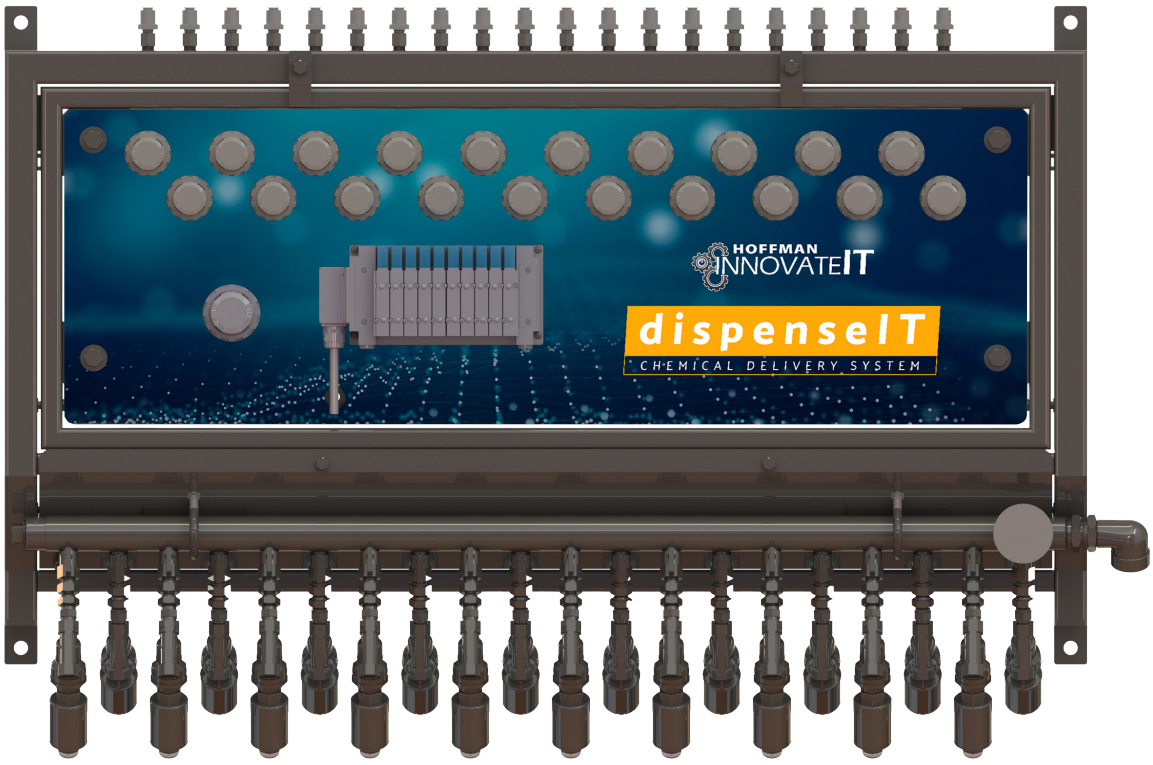
dispenseIT Gen2

CHEMICAL DELIVERY SYSTEM

Instruction Manual

V 2.0, 1-7-26



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Contents

Introduction

1. Introduction

The manufacturer innovateIT Car Wash Equipment LLC is committed to the continuous improvement of its equipment construction quality and the safe operation of its equipment.

1.1 Warranty

This manual covers the installation, intended use, and maintenance of the dispenseIT Chemical Delivery System. Misuse or improper operation of this device will void the manufacturer's warranty.

innovateIT Car Wash Equipment LLC warrants the supplied equipment for a period of one (1) year from the date of shipment and shall be liable for any defects due to defective materials or workmanship of its own manufactured equipment. innovateIT Car Wash Equipment LLC reserves the right, at its sole discretion, to either repair or replace any defective equipment, provided the Buyer informs ICWE in writing immediately upon discovery of such defects.

Warranty claims may be subject to evaluation by innovateIT Car Wash Equipment LLC. The Buyer must obtain a Return Material Authorization (RMA) prior to returning any product. Returned items must be shipped freight prepaid and properly packaged to prevent damage. If the claim is deemed to fall within the scope of warranty, innovateIT Car Wash Equipment LLC will, at its discretion, repair, replace, or issue a credit for the item. Products determined to be outside the scope of warranty will be returned to the Buyer at their expense or disposed of upon written instructions. If the Buyer requires a replacement during the evaluation period, such replacement will be provided at the Buyer's expense unless the claim is approved and credit is issued following the evaluation.

All items covered under warranty will be shipped exclusively via standard ground shipping methods at no additional cost to the Buyer. Should the Buyer request an alternative shipping method, such as expedited or international shipping, the Buyer will be solely responsible for any cost difference between ground shipping and the requested method.

innovateIT Car Wash Equipment LLC shall not be liable for damages caused by improper or unsuitable use of the supplied equipment, particularly due to incorrect or negligent handling, improper maintenance, incorrect installation or commissioning of the equipment, or improper or incorrect utility supplies (electrical, water, or air).

When purchasing through a distributor, please ask about their warranty coverage on the unit.

1.2 Safety Information

The instructions in this manual provide you with the information necessary to install and operate the dispenseIT. Before starting installation, the instruction manual should be carefully read and understood. This relates to all dispenseIT documents from innovateIT Car Wash Equipment.

The basic pre-requisite for safe working is compliance with all the safety and handling instructions stated in this manual. Furthermore, follow all local accident, hazard prevention regulations or general safety regulations when installing and operating the dispenseIT.

The equipment's operation, maintenance, and troubleshooting must only be carried out by trained personnel. Personnel should be able to interpret a wiring diagram, use a multimeter to read AC and DC power, and apply Lock Out Tag Out (LOTO) safety procedures specific to the equipment.

Electrical installation must adhere to local codes and the National Electrical Code, ANSI/NFPA 70 for electrical wiring. To avoid electrical shock hazards, do not operate this device when controller enclosures are open and energized. Electrical power must be shut off and a lock-out procedure utilized to ensure all electrical power is disabled before performing maintenance to any portion of the system.

Plumbing installation must adhere to a local code and Uniform Plumbing Code (UPC), and plumbing connections and drains must adhere to local standards and facility codes.

Do not remove any Caution, Warning, or any other descriptive labels from the dispenseIT. Do not operate this device in an explosive environment or in the presence of flammable materials.

Movement or vibrations during shipment may cause connections to loosen. Check all connections before starting up a unit.

This unit's electrical enclosure is intended for installation in ordinary locations, by the National Electrical Code, ANSI/NFPA 70, where the ambient temperature does not exceed 104°F maximum.

innovateIT Car Wash Equipment LLC does not accept liability for accidents or damages due to negligence or disregard for the instructions in this manual. Also, the Company does not accept liability for damages due to improper use of the equipment.

This instruction manual should always be kept in a safe and easily accessible place near the equipment's site of installation and operation, and be available for the operator at the user site at any time.

If the manual is damaged, lost, or misplaced, you should immediately request a new copy from innovateIT Car Wash Equipment LLC.

1.2.1 Notifications & Symbols

The electrical inputs and outputs (I/O) has been selected to minimize the number of sensing devices while providing the ability to diagnose failure of the equipment.

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTE is used to address practices not related to physical injury.

2. System Overview

The dispenseIT Chemical Delivery System is a reliable, automated chemical delivery solution designed to ensure precise and consistent mixing and application of cleaning chemicals in car wash systems. Its primary function is to automate the accurate dilution and distribution of chemicals, ensuring optimal performance for a wide variety of car wash applications.

By using controlled solenoids and a highly efficient siphoning mechanism, the dispenseIT delivers the correct chemical concentration at precise intervals, reducing chemical waste and improving wash quality. The system integrates easily with a car wash's existing control infrastructure and can be tailored to different setups through adjustable components, ensuring flexibility for any wash size or configuration.

2.1 Features & Functions

innovateIT Car Wash Equipment LLC has developed the dispenseIT system as a reliable and precise chemical delivery solution designed to streamline the mixing and application of cleaning chemicals in car wash systems.

The dispenseIT uses Dema Rocket Injectors to accurately mix chemicals with water. The injectors create a siphon effect as water flows through them at high pressure, drawing the chemical from its container and mixing it with water. Adjustable dilution tips control the chemical-to-water ratio, ensuring accurate chemical dosing for each application.

All valves are equipped with individual isolation capability, allowing the operator to service or troubleshoot specific functions without interrupting the operation of the full system. The integration of 3-way air solenoids enhances this functionality by enabling redirection or controlled bypass of flow paths, improving service efficiency and operational flexibility.

The system includes a Grundfos variable frequency drive (VFD) pump, which provides precise control over water flow and pressure. This ensures consistent chemical delivery even under varying load conditions, while maintaining energy-efficient operation.

Additionally, the dispenseIT features an integrated electrical enclosure that consolidates all control systems for both the chemical delivery and the pump, with manual valve override capability included to support direct function testing. The enclosure is designed to simplify installation and reduce service complexity by minimizing cable penetrations and complies with local electrical codes.

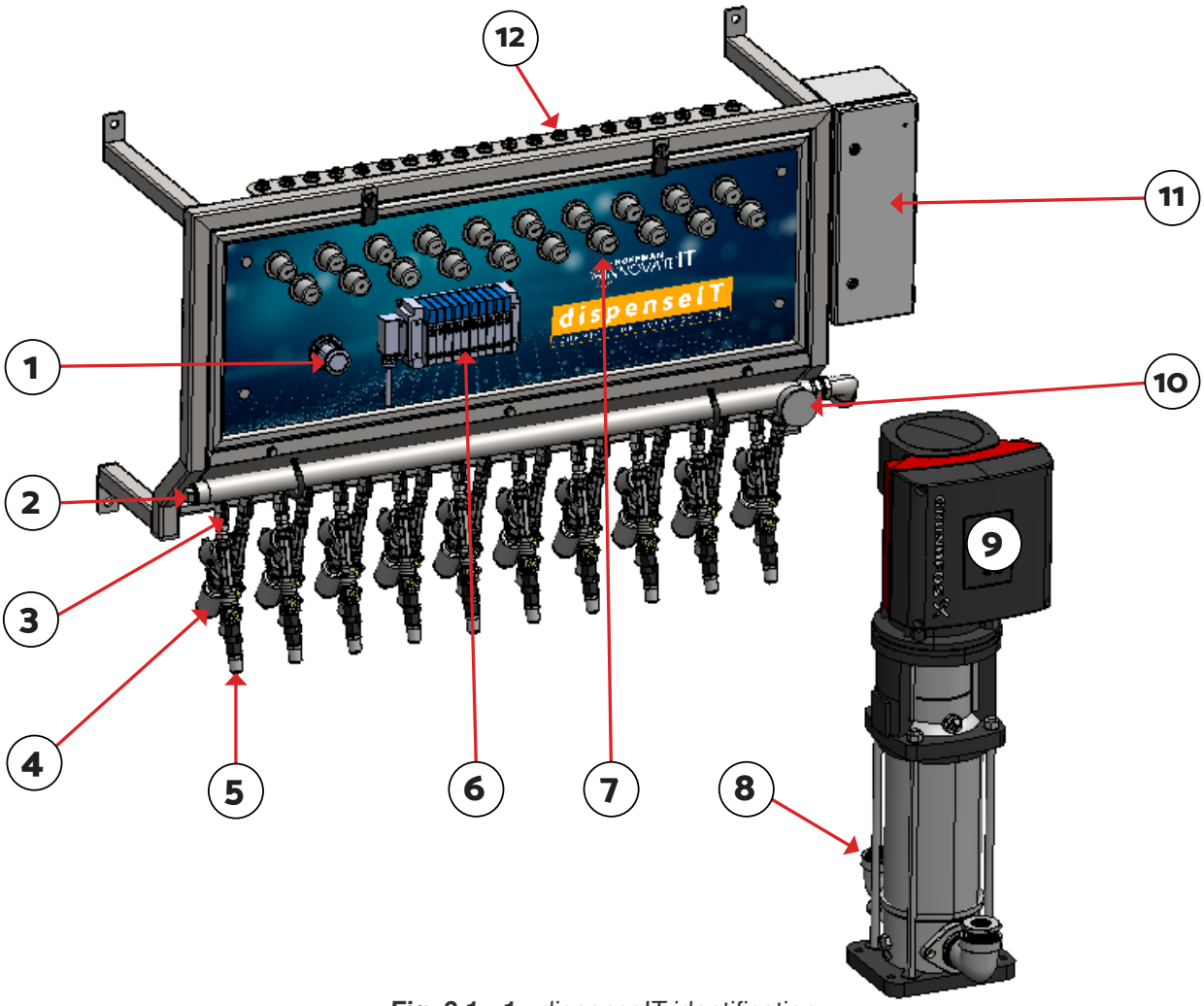


Fig. 2.1 - 1 *- dispenseIT identification*

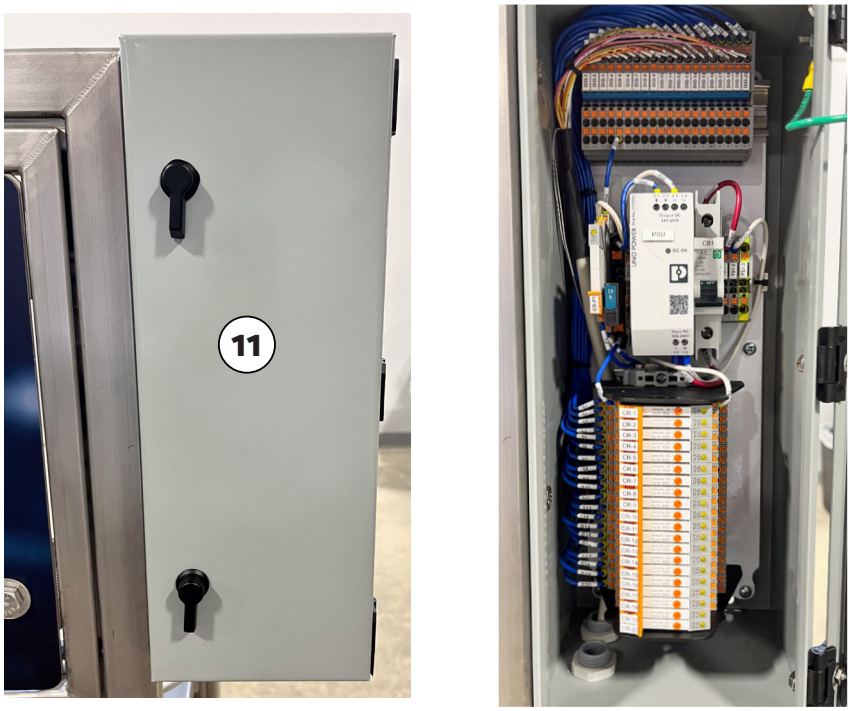


Fig. 2.1 - 2 *- dispenseIT electrical enclosure*

Table 2.1 - 1 *- dispenseIT component features and functions*

#	Component	Features/Functions
1	Main Air Regulator	- Adjusts system air pressure for appropriate valve operation
2	Manifold	- Supplies process water to function valves
3	Isolation Valves	- Allows individual functions to be isolated during maintenance or trouble-shooting without shutting down the entire system
4	Process Valves/Solenoids	- Air operated valve to regulate the flow of process water
5	DEMA Rocket Injectors	- Creates a siphon effect to accurately mix chemicals with water, controlled by adjustable dilution tips for precise chemical concentration
6	Air Control Manifold	- Controls flow of air for foam regulators and process valves
7	Foam Air Regulators	- Allows individual function foam air control
8	Main Water Inlet	- Entry point for site water supply
9	Grundfos VFD Pump	- Provides controlled water flow and pressure with energy-efficient operation, ensuring consistent chemical delivery under various conditions
10	Manifold Pressure Gauge	- Mechanical gauge to show live manifold water pressure
11	Electrical Enclosure	- Customer connection point for function control signals
12	Foaming Air Output To Tunnel	- Connection point for foam applicator process air

2.2 System Specifications

Table 2.2 - 1 - *dispenseIT specifications*

Pump Output	5 HP - 30 GPM @ 200 psi 7.5 HP - 40 GPM @ 200 psi
Solution Output (Flow Rates)	0.3-15 GPM @ 200 psi
Voltage (Pump)	208 VAC / 3PH 480 VAC / 3PH
Max Current (Pump)	17 A (208) 11 A (480)
Power Requirement	Constant 120 VAC
Control Inputs	24 VAC/DC - 9 mA per function 120 VAC - 4 mA per function
Air Supply^	2 SCFM @ 80-100 psi
Air Connection	3/8 Poly tube
Water Connections	5 HP - 1.25” FNPT 7.5 HP - 2” FNPT Municipal supply 1/2” - 3/4” Discharge per function
Dimensions - 10 Function Floor Mount	29.75” w x 73.75” h x 23.25” d
Dimensions - 15 Function Floor Mount	39.125” w x 73.75” h x 23.25” d
Dimensions - 20 Function Floor Mount	48.5” w x 73.75” h x 23.25” d
Dimensions - 10 Function Wall Mount	29.75” w x 29.5” h x 14.25” d
Dimensions - 15 Function Wall Mount	39.125” w x 29.5” h x 14.25” d
Dimensions - 20 Function Wall Mount	48.5” w x 29.5” h x 14.25” d
Dimensions - Pump	16” w x 48” h x 16” d

3. Installation

Installation of the dispenseIT must conform to local plumbing, electrical, and sanitation codes. The customer is responsible for obtaining all permits and ensuring the following conform to all state and local codes before installing the dispenseIT.

3.1 Installation Preparation

Locate where the dispenseIT will be installed with your installer. Take into consideration the following points:

- Location of the water supply, air supply, and 3PH electrical supply for the dispenseIT
- Location of the control wiring from tunnel controller for the dispenseIT
- Location of any equipment that may be spraying water
- Distance from the dispenseIT to the applicator arches

Refer to Fig. 3.1 - 1 for solenoid, air regulator, and valve alignment for each function.

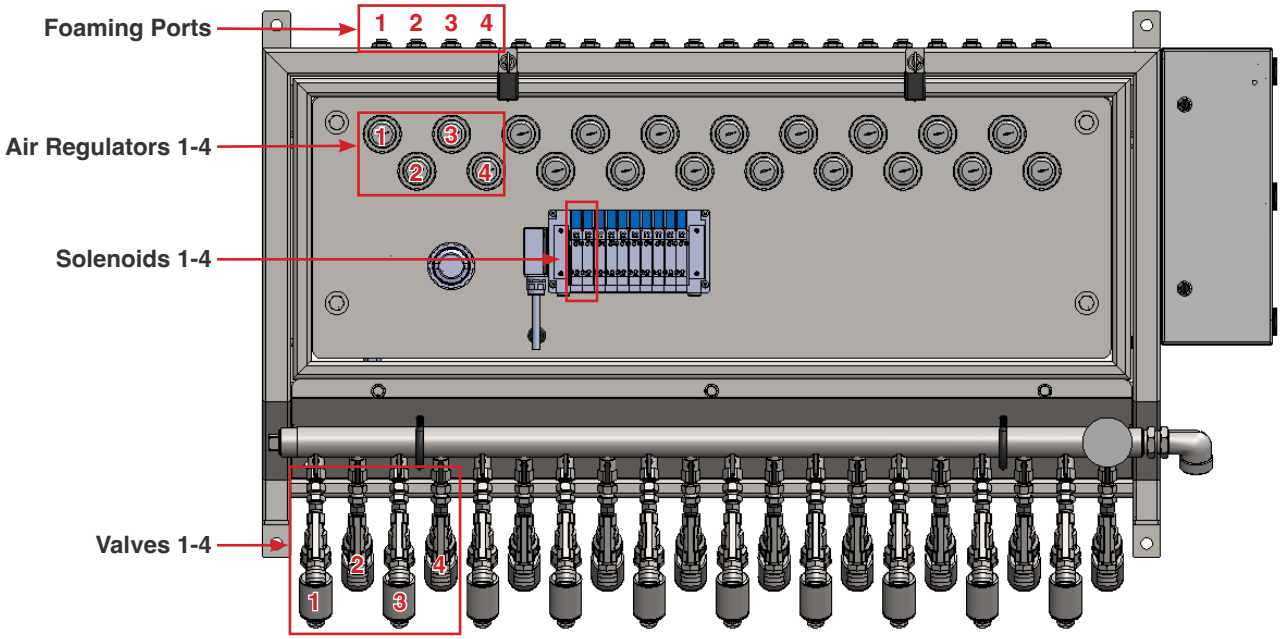


Fig. 3.1 - 1 - *Solenoid, air regulator, foaming ports, and valve alignment*

3.2 Mechanical Installation

Place equipment in the equipment room where the installation will take place. If possible, have the unit away from areas where the pump could take a direct spray from liquids.

