

# **FlexPro Hi-Vacuum Series**

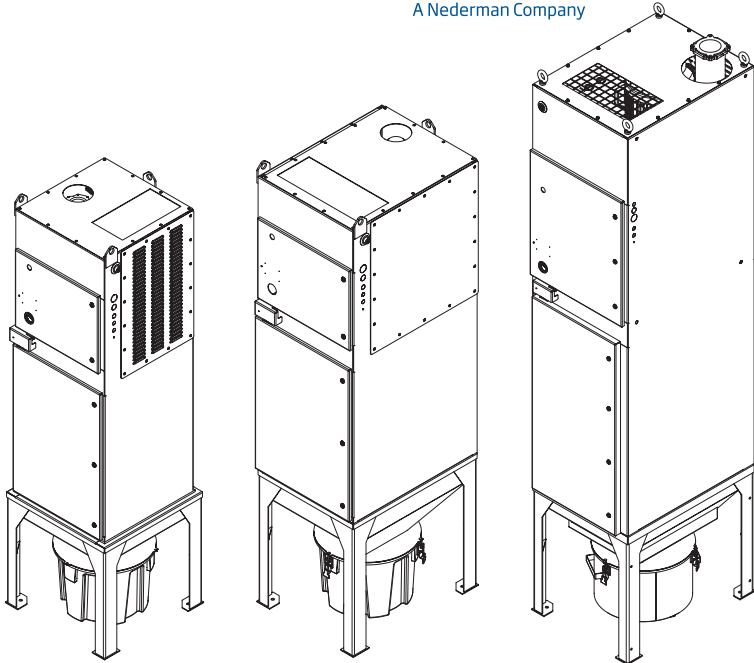
*HVE Series Cartridge Collectors*

## **Owner's Manual**

*Installation, Operation & Maintenance*

*Revised February 2024*





**HVE-350-80-1**

**HVE-550-80-2**

**HVE-950-80-2**

# **FlexPro** **Hi-Vacuum Series**

*HVE Series Cartridge Collectors*

## **Owner's Manual** *Installation, Operation & Maintenance*

**Models:**

HVE-350-80-1

HVE-550-80-2

HVE-950-80-2

Manufactured by:

**RoboVent**

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# ***Congratulations!***

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Dear Customer,

Thank you for purchasing a FlexPro Hi-Vacuum Series Collector. This manual will help you install, start-up, commission, maintain, and troubleshoot your new dust collector. Please take time to read this manual thoroughly before installing and/or operating your unit.

When your FlexPro dust collector is due for scheduled maintenance, keep in mind that RoboVent has specially trained staff to perform these tasks. If you would like one of our qualified service staff to discuss a customized service plan for your factory, don't hesitate to reach out. Our team can also discuss the wide array of replacement filter cartridges we have in stock for purchase to maximize your dust collectors efficiency and performance. For any technical issues you may experience, RoboVent has a dedicated technical support team that is only a call away 24-7.

At RoboVent, we are committed to making your facility a safe and healthy environment for your workers. We look forward to continuing to work with you!

The RoboVent Team



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**SECTION 100**

# ***Important Safety Instructions***

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## Important Safety Instructions

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**Failure to follow all instructions may result in electric shock, bodily injury and/or destruction of the unit.**



**Use of controls, adjustments, or performance of procedures other than those specified herein, may result in electrical shock.**

### IMPORTANT SAFETY INSTRUCTIONS

1. Read all instructions thoroughly.
2. Heed all warnings.
3. Do not block intake or exhaust vents. Keep the exhaust vent free from debris and materials that could restrict airflow. Prolonged restriction could damage the motor and electrical components. Any blockage of the air flow will decrease efficiency of this unit.
4. Refer all service matters to qualified service personnel. Servicing is required when the unit is damaged in any way including the control panel, supply wiring or in the case of excessive filter loading.
5. **Disconnect power before working on the motor or blower wheel. The motor or blower wheel should be disassembled only by a factory authorized technician.**
6. **Risk of serious personal injury or death!**  
Use extreme care to make sure you are never in a position where your body (or any item you are in contact with, such as a screwdriver or test instrument) can accidentally touch the blower wheel.
7. If welding stainless steel, special safety measures need to be followed when maintaining collector. Consult your Safety Director for further information on **OSHA's Hexavalent Chromium Standards.**





