user manual

HydroMinder™ HP

HYDRO

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1.00 Overview

1.01 Safety Precautions

WARNING! Please read precautions thoroughly before operation. Must meet all applicable local codes and regulations.

THANK YOU FOR YOUR INTEREST IN OUR PRODUCTS

Please use this equipment carefully and observe all warnings and cautions.

WEAR protective clothing and eyewear when dispensing chemicals or other materials or when working in the vicinity of all chemicals, filling or emptying equipment, or changing metering tips.

protective footware, such as steel toed shoes, when installing the unit and its peripherals.

NOTE Disconnect all electrical power during installation, service, and/or any time electrical connections are exposed.

Installation of the system must be performed according to the instructions of this manual. It is the responsibility of the installer to ensure that the equipment or system into which the product is incorporated complies with all relevant legislation and codes of practice which apply in the country of use.

Regularly inspect equipment and keep equipment clean and properly maintained.

Warranty is voided if the user modifies, adds, or suppresses any feature of the unit.

All components involved in maintenance tasks must be the ones registered in the spare parts list supplied by the manufacturer. Otherwise the Warranty is void.

1.02 Description of the System

The HydroMinder HP is a high pressure, venturi injector-based, multi-channel chemical dilution system for use in bay and tunnel car washes.

The panel works in conjunction with a pump to provide pressurized water and a VFD to regulate the pump's output at a constant 200 psi.

HydroMinder HP is available in two sizes, 5 or 7 product configurations.

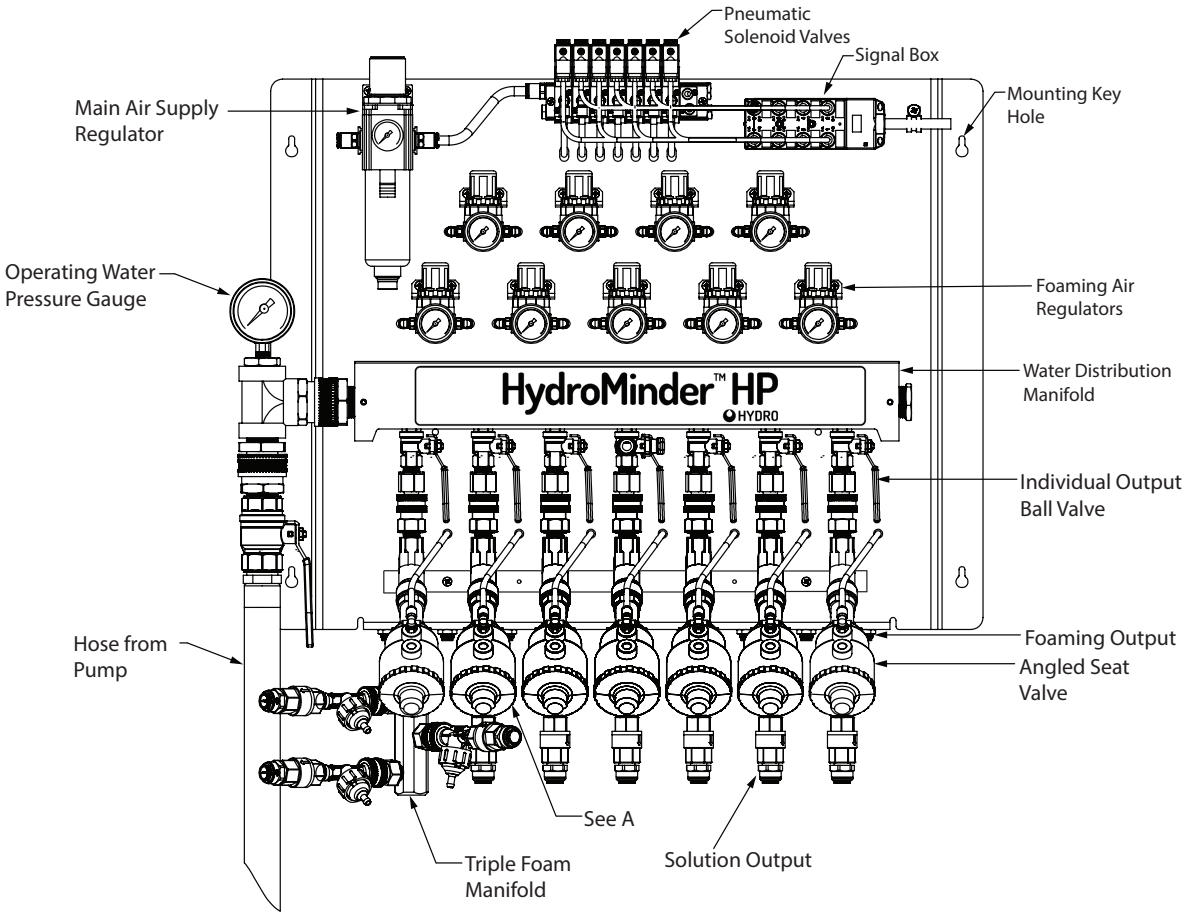
Product Features

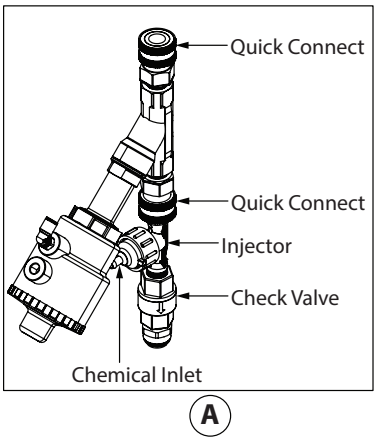
- Valve Injector flow rates of 0.75 to 12 GPM per application.
- Individually controlled foaming pressure lines for each application.
- Triple foaming supported tied to three individually controlled foaming pressure lines.
- Quick disconnects and shutoffs for each valve for ease of installation and maintenance.
- Stainless steel componentry for superior longevity.

1.00 Overview (continued)

1.03 Panel Components

The diagram below list the componentry of a 7 valve system. The 5 valve system differs in number of valves and supporting componentry.