- **Floor Mount**: Turn the swivel casters so the wheels point forward and lock in place to ensure maximum stability
  - Safety chain is required.
- **Wall Mount**: Mounting hardware and wall must be capable of supporting unit's weight. Place the pump on the floor to the right of the unit.
  - Be sure to install the supplied stainless steel guard around the pump's base to avoid damage by barrels, barrel carts, etc.
  - Recommended height is at least 4', measured from the bottom of the frame to the floor

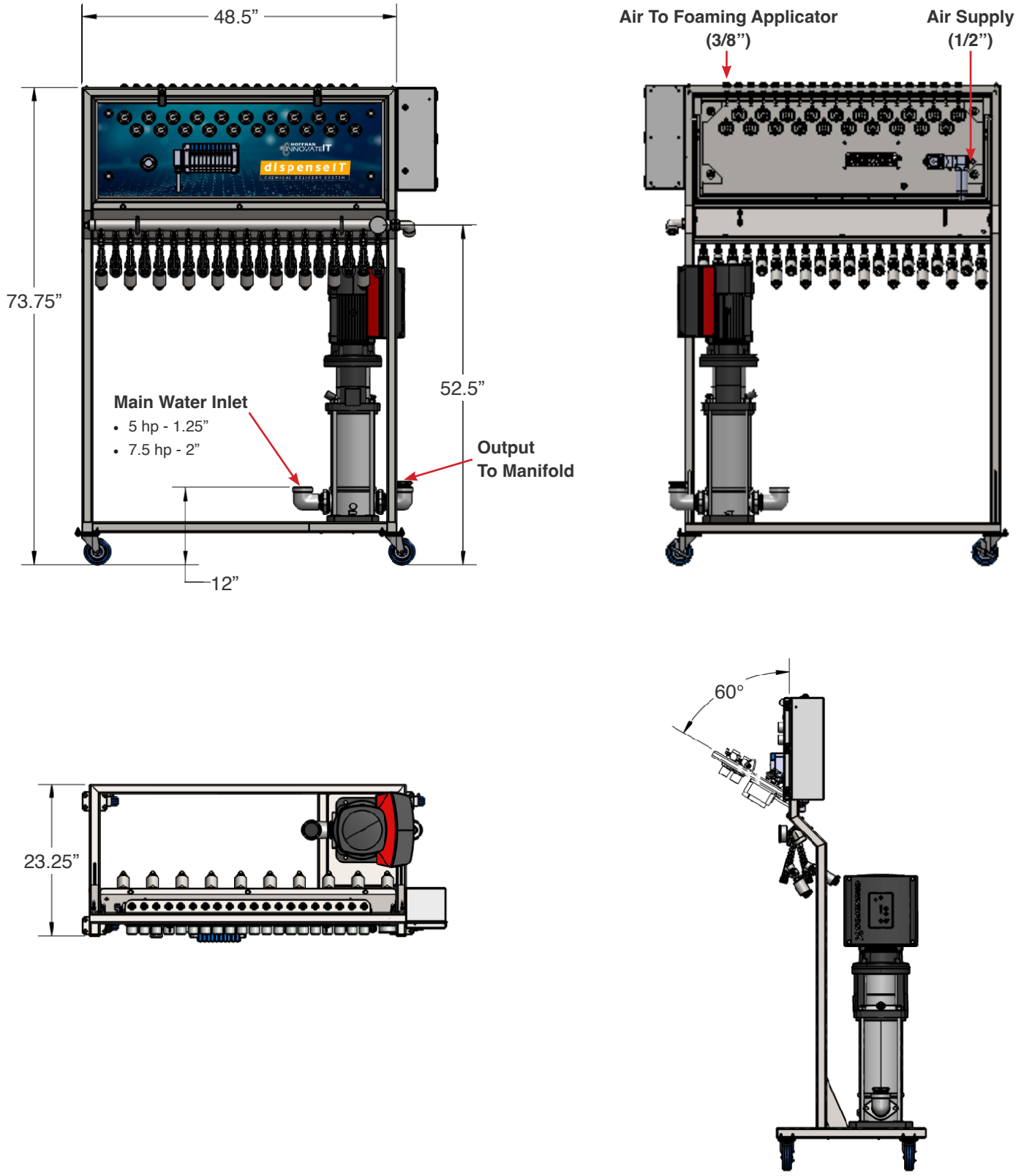


Fig. 3.2 - 1 - *20 Function Floor Mount dispenseIT*

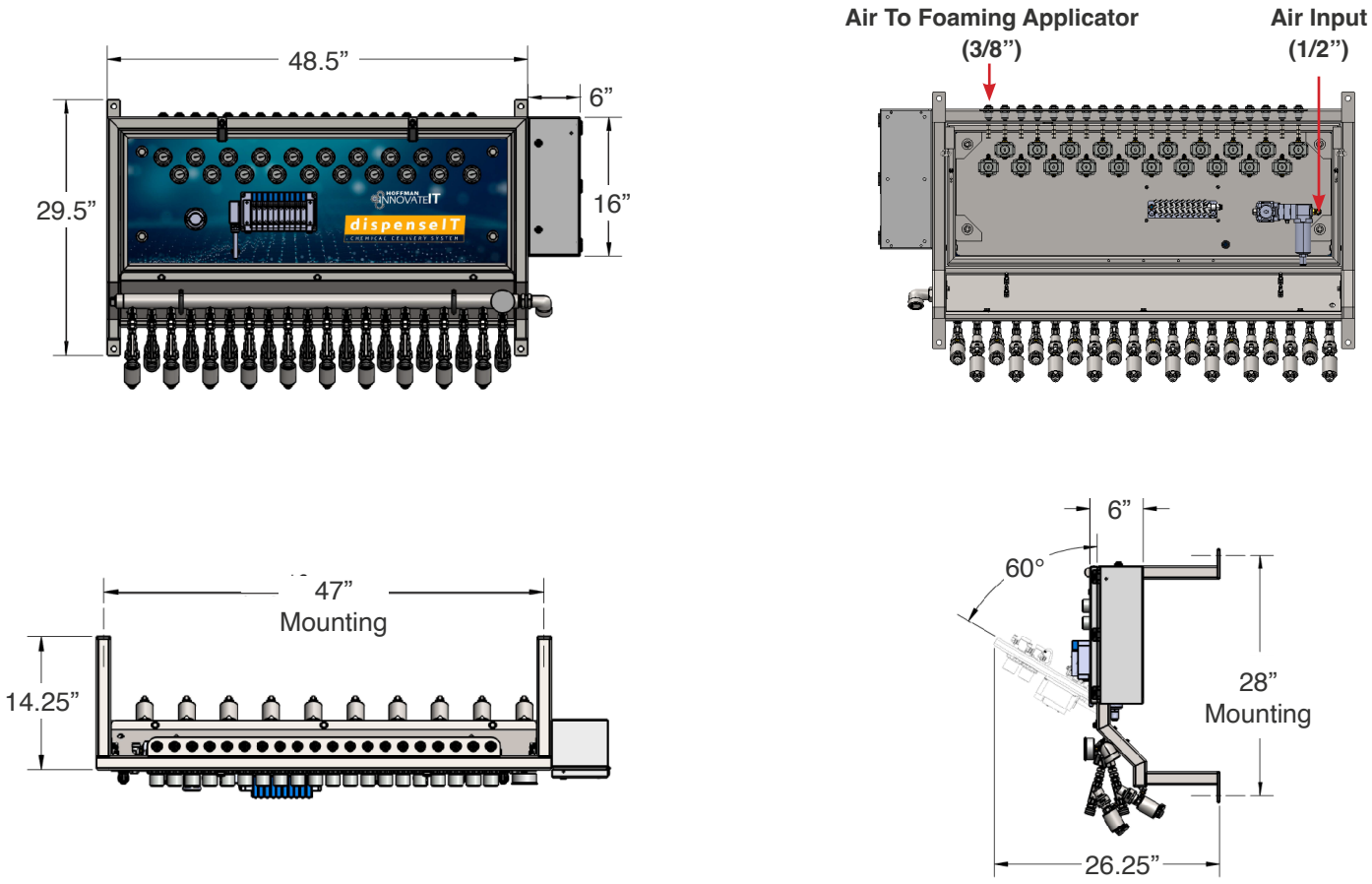


Fig. 3.2 - 2 - *20 Function Wall Mount dispenseIT*

3.2.1 Installing Water Lines

NOTE

If installing the optional innovateIT-supplied particle filter, install it inline on the Main Water Inlet side of the pump.

1. Install the water feed line to the location of the dispenseIT (2” for 7.5 HP pump, 1.25” for 5 HP pump).
   - **Existing Buildings** - Flush the new water line for a minimum of 5 minutes to ensure that any debris in the water line is completely flushed out.
   - **New Buildings** - Flush the water line for a minimum of 15 minutes to ensure that any debris in the water line is completely flushed out.

⚠ WARNING!

Failure to flush water lines prior to connecting to and operating the pump
could lead to catastrophic failure of the Grundfos pump

2. Install water feed line to the inlet side of the pump using appropriately sized fittings based on pump size (Fig. 3.2.1 - 1, following page).
3. Install hose from the pump discharge to the dispenseIT manifold using the following steps.
   i. Connect supplied fittings (shipped with injectors) to the manifold side of the hose.
      - **Standard:** Assembly order is: nipple, 1” elbow, hose barb.
      - **Split Manifold:** Assembly order is: nipple, 1” street elbow, check valve, hose barb.

- **Hose Length:**
  - **Wall Mount:** Shipped with 6’ hose. Hose may be shortened if =desired.
  - **Floor Mount:** Hose is factory-installed and shipped cut to correct length.

ii. Thread other hose end into pump discharge.

iii. Connect nipple to swivel fitting on the manifold.

iv. Tighten hose clamps appropriately.

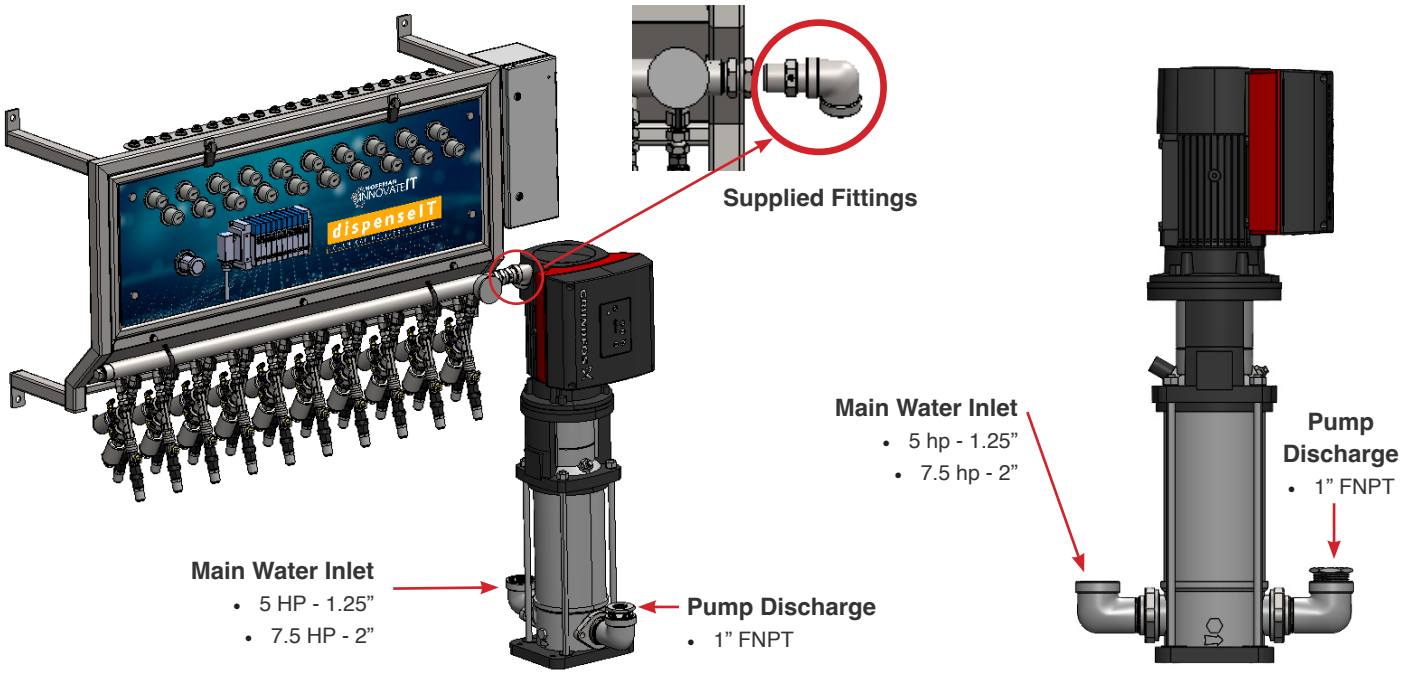


Fig. 3.2.1 - 1 - *Water lines connections*

3.2.2 Installing Main Air Line

1. Install main airline feed to inlet side of the Main Air Regulator (Fig. 3.3.2 - 1).

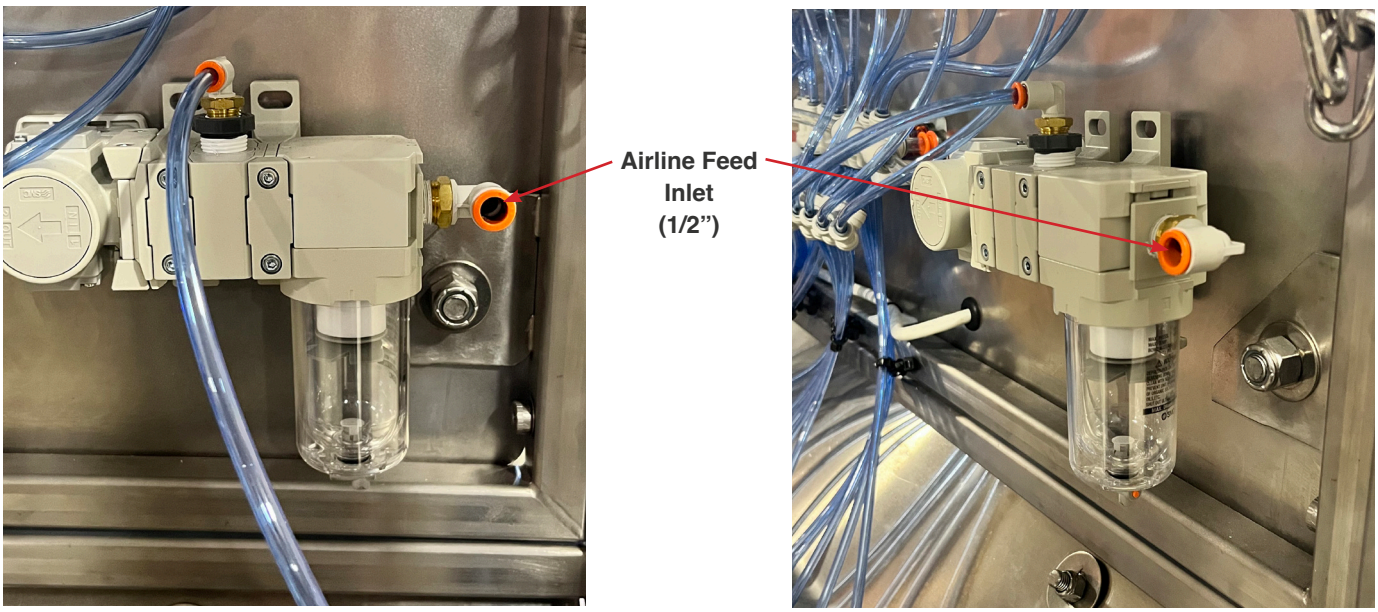


Fig. 3.2.2 - 1 - *Airline feed to Main Air Regulator*

3.2.3 Installing Injectors

All injectors are shipped with the unit. Installation of injectors is done with provided quick connectors.

1. Install metering tips into the barb of the injector. Consult your chemical solutions provider for dilution rates or refer to Appendix 3.
2. Install a ¼" chemical compatible hose from the chemical barrels to the injector barb.
3. Install chemical compatible foot valves for each function on the draw side of the hose (the part of the hose that rests inside of the product barrel).
    - It is recommended to use a 3' piece of PVC pipe for the line to run through to keep the suction straight down in your chemical barrel.

3.2.4 Installing Liquid and Air Connections for Functions

NOTE
High Flow injectors (above 5 gpm) require ¾" process line.

1. Connect 1/2" poly tube (Standard Flow injector) or 3/4" Boston hose (High Flow injector) liquid lines to the appropriate injector port as specified in your customer configuration form (Fig. 3.2.4 - 1).

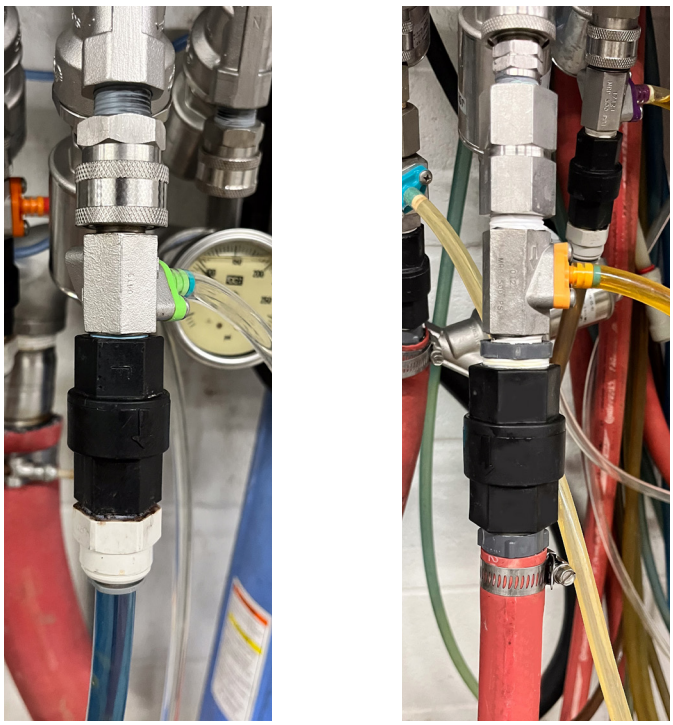


Fig. 3.2.4 - 1 - *Liquid connection to Standard Flow (left) and High Flow (right) injector port*

2. Connect 3/8" poly tube air lines to the appropriate foam port on top of the system that aligns to the corresponding process valve. Functions are identified 1-10, 1-15, or 1-20 from left to right.
3. Turn on water and line supplies and check for leaks.

3.2.5 Installing Airgun Kit (Optional)

1. Turn off the main air supply to the unit.
2. Manually actuate any control valve to relieve air pressure in the system.
3. Remove the 1/4” plug from the underside of the Main Air Regulator assembly (Fig. 3.2.5. - 1).