SECTION 200

# *Glossary of Terms*



**Autogates/Blast Gates:** Blast gates are gate valves used to focus a dust collection system's vacuum pressure for maximum dust (or other material) extraction at the desired location. Blast gates are positioned near individual pieces of machinery and operate by being, by default, closed — blocking air flow. They are opened as needed to achieve the desired air velocities at the specific inlet point.

**Containment:** This term is used to describe the portion of the dust collector that is collecting particulate for removal and/or disposal. This is typically either a hopper, or a tray.

**Control Panel (RV-3.0):** A RoboVent Control System that controls the Blower and Pulsing functions through an easy to understand Interface. Control the pulse timing and trigger points; Set Filter service alarms; setup Automatic Run schedules. Operate and control the blower speed manually or automatically through the control screen. Monitor Filter pressure and see operation events.

**Damper:** A damper is a valve or plate that stops or regulates the flow of air inside a duct, chimney, VAV box, air handler, or other air-handling equipment. A damper may be used to cut off central air conditioning (heating or cooling) to an unused room, or to regulate it for room-by-room temperature and climate control.

**Delta3:** RoboVent's proprietary Spark Arrestor that utilizes cylindrical force and air patterns to extinguish sparks and prevent them from entering a dust collection system.

**Differential Pressure:** The difference in pressure between the dirty air side of the enclosed plenum and the clean air side of the enclosed plenum. This difference quantifies the amount of loading across the cartridge filters installed in the machine and allows you to monitor and understand when a filter change is necessary. Typically measured in either KPA (Kilopascal) or Inches of Water Column (Notated by SP or WC).

**Fire Suppression System:** A system that is installed onto an industrial machine, e.g. a dust collector, to control a fire from spreading. These systems allow necessary personnel to get to the scene of the event and react appropriately, while using gas or chemical agents in the space the event occurred to limit its immediate damage.

**Hexavalent Chromium:** Hexavalent chromium [Cr(VI)] is one of the valence states (+6) of the element chromium. It is usually produced by an industrial process. Cr(VI) is known to cause cancer. In addition, it targets the respiratory system, kidneys, liver, skin and eyes. Chromium metal is added to alloy steel to increase hardenability and corrosion resistance. A major source of worker exposure to Cr(VI) occurs during "hot

work<sup>1</sup> such as welding on stainless steel and other alloy steels containing chromium metal. Cr(VI) compounds may be used as pigments in dyes, paints, inks, and plastics. It also may be used as an anticorrosive agent added to paints, primers, and other surface coatings. The Cr(VI) compound chromic acid is used to electroplate chromium onto metal parts to provide a decorative or protective coating.

**HMI:** A human-machine interface (HMI) is the user interface that connects an operator to the controller for an industrial system. In the dust collection industry, these interfaces are utilized to connect the operator with the PLC that is controlling the operation of the equipment.

**Hopper:** A container for a bulk material such as grain, rock, or trash, typically one that tapers downward and is able to discharge its contents at the bottom. In the dust collection industry, a hopper is used to contain and funnel collected particulate into a tray or barrel so it can be cleaned out and/or removed from the dust collector.

**OSHA:** The Occupational Safety and Health Administration, an agency of the US government under the Department of Labor with the responsibility of ensuring safety at work and a healthful work environment. OSHA's mission is to prevent work-related injuries, illnesses and deaths.

**Plenum:** an enclosed chamber where a treated substance collects for distribution, as heated or conditioned air through a ventilation system.