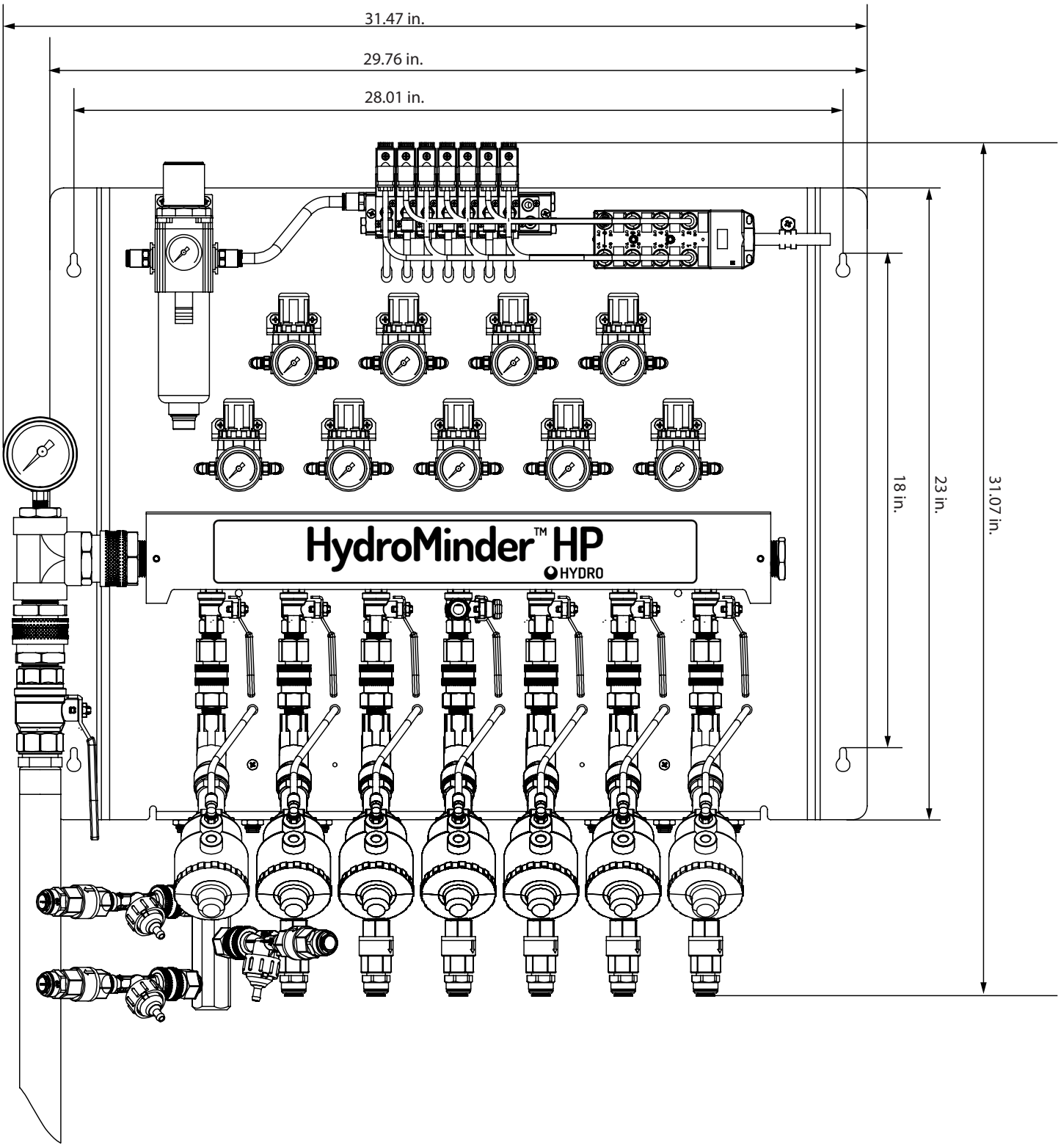




1.00 Overview (continued)

1.04 Panel Dimensions

Note: Dimensions are same for both 5 valves and 7 valves system.



2.00 Specification

HydroMinder HP Panel	
Wall Mount	
Provided Hardware	No. 8 Screw and Anchor kit
Air Supply	
Min. Pressure Required	80 psi Dry
Tubing Size	3/8” OD - to be supplied on site
Recommended Material	Polyethylene
Connection Type	Push-To-Connect
Control Signals	
Signal Voltage	Specified at purchase
Cable length	30 meters
Chemical Supply	
Tubing Size	1/4” ID - to be supplied on site
Recommended Material	Vinyl
Connection Type	Barb
Solution Outlets	
Tubing Size	1/2” OD - to be supplied on site
Recommended Material	Polyethylene
Connection Type	Push-To-Connect
Foaming Outlets	
Tubing Size	3/8” OD - to be supplied on site
Recommended Material	Polyethylene/Polyurethane
Connection Type	Push-To-Connect
Injectors	
Available Flow Rates	0.75, 1, 1.5, 2, 2.25, 3.25, 4, 5.5, 7, 8, 9, 10, and 12 gpm
Weights and Dimensions	
Weight	75 lbs
Height	31.07”
Width	31.47”
Depth	6”

Pump	
Floor Mount	
Hardware	Anchors for 1/2” Bolt Holes - to be supplied onsite
Pump Inlet (From City)	
Min. Pressure	40 psi
Provided Hose Length	6 ft.
Provided Hose Size	1” ID
Provided Connection Type	1” Barb
Pump Outlet (To Panel)	
Working Pressure	200 psi (Factory Set)
Provided Hose Length	6 ft.
Provided Hose Size	1” ID
Provided Connection Type (Pump Outlet)	1” NPT
Provided Connection Type (Panel Inlet)	Quick Connect
Electric	
Input Voltage	Specified at purchase (Check VFD Name plate) 480 VAC 3-Phase 240 VAC 3-Phase
Weights and Dimensions	
Weight	127 lbs
Height	41”
Width	10”
Depth	9”
Max. Pump Capacity	20 gpm

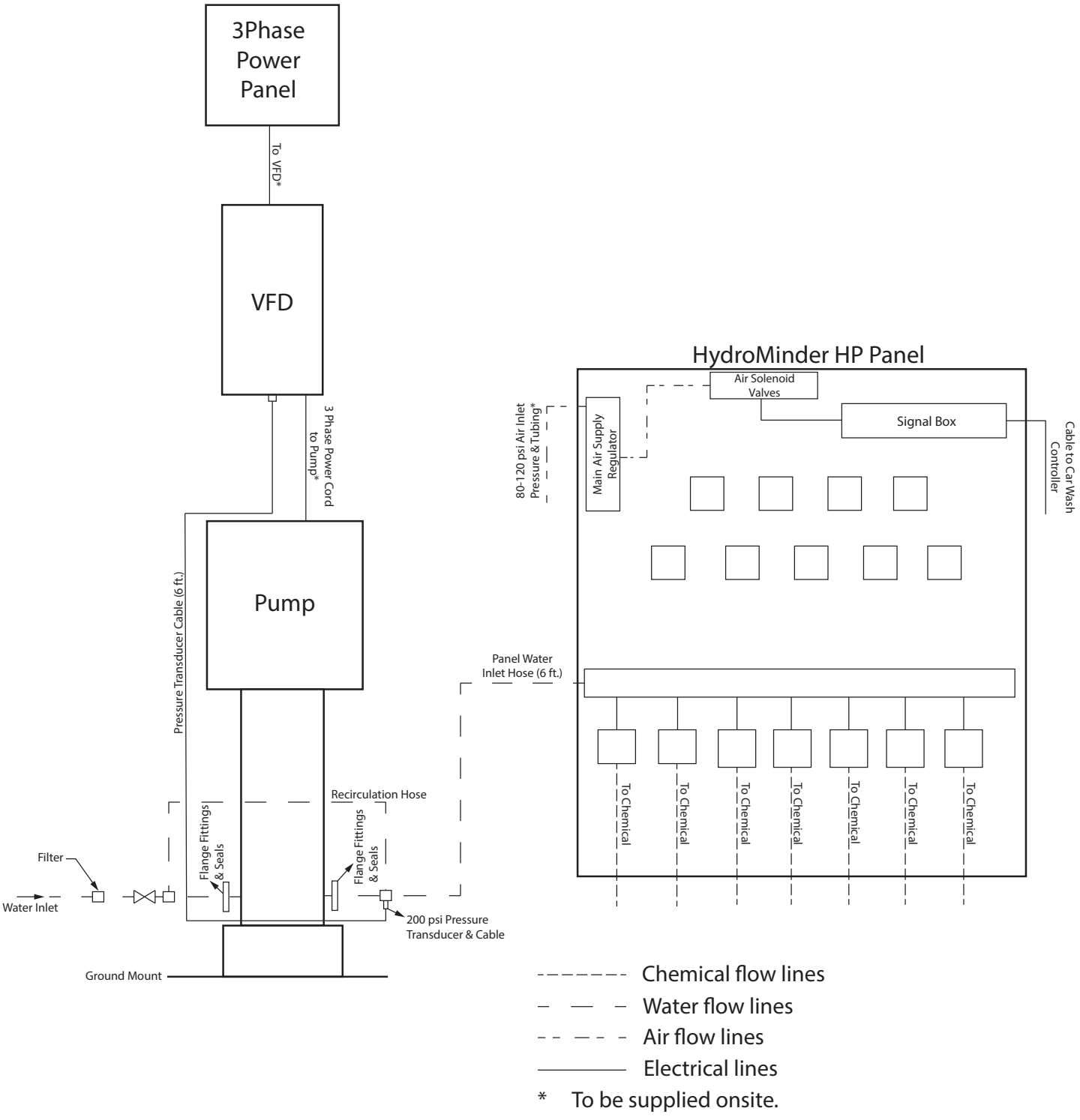
VFD	
Wall Mount	
Provided Hardware	No. 8 Screw and Anchor kit
Electric	
Input/ Output Voltage	Specified at purchase (Check VFD Name plate) 480 VAC 3-Phase 240 VAC 3-Phase
Max Rated Power	6.4 Amps at 480 VAC 12.9 Amps at 240 VAC
Max Frequency	60 Hz
Pressure Transducer Cable	
Provided cable Length	6 ft.
Weights and Dimensions	
Height	11”
Width	7.5”
Depth	8”

3.00 Panel Installation

3.01 Site Survey

When determining where to install the panel, consider the distance to the pump stand, air supply, car wash control panel, and chemical containers. Incoming/outgoing connections will need to accommodate the distance. Also consider how the solution, chemical, and air lines will be routed, and what hardware will be required to accomplish that scheme.