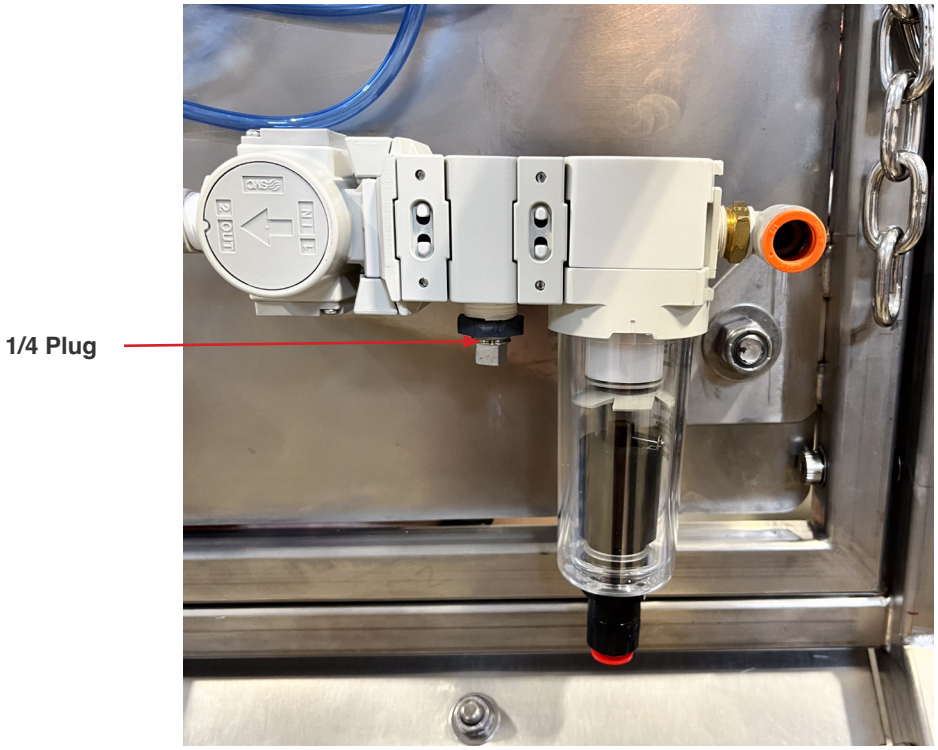


Fig. 3.2.5 - 1 - *1/4” plug on Main Air Regulator*

4. Install 1/4” push connect elbow into the port.
5. Install bulkhead fitting into the lower left hole on the bottom panel with threaded fitting pointing towards the front of the unit (Fig. 3.2.5 - 2, following page).
6. Use supplied hardware to bolt the bracket to the underside left of the frame
7. Install the air hose into the bulkhead fitting.
8. Install the airgun attachment to the hose.
9. Connect poly tube from the elbow to the back side of the bulkhead fitting.
10. Turn on the main air supply to the unit.

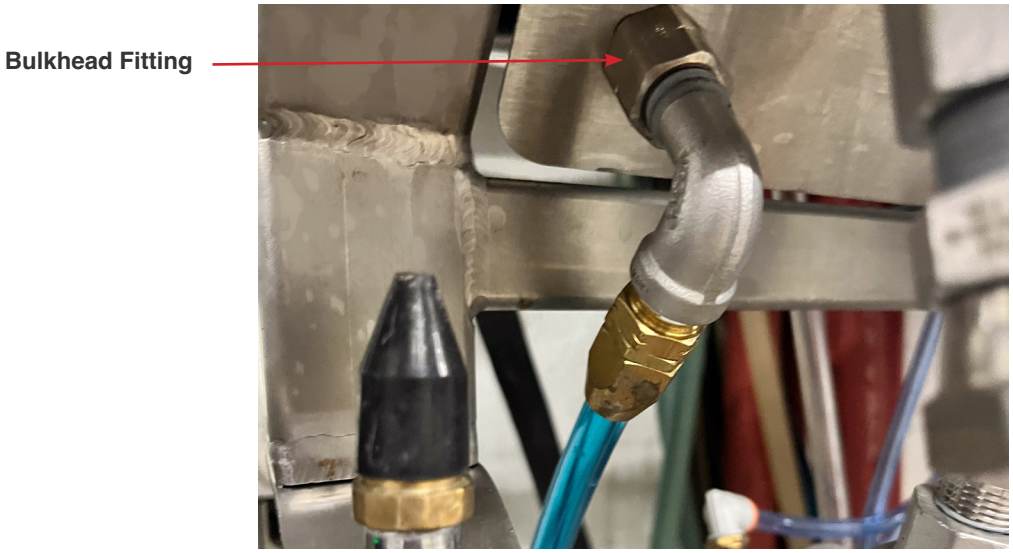


Fig. 3.2.5 - 2 - *Bulkhead fitting for Airgun kit*

3.3 Electrical Installation

⚠ WARNING!

Electrical installation to be performed by a qualified electrician. Follow all local codes.
3PH breaker power to be supplied by customer.

The electrical schematics and connection points in the controller are designated in **Appendix 4**.

1. Confirm system voltage prior to starting electrical installation.
2. Install the pump's electrical connections.
3. Use the bottom hole of the pump's electrical box for the 3PH incoming power. Wire conductors to the L1, L2, and L3 conductors (Fig. 3.3 - 1, following page).
4. Connect the grounding conductor to the ground lug (Fig. 3.3 - 2, following page).
5. Connect the 3PH power to the pump's terminal strip (terminal wiring plug can pull out for wiring ease). Inspect to ensure the terminal plug is fully seated.
6. Make electrical connections as listed in tables 3.3 - 1 to 3.3 - 3 and as shown in Fig. 3.3 - 5.

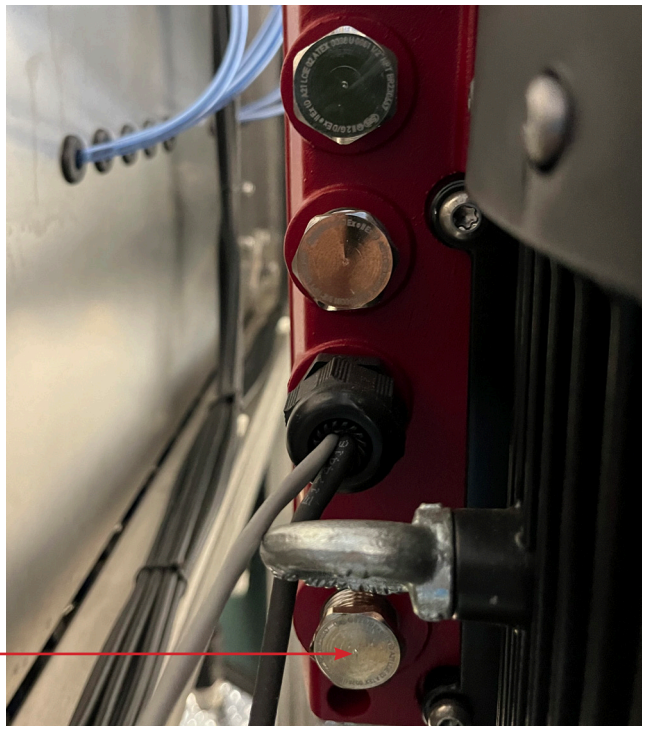


Fig. 3.3 - 1 - *Pump 3 PH incoming power connection*

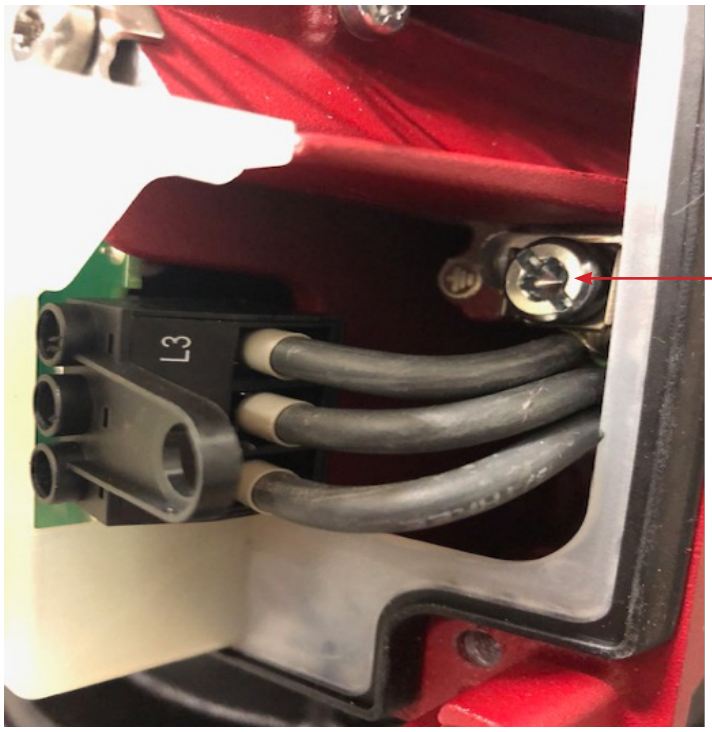


Fig. 3.3 - 2 - *Pump grounding conductor and ground lug*

NOTE

Voltage from the tunnel controller relay matches that of the coils on the dispenseIT (110VAC, 24VAC, or 24VDC).

Table 3.3 - 1 - *Pump run signal* ***(Wall Mount units only)***

Enclosure Terminal	Connection
PTS1	Terminal 2 (DI1) on Grundfos Pump
PTS2	Terminal 6 (GND) on Grundfos Pump

Table 3.3 - 2 - *Tunnel controller connections for functions*

Enclosure Terminal	Connection
CR 1-20 - Terminal A1	Function 1-20 incoming signal
TS 1-1 - Terminal 2	Function common neutral

Table 3.3 - 3 - *Customer supplied 120VAC connections*

Enclosure Terminal	Connection
TS 1-2 - Terminal 2	120VAC constant power
TS 1-3 - Terminal 2	120VAC neutral
TS 1-4 - Terminal 2	Ground terminal

Table 3.3 - 4 - *Pump control wiring*

NOTE

The Pump Run cable is pre-wired on Floor Mount units. Connections for Wall Mount units are shown in Fig. 3.3 - 4.

NOTE

In dual-pump Split Manifold units, Pump 1 (P1) refers to the left pump when facing the front of the unit, and Pump 2 (P2) refers to the right pump. In single-pump units, P1 is the designated terminal for the pump connection.

Install pump run whip through pre-installed cable gland (Fig 3.3 - 3).

Enclosure Terminal	Connection
P 1 - Terminal 2	Red wire from pre-wired pump whip
P 1 - Terminal 4	Black wire from pre-wired pump whip
P 2 - Terminal 2*	Red wire from pre-wired pump whip
P 2 - Terminal 4*	Black wire from pre-wired pump whip

**Split manifold units only*

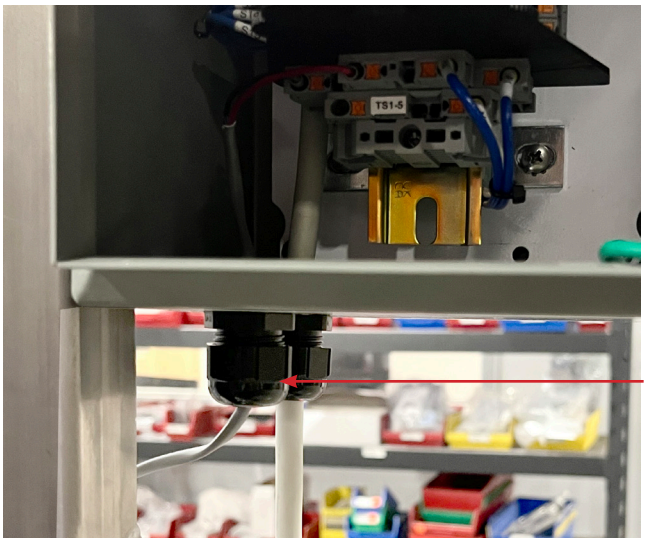


Fig. 3.3 - 3 - *Pump Run cable gland*

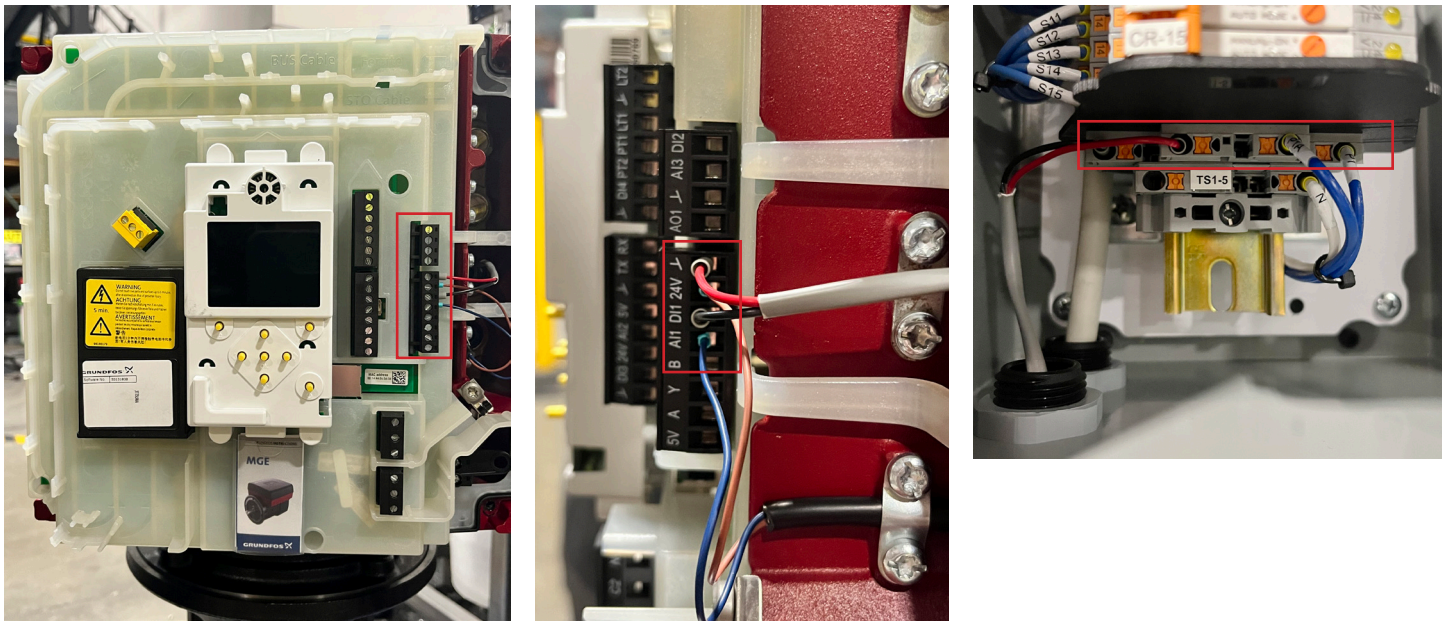


Fig. 3.3 - 4 - *Pump Run signal wiring (Single pump model shown)*

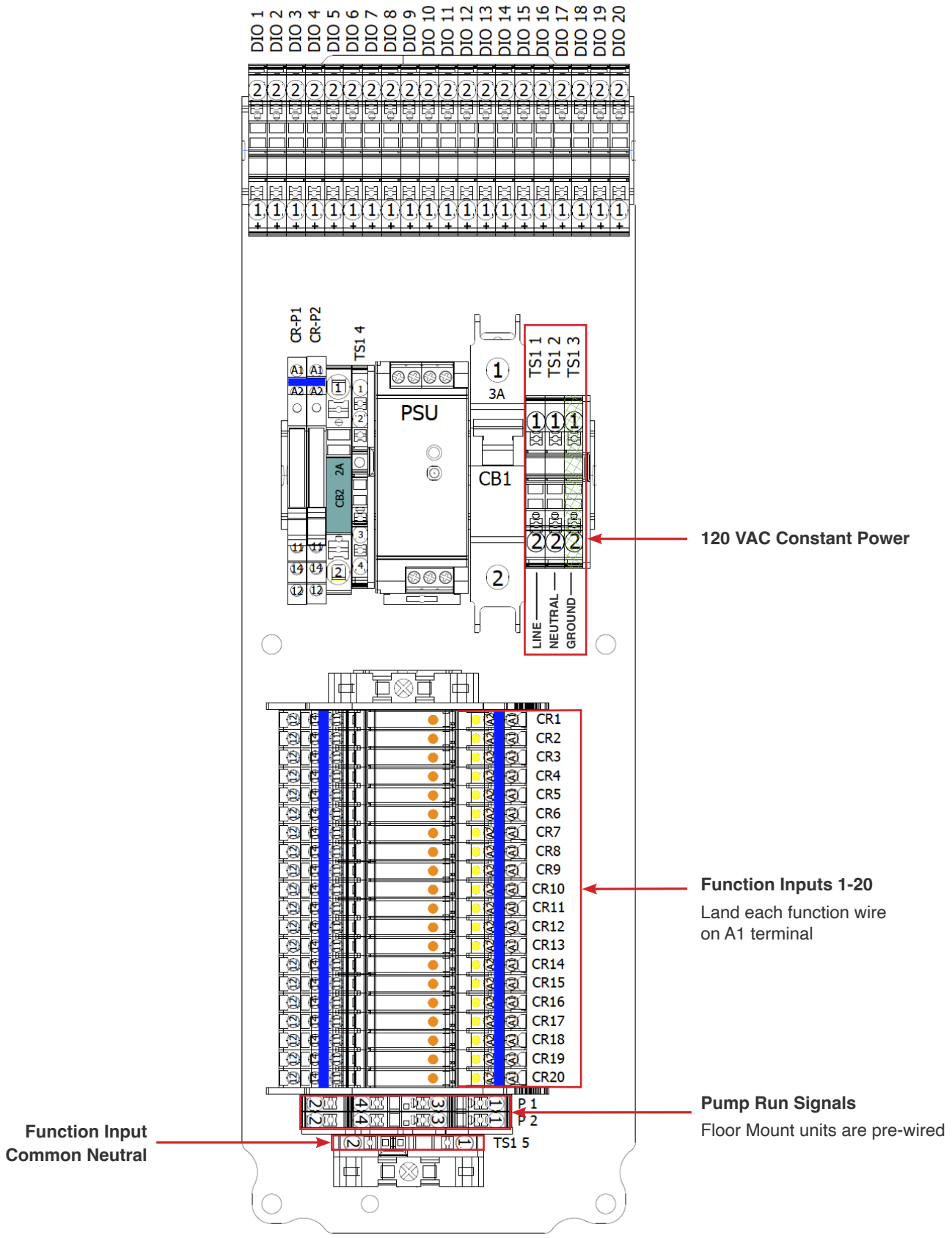


Fig. 3.3 - 5 - *Electrical connection points*

4. Startup & Operation

⚠ WARNING!

Check and verify the tightness of all power distribution lines (screw terminals) before the startup process.

NOTE

Ensure all steps and precautions in Section 3 have been completed before starting up the dispenseIT.

4.1 Priming The Pump

1. Turn on utility power from the wash to the dispenseIT system.
2. Close the pump isolating valve(s) and open the priming plug located on the on the pump head on the front side of the pump (Fig. 4.1 - 1).
3. Gradually open the isolating valve in the suction line until a steady stream of airless water runs out of the priming hole.
4. Close the plug and tighten securely.
5. Completely open the isolating valves.

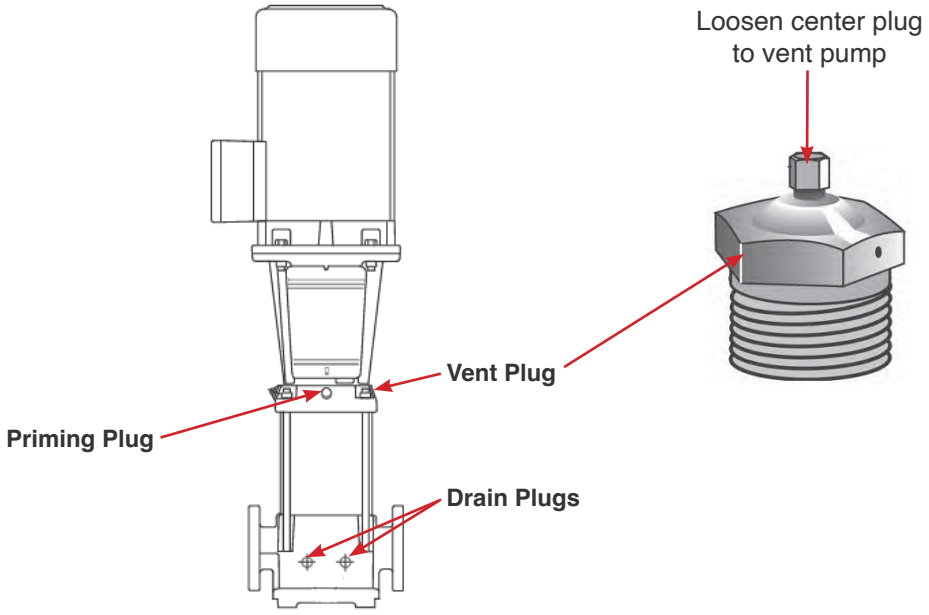


Fig. 4.1 - 1 - *Position of pump plugs*

4.1.1 Split Manifold Capability (Optional)

NOTE

If your system includes a split manifold, you must perform the steps listed in Section 4.1 - Priming the Pump and all subsequent pump steps for each individual pump. Ensure each side of the system is properly primed and ready before continuing setup.