**Pulse Cleaning System:** In RoboVent's FlexPro Dust Collectors, dust and fume enters from the side or back of the unit and flows from outside to inside the cartridge filters. The cartridge filters are cleaned by short bursts of compressed air injected through a common manifold that supports individual solenoid valves. The compressed air is accelerated by a special nozzle mounted above the filter cartridge. Since the duration of the compressed-air burst is very short, it acts as a rapidly moving air bubble, traveling through the entire length of the cartridge and causing the surfaces to flex. This flexing of the cartridges breaks the dust cake, and the dislodged dust falls into a storage tray or hopper below. Reverse pulse-jet dust collectors can be operated continuously and cleaned without interruption of flow because the burst of compressed air is very small compared with the total volume of dusty air through the collector. The bursts of air are timed, and controlled by the pressure differential of the filters, as well as by pre-programmed threshold settings within the collectors onboard control system.

## *Glossary of Terms*

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**SafeSensor:** An optional particulate monitoring device that is commonly referred to as a smoke detector. This device, if equipped, alerts your dust collector in the event of a thermal event or bypass. The device is triggered by smoke passing by the photoelectric sensing eye.

**VFD:** A variable frequency drive setup with pressure transmitters to control the speed of the motor on the dust collector. This device regulates the motor speed and increases its speed to compensate for losses occurring within the dust collector, primarily filter loading. This allows the dust collector to maintain a consistent airflow throughout the life of the cartridge filters while also saving energy by eliminating the need to run a collector at full speed with little to no filter resistance.

*SECTION 300*

# *Specifications & Features*

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# Specifications & Features

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## HVE-175-80-1

### Specifications Chart

Weight Full	565 lbs (256.28 kg)
Horse Power	5.5 HP
Maximum Airflow	140 CFM @ 80"wg
Voltage Supply	240 V = 16.8 FLA 480 V = 8.4 FLA 575 V = 7.0 FLA

## HVE-350-80-1

### Specifications Chart

Weight Full	1750 lbs (793.8 kg)
Horse Power	10 HP
Equivalent Filter Area	354 ft <sup>2</sup> (32.89 m <sup>2</sup> )
Maximum Airflow	350 CFM @ 80"wg (9.91 m <sup>3</sup> /min @ 19.91 kPa)
Operating Temperature	10 – 50° C (50 – 120° F)
Cabinet Construction	11-gauge Steel, Polyester Powdercoat
Compressed Air Requirements	Offline Pulse: 12.24 SCFM Online (Dynamic Pulse): 6.35 SCFM 11 m <sup>3</sup> /hr (6.34 SCFM) @ 5.9 bar (85 psi)
Compressed Air Connection	3/4" (19.05mm) NPT Hard Pipe
Voltage Supply	240 V = 28 FLA 480 V = 14 FLA 575 V = 11 FLA
Control Voltage	24 VDC