Refer the below diagram to locate the panel and peripheral components.



3.00 Panel Installation (continued)

3.02 Required Skills and Tools

Skills	
Mechanical	Mounting the panel and assembling injectors
Electrical	Knowledge of 3 phase systems and local electrical code for VFD/Pump Familiar with car wash controller trigger signals
Plumbing	Assembling pump flanges, threaded connections, and hose connections Connecting solution lines
Air	Connecting air lines
Chemical	Connecting chemical pick up lines
Process	Knowledge of car wash applications

Tools	
Mechanical	Hammer Drill Masonry Bits Impact Driver Bubble Level Tape Measure Pencil/Marker Wrench Set Screwdriver Set
Electrical	Cable – length determined by pump/VFD location Cable Stripper Wire Stripper Multimeter Flexible Watertight Conduit Ring Terminals and Crimper
Plumbing	Pipe Wrench Teflon tape/Pipe dope Tube Cutters 1” Hose Clamps

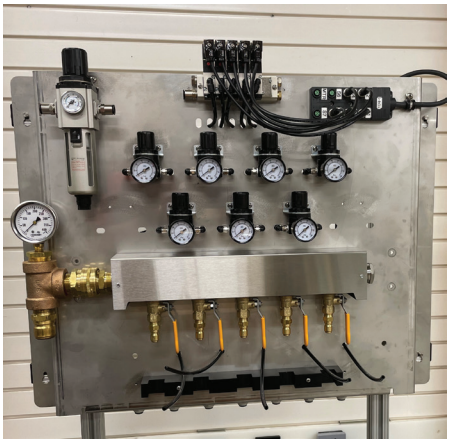
3.00 Panel Installation (continued)

3.03 Mounting the Panel

Warning! - Wear protective PPE, such as steel toed shoes and safety glasses, when installing the unit and its peripherals.

Note: Two people will be required to mount the panel.

1. Determine where the panel will be mounted. The surface must be vertical and able to withstand the weight of the panel. Refer to the site survey diagram for location.
2. A paper template with bolt hole locations is included for ease of installation. Tape the template to the mounting surface. The template must be tight for accurate placement of the bolts.
3. Drill pilot holes and insert the anchors into the holes. Drive the bolts approximately 1/4 in. from the wall to allow the panel to drop in the key slot.
4. Align the panel over the bolts and drop it into place. After dropping the panel into position, drive the bolts hand tight.
5. Install the angled seat valves to the quick connect fittings on the ball valves. Insert each corresponding air tube to the seat valve.



3.04 Signal Wiring

Warning! - Ensure the voltage from the car wash trigger signals matches the voltage stated on the air solenoids.

Run the signal box cable to the car wash control panel and connect the trigger wires to the appropriate terminals.

Refer the below table and the car wash control panel schematics to identify the appropriate wiring locations.

Signal Box Wiring	
Connections	**Wire Color**
Supply VAC	Brown (Not Used)
Neutral	Blue
Valve 1	White
Valve 2	Green
Valve 3	Yellow
Valve 4	Grey
Valve 5	Pink
Valve 6	Red
Valve 7	Black
Valve 8	Violet (Not Used)
Ground	Green/Yellow

3.05 Air Supply

Run tubing from the compressed air supply to the main air regulator on the panel. Adjust the panel's regulator to 80-120 psi.

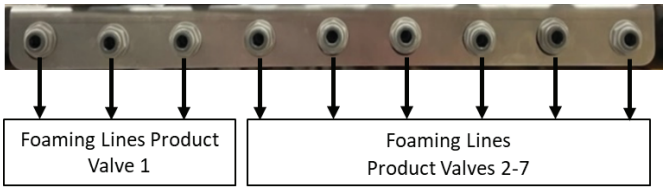
3.00 Panel Installation (continued)

3.06 Foaming Outlets

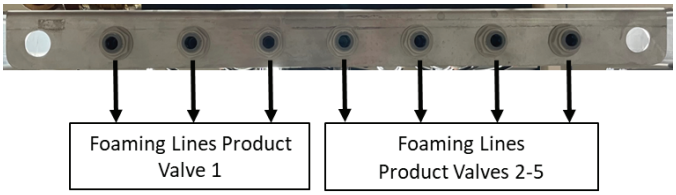
Run tubing from the foaming applications to the panel's foaming outlets. The order of the valves corresponds to the order of the foaming outlets. If an application doesn't require a foaming connection, leave the outlet empty.

Triple Foaming Application

The first three foaming outputs are for triple foaming applications on solution valve 1. If a single foaming application is used on valve 1, only one foaming output needs connected



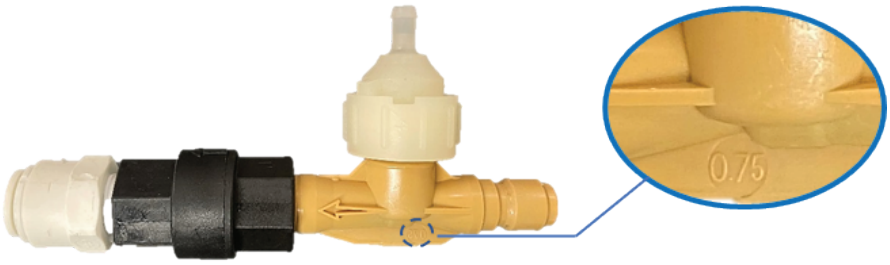
7 Valve Foaming Outlet



5 Valve Foaming Outlet

3.07 Solution Lines

1. Choose the injector size for each application. Refer to each application's flow recommendation for a starting size. The injector flow rates are specified by the color and have the flow rate stamped on the body.



2. Insert the injector into the angled seat valve's quick connect.
3. Run solution lines to the Push-In connections

Single flow application:

Triple flow application:

3.00 Panel Installation (continued)

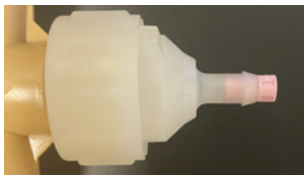
3.08 Chemical Supply Lines

1. The chart below should be used as a guideline for selecting the metering tip but is based on water-thin products. Performing a titration will guarantee desired dilutions are achieved.

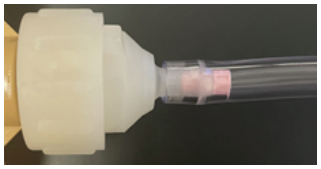
	Nominal Tips	Size	0.75	1	1.5	2	2.25	3.25	4	5.5	7	8	9	10	12
	Grey	0.128	5	6	7	7	7	9	10	11	13	14	15	16	18
	Black	0.098	5	7	7	7	7	9	10	11	13	14	15	17	19
	Beige	0.070	5	7	8	8	8	11	12	14	17	19	21	22	26
	Red	0.052	5	7	9	9	9	15	17	22	27	30	34	37	44
	White	0.043	6	8	11	12	14	23	27	37	47	54	60	67	80
	Blue	0.040	7	9	12	14	17	27	32	44	56	64	72	80	97
	Tan	0.035	8	11	17	19	21	36	43	59	76	87	97	108	130
	Green	0.028	12	16	22	27	31	57	67	94	121	139	157	175	211
	Orange	0.025	14	19	28	34	40	68	82	114	146	167	189	210	253
	Brown	0.023	17	23	33	40	47	85	101	141	182	209	236	263	317
	Yellow	0.020	24	33	43	55	68	111	134	188	241	276	311	347	418
	Aqua	0.018	27	36	52	65	77	124	150	208	267	306	344	383	461
	New Red*	0.015	37	51	71	90	99	138	166	232	281	319	358	396	469
	Purple	0.014	48	64	53	107	119	190	230	322	414	476	537	599	722
	Pink	0.010	83	110	140	193	218	302	368	500	632	719	807	895	1011
	Precision Pink*	0.0095	95	120	156	204	227	312	377	509	637	724	811	897	1040
	Lt Purple*	0.009	108	130	173	216	237	323	387	517	643	729	815	900	1070
	Olive-Green*	0.008	121	146	195	243	267	363	435	582	724	820	916	1013	1204
	Red Purple*	0.007	184	204	245	289	312	409	488	665	861	1005	1159	1322	1679
	Lt Orange*	0.006	246	261	296	335	357	455	542	748	999	1190	1401	1632	2153

*Inlcuded in Lean Tip Kit HYD90031210

2. Insert the metering tip into the hose barb.



3. Slide the chemical pick-up tubing completely over the barb.



4. Install a footvalve/check valve and/or filter (not provided) on the other end of supply tube and place in the chemical container.