If your dispenseIT system is equipped with the optional split manifold, you gain the flexibility to operate multiple water configurations simultaneously. This setup allows you to:

- Run different water pressures
- Utilize varied water temperatures
- Draw from multiple water sources

The split manifold also adds system redundancy, helping keep your wash operational even if one side requires maintenance or troubleshooting.

The operating mode of the Split Manifold dispenseIT depends on two key settings:

- Ball valve position
- Selector switch position

These components are shown in Figure 4.1.1 - 1.

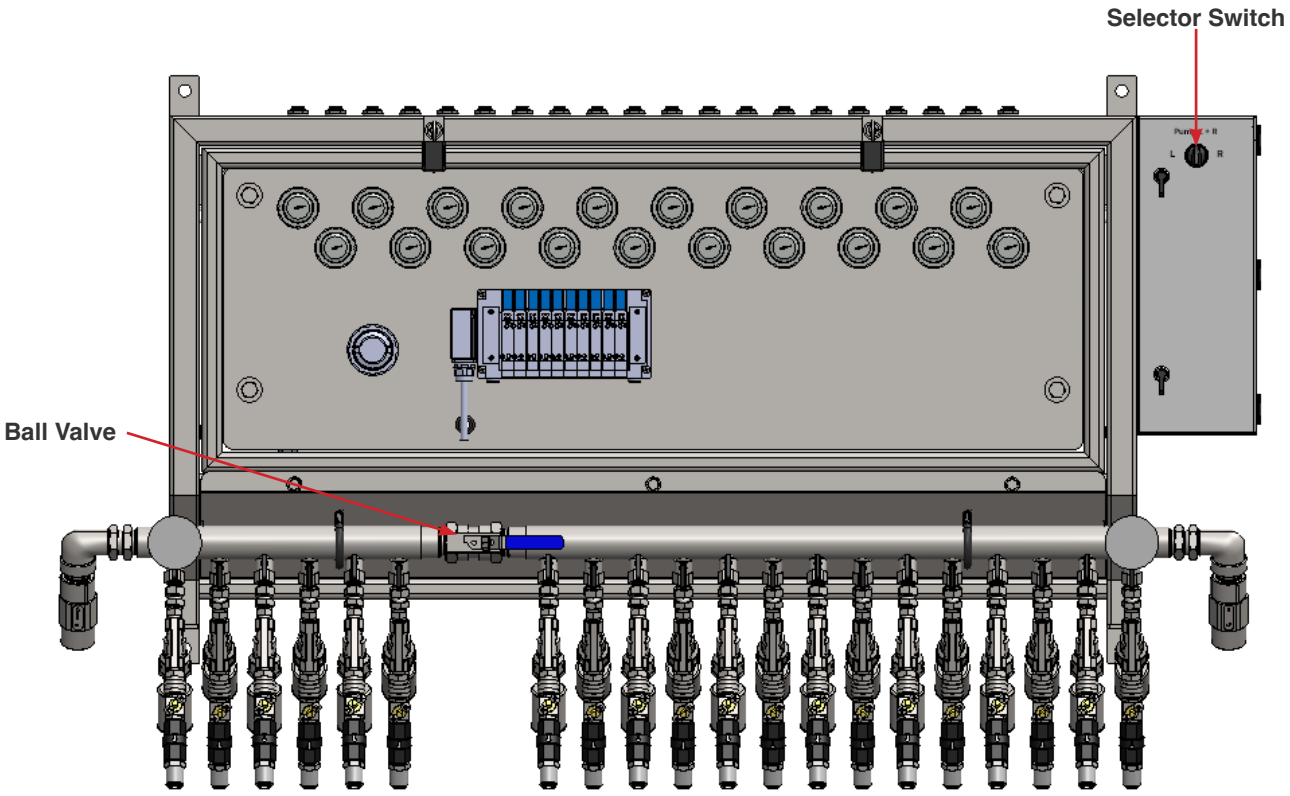


Fig. 4.1.1 - 1 - *Split manifold layout*

Refer to Table 4.1.1 - 1 to determine the correct mode of operation based on your current valve and switch settings. This chart outlines how different combinations of valve and switch positions affect system behavior—whether operating one pump or both.

Table 4.1.1 - 1 - *Split Manifold operating modes*

Ball Valve Position	Selector Switch Position	Mode	Summary
Closed (handle perpendicular)	Pump L+R	Split (dual pump)	Functions are divided between pumps as follows: • 10 Function: Left 5 / Right 5 • 15 Function: Left 5, Right 10 • 20 Function: Left 6, Right 14
Open (handle parallel)	L	Single Pump (Left)	Left pump operates all functions
Open (handle parallel)	R	Single Pump (Right)	Right pump operates all functions

4.2 Starting The Pump

1. Verify that the electrical connections are in accordance with the wiring diagram on the motor.
2. Turn on utility power from the wash to the dispenseIT system.
3. Switch on the power and observe the direction of rotation.
4. When viewed from above, the pump should rotate counterclockwise.
5. To reverse the direction of rotation, first switch off the power supply. Interchange any two phases of the power supply.
6. Switch on the power again and check for proper direction of rotation. Once direction of rotation has been verified, switch off the power again.

4.3 Pump Settings

The Grundfos Pump arrives pre-programmed. For additional pump settings and pump programming instructions, refer to Appendix 3 - Pump Programming.

4.4 Verifying System Pressure

1. Verify that the system pressure on the dispenseIT pressure gauge and on the pump's display screen match (min 100 psi - max 200 psi) (Fig. 4.4 - 1, following page). To adjust system pressure, refer to Appendix 3.
2. Check the system for leaks.
3. While the pump is running, prime the pump a final time.

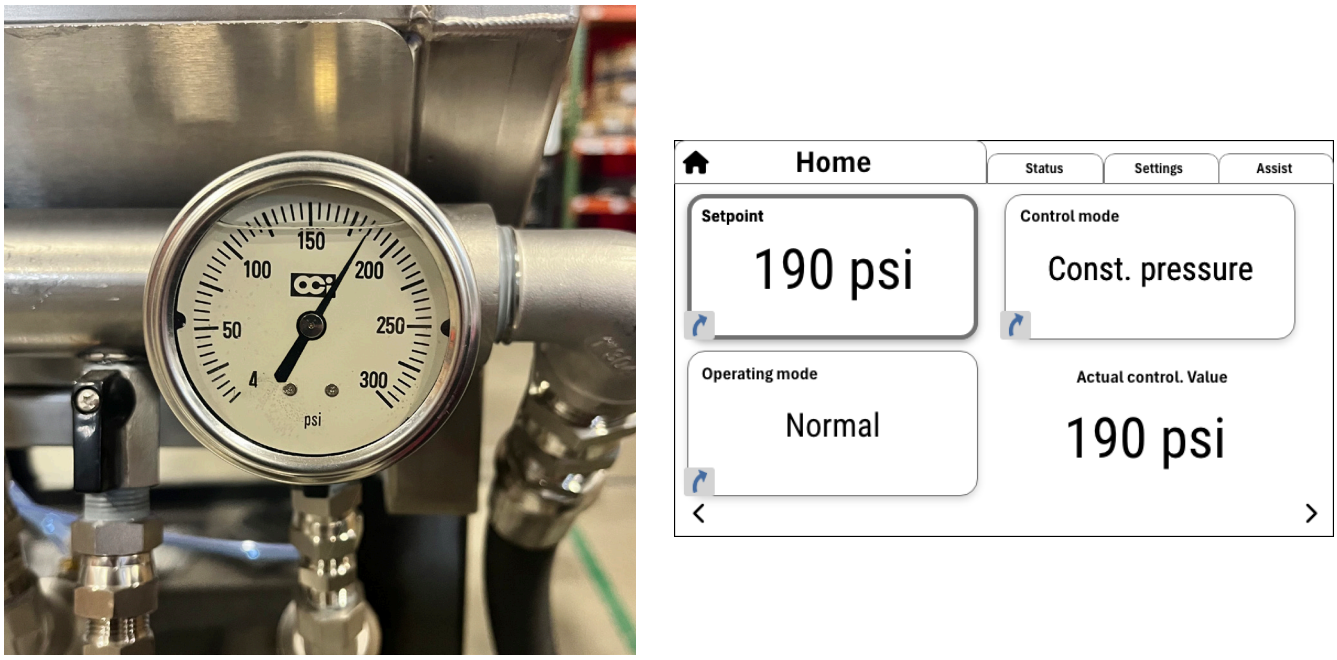


Fig. 4.4 - 1 - *dispenseIT pressure gauge and pump home screen display*

4.5 Verifying System Functions

1. Open the electrical enclosure and locate the orange rotary dial on CR 1-20 (Fig. 4.5 - 1).

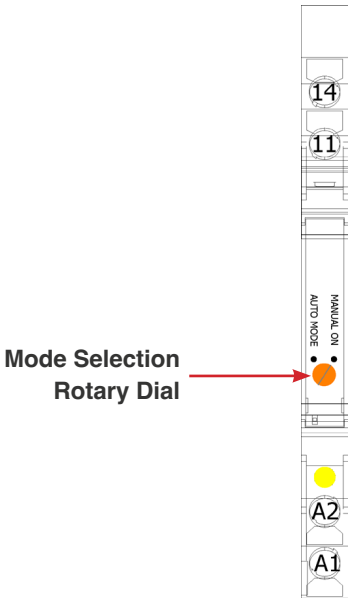


Fig. 4.5 - 1 - *Rotary dial for manual testing of functions*

2. Turn the CR1 rotary dial to **'Manual On'**.
3. Confirm that the corresponding solenoid indicator light illuminates on the Air Control Manifold.
4. Both the liquid and air solenoid should open.
5. Check for leaks at the poly tube connections.
6. The function will remain on as long as it is set to **'Manual On'**.
7. Once you've confirmed the function is operational, return the rotary dial to **'Auto Mode'**.
8. Repeat the process with all remaining functions.

9. If the corresponding solenoid indicator light doesn't illuminate, refer to the Valves/Solenoids section within Section 6 -Troubleshooting for further guidance.

4.5.1 Setting Foaming Functions

To effectively set up and adjust the foaming functions on the dispenseIT, use the air regulator knob to control the foam density and texture (Fig. 4.5.1 - 1).

- **Increase Foam Thickness:**
  - If a thicker or denser foam is desired, increase the air supply to the mixture.
  - To do this, pull the air regulator knob and turn clockwise. This adjustment allows more air into the system, increasing foam density.
- **Decrease Foam Thickness:**
  - For a thinner or less dense foam, reduce the air supply.
  - Pull the air regulator knob and turn counter-clockwise. This reduces air in the mixture, resulting in a lighter application.

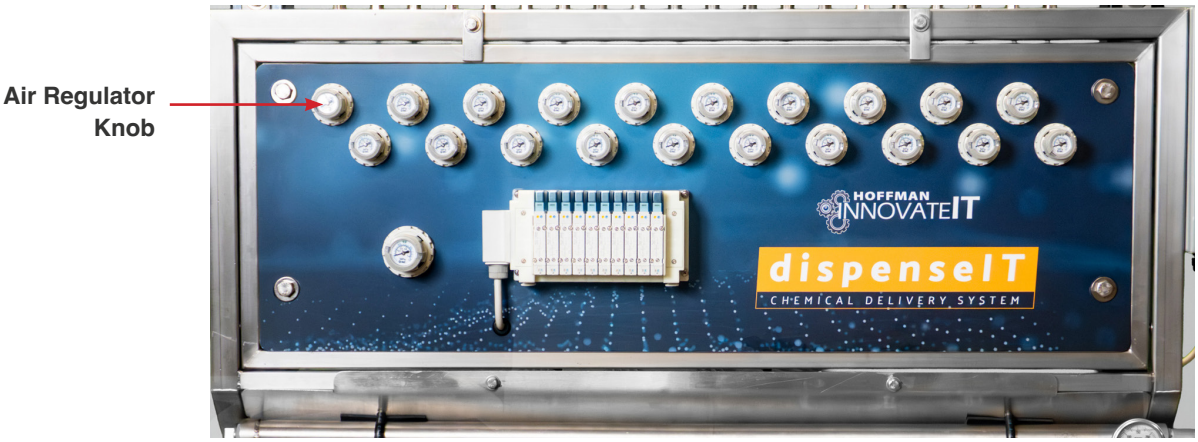


Fig. 4.5.1 - 1 - *Air regulator knob*

5. Service & Maintenance

The best method to maintain the dispenseIT is to take a few minutes daily to examine the unit for leaks or any indication of a mechanical or electrical fault.

If a change in performance or operation is observed, it is essential to take corrective action quickly to minimize the potential damage to the system.

There are elements of the system that will require normal maintenance actions. These items are listed in the following section.

5.1 Service Schedule

Table 5.1 - 1 - *Service schedule*

Check	Frequency	Process
Visual Inspection	Daily	• Inspect entire system for leaks, loose connections, or visible damage.
Chemical Draw Lines	Daily	• Ensure chemical draw lines are clear and unobstructed. Replace if damaged or clogged.
Injectors	Weekly	• Check injectors for any chemical buildup or blockages. • Air and water are preferred cleaning method. Take care with any mechanical cleaning to ensure that orifice sizes of metering tips are not altered.
Compressed Air Lines	Weekly	• Ensure compressed air lines are free of leaks and delivering consistent air pressure. • Confirm no moisture is present in air lines or main regulator moisture trap.
Process Air Valves	Monthly	• Test process air valves to ensure proper activation and closing during chemical delivery.
Manifold Assembly	Monthly	• Inspect the manifold for any blockages or signs of wear; ensure proper flow.

6. Troubleshooting

For product support, contact support@innovateITcarwash.com, or call (518) 741-4200 (option 2).

Symptom	Potential Causes	Solution
Pump		
Pump Will Not Run	• No 3PH power to pump.	• Verify pump has constant voltage. Check any breakers, disconnect switches, and/or fuses installed in the electrical system.
	• Incorrect 3PH voltage supplied to pump.	• Verify that the supplied 3PH voltage matches the pump.
	• Pump not in 'run'.	• Press the power button on the pump screen.
	• Relay in dispenseIT electrical enclosure is not energized.	• Verify the relay for the function is energized when the tunnel controller is on. The relay LED indicator light should be on.
	• No 120VAC power to control panel.	• Test and verify that there is voltage at the 120 VAC customer connection terminals. • Verify that CB1 is in the On position.
	• No 24DC control power.	• Verify that CB2 is not tripped and displaying red light. • If red light, push in CB2 to reset.
Pump Leaks Water	• Not enough thread tape/pipe sealant.	• Install new thread tape/pipe sealant.
	• Loose pipe thread fittings or flange bolts.	• Tighten the fittings and the flange bolts.
	• Bad flange gasket.	• Replace the old gaskets.
	• Failed pump seals.	• Replace/repair pump seals.

Symptom	Potential Causes	Solution
Pump		
Low Water Pressure On System	• Pump is not running.	• Verify items listed in 'Pump Will Not Run' section.
	• Pump setpoint is too low.	• Raise the pump setpoint to the desired pressure.
	• Insufficient water supply to pump.	• Check water supply to pump.
	• Pump is not primed.	• Follow instructions in Section 4.1 to properly prime the pump.
	• Motor rotation is incorrect.	• Follow the instructions in Section 4.1 to verify motor rotation.
	• Defective gauge on system.	• Compare the dispenseIT system gauge reading to the pressure on the pump screen. Replace the gauge if necessary.
	• Defective pump.	• Replace pump.
	• Defective transducer on pump.	• Consult Grundfos factory technical support.
Injector		
Injector Not Drawing Chemical	• Clogged chemical feed line from chemical barrel.	• Check the hose, foot valve, metering tips, and injector barb for clogs.
	• Too much back pressure on the injector.	• Check for clogged lines or clogged nozzles on applicator arch. • Verify injector sizing and install a smaller injector if necessary.
	• Clogged injector.	• Rinse the injector with hot water. • Blow compressed air through the injector chemical hose barb and the injector nozzle. • Remove the injector nozzle, clean, and reassemble.
Injector Draws Chemical For A Brief Moment	• Injector is too large.	• Install a smaller injector. • Install larger or more spray nozzles on the applicator.
	• Too much back pressure on injector.	• Check for clogged lines or nozzles on applicator arch. • Install a smaller injector.

Symptom	Potential Causes	Solution
Injector		
Injector Has A Low But Consistent Vacuum Chemical Draw	• Injector is too small.	• Install a larger injector. • Install smaller spray nozzles on the applicator. • Remove spray nozzles from the applicator.
No Water Flow Through Injectors	• Manifold solenoid isolation ball valve is closed.	• Open the ball valve and verify water flow through the solenoid to the injector.
	• Debris in solenoid.	• Isolate the solenoid. • Disassemble the solenoid and check for debris. • Clean as necessary. • Reassemble the solenoid.
	• Fault solenoid.	• Install repair kit in solenoid or replace solenoid.
Valves/Solenoids		
Water Constantly Flowing Through Applicator Lines	• Process valve is not fully closing	• If connected to a non-foaming applicator, bleed air (2-5 psi) through the regulator.
	• Check valve with excessive spring force is holding air in the line	• Reduce closing force on the check valve that allows the process valve to fully close. • If on a foaming applicator - move check valve upstream of the foam generator. • Remove the check valve.
Nonstop Water Flow To Applicator	• Function is energized.	• Check tunnel controller for overrides and stuck relays.
	• Debris in solenoid.	• Isolate the function's solenoid using the ball valve. • Disassemble the solenoid and check the valve for debris or worn parts.
	• Fault solenoid.	• Install repair kit in solenoid or replace solenoid.

Symptom	Potential Causes	Solution
Valves/Solenoids		
Valve Won't Actuate (Open)	• No 120VAC power to control panel.	• Test and verify that there is voltage at the 120 VAC customer connection terminals. • Verify that CB1 is in the On position.
	• No 24DC control power.	• Verify that CB2 is not tripped and displaying red light. • If red light, push in CB2 to reset.
	• No tunnel controller signal	• Verify tunnel controller signal is present at the function relay - CR 1-20. • If no signal is present, consult with your tunnel controller provider.

6.1 Manually Testing Functions

The dispenseIT includes a manual solenoid testing feature that enables the user to verify proper valve operation and air supply independently of automated controls. This function is useful during system setup, maintenance, and troubleshooting. **The pump does not activate during manual testing.**

1. Ensure air is supplied to system through Main Air Regulator (set to 80-90 psi).
2. Press in the blue or yellow button on the front of each solenoid card on the Air Control Manifold (Fig. 4.4.2 - 1).