## Specifications & Features

### HVE-550-80-2

#### Specifications Chart

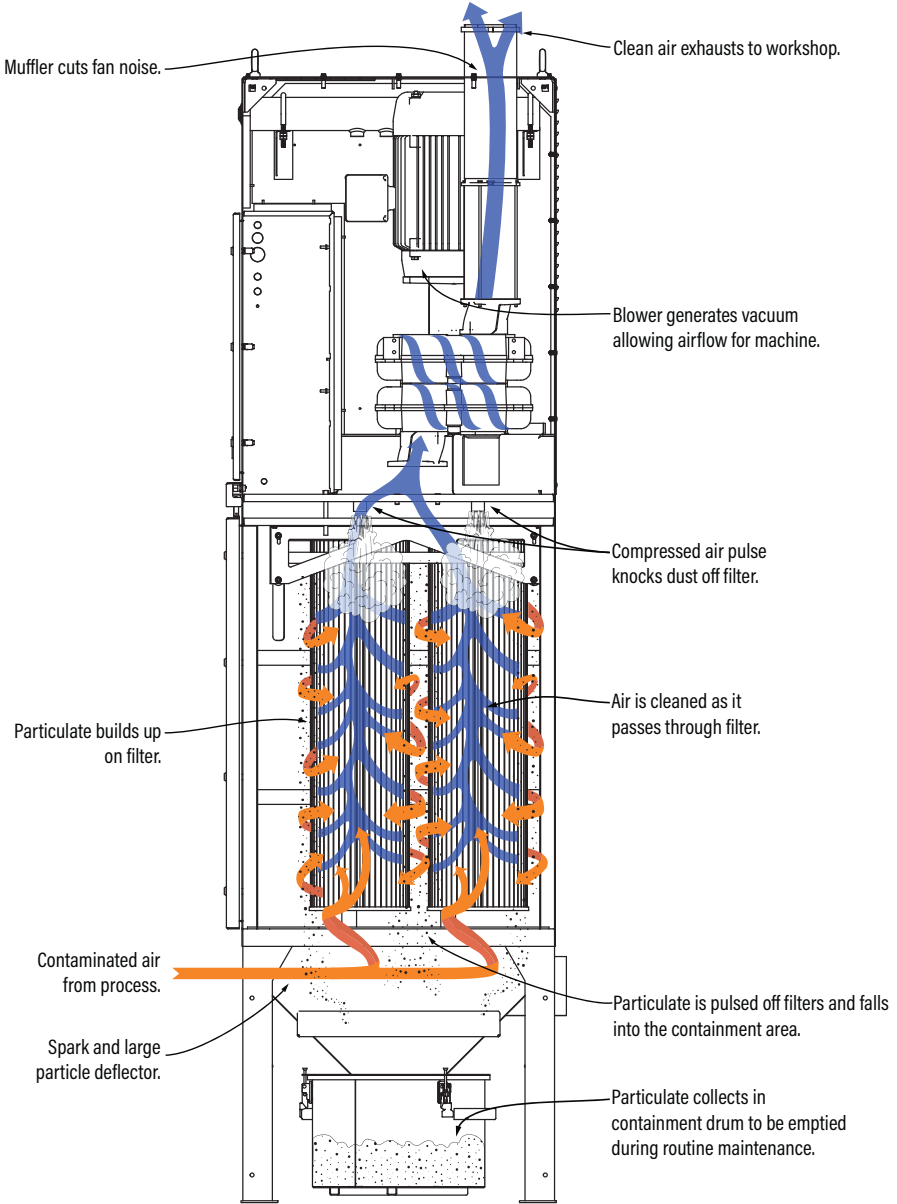
Weight Full	2250 lbs (1020.6 kg)
Equivalent Filter Area	708 ft <sup>2</sup> (65.8 m <sup>2</sup> )
Horse Power	15 HP
Maximum Airflow	520 CFM @ 80"wg (884 m <sup>3</sup> /hr @ 20 kPa)
Operating Temperature	10 – 50° C (50 – 120° F)
Cabinet Construction	11-gauge Steel, Polyester Powdercoat
Compressed Air Requirements	Offline Pulse: 12.24 SCFM Online (Dynamic Pulse): 6.35 SCFM 11 m <sup>3</sup> /hr (6.34 SCFM) @ 5.9 bar (85 psi)
Compressed Air Connection	3/4" (19.05mm) NPT Hard Pipe
Voltage Supply	240 V = 42 FLA 480 V = 21 FLA 575 V = 17 FLA
Control Voltage	24 VDC

### HVE-950-80-2

#### Specifications Chart

Weight Full	3250 lbs (1474.2 kg)
Horse Power	40 HP
Equivalent Filter Area	1024 ft <sup>2</sup> (95.1 m <sup>2</sup> )
Maximum Airflow	1050 CFM @ 70"wg (595 m <sup>3</sup> /hr @ 17 kPa)
Operating Temperature	10 – 50° C (50 – 120° F)
Cabinet Construction	11-gauge Steel, Polyester Powdercoat
Compressed Air Requirements	Offline Pulse: 12.24 SCFM Online (Dynamic Pulse): 6.35 SCFM 11 m <sup>3</sup> /hr (6.34 SCFM) @ 5.9 bar (85 psi)
Compressed Air Connection	3/4" (19.05mm) NPT Hard Pipe
Voltage Supply	240 V = 104 FLA 480 V = 52 FLA 575 V = 41 FLA
Control Voltage	24 VDC