4.00 Pump Installation

4.01 Pump Overview

Warning! Do not run the without water. The pump needs primed before operation.

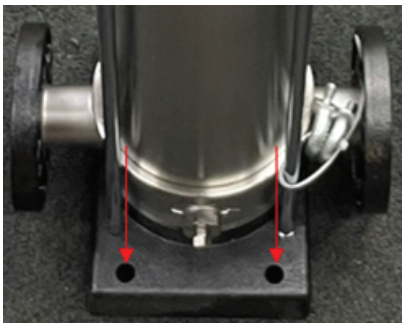
Note: Only qualified personnel should perform the installation.

Pump Installation Consideration

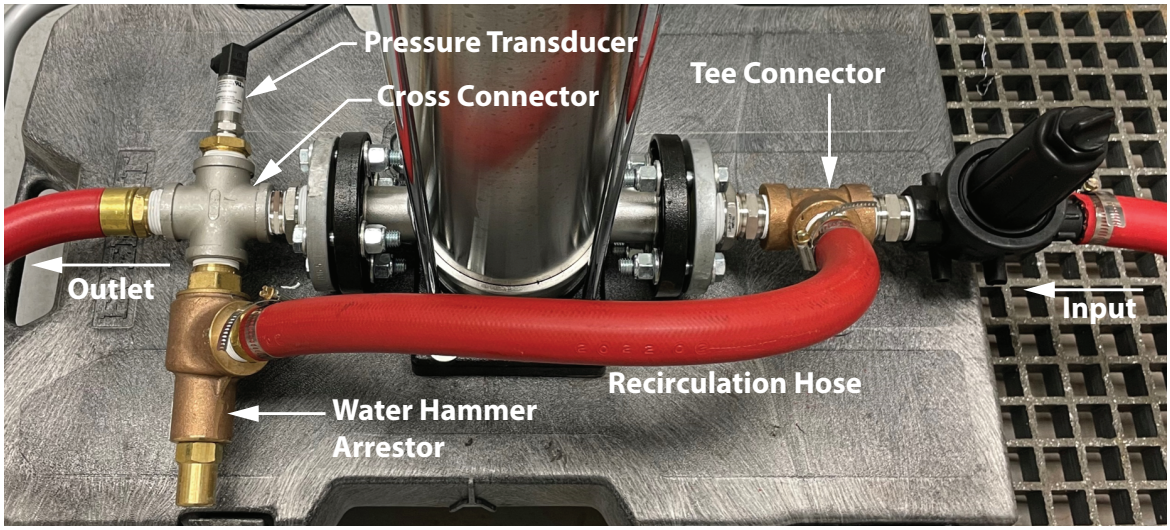
1. Use pipe dope or teflon tape for threaded connections.
2. Consider the proximity of the panel and VFD when choosing the pump location. A 6 ft. hose is provided that connects from the pump outlet to the panel. A 6 ft transducer cable will need to connect from the VFD to pressure inducer at the pump outlet.
3. Consider the pump inlet and outlet locations. The orientation will determine the distance it can be installed from the wall. The water hammer arrestor extends approximately 9 in. and the pressure transducer extends approximately 6 in.
4. Ensure the correct orientation of tee connector, cross connector and water arrestor while installing the hardware.
5. A water filter is provided that can either be installed on the pump's inlet plumbing or at the source of the water supply. If installed on the pump's inlet plumbing, it will require installing before the pump is mounted as it will require tilting the pump up to prevent interference when screwing the filter on

4.02 Floor Mount

1. The pump should be installed on cement base, or other similar base. The pump should be located in a well ventilated but frost-free area. Refer to Section **Site Survey** diagram for location.
2. Align the pump into position and create pilot holes using the stand's bolt holes as guides. Drive the four anchors to secure the pump base to the floor.



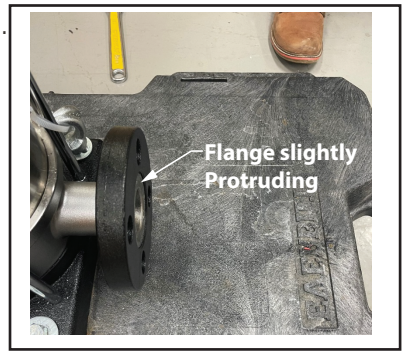
Pump Connection



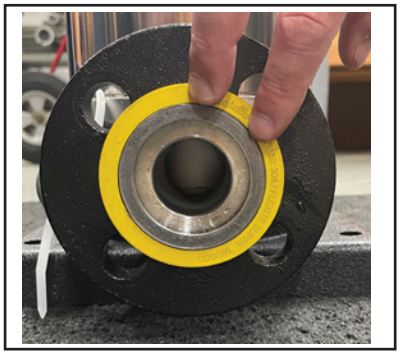
4.00 Pump Installation (continued)

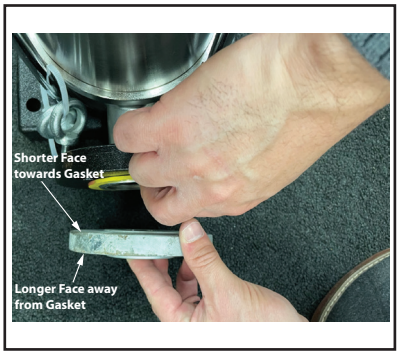
4.03 Gaskets Installation

Sealing gaskets and the following hardware needs to be installed on both the inlet and outlet of the pump.

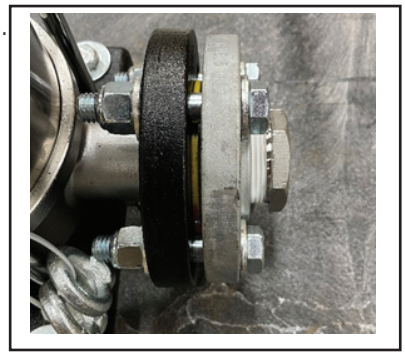
1. 

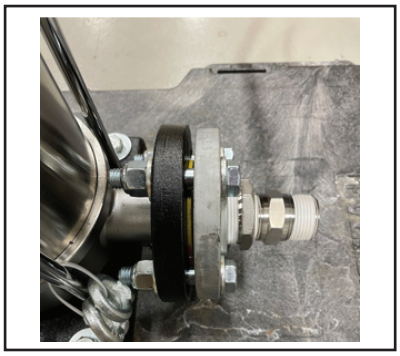
Remove the cover sticker. Rotate the flange to protrude slightly.

2. 
Place and hold the gasket on the black flange.

3. 

Align the flange on the gasket with shortest face towards the gasket.

