29 CFR 1910.1200)

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### 16. Other Information

**Label Hazard Warning:** HIGHLY REACTIVE. OZONE GAS AFFECTS THE RESPIRATORY SYSTEM.

**Label Precautions:** Keep away from heat, sparks and flame. Avoid contact with eyes, skin and clothing. Avoid breathing. Use with adequate ventilation.

**Label First Aid:** If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.

**Product Use:** Laboratory Reagent.

**Revision Information:** Pure. New 16 section MSDS format, all sections have been revised.

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## Ozone MSDS

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