## Airflow Schematic





## Components

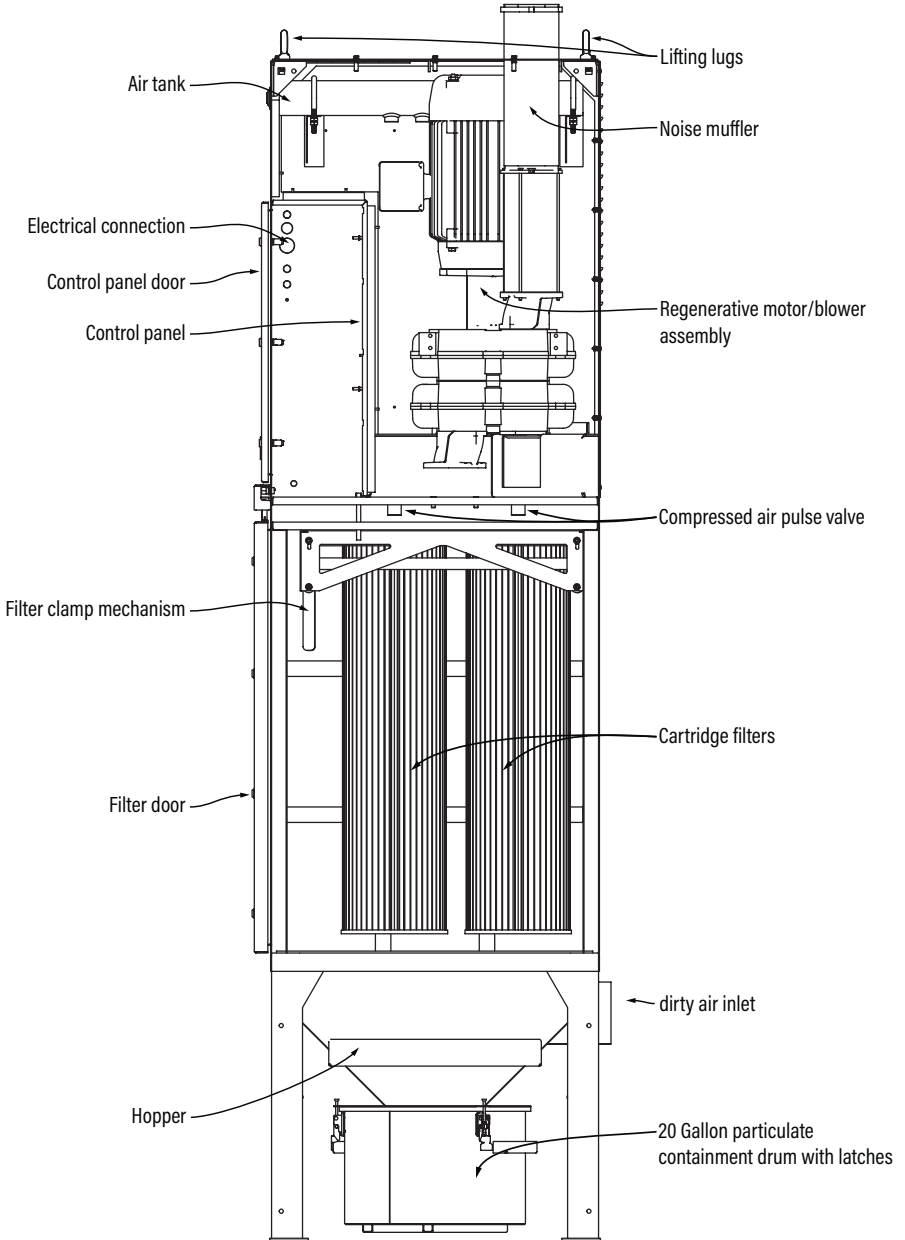




FIGURE 1

**Features****1. High Performance Blower Design**

Each RoboVent FlexPro Series Collector comes with a high output airfoil blower and direct drive motor. This highly efficient blower design and direct drive system maximizes the airflow (CFM) delivered by the motor power requirements. (see Figure 1).