4. 
Secure the flange with bolts, washers and nuts. Tighten with star method. Install the 1” Female reducer bushing.

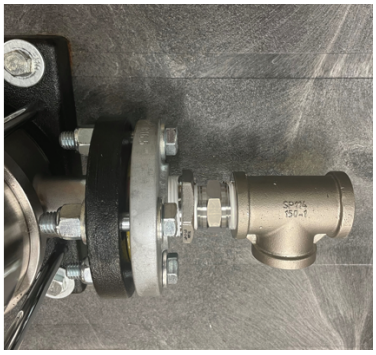
5. 
Install the straight connector.

4.00 Pump Installation (continued)

4.04 Pump Inlet

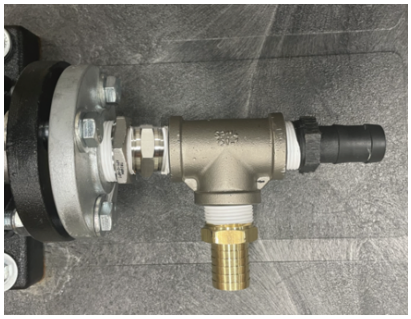
Note: Follow step 2a if the filter will not be installed on the pump inlet plumbing. Follow step 2b if the filter will be installed on the pump inlet plumbing.

1.



Install the Tee Connector. The branch of the tee must face towards the water hammer arrestor.

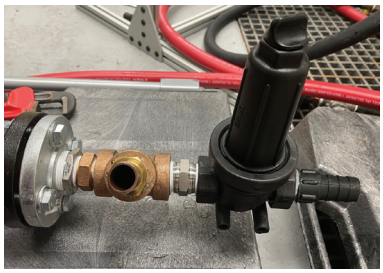
2. a.



Install the Metal Barb fitting at the center branch and the plastic barb fitting in the remaining open branch.

Install the filter before the pump plumbing. Arrows on the filter indicate the flow of water

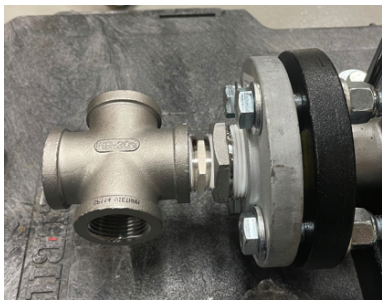
2. b.



Add a straight connector and plastic barb fitting to the filter. Arrows on the filter indicate the flow of water. The filter will interfere with the ground when installing so the pump will need tilted up.

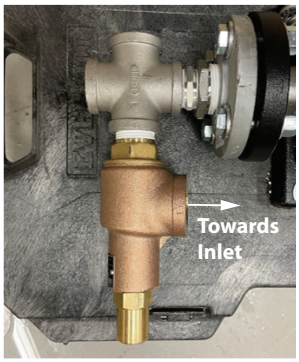
4.05 Pump Outlet

1.



Install the cross fitting into the straight connector. The cross's branches should be approximately horizontal to the floor.

2.



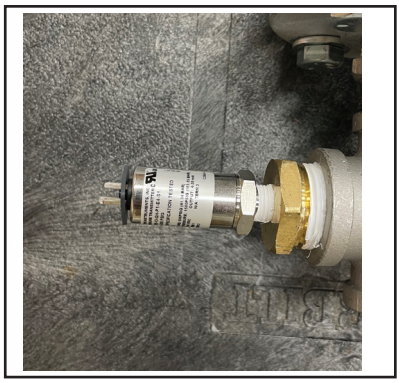
Install the water hammer arrestor and ensure the arrestor's opening is facing towards the pump inlet.

3.

Install the barb fitting on the arrestor and reducer bushing on the cross fitting.

4.00 Pump Installation (continued)

4.05 Pump Outlet (Continue)

4. 

Thread the pressure transducer inside the Bushing.

4.06 Hoses

1. Install the incoming water supply and recirculation hose on the barb fittings using hose clamps.
2. Connect outlet hose to the pump inlet and attach the opposite end to the quick connect on the panel. Turn the ball valve on the hose to ON position.

4.07 Prime Pump

1. Ensure the pump's water supply is on and the pump's outlet hose is connected to the panel with the ball valve in the ON position
2. Slowly open the vent plug on the pump to bleed air in the system. Once water starts spraying out the valve, ensure that all air pockets have escaped by leaving the valve open until no air is observed for at least one minute. Close the vent plug.

Note: Water will spray out of the vent plug when performing this step.

3. Ensure minimum 40 psi pressure is maintained on the panel water pressure gauge.

5.00 VFD Installation

5.01 VFD overview

WARNING!: The Pump must be primed before installing the VFD to prevent dry running.

WARNING!: Please follow safe electrical precautions.

Follow the directions below for installing the VFD. Only qualified personnel should perform the installation.

VFD Installation Considerations

1. Determine how to connect the electrical cables from power source to the VFD and from VFD to the pump.
2. The VFD mounting height needs to be considered for ease of access to operate the unit. Refer to section **Site survey**.
3. The VFD is preset so that once power is received, it will drive the pump to 200 psi. The pump must be primed before this step and connected to the panel so that pressure can be checked on the panel's gauge.

Types of VFD

Part Number	Description
HYD10100457	200-240 VAC VFD ASSY with Pressure Transducer Cable
HYD10100458	380V-480 VAC VFD ASSY with Pressure Transducer Cable

5.02 Mounting the VFD

1. Refer to section Site Survey diagram for mounting VFD.

Note: Mount the VFD away from areas subjected to steam or chemicals.

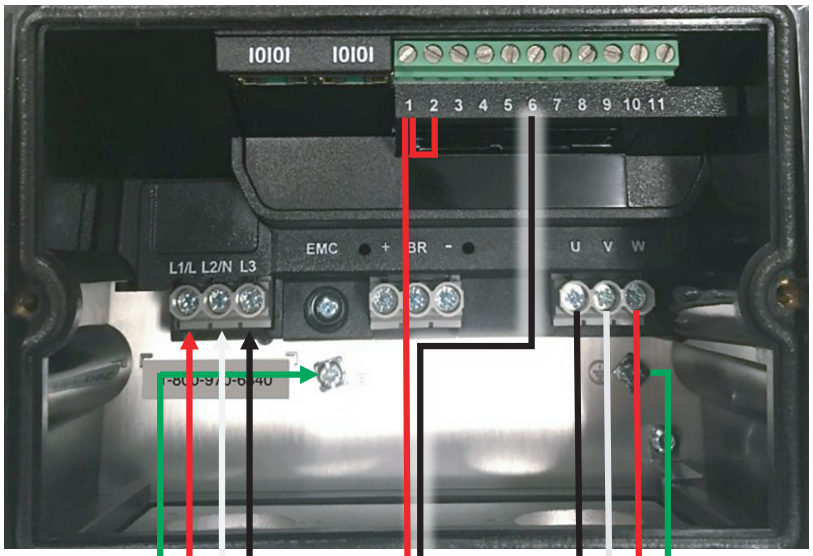
2. Place the VFD on the wall and mark the screw locations.
3. Drill 1/4" pilot holes and insert anchors. Drive the bolts approximately 1/8" from the wall.
4. Place the VFD key holes on the bolts and push down to lock into position. Tighten the bolts on the VFD frame.

5.03 Wiring the VFD

1. Remove the two bolts on the VFD cover for terminal locations. Also remove the pump cover
2. Wire the following:
   a. Three phase cable from the power source to the VFD
   b. Three Phase Power cable from VFD to the pump
   c. Pressure Transducer cable from VFD to the pressure transducer

Note: Do not turn ON power to VFD until the next step.