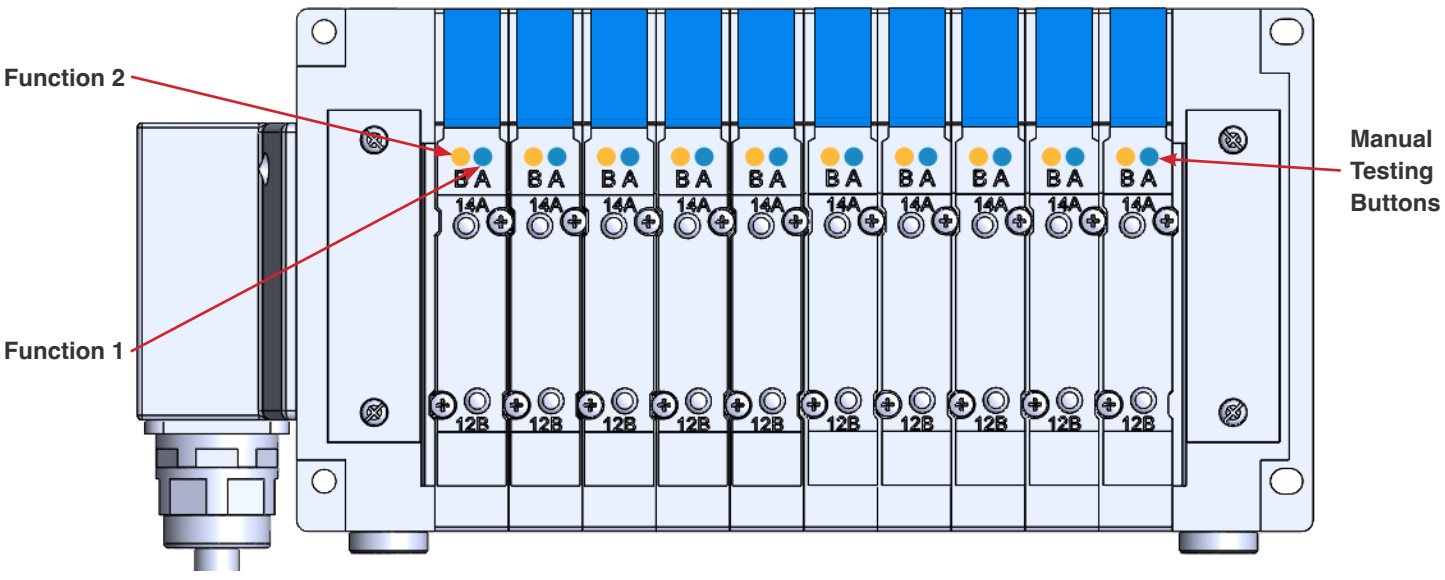


Fig. 4.4.2 - 1 - *Air Control Manifold solenoid testing buttons*

3. Each solenoid position has two functions, labeled A and B. The functions alternate in pairs as you move down the manifold. This pattern continues in sequence for all valve modules (e.g.,):
    - A = Function #1, B = Function #2
    - A = Function #3, B = Function #4
    - A = Function #5, B = Function #6
4. Confirm that the corresponding process valve activates. The blue indicator should push into the clear cap, signaling the valve is open.
5. Repeat the process for all solenoids to ensure each valve fires correctly.
6. If any valves do not open, refer to the Valves/Solenoids section within Section 6 -Troubleshooting for further guidance.

7. Recommended Spare Parts

Below is a list of recommended spare parts to keep in stock, as they may require replacement during normal system operation. For parts ordering, please contact partsales@innovateITcarwash.com.

For a complete reference of all system components, see Appendix 1 - System Identification, which includes a detailed parts diagram.

innovateIT Product Number	Description
7406156	Foaming Regulator
7303664	Process Air Valve
DS-CV0074	Standard Flow Injector Check Valve
DS-CV0072	High Flow Injector Check Valve
7903683	Standard Metering Tips
7306634	Air Control Manifold Solenoid Card
7406153	Main Air Regulator
6106214	24 VAC/DC Electrical Relay
6106194	120 VAC Electrical Relay

7.1 Replacing Foaming Regulator

The following tools are needed to complete this task:

- 9/16” Wrench

1. Turn off electrical supply to the unit.
2. Turn off the main air supply to the unit.
3. Open the regulator fully to vent all air out of the line.
4. Disconnect the two poly tube lines at the rear of the regulator (Fig. 7.1 - 1, following page).
    - Solenoid to regulator
    - Regulator to foaming output
5. Unthread the capture nut on the regulator (Fig. 7.1 - 2, following page).
6. Remove regulator.
7. Remove the elbows from the rear of the regulator
8. Reinstall elbows into the rear of the new regulator.
9. Install the new regulator on the panel with the new capture nut.
10. Reconnect the two poly lines listed in step 4.
11. Turn on the main air supply.
12. Turn on the electrical supply to the unit.

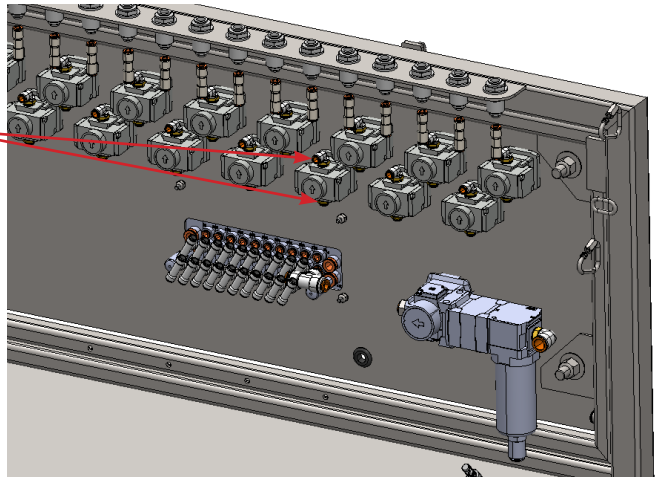


Fig. 7.1 - 1 - *Foaming regulator poly line connection points*

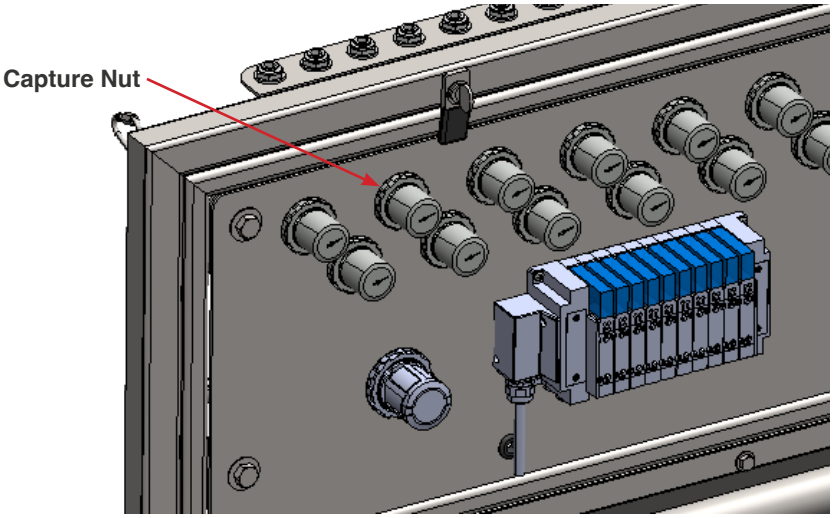


Fig. 7.1 - 2 - *Regulator capture nut location*

7.2 Replacing Process Air Valve

The following tools are needed to complete this task:

- 1 1/16” Wrench
- 15/16” Wrench
- 9/16” Wrench

1. Turn off the main air supply to the unit.
2. Close the ball valve on the selected function (Fig. 7.2 - 1, following page).
3. Disconnect the quick connect fitting.
4. Disconnect the air line to the valve.
5. Disconnect the valve at the swivel fitting.
6. Remove the hex nipple, quick connect, and the two air fittings from the head of the valve.
7. Replace the hex nipple, quick connect, and the two air fittings on the new valve.
8. Reinstall into the swivel fitting.
9. Reinstall the injector kit.
10. Reconnect the air line to the valve.
11. Open the ball valve on the selected function.
12. Turn on the main air supply.

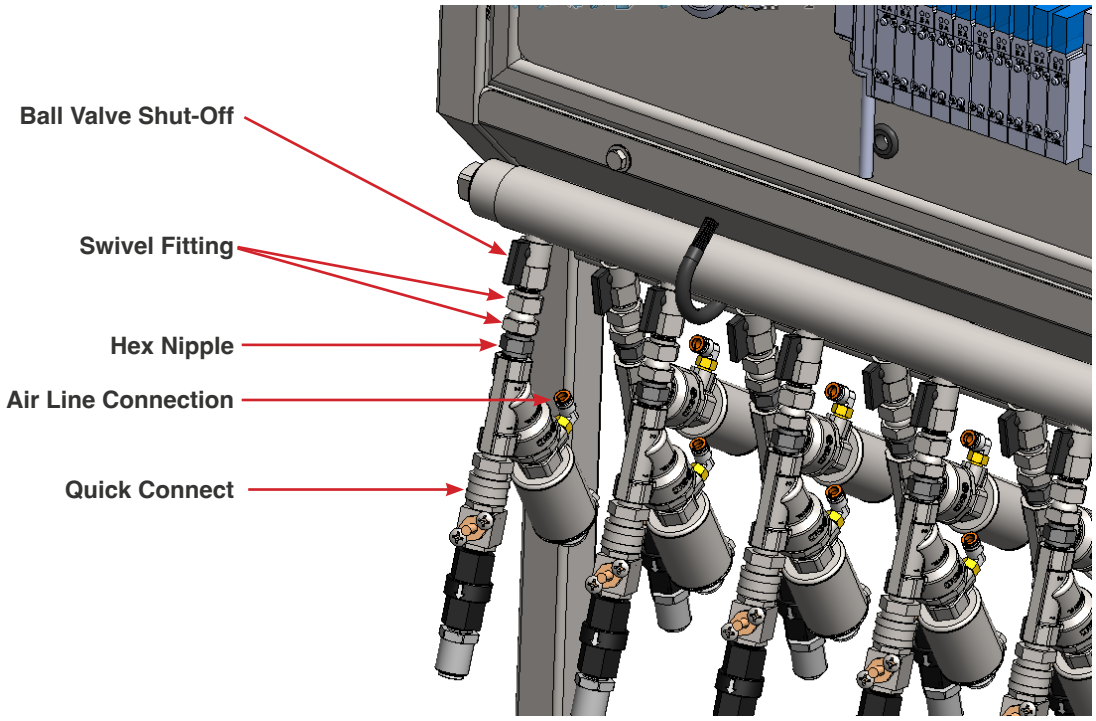


Fig. 7.2 - 1 - *Process air valve replacement*

7.3 Replacing Water Check Valve

The following tools are needed to complete this task:

- 2 Adjustable Wrenches

1. Close the ball valve to the function.
2. Disconnect output line from the poly tube fitting.
3. Remove quick connect from valve.
4. Unthread the check valve from the injector (Fig. 7.3 - 1, following page).
5. Confirm the orientation of the arrow on the check valve.
6. Replace poly tube fitting onto the new check valve.
7. Reinstall the push connect onto the injector.
8. Reconnect poly tube.
9. Open the ball valve.

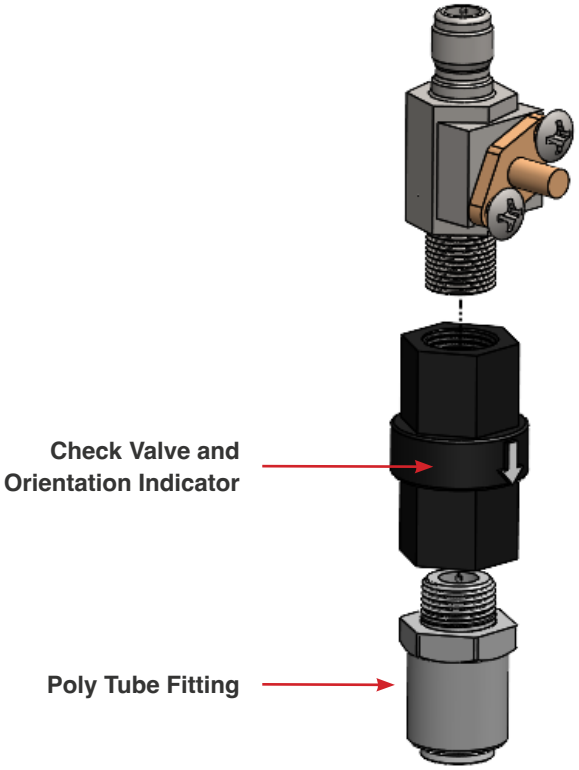


Fig. 7.3 - 1 - *Check valve replacement*

7.4 Replacing Metering Tip

1. Disconnect poly tube.
2. Unscrew metering tip (Fig. 7.4 - 1).
3. Install new tip.

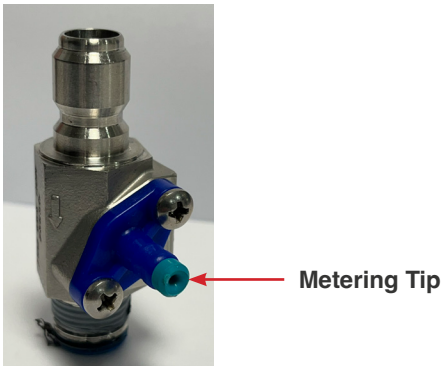


Fig. 7.4 - 1 - *Metering tip replacement*

7.5 Replacing Air Solenoid Card

1. Turn off the main air supply to the unit.
2. Remove the two screws from the desired card (Fig. 7.5 - 1, following page).
3. Carefully remove the card from the manifold.
4. Install the new card.
5. Tighten the two screws.

6. Turn on the main air supply.
7. Check for leaks.

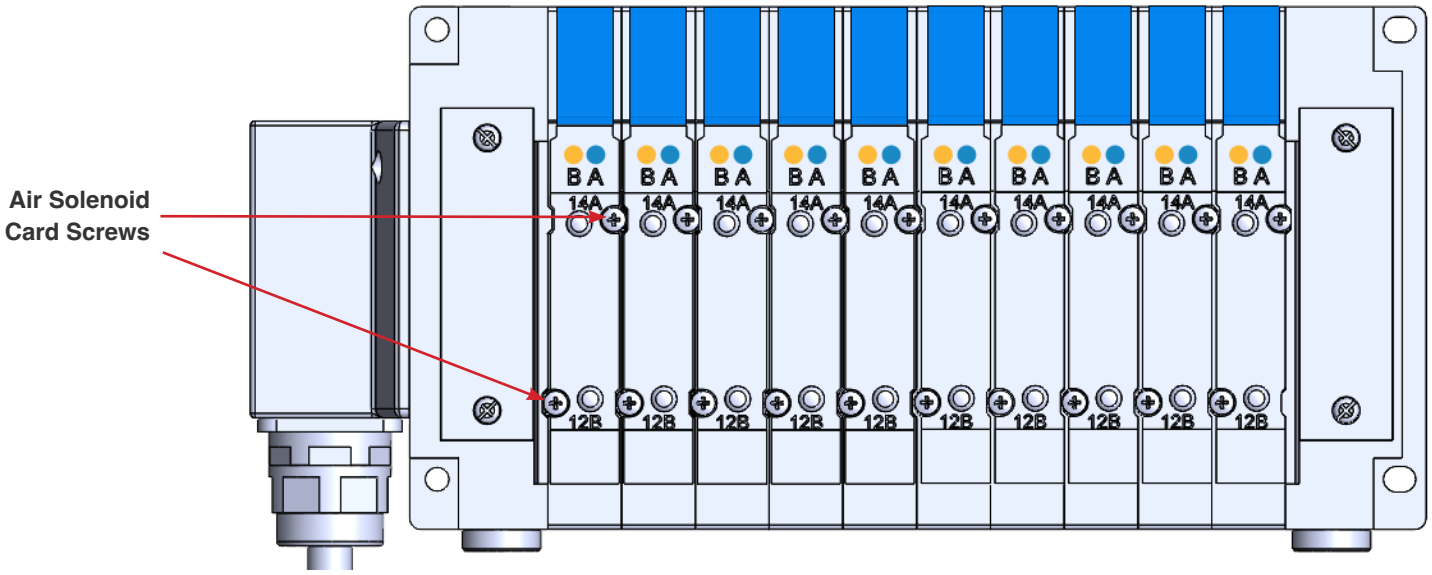


Fig. 7.5 - 1 - *Air solenoid card replacement*

7.6 Replacing Relay

1. Turn off electrical supply to the unit.
2. Slide orange retaining tab to the left (Fig. 7.6 - 1).
3. Remove existing relay module.
4. Insert replacement relay. Press firmly until orange tab locks the relay into the place.
5. Turn on the electrical supply to the unit and verify the relay is operational.

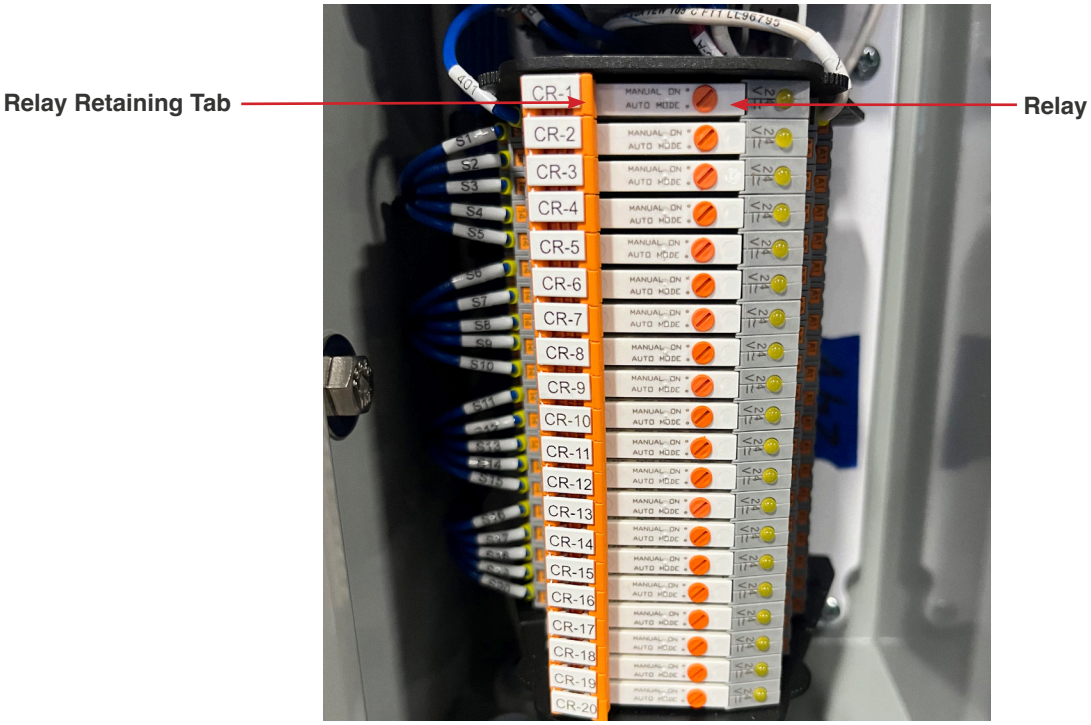
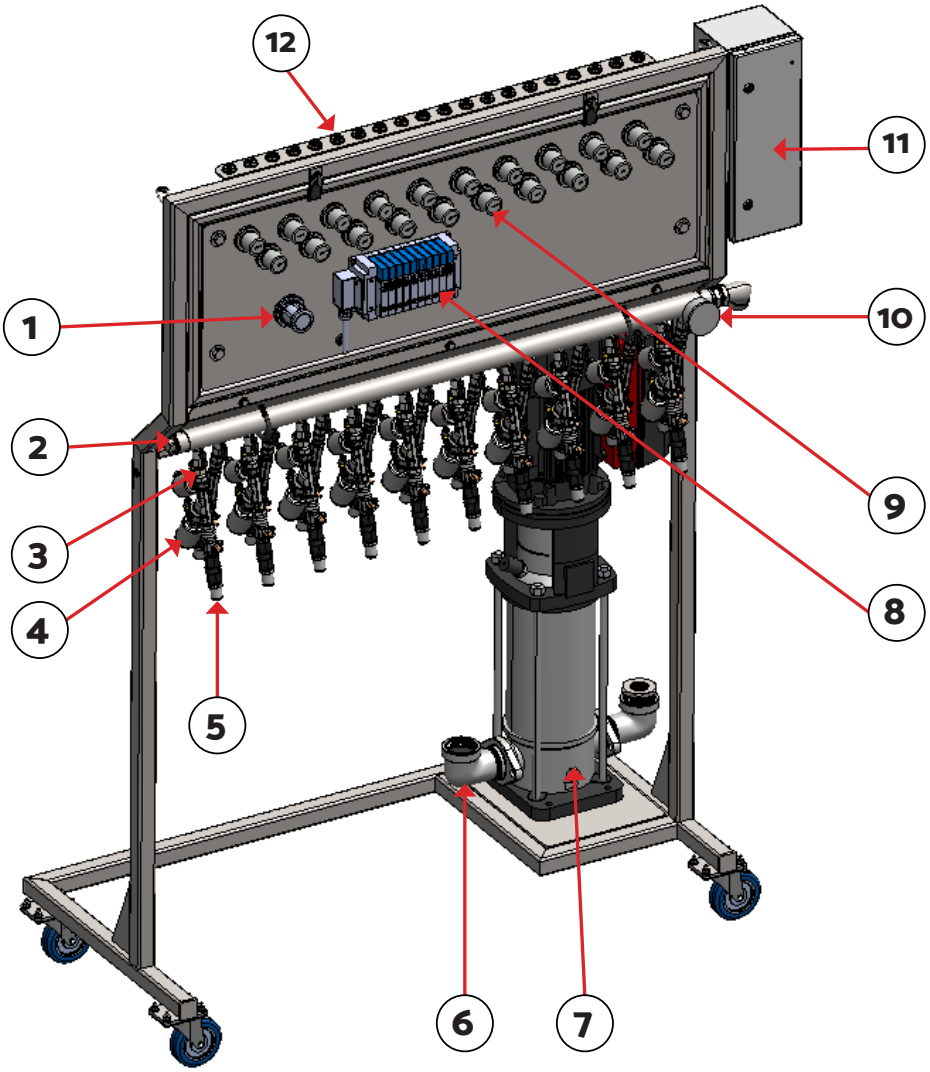