**2. Front Load System**

Cartridge filters are easily accessible through an oversized front door. The cartridge filters are mounted on a robust filter yoke, and they are secured with a threaded handle. This makes it easy to change and replace filters. (See Figure 2)



FIGURE 2

**3. Pulse Filter Cleaning System**

RoboVent filter cleaning systems utilizes powerful compressed air pulses for unmatched filter cleaning. The on-line and off-line cleaning cycles are pre-programmed for optimal efficiency but can be customized for changes in usage patterns. (see Figure 3).

**4. Pulse Cleaning Valves**

The RoboVent FlexPro Series Collectors utilize a special cleaning cone which optimizes the cleaning pulse by ensuring that the developed overpressure in the filter is even throughout the filter element. (see Figure 3).

**5. Sturdy 7 and 11 GA Reinforced Collector Housing Construction**

This heavy-duty construction secures a lifetime of industrial use. Seams are welded and sealed to assure there are no leaks or cracks that could contaminate the facility air system.



FIGURE 3

**6. Acoustic Motor Plenum (HVE-950-80-2 Only)**

High-density sound materials and Bass Trap Acoustics have been implemented as part of the blower compartment. The acoustically designed plenum greatly reduces motor and blower noise levels and decreases ambient noise into the facility.



FIGURE 4

## 7. Control Panel

The Modular Control panel contains all the components that operate the FlexPro. Everything is contained within the enclosure allowing the controls to be mounted in various location configurations on or near the Machine. (see Figure 4).

## 8. ePad Control System:

ePad control system allows control of all aspects of the collector's functions including the blower, filter differential pressure and filter pulsing system. Preset from the factory with settings to cover most applications with optimal pulsing for efficient dust removal. ePad Control System allows for the user to adjust the pulsing schedule if needed due to changes in production or increased usage and Auto or Manual start of the blower. (see Figure 5)



FIGURE 5

## 9. Large Capacity Dust Tray/Optional Hopper

RoboVent FlexPro Series Collectors come standard with a 20 gallon steel drum (see Figure 6). An optional 55 gallon drum is available for heavy dust production applications or extra capacity to reduce frequency of dust clean outs. Both are designed to capture and store particulate pulsed off the filter cartridges and minimize "re-entrainment." (Re-entrainment is the term used for picking up dust that has already been removed from the filter and re-depositing it on the filter.)

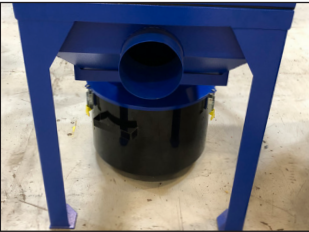


FIGURE 6

## 10. SafeSensor Particulate Monitoring Device (option)

If equipped, the SafeSensor particulate monitoring device detects a leak past your filters. If a leak occurs, the system shuts the equipment down and sets off an alarm. The SafeSensor also monitors smoke, and in case of a thermal event, will automatically shut down the motor and blower. It will also change the andon light to red and sound a high intensity audible alarm. (see Figure 7).



FIGURE 7



FIGURE 8

### 11. A15 PleatLock Filters (Standard, alternate medias are available)

The A15 PleatLock filter media is RoboVent's high quality cellulose/polyester blend that provides superior filtration efficiency and long life in welding applications. Every filter is fire retardant and uses Nanofiber technology to achieve a MERV 15 efficiency rating. A15 PleatLock filters are highly-efficient for particulate down to 0.1 micron in size. (Figures 8).

### 12. VFD: Variable Frequency Drive

The VFD system uses a sensor that constantly monitors the airflow. Using a VFD, it automatically adjusts the RPM of the motor to compensate for filter loading. This reduces energy peaks, resulting in 20%-30% energy savings, and extending filter life. The VFD is key for a system that is quieter, can operate at maximum operating efficiency and saves you money. (see Figure 9).



FIGURE 9

### 13. AutoSaver Auto On/Off (option)

The AutoSaver feature (if equipped) allows your RoboVent FlexPro Series air filtration system to rest when not needed, saving energy dollars. This also allows the unit to enter off-line pulsing mode to reduce filter loading if filter pressure is above threshold limits. The AutoSaver turns the system on when cutting, welding, or process operations start and turns it off after the operation is complete. (see Figure 10).