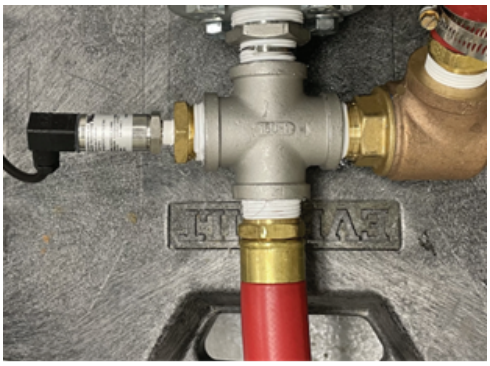
5.00 VFD Installation (continued)



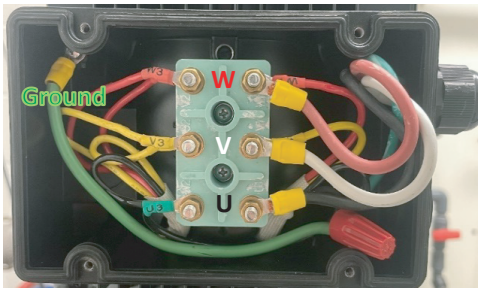
From: Power Source	Pressure Transducer	To: Pump Motor
Connect three phase power to L1, L2, L3, and ground	Connect the transducer's red wire to T1 and black wire to T6.	Connect motor cable to U,V,W and ground

On/Off Operation

For VFD operation, T2 must receive voltage from T1. Bridge T2 to T1 to enable continuous VFD operation. See Section 5.05 to automate on/off operation of the VFD.



Connect pressure transducer cable.

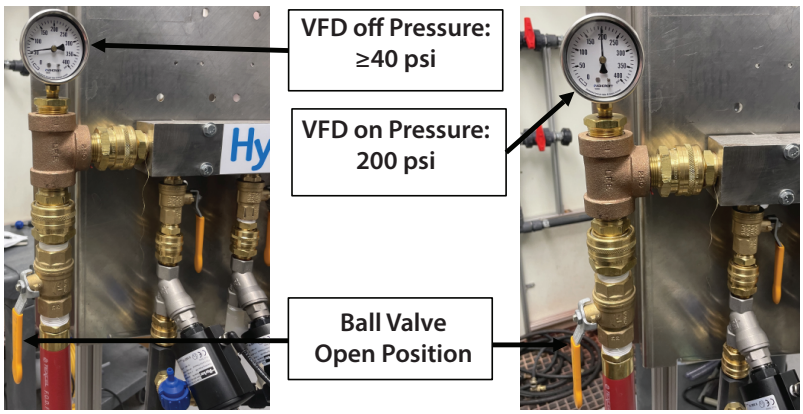


Connect pump motor cable.

5.04 VFD and Pump Operation Check

On the pump motor, rotating direction is critical. Rotation will need to be checked in tandem when the power is released to the VFD. The rotating direction is indicated on the fan cover.

1. Before releasing power to the VFD, Confirm the following:
   a. The pump is primed.
   b. The water supply is on.
   c. The pump's outlet hose is connected to the panel with the ball valve open and pressure atleast 40 psi.
   d. The pressure transducer is plugged in.
   e. You are prepared to quickly turn power off if the motor rotation is wrong. Two people may be required; one to control the power and one to watch the motor rotation.
2. Turn the VFD's power source on while checking the motor rotation in tandem. Immediately stop power to the VFD if the rotation is wrong. Interchanging any two leads with power off can reverse the pump rotation.
3. Verify the pressure gage reads approximately 200 psi.



5.00 VFD Installation (continued)

5.05 Operating the VFD

Automatic ON/OFF operation

If desired, the installer can preserve pump life by automating the VFD so that is only on during the car wash's operating hours. T1 is tied to the VFD's internal (isolated) 24V supply. T2 has the function of 'Run Enable', meaning the VFD will operate only when it receives the 24V signal from T1. When these connections are bridged, run is always enabled. To enable run only during operating hours, remove the bridge and wire T1 and T2 to a relay or contactor that is only energized during operating hours.

Manual ON/OFF Operation

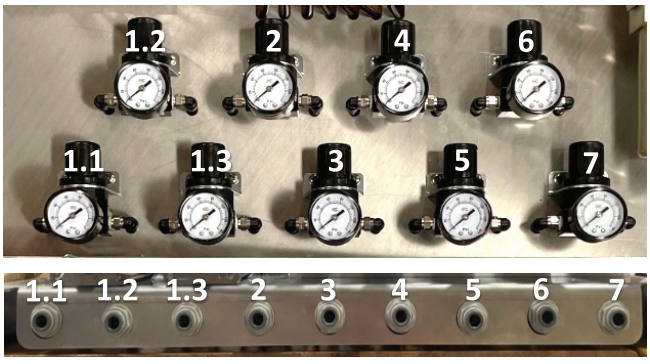
To preserve pump life, the VFD will need to be turned off during non operating hours.

5.06 System Start UP

After installing the panel, pump and VFD the operating variables will needs to be optimized. Perform the following steps

1. Ensure incoming air pressure is at 80 psi and water pressure at 200 psi.
2. Prime the chemical lines by manually engaging each air solenoid button.

3. Set the foaming pressure for each application.



4. Verify Injector Flow rates and chemical dilutions to the car wash application. Injectors and metering tips initially chosen may needs to be exchanged to achieve desired results. Performing a titration will guarantee desired dilutions are achieved. A chemical scale may be used to verify amount of chemical used per car.

6.00 Maintenance and Troubleshooting

6.01 Maintenance

	3 month	6 month	Annually
Panel			
Check Foot Valves Strainers	x		
Check and Replace Metering Tips	x		
Check and Drain Supply Air Regulator	x		
Check the chemical pick-up tubing, air tubing, and solution tubing for brittleness. Exchange if necessary		x	
Check all tubing connections		x	
Pump			
Check pump filter	x		
Inspect piping and joints for leaks	x		
Check the power cable ensuring screw terminals are correctly torqued with no signs of heat damage			x
VFD			
Check all electrical connections, ensuring screw terminals are correctly torqued; and that power cables have no signs of heat damage			x
Check the enclosure is free from dust and condensation			x

6.02 Troubleshooting

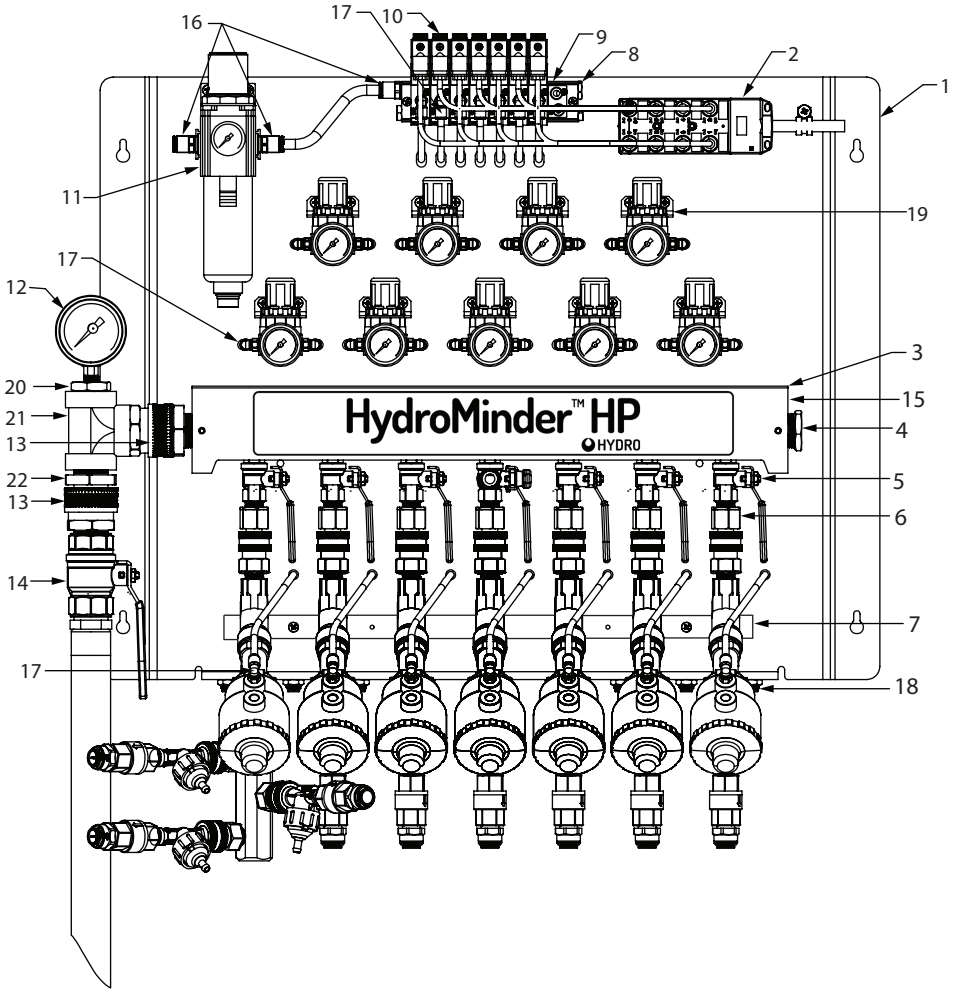
Problem	Cause	Solution
Panel		
1. No Concentrate Draw	• Clogged foot valve	• Clean or replace
	• Metering Tip/Check Valve/Injector has scale build up	• Clean or replace
	• Concentrate Container is empty	• Replace with full container
	• Air leak in chemical pick-up tube	• Check connections or replace tube if brittle
	• Clogged application nozzle	• Clean or replace
2. Excess concentrate draw	• Metering tip missing or not in place	• Press correct tip firmly into barb
	• Chemical above injector	• Place concentrate below the injector
3. No Solution discharge	• No water	• Open water supply
	• Injector Clogged	• Clean or replace
	• Water Supply ball valve in OFF position	• Move ball valve to ON position
	• Injector ball valve in OFF position	• Move ball valve to ON position
	• Inadequate water pressure	• Check if VFD is ON
	• Inadequate supply air pressure	• Check incoming air pressure – 80 psi required
	• Faulty air solenoid	• Replace
	• Signal not received	• Verify air solenoid indicator light is on when triggered
	• Injector valve fails to open	• Replace