Fig. 7.6 - 1 - Relay replacement

Appendix 1 - System Identification



#	Component
1	Main Air Regulator
2	Manifold
3	Shut-Off Valves
4	Solenoids
5	DEMA Rocket Injectors
6	Main Water Inlet

#	Component
7	Grundfos VFD Pump
8	Air Control Manifold
9	Foam Air Regulators (1 Per Function)
10	Manifold Pressure Gauge
11	Electrical Enclosure
12	Foaming Air Output (To Tunnel)

Appendix 2 - Injector PSI Flow/Dilution Data

Flow Rate (GPM) @ 200 PSI		0.30	0.55	0.85	1.1	1.7	2.4	2.6	3.4	4.3	5.3	6.1
Outlet Pressure		50 PSI	60 PSI	70 PSI	90 PSI	90 PSI	90 PSI	90 PSI	90 PSI	90 PSI	90 PSI	90 PSI
Nozzle Size		0.029"	0.040"	0.051"	0.057"	0.070"	0.083"	0.086"	0.098"	0.116"	0.125"	0.136"
Metering Tip & Part Numbers	Copper - 100.15.14	1:96	1:141	1:130	1:277	1:426	1:582	1:715	1:812	1:1108	1:1441	1:1420
	Pumpkin - 100.15.15	1:77	1:116	1:118	1:179	1:283	1:389	1:440	1:603	1:709	1:878	1:948
	Burgundy - 100.15.16	1:57	1:91	1:107	1:157	1:260	1:366	1:395	1:519	1:608	1:777	1:845
	Lime - 100.15.17	1:38	1:66	1:96	1:114	1:197	1:274	1:299	1:408	1:459	1:601	1:633
	Tan - 100.15.0	1:35	1:64	1:85	1:101	1:178	1:207	1:269	1:366	1:418	1:545	1:543
	Orange - 100.15.1	1:26	1:47	1:64	1:87	1:136	1:170	1:201	1:259	1:389	1:405	1:475
	Turquoise - 100.15.2	1:20	1:35	1:46	1:85	1:135	1:169	1:200	1:257	1:277	1:404	1:401
	Pink - 100.15.3	1:13	1:23	1:31	1:50	1:74	1:103	1:114	1:152	1:185	1:229	1:254
	Lt. Blue - 100.15.4	1:13	1:20	1:29	1:38	1:58	1:71	1:90	1:119	1:146	1:182	1:191
	Brown - 100.15.5	1:12	1:17	1:26	1:34	1:56	1:66	1:86	1:113	1:133	1:172	1:185
	Red - 100.15.6	1:11	1:15	1:22	1:28	1:42	1:60	1:64	1:87	1:110	1:132	1:143
	White - 100.15.7	1:10	1:12	1:18	1:24	1:37	1:56	1:58	1:76	1:95	1:114	1:129
	Green - 100.15.8	1:10	1:10	1:16	1:22	1:33	1:46	1:48	1:68	1:82	1:103	1:116
	Blue - 100.15.9	1:9.9	1:8.4	1:13	1:17	1:25	1:35	1:31	1:53	1:64	1:75	1:86
	Yellow - 100.15.10	1:9.5	1:7	1:10	1:11	1:17	1:23	1:24	1:33	1:43	1:51	1:60
	Black - 100.15.11	1:9	1:5.6	1:7.8	1:8.7	1:13	1:19	1:19	1:25	1:31	1:40	1:42
	Purple - 100.15.12	1:8.6	1:5.2	1:6.9	1:6.4	1:6.5	1:9	1:10	1:13	1:16	1:19	1:22
	Gray - 100.15.13	1:8.2	1:4.8	1:5.9	1:6.3	1:5.9	1:7.8	1:8	1:10	1:12	1:15	1:16
	No Tip	1:8.1	1:4.7	1:5.5	1:6.1	1:5.1	1:6.4	1:6.5	1:7.4	1:7.6	1:9.5	1:11.1

NOTE: Dilution Ratios are based on 200 PSI inlet pressure and 90 PSI outlet pressure. Dilution Ratios are based on drawing water or water-thin product through the metering tip. Different viscostities and temperatures will affect the draw rates and lower the amount of fluid inducted increasing the overall dilution ratio making the injectors more lean.

Dual Metering Barb Information Available Upon Request

Rocket XL Dilution Chart (100 PSI) 1/4 Barb				
Metering Tip Color and Part Numbers	Nozzle Size			
	161 (8 GPM)	177 (10 GPM)	185 (12 GPM)	206 (15 GPM)
Copper - 100.15.14	1:1502	1:1818	1:1994	1:2204
Pumpkin - 100.15.15	1:1001	1:1215	1:1327	1:1780
Burgundy - 100.15.16	1:859	1:1009	1:1144	1:1633
Lime - 100.15.17	1:669	1:835	1:884	1:1309
Tan - 100.15.0	1:588	1:697	1:795	1:983
Orange - 100.15.1	1:536	1:667	1:707	1:913
Turquoise - 100.15.2	1:432	1:522	1:570	1:653
Pink - 100.15.3	1:275	1:345	1:362	1:490
Lt. Blue - 100.15.4	1:199	1:247	1:262	1:341
Brown - 100.15.5	1:183	1:222	1:241	1:301
Red - 100.15.6	1:152	1:188	1:200	1:231
White - 100.15.7	1:144	1:177	1:189	1:217
Green - 100.15.8	1:123	1:151	1:153	1:201
Blue - 100.15.9	1:81	1:105	1:107	1:149
Yellow - 100.15.10	1:54	1:70	1:72	1:97
Black - 100.15.11	1:45	1:56	1:59	1:76
Purple - 100.15.12	1:23	1:28	1:29	1:37
Gray - 100.15.13	1:17	1:21	1:22	1:27
No Tip	1:9.3	1:10.7	1:10.5	1:12.8

Rocket XL Dilution Chart (100 PSI) 3/8 Barb				
Metering Tip Color and Part Numbers	Nozzle Size			
	161 (8 GPM)	177 (10 GPM)	185 (12 GPM)	206 (15 GPM)
Clear	1:424	1:522	1:560	1:694
Purple - 100.15.12	1:260	1:320	1:344	1:425
Yellow - 100.15.10	1:187	1:230	1:247	1:306
Green - 100.15.8	1:120	1:148	1:159	1:196
Pink - 100.15.3	1:98	1:120	1:129	1:160
Turquoise - 100.15.2	1:55	1:68	1:73	1:91
Black - 100.15.11	1:43	1:53	1:57	1:71
Gray - 100.15.13	1:34	1:42	1:45	1:55
Red - 100.15.6	1:28	1:34	1:37	1:46
Blue - 100.15.9	1:22	1:27	1:28	1:35
Brown - 100.15.5	1:16	1:20	1:21	1:26
White - 100.15.7	1:14	1:17	1:18	1:22
Orange - 100.15.1	1:10	1:13	1:14	1:17
Lt. Blue - 100.15.4	1:9	1:11	1:11	1:14
Tan - 100.15.0	1:7	1:8.5	1:9	1:11
No Tip	1:6.5	1:8.2	1:7.4	1:9.5

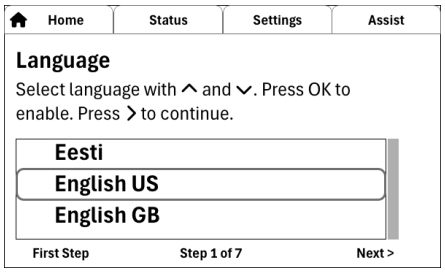
	Rocket #	Incoming Pressure (in PSI)					
		20	60	100	150	200	250
Rocket Low Flow	211.029	0.12	0.17	0.20	0.25	0.30	0.35
	211.040	0.28	0.35	0.4	0.48	0.55	0.6
	211.051	0.4	0.50	0.6	0.75	0.85	0.95
Rocket	211.057	0.6	0.70	0.8	0.95	1.1	1.25
	211.070	0.7	1.08	1.3	1.5	1.7	1.9
	211.083	0.95	1.3	1.6	1.9	2.4	2.65
	211.086	1	1.5	1.75	2.2	2.6	2.8
	211.098	1.4	1.9	2.3	2.9	3.4	3.6
	211.116	1.7	2.6	3.2	3.8	4.3	4.8
	211.125	2.1	3	3.7	4.4	5.3	5.6
	211.136	2.2	3.60	4	5	6.1	6.3
Rocket XL	211.161	3.9	5.10	6.4	7.6	8.8	9.4
	211.177	4.7	6.20	7.6	9.1	10.6	11.3
	211.186	5.2	6.70	8.5	10	11.4	12.2
	211.207	6.7	8.70	10.6	12.6	14.5	15.5
All flowrates listed in gallons per minute							

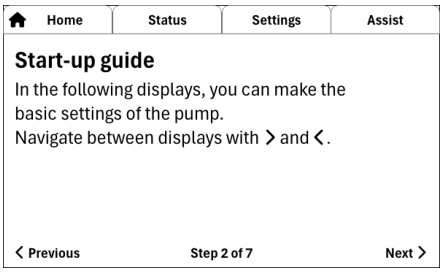
Appendix 3 - Pump Programming

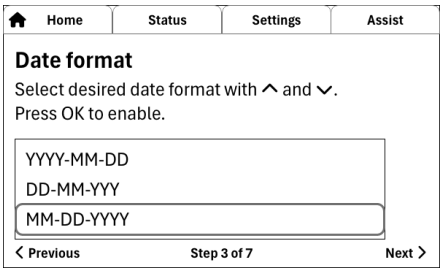
Pump Programming

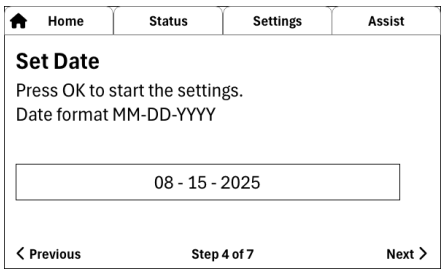
The Grundfos Pump arrives pre-programmed. In the event that the pump settings are reset—whether due to an accidental reset or maintenance requirement—follow the steps below to reprogram the pump with the factory-default settings provided by innovateIT. After selecting your language, the pump incorporates a startup guide, after which the main menus appear in the display.

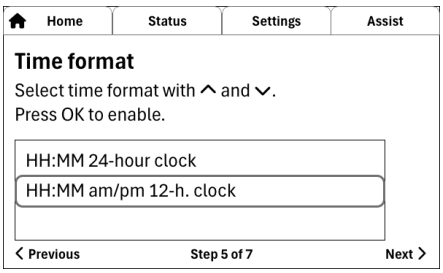
1. Select your language.
2. Press **>** to begin the startup guide.
3. Select your preferred date format. Press **OK** to enable. Press **>** to move to the next step.
4. Set the current date. Press **OK** to start the setting. Press **>** to move to the next step.
5. Select your preferred time format. Press **>** to move to the next.
6. Set the current time Press **OK** to start the setting. Press **>** to move to the step next.
7. Under 'Setting of pump' select 'Run with Constant pressure.' Press **OK** to enable.
8. The screen will now display the message 'Pump is running...Const. pressure,' followed by the Home screen.
9. From the Home screen, select 'Setpoint' and press **OK**.
10. Using the arrows, adjust the setpoint to 180-200 psi based on preferred setting. Select the digit with **<** and **>** and adjust with **^** and **v.** Press **OK** to start the setting.
11. Press **<** to return to the Settings screen. Navigate down to 'Ramps' and press **OK**.
12. Select 'Ramp-up.'
13. Set the ramp-up time to 1.0 sec. Press **OK** to start the setting.
14. Press **<** to return to the Settings screen.
15. Select 'Ramp-down.'
16. Set the ramp-down time to 1.0 sec. Press **OK** to start the setting.
17. The pump is now reset to its factory-default settings.

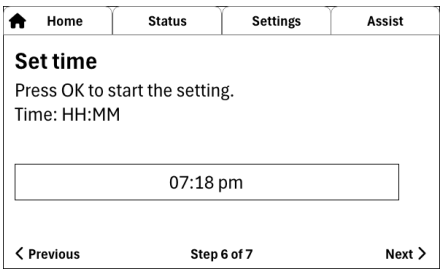


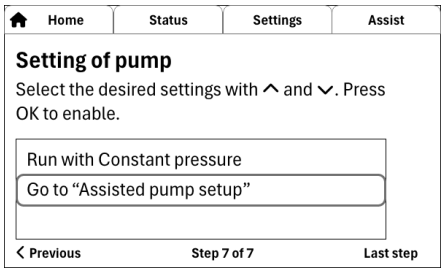


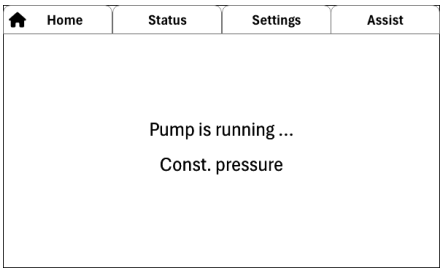


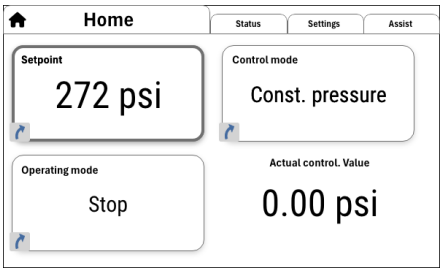


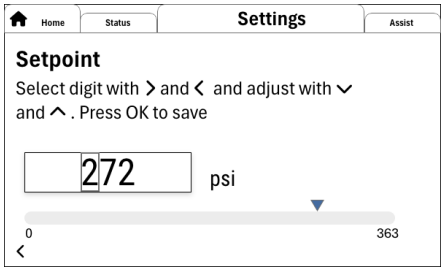


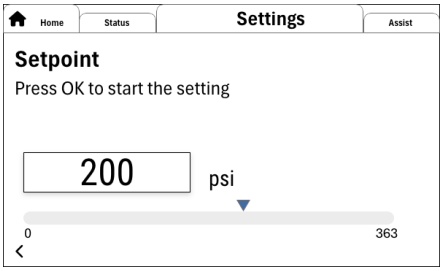


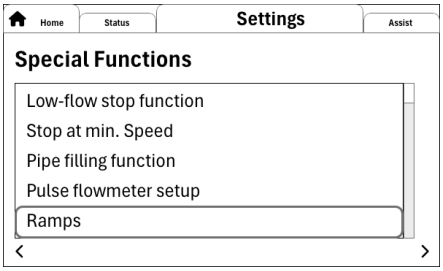

Home
Status
Settings
Assist
Setting of pump
Select the desired settings with ^ and v. Press OK to enable.
Run with Constant pressure
Go to “Assisted pump setup”
Previous
Step 7 of 7
Last step

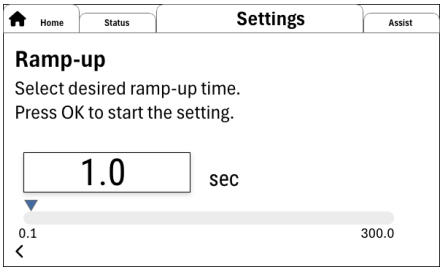

Home
Status
Settings
Assist
Pump is running ...
Const. pressure

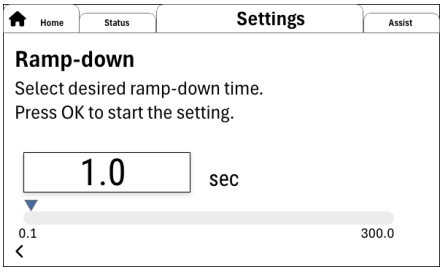

Home
Status
Settings
Assist
Setpoint
272 psi
Control mode
Const. pressure
Operating mode
Stop
Actual control. Value
0.00 psi


Home
Status
Settings
Assist
Setpoint
Select digit with > and < and adjust with v and ^. Press OK to save
272
psi
0
363


Home
Status
Settings
Assist
Setpoint
Press OK to start the setting
200
psi
0
363


Home
Status
Settings
Assist
Special Functions
Low-flow stop function
Stop at min. Speed
Pipe filling function
Pulse flowmeter setup
Ramps


Home
Status
Settings
Assist
Ramp-up
Select desired ramp-up time.
Press OK to start the setting.
1.0
sec
0.1
300.0


Home
Status
Settings
Assist
Ramp-down
Select desired ramp-down time.
Press OK to start the setting.
1.0
sec
0.1
300.0

Appendix 4
Electrical Schematics

ICWE# 1206466

SUB-DS2.0-20FS-120-CONTROLBOX

Sheet	Revision	Description
01	0	COVER SHEET & DRAWING LIST
02	0	ENCLOSURE BILL OF MATERIALS
03	0	ENCLOSURE BILL OF MATERIALS
04	0	ENCLOSURE DETAIL
05	0	ENCLOSURE BACK PANEL DETAILS
06	0	24VDC POWER DISTRIBUTION
07	0	RELAY COILS
08	0	RELAY CONTACTS
09	0	PUMP RUN CIRCUIT - LEFT
10	0	PUMP RUN CIRCUIT - RIGHT
11	0	SELECTOR SWITCH
C01	0	CUSTOMER CONNECTIONS
C02	0	BACKPANEL DIMENSIONS
ENCLOSURE BI...	0	ENCLOSURE BILL OF MATERIALS

UNLESS OTHERWISE NOTED:
1) ALL DIMENSIONS ARE IN INCHES
2) BREAK ALL SHARP EDGES
3) TOLERANCES (NON ACCUMULATIVE):

FOR MACHINED SURFACES:
DECIMAL 1 PLC. +/- .03"
DECIMAL 2 PLC. +/- .01"
DECIMAL 3 PLC. +/- .005"
FRACTIONAL +/- 1/64"
ANGLES +/- .5"

FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC:
FRACTIONAL +/- 1/16"
ANGLES +/- 1°

DRAWING REFS.

REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/29/2025		jeffr		

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20FS-24-CONTROLBOX
DRAWING: COVER SHEET & DRAWING LIST
ICWE# 1206466

DWG. SIZE
SHEET 01
REV 0

ITEM	Quantity	Description	MFG	CATALOG - MFG	CATALOG - ICWE	Mark
1	1	CONTACT MOUNTING LATCH ,800F SERIES	Allen-Bradley	800F-ALP	6106552	SW
2	1	SELECTOR SWITCH,3 POS., MAINT, 800F SERIES	Allen-Bradley	800FM-SM32	6106551	SW
3	2	NC CONTACT BLOCK , 800F SERIES	Allen-Bradley	800F-X01	6106550	SW
4	2	N.O CONTACT BLOCK , 800F SERIES	Allen-Bradley	800F-X10	6106553	SW
5	2	DIN RAIL SUPPORT BRACKET, 25mm H, 2 HOLE MOUNT	IBOCO	DN-SSB25-10	6906586	MAIN ENCLOSURE BACKPLATE
6	2	Cable Gland , 0.5" NPT, Single Port, 0.157" - 0.354"	Lapp Group	S1212	ELE-PG-1/2-3*9	MAIN ENCLOSURE
7	1	CIRCUIT BREAKER, THERMAL, TERMINAL BLOCK PLUGIN, 2A	Phoenix Contact	0712217	6203246	CB2
8	2	TERMINAL BLOCK,END CLAMP, GRAY	Phoenix Contact	0800886	6103201	MAIN ENCLOSURE BACKPLATE
9	2	DIN RAIL, 35mm x 7.5mm, PERFORATED	Phoenix Contact	0801733	ELE-DIN-RAIL	MAIN ENCLOSURE BACKPLATE
10	1	DIN RAIL, 35mm x 15mm, PERFORATED	Phoenix Contact	1201730	ELE-DIN-RAIL-DEEP	MAIN ENCLOSURE BACKPLATE
11	2	CONTROL RELAY, COIL 24DC, 6A CONTACTS SP	Phoenix Contact	2900299	6105047	CR-P1, CR-P2
12	1	POWER SUPPLY, 100 - 240V AC INPUT, 24VDC OUTPUT, 2.5A, SINGLE PHASE	Phoenix Contact	2902992	6306235	PSU
13	20	CONTROL RELAY, COIL 120VAC, 6A CONTACTS, MANUAL OVERIDE, WITH BASE	Phoenix Contact	2909669	6106194	CR1, CR2, CR3, CR4, CR5, CR6, CR7, CR8, CR9, CR10, CR11, CR12, CR13, CR14, CR15, CR16, CR17, CR18, CR19, CR20
14	1	RELAY BRIDGE, BLUE, CONTINOUS BRIDGE	Phoenix Contact	2966692	ELE-RLY-PHNX-JMPR	MAIN ENCLOSURE BACKPLATE
15	2	RELAY BANK SEPARATION PLATE	Phoenix Contact	2966841	EL-TRM- 2966841	MAIN ENCLOSURE BACKPLATE
16	1	TERMINAL END COVER, GRAY, 1 ROW/ 2PT	Phoenix Contact	3030417	EL-TRM-3030417	TS1
17	1	TERMINAL BLOCK, END COVER, GRAY, 1 ROW/ 1PT	Phoenix Contact	3030420	EL-TRM-3030420	TS1
18	2	TERMINAL END COVER, GRAY, 1 ROW/ 4 PT	Phoenix Contact	3030514	EL-TRM-3030514	MAIN ENCLOSURE BACKPLATE, DIO
19	1	TERMINAL BLOCK BRIDGE, BLUE, PITCH 5.2mm, 20 POS, 24A	Phoenix Contact	3036929	6103594	MAIN ENCLOSURE BACKPLATE
20	1	TERMINAL BLOCK; FEED-THROUGH; 2 POSITION; 24A; 800V; PUSH-IN CONNECTION; 26-12 AWG; GRAY; PT SERIES	Phoenix Contact	3209510	EL-TRM-3209510	TS1 5
21	1	TERMINAL BLOCK, WHITE, 24A, 1 ROW/ 4PT, 26...12 AWG	Phoenix Contact	3209579	6103208	TS1 4

UNLESS OTHERWISE NOTED:
1) ALL DIMENSIONS ARE IN INCHES
2) BREAK ALL SHARP EDGES
3) TOLERANCES (NON ACCUMULATIVE):

FOR MACHINED SURFACES:
DECIMAL 1 PLC. +/- .03"
DECIMAL 2 PLC. +/- .01"
DECIMAL 3 PLC. +/- .005"
FRACTIONAL +/- 1/64"
ANGLES +/- .5"

FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC:
FRACTIONAL +/- 1/16"
ANGLES +/- 1°

DRAWING REFS.

REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/29/2025		jeffr		

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20FS-24-CONTROLBOX

DRAWING: ENCLOSURE BILL OF MATERIALS

ICWE# 1206466

DWG. SIZE

SHEET 02

REV 0

ITEM	Quantity	Description	MFG	CATALOG - MFG	CATALOG - ICWE	Mark
22	20	TERMINAL BLOCK, GRAY, DIODE,1 ROW/ 4PT, 26...12 AWG. 0.5A, 800V	Phoenix Contact	3210279	6105020	DIO 1, DIO 2, DIO 3, DIO 4, DIO 5, DIO 6, DIO 7, DIO 8, DIO 9, DIO 10, DIO 11, DIO 12, DIO 13, DIO 14, DIO 15, DIO 16, DIO 17, DIO 18, DIO 19, DIO 20
23	2	TERMINAL BLOCK, GRAY, 22A, 2 ROW/ 2PT, 26...12 AWG	Phoenix Contact	3210567	6103207	P 1, P 2
24	1	TERMINAL BLOCK END COVER,GRAY,2 ROW/ 2 PT	Phoenix Contact	3211634	6103205	P
25	2	TERMINAL BLOCK, 1 ROW, 2 PT, 32A, 24..10AWG	Phoenix Contact	3211757	6103298	TS1 1, TS1 2
26	1	TERMINAL BLOCK,GND, 1 ROW, 2 PT, 32A, 24..10AWG	Phoenix Contact	3211766	6103718	TS1 3
27	1	TERMINAL BLOCK, FUSE HOLDER, 24V LED, 25A	Phoenix Contact	3212172	6203206	MAIN ENCLOSURE BACKPLATE
28	2	PG 1/2" NUT	Phoenix Contact	PG-1/2-N	ELE-PG-1/2-N	MAIN ENCLOSURE
29	1	ENCLOSURE ASSEMBLY, 6"W x 16"H X 6"D, W/ LATCHES	Saginaw	ICW2-16066ELJ	6006437	ENCLOSURE
30	1	ENCLOSURE BACKPLANE FOR ICW2-16066ELJ	Saginaw	ICW2-16066ELJ BACKPLANE	6006438	MAIN ENCLOSURE BACKPLATE
31	1	CIRCUIT BREAKER, 3A, C-CURVE, 1P, BRANCH 14kA (UL489)	Schneider Electric	M9F42103	6203736	CB1

UNLESS OTHERWISE NOTED:
1) ALL DIMENSIONS ARE IN INCHES
2) BREAK ALL SHARP EDGES
3) TOLERANCES (NON ACCUMULATIVE):

FOR MACHINED SURFACES:
DECIMAL 1 PLC. +/- .03"
DECIMAL 2 PLC. +/- .01"
DECIMAL 3 PLC. +/- .005"
FRACTIONAL +/- 1/64"
ANGLES +/- .5"

FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC:
FRACTIONAL +/- 1/16"
ANGLES +/- 1°

DRAWING REFS.

REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/29/2025		jeffr		

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20FS-24-CONTROLBOX

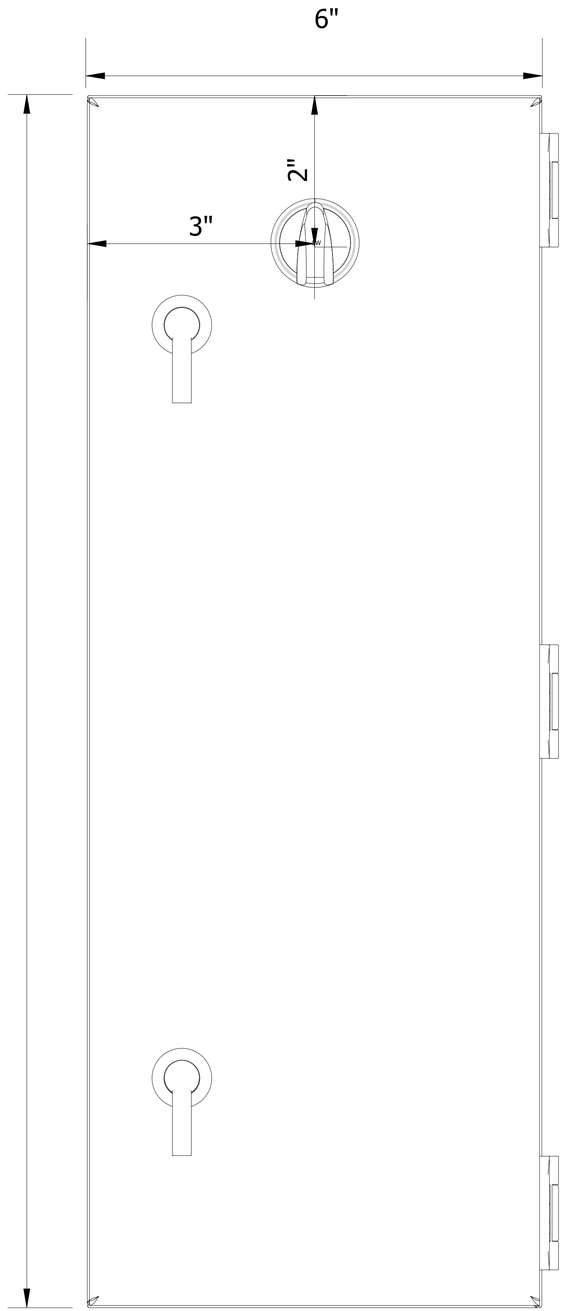
DRAWING: ENCLOSURE BILL OF MATERIALS

ICWE# 1206466

DWG. SIZE

SHEET 03

REV 0



1206464

SYSTEM:			
PROJECT#		EQUIP. NO.	
DWG#	06	MFR. DATE	

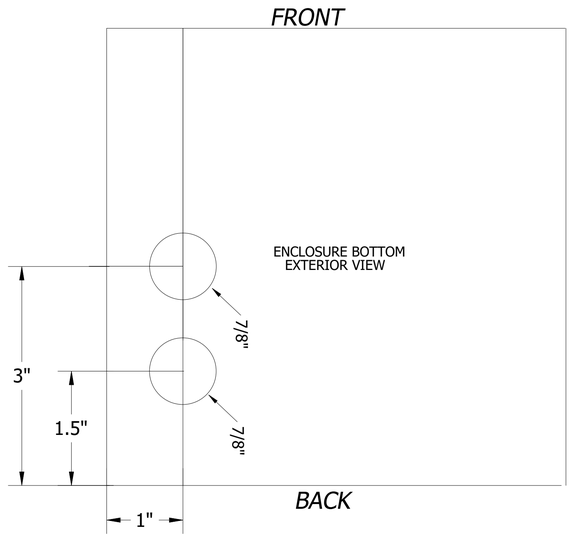
ELECTRICAL DATA

VOLTAGE: 120VAC Hz. 60 PHASE 1 FLC 1A

MAX CIRCUIT BREAKER/ FUSE SIZE 10

ENCLOSURE RATING TYPE 1

SHORT CIRCUIT CURRENT 14 kA RMS SYMETRICAL @ 120 VAC



UNLESS OTHERWISE NOTED:
1) ALL DIMENSIONS ARE IN INCHES
2) BREAK ALL SHARP EDGES
3) TOLERANCES (NON ACCUMULATIVE):

FOR MACHINED SURFACES:
DECIMAL 1 PLC. +/- .03"
DECIMAL 2 PLC. +/- .01"
DECIMAL 3 PLC. +/- .005"
FRACTIONAL +/- 1/64"
ANGLES +/- .5"

FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC:
FRACTIONAL +/- 1/16"
ANGLES +/- 1"

DRAWING REFS.

REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/29/2025		jeffr		

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20FS-24-CONTROLBOX

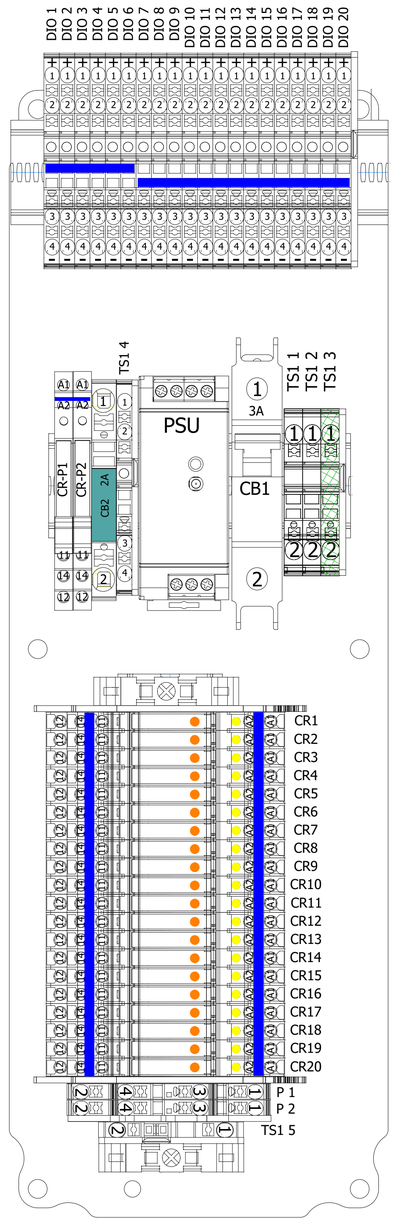
DRAWING: ENCLOSURE DETAIL

ICWE# 1206466

DWG. SIZE

SHEET 04

REV 0



UNLESS OTHERWISE NOTED:
1) ALL DIMENSIONS ARE IN INCHES
2) BREAK ALL SHARP EDGES
3) TOLERANCES (NON ACCUMULATIVE):

FOR MACHINED SURFACES:
DECIMAL 1 PLC. +/- .03"
DECIMAL 2 PLC. +/- .01"
DECIMAL 3 PLC. +/- .005"
FRACTIONAL +/- 1/64"
ANGLES +/- .5"

FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC:
FRACTIONAL +/- 1/16"
ANGLES +/- 1"

DRAWING REFS.

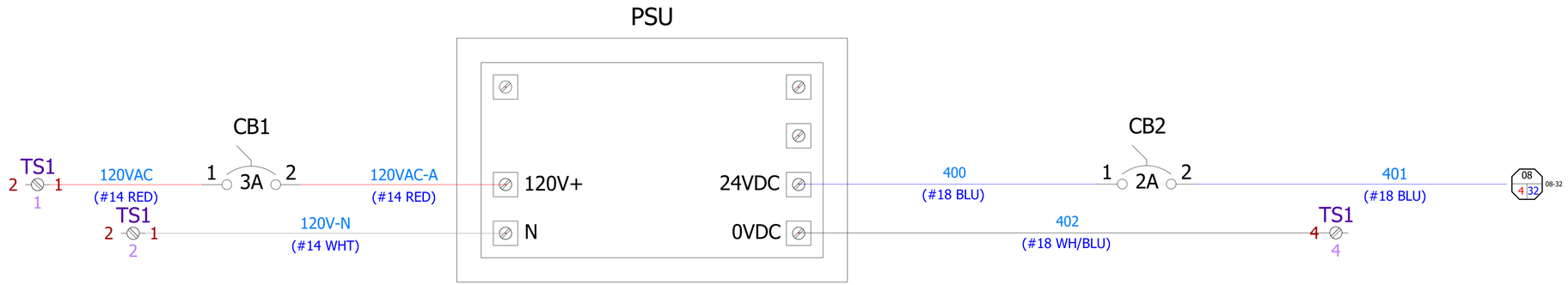
REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/29/2025		jeffr		

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20FS-24-CONTROLBOX
DRAWING: ENCLOSURE BACK PANEL DETAILS
ICWE# 1206466

DWG. SIZE
SHEET 05
REV 0



UNLESS OTHERWISE NOTED:
1) ALL DIMENSIONS ARE IN INCHES
2) BREAK ALL SHARP EDGES
3) TOLERANCES (NON ACCUMULATIVE):

FOR MACHINED SURFACES:		FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC:	
DECIMAL 1 PLC.	+/- .03"	FRACTIONAL	+/- 1/16"
DECIMAL 2 PLC.	+/- .01"	ANGLES	+/- 1°
DECIMAL 3 PLC.	+/- .005"		
FRACTIONAL	+/- 1/64"		
ANGLES	+/- .5°		

DRAWING REFS.

REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/29/2025		jeffr		

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20FS-24-CONTROLBOX

DRAWING: 24VDC POWER DISTRIBUTION

ICWE# 1206466

DWG. SIZE

SHEET 06

REV 0

CUSTOMER SUPPLIED
120VAC COMMON

TS1
2 — 1
5

N
(#14 WH)

CONNECT TO:
CR1 TERMINAL A2

COMMON BUS

11 — 14 08-6-1	CR1 (A2 / A1)	FUNCTION #01
11 — 14 08-6-3	CR2 (A2 / A1)	FUNCTION #02
11 — 14 08-6-4	CR3 (A2 / A1)	FUNCTION #03
11 — 14 08-6-6	CR4 (A2 / A1)	FUNCTION #04
11 — 14 08-6-7	CR5 (A2 / A1)	FUNCTION #05
11 — 14 08-6-9	CR6 (A2 / A1)	FUNCTION #06
11 — 14 08-6-11	CR7 (A2 / A1)	FUNCTION #07
11 — 14 08-6-12	CR8 (A2 / A1)	FUNCTION #08
11 — 14 08-6-14	CR9 (A2 / A1)	FUNCTION #09
11 — 14 08-6-16	CR10 (A2 / A1)	FUNCTION #10
11 — 14 08-6-17	CR11 (A2 / A1)	FUNCTION #11
11 — 14 08-6-19	CR12 (A2 / A1)	FUNCTION #12
11 — 14 08-6-20	CR13 (A2 / A1)	FUNCTION #13
11 — 14 08-6-22	CR14 (A2 / A1)	FUNCTION #14
11 — 14 08-6-24	CR15 (A2 / A1)	FUNCTION #15
11 — 14 08-6-25	CR16 (A2 / A1)	FUNCTION #16
11 — 14 08-6-27	CR17 (A2 / A1)	FUNCTION #17
11 — 14 08-6-29	CR18 (A2 / A1)	FUNCTION #18
11 — 14 08-6-30	CR19 (A2 / A1)	FUNCTION #19
11 — 14 08-6-32	CR20 (A2 / A1)	FUNCTION #20

UNLESS OTHERWISE NOTED:
1) ALL DIMENSIONS ARE IN INCHES
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FOR MACHINED SURFACES:
DECIMAL 1 PLC. +/- .03"
DECIMAL 2 PLC. +/- .01"
DECIMAL 3 PLC. +/- .005"
FRACTIONAL +/- 1/64"
ANGLES +/- .5"

FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC:
FRACTIONAL +/- 1/16"
ANGLES +/- 1°

DRAWING REFS.