FIGURE 10

**FIGURE 11**

#### **14. Supprex-200 Fire Suppression System (option)**

The Supprex-200 Fire Suppression System is engineered to our exacting standards for safety and effectiveness. If heat is detected, FM-200 gas (Figure 11) is released to suppress the fire either directly at the heat source through specialized heat sensitive tubing, or indirectly into the cabinet through a special discharge nozzle(s). With the Supprex-200 System there is little or minimal clean up after a fire as it is a clean agent.

The effectiveness of this suppression system is greatly enhanced with the safe sensor smoke detection that is standard on all RoboVent FlexPro collectors. Once smoke is detected, the unit goes into an emergency alarm state, immediately shutting off the blower and activating the motorized dampers to a closed position. This prevents air from continuing to flow through the system and maximizes the hold time of the FM-200 gas in the event the heat rises enough in the cabinet to trigger its release. An optional ABC-Dry Chemical suppression system is also available.



*SECTION 400*

***Receiving &  
Inspection***

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## **Receiving & Inspection**

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### **Receiving**

RoboVent equipment is typically shipped on skids or direct loaded. The number of skids will vary, depending the type, size and accessories ordered. The skids or direct loaded equipment are too heavy to lift by hand. The items will need to be unloaded by an industrial forklift, crane, or overhead crane.

### **Inspection**

A visual inspection of your equipment should be performed before it is removed from the truck. Dents, scratches, and other damages should be noted on the shipping documents, and also photographed. The structural integrity of the housing can be adversely affected by large dents. RoboVent should be immediately notified of any structural damage to your equipment. It is the purchaser's responsibility to file shortage reports and damage claims with the carrier and with your RoboVent Representative. The carrier is responsible for any damage to the equipment while it is in transit unless specific arrangements are made otherwise.

Compare the number of items received against the carrier's bill of lading. Inspect all items for apparent damage. Immediately report any shortages or obvious damage to the carrier and to your local RoboVent Representative, call the factory at **1-(888)-762-6836**, or email: **customer.service@robovent.com**.

When all skids are completely unpacked and uncrated, check all items received against the packing lists. Further inspect the unit and components for hidden damage. Again, report any shortage or damage to the carrier and to your local RoboVent Representative.

The filter cartridges are typically shipped installed in your collector. Be sure to check them for alignment, as they may have shifted during transit. If they have shifted, it is possible that damage may have been done. Remove all filter cartridges and inspect thoroughly.

Note: Do not return any damaged components without first contacting your RoboVent Representative to obtain a Returned Goods Authorization (RGA).

### **Small Parts**

Carefully inspect all packing material before it is discarded, to be sure that no small parts have been missed.

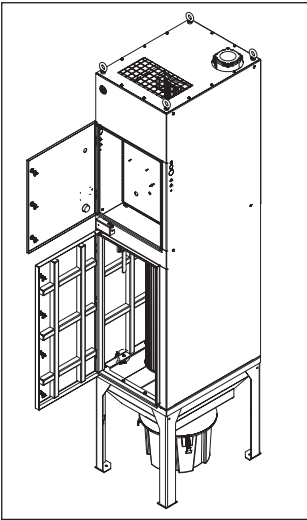


*SECTION 500*

# *Installation*

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**SECTION 500**  
**Installation**



**FIGURE 12**

**Process for Locating**

Inspect packaging and machine for missing parts or shipping damage as described in the **“Receiving & Inspection”** section.

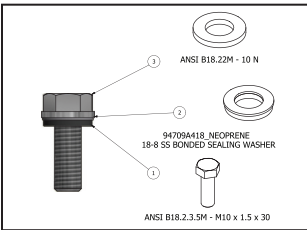
Use the following steps to unpack and locate:

1. Remove packing material and crating from sides.
2. Use a crane attached to lifting points to remove from pallet.
3. Set machine in place with forklift or crane. Connect to process(es) with high-vacuum ducting.
4. Adjust airflow to ensure effective fume capture. Refer to operating instructions.