6.00 Maintenance and Troubleshooting (continued)

Problem	Cause	Solution
Panel		
4. Nonstop solution discharge	• Injector valve fails to close	• Replace valve
	• Air Solenoid fails to close	• Replace valve
	• Trigger signal fails to stop	• Check source of trigger signal
5. No Foaming Pressure	• Inadequate supply air pressure	• Check incoming air pressure – 80 psi required
	• Inadequate foaming air pressure	• Check applications pressure
	• Air tubing disconnected	• Check tubing connections
6. The Standard HYD690014 and Lean HYD90031210 tip kits are combined and the two reds are not discernable	• Red and New Red tip colors look very similar	• Hold Red and New Red and look through the orifice of both, you will see a distinct difference in the aperture. The opening of Red is much larger than New Red
Pump/VFD		
1. Pump can't maintain 200 psi	• Total injector flow rates more than 20 gpm	• Lower total flow rate for max. 20 gpm
	• Undersized supply piping	• Replace with larger piping
	• Inadequate water supply	• Check source supply pressure – 40 psi required
	• Leak in pump plumbing	• Check and fix leaks
2. Pump doesn't turn ON	• No Electric Supply	• Check power going to VFD
	• Lose wiring in VFD or pump motor	• Check wiring at VFD and pump motor
	• T2 Not Receiving Voltage from T1	• Check wiring
	• Overheating relay tripped	• Check system
	• Motor is defective	• Repair
3. Pump trips immediately when power turned on	• Fuses are blown	• Replace fuses
	• Cable connection is loose or faulty	• Check wiring at VFD, pump motor, and pressure transducer

7.00 Spare Parts

7.01 Panel Spare Parts - 1 of 2

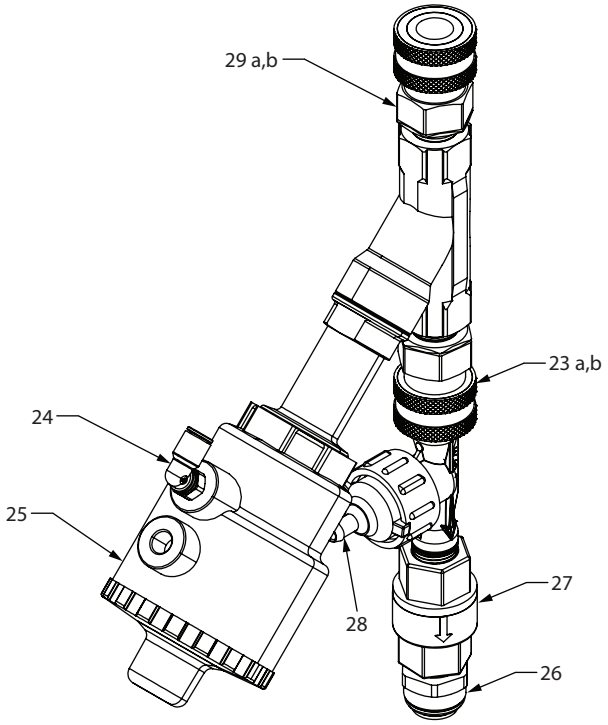


S.No	Part Number	Description
1	HYD10100124	Mounting Plate
2	HYD10100395	Signal Box
3	HYD10100112 HYD10100111	7 Valve Manifold Cover 5 Valve Manifold Cover
4	HYD10100126	Manifold Plug, 1" NPT
5	HYD10100349	Ball Valve, 3/8" NPT
6	HYD10100129	Quick Connect Plug, 3/8" MPT, Brass
7	HYD10100123 HYD10100380	7 Valve Support Bar 5 Valve Support Bar
8	 HYD10100382 HYD10100347	Pneumatic Solenoid manifold 7 valve Solenoid manifold 5 valve Solenoid manifold
9	HYD10100383	Blanking Plate, 3 Way, 100 Series
10	HYD10100335 HYD10100336 HYD10100337	Pneumatic Solenoid Valve 24 VDC Assembly Pneumatic Solenoid Valve 120 VAC Assembly Pneumatic Solenoid Valve 24 VAC Assembly
11	HYD10100342	Main Air Regulator and Input Connector
12	HYD10100350	Pressure Gauge 1/4 NPT Male Bottom Connection, 2-1/2" Dial

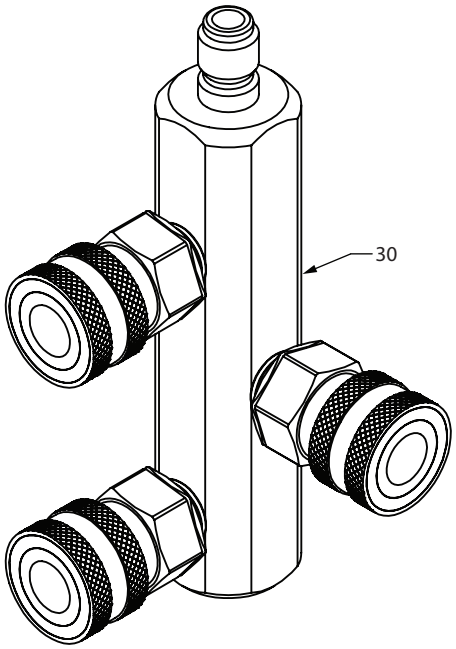
S.No	Part Number	Description
13	HYD10100127 HYD10100477	1" Quick Connect Socket 1" Quick Disconnect O-ring Kit
14	HYD10100352	Ball Valve, 1" NPT
15	HYD10100121 HYD10100343	7 Valve Water Manifold 5 valve Water Manifold
16	HYD10100386	Male Connector, 3/8 in Tube Size, 1/4" Pipe Size
17	HYD10100385	Elbow, 1/4 Tube x 1/8 MNPT
18	HYD10100389	Foaming Air Outlet Connector, 3/8" X 1/4" Tube
19	HYD10100341	Foaming Air Regulator and 2 elbows
20	HYD10100351	Bushing Adapter with Hex Body, 1 NPT Male, 1/4 NPT Female
21	HYD10100362	Tee Connector
22	HYD10100128	Quick Connect Plug
Not Shown:		
	HYD10100338	Solenoid Valve Gasket
	HYD10100387	Air Union Tee, 1/4" (behind panel)
	HYD10100388	Air Check Valve, 1/4" (behind panel)
	HYD10100122	Water Manifold Spacer (behind manifold)

7.00 Spare Parts (continued)

7.02 Panel Spare Parts - 2 of 2



Seat Valve



Triple Foam Manifold

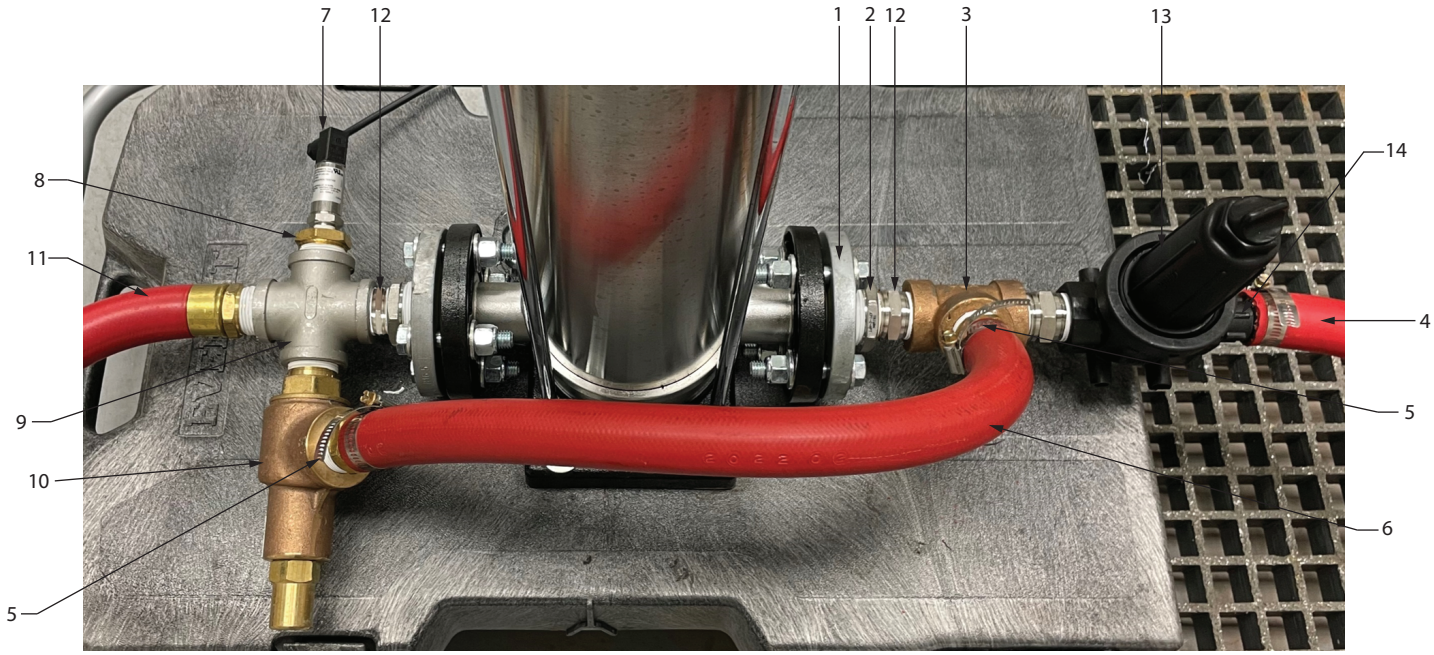
S.No	Part Number	Description
23a	HYD10100346	Quick Connect Socket, 3/8“ MPT SS, with Viton O-ring
b	HYD10100479	3/8” Stainless Steel Quick Disconnect O-ring Kit
24	HYD10100385	Elbow, 1/4 Tube x 1/8 MNPT
25	HYD10100344	Angled Seat Valve Assy with Quick Connects/ Elbow
26	HYD10100379	Injector John Guest Fitting
27	HYD10100348	Injector Check Valve
28	HYD10100331	KYNAR/AFLAS HAAS Valve
29a	HYD10100345	Quick Connect Socket, 3/8” MPT Brass
b	HYD10100478	3/8” Brass Quick Disconnect O-ring Kit
30	HYD10100119	Triple Foam Manifold with Quick Connects

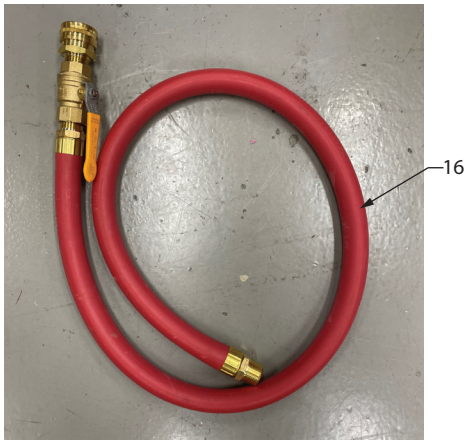
Part Number	Size of Injector
HYD-HP1-EP75	0.75 GPM Injector Kit
HYD-HP1-E1P0	1.00 GPM Injector Kit
HYD-HP1-E1P5	1.50 GPM Injector Kit
HYD-HP1-E2P0	2.00 GPM Injector Kit
HYD-HP1-E2P25	2.25 GPM Injector Kit
HYD-HP1-E3P25	3.25 GPM Injector Kit
HYD-HP1-E4P0	4.00 GPM Injector Kit
HYD-HP1-E5P50	5.50 GPM Injector Kit
HYD-HP1-E7P0	7.00 GPM Injector Kit
HYD-HP1-E8P0	8.00 GPM Injector Kit
HYD-HP1-E9P0	9.00 GPM Injector Kit
HYD-HP1-E10P0	10.00 GPM Injector Kit
HYD-HP1-E12P0	12.00 GPM Injector Kit

Note: Injector kit includes Injector, HAAS valve, Check valve, John Guest Fitting and Dilution Tips.

7.00 Spare Parts (continued)

7.03 Pump Spare Parts





S.No	Part Number	Description
1	HYD10100358	Steel Flange
2	HYD10100353	Bushing Adapter, 1-1/4 Male x 1 Female
3	HYD10100362	Tee Connector
4	HYD10100375	Pump Inlet Hose
5	HYD10100361	Brass Barbed Fitting
6	HYD10100376	Recirculation Hose
7	HYD10100125	Transducer (With M12 Cable)
8	HYD10100351	Bushing Adapter, 1 NPT Male, 1/4 NPT Female
9	HYD10100360	Cross Connector
10	HYD10100378	Pressure Relief Valve
11	HYD10100377	Pump Outlet Hose
12	HYD10100359	Straight Connector with Hex, 1” NPT Male
13	HYD10100366	1” NPT T-Strainer
14	HYD10100363	Plastic Barbed Fitting
15	HYD10100339	Quick Disconnect Manifold Gauge Assembly
16	HYD10100340	Quick Disconnect Pump Hose Assembly
Not Shown:		
	HYD10100357	Flange Gasket

8.00 Warranty

8.01 Limited Warranty

Seller warrants solely to **Buyer** the Products will be free from defects in material and workmanship under normal use and service for a period of one year from the date of completion of manufacture. This limited warranty does not apply to (a) hoses; (b) products that have a normal life shorter than one year; or (c) failure in performance or damage caused by chemicals, abrasive materials, corrosion, lightning, improper voltage supply, physical abuse, mishandling or misapplication. In the event the products are altered or repaired by **Buyer** without **Seller's** prior written approval, all warranties will be void.
No other warranty, oral, expressed or implied, including any warranty of merchantability or fitness for any particular purpose, is made for these products, and all other warranties are hereby expressly excluded.

Seller's sole obligation under this warranty will be, at **Seller's** option, to repair or replace F.O.B. **Seller's** facility in Cincinnati, Ohio any Products found to be other than as warranted.

8.02 Limitation of Liability

Seller's warranty obligations and **Buyer's** remedies are solely and exclusively as stated herein. **Seller** shall have no other liability, direct or indirect, of any kind, including liability for special, incidental, or consequential damages or for any other claims for damage or loss resulting from any cause whatsoever, whether based on negligence, strict liability, breach of contract or breach of warranty.