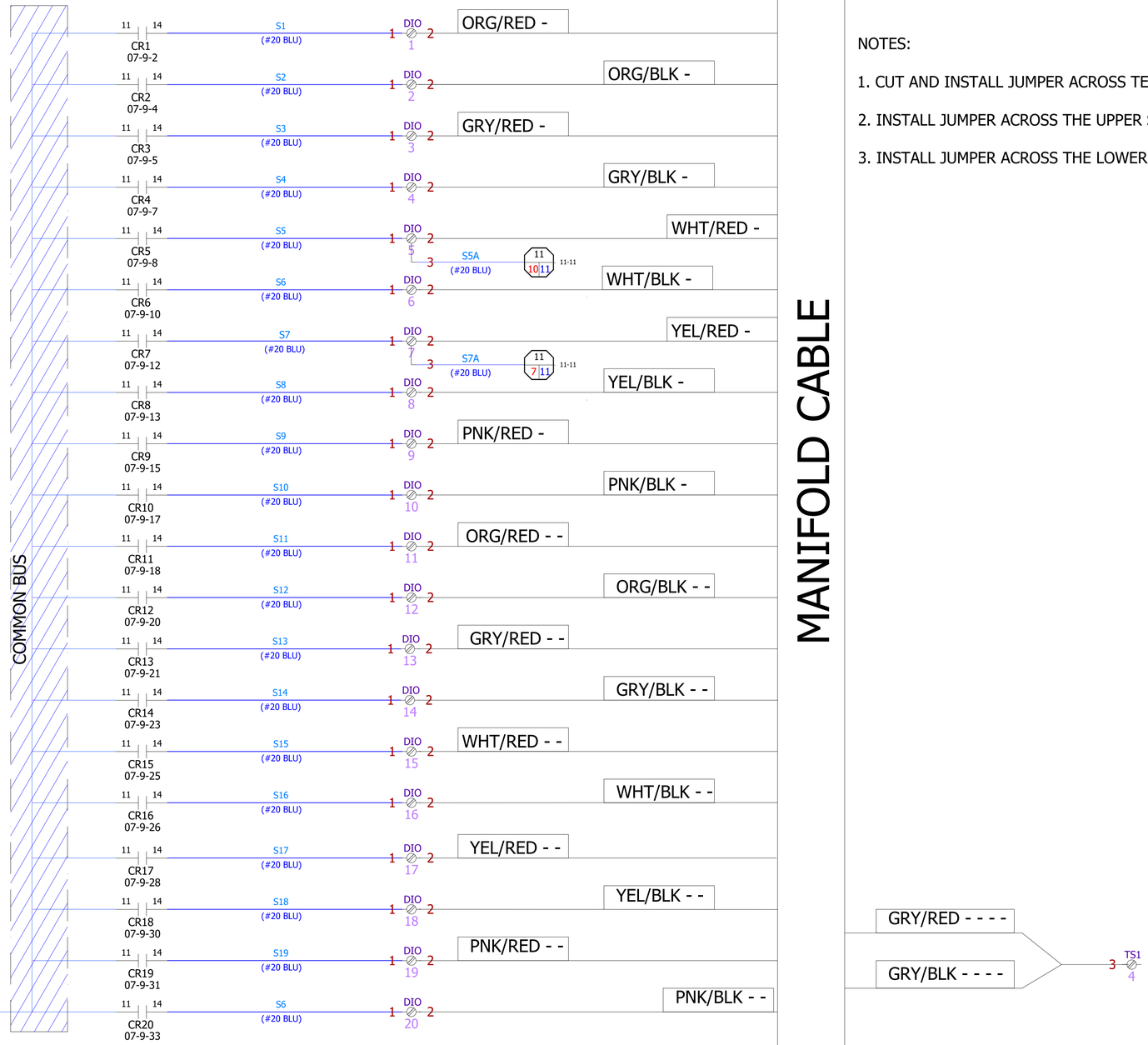
REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/29/2025		jeffr		

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20FS-24-CONTROLBOX
DRAWING: RELAY COILS
ICWE# 1206466

DWG. SIZE
SHEET 07
REV 0



NOTES:

1. CUT AND INSTALL JUMPER ACROSS TERMINAL 11 OF CR 1-20
2. INSTALL JUMPER ACROSS THE UPPER SLOT OF DIO1 -DIO6 TERMINALS
3. INSTALL JUMPER ACROSS THE LOWER SLOT OF DIO7 -DIO20 TERMINALS

UNLESS OTHERWISE NOTED:
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DECIMAL 2 PLC. +/- .01"
DECIMAL 3 PLC. +/- .005"
FRACTIONAL +/- 1/64"
ANGLES +/- .5"

FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC:
FRACTIONAL +/- 1/16"
ANGLES +/- 1"

DRAWING REFS.

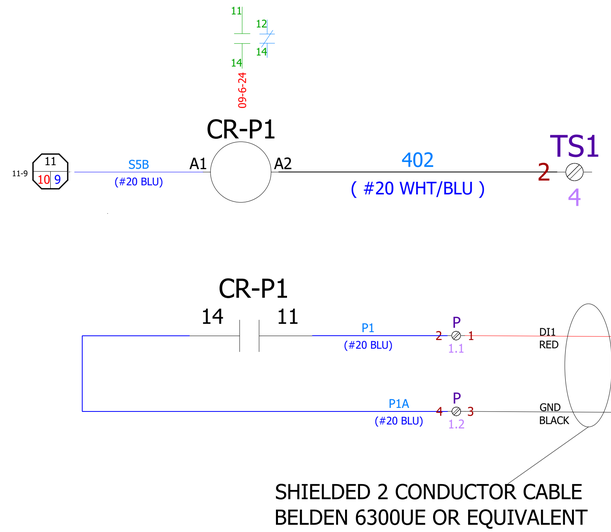
REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/29/2025		jeffr		

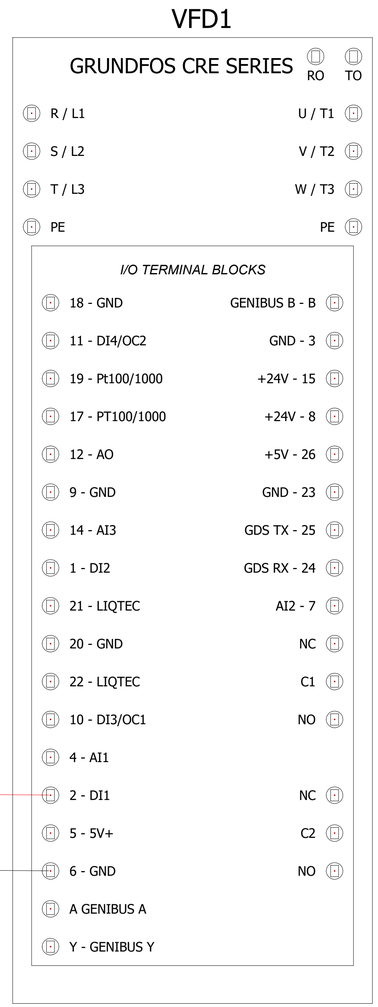
INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20FS-24-CONTROLBOX
DRAWING: RELAY CONTACTS
ICWE# 1206466

DWG. SIZE
SHEET 08
REV 0





UNLESS OTHERWISE NOTED:
1) ALL DIMENSIONS ARE IN INCHES
2) BREAK ALL SHARP EDGES
3) TOLERANCES (NON ACCUMULATIVE):

FOR MACHINED SURFACES:
DECIMAL 1 PLC. +/- .03"
DECIMAL 2 PLC. +/- .01"
DECIMAL 3 PLC. +/- .005"
FRACTIONAL +/- 1/64"
ANGLES +/- .5"

FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC:
FRACTIONAL +/- 1/16"
ANGLES +/- 1"

DRAWING REFS.

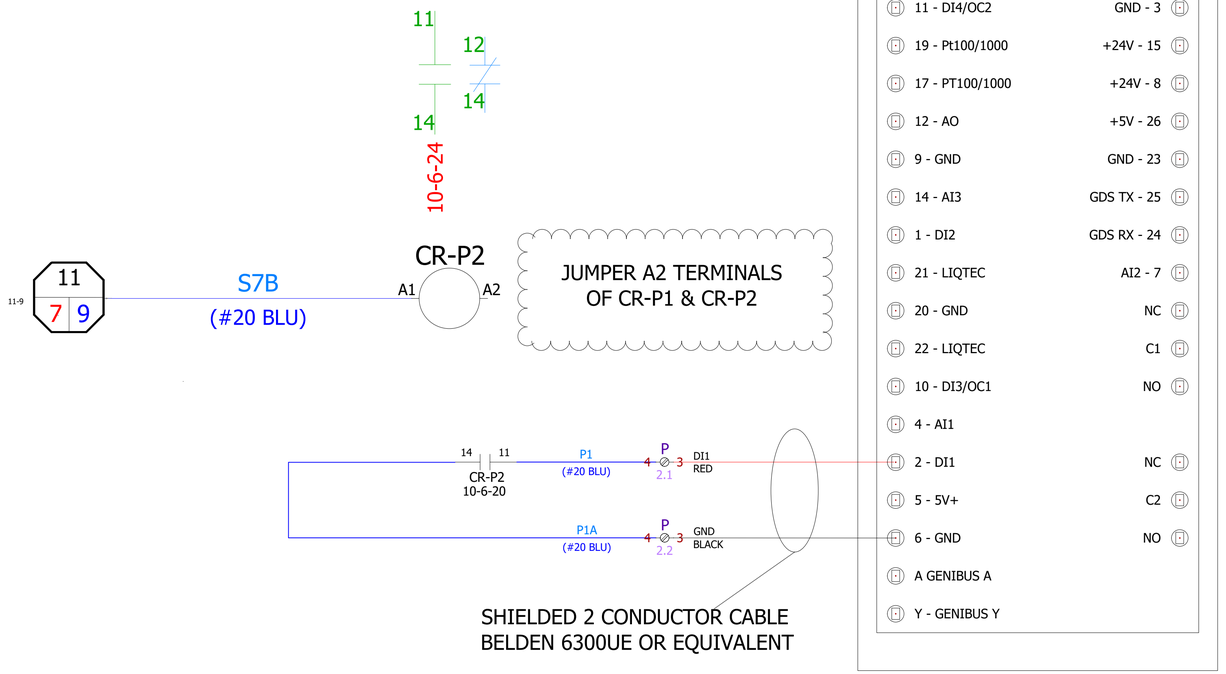
REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/29/2025		jeffr		

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20FS-24-CONTROLBOX
DRAWING: PUMP RUN CIRCUIT - LEFT
ICWE# 1206466

DWG. SIZE
SHEET 09
REV 0



VFD2

GRUNDFOS CRE SERIES

RO TO

R / L1	U / T1
S / L2	V / T2
T / L3	W / T3
PE	PE

I/O TERMINAL BLOCKS

18 - GND	GENIBUS B - B
11 - DI4/OC2	GND - 3
19 - Pt100/1000	+24V - 15
17 - PT100/1000	+24V - 8
12 - AO	+5V - 26
9 - GND	GND - 23
14 - AI3	GDS TX - 25
1 - DI2	GDS RX - 24
21 - LIQTEC	AI2 - 7
20 - GND	NC
22 - LIQTEC	C1
10 - DI3/OC1	NO
4 - AI1	
2 - DI1	NC
5 - 5V+	C2
6 - GND	NO
A GENIBUS A	
Y - GENIBUS Y	

UNLESS OTHERWISE NOTED:
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FRACTIONAL +/- 1/16"
ANGLES +/- 1"

DRAWING REFS.

REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/29/2025		jeffr		

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20FS-24-CONTROLBOX

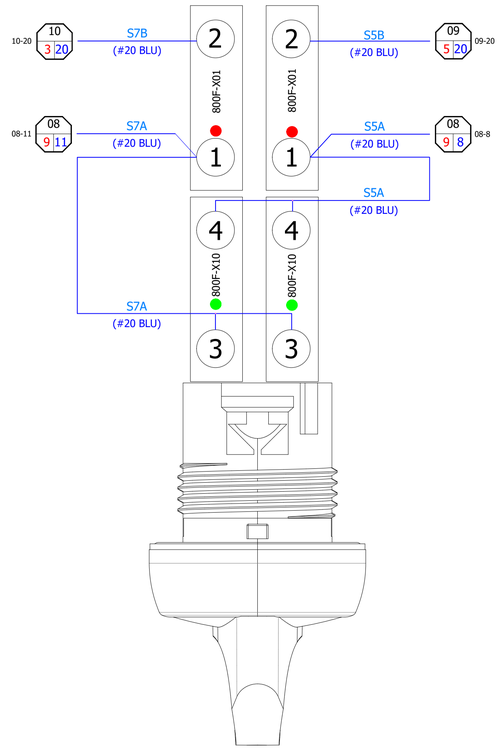
DRAWING: PUMP RUN CIRCUIT - RIGHT

ICWE# 1206466

DWG. SIZE

SHEET 10

REV 0



TOP VIEW

UNLESS OTHERWISE NOTED:
1) ALL DIMENSIONS ARE IN INCHES
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FOR MACHINED SURFACES:
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ANGLES +/- .5"

FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC:
FRACTIONAL +/- 1/16"
ANGLES +/- 1"

DRAWING REFS.

REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/29/2025		jeffr		

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20FS-24-CONTROLBOX

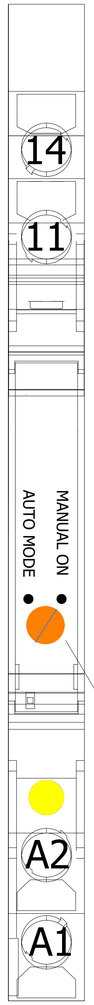
DRAWING: SELECTOR SWITCH

ICWE# 1206466

DWG. SIZE

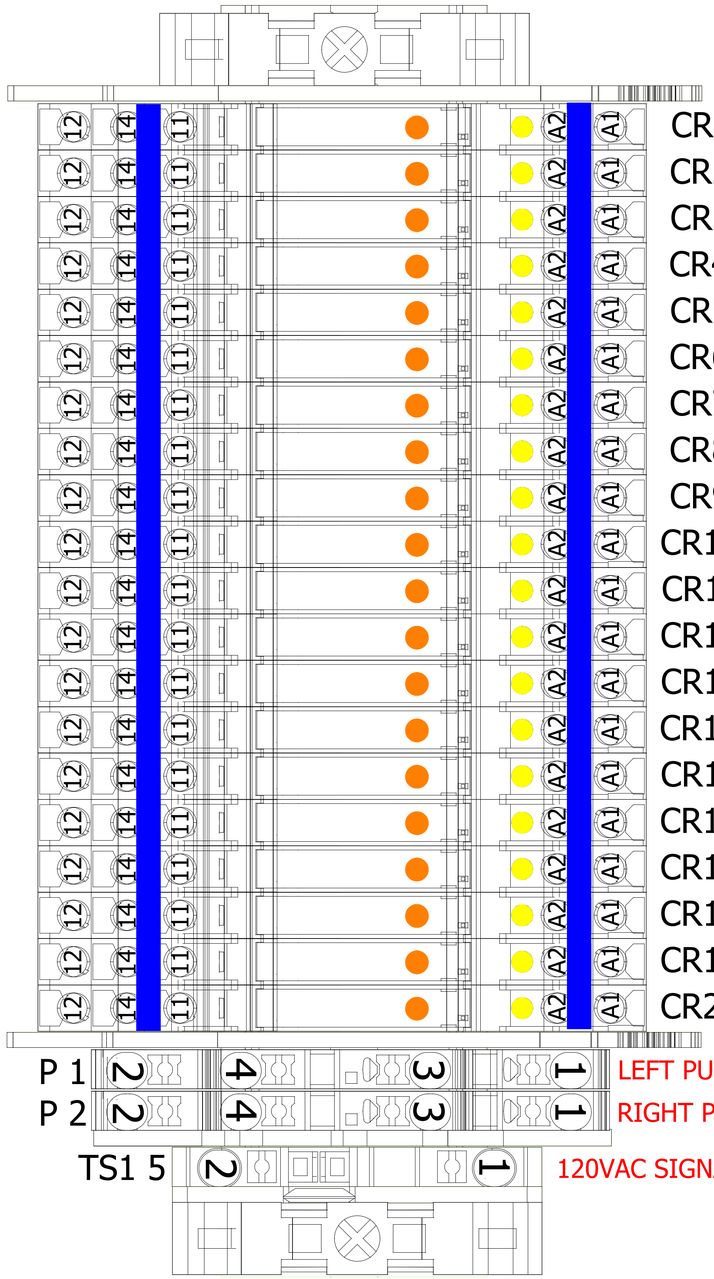
SHEET 11

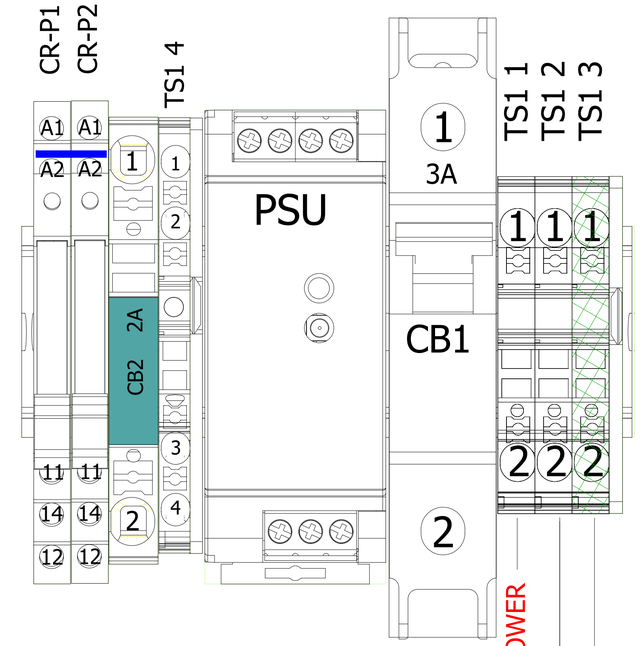
REV 0



TO MANUALLY TEST EACH FUNCTION,
TURN THE ROTARY DIAL OF EACH RELAY
TO "MANUAL ON"

TO RESUME NORMAL OPERATION:
TURN THE ROTARY DIAL BACK
TO "AUTO MODE"





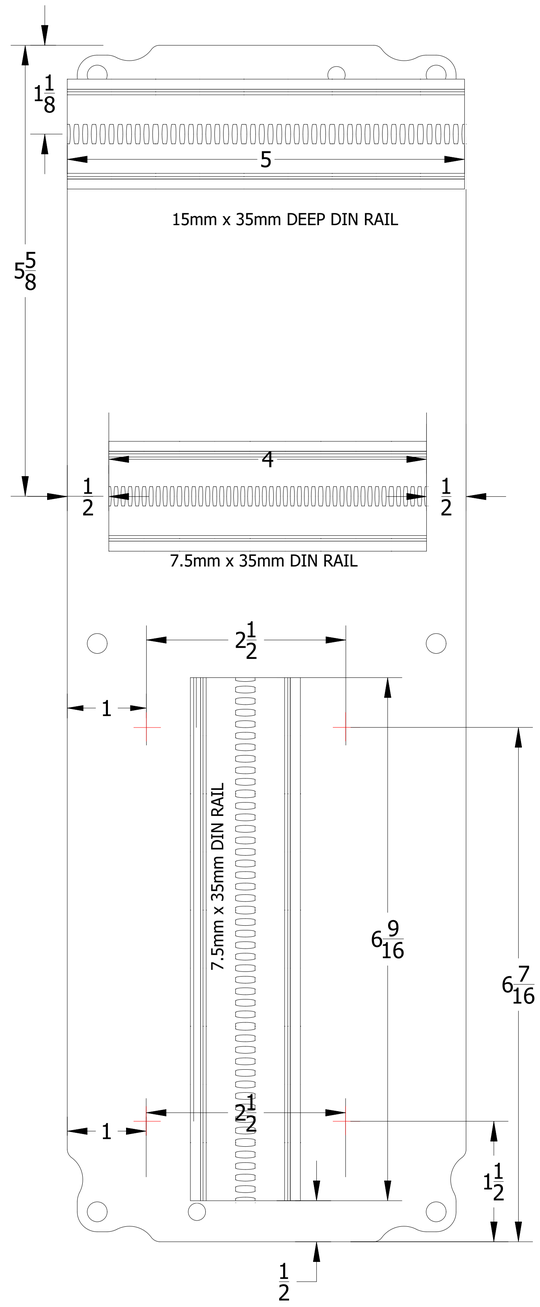
UNLESS OTHERWISE NOTED: 1) ALL DIMENSIONS ARE IN INCHES 2) BREAK ALL SHARP EDGES 3) TOLERANCES (NON ACCUMULATIVE):	FOR MACHINED SURFACES: DECIMAL 1 PLC. +/- .03" DECIMAL 2 PLC. +/- .01" DECIMAL 3 PLC. +/- .005" FRACTIONAL +/- 1/64" ANGLES +/- .5"	FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC: FRACTIONAL +/- 1/16" ANGLES +/- 1"	DRAWING REFS.					
				0	6/26/2025		jeffr	
				REV	DATE	DESCRIPTION	DRAWN	CHKD APPV

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20F-120-CONTROLBOX
DRAWING: CUSTOMER CONNECTIONS
ICWE# 1206465S

DWG. SIZE
SHEET C01
REV 0



UNLESS OTHERWISE NOTED:
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3) TOLERANCES (NON ACCUMULATIVE):

FOR MACHINED SURFACES:
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DECIMAL 2 PLC. +/- .01"
DECIMAL 3 PLC. +/- .005"
FRACTIONAL +/- 1/64"
ANGLES +/- .5"

FOR FABRICATION WELDMENTS, SAWCUTS, BENDS ETC:
FRACTIONAL +/- 1/16"
ANGLES +/- 1"

DRAWING REFS.

REV	DATE	DESCRIPTION	DRAWN	CHKD	APPV
0	8/4/2025		jeffr		

INNOVATEIT
16 Kairnes Street
Albany, NY 12205
(518) 741- 4200

SCALE

PROJECT: SUB-DS2.0-20F-S-24-CONTROLBOX
DRAWING: BACKPANEL DIMENSIONS
ICWE# 1206464

DWG. SIZE
SHEET C02
REV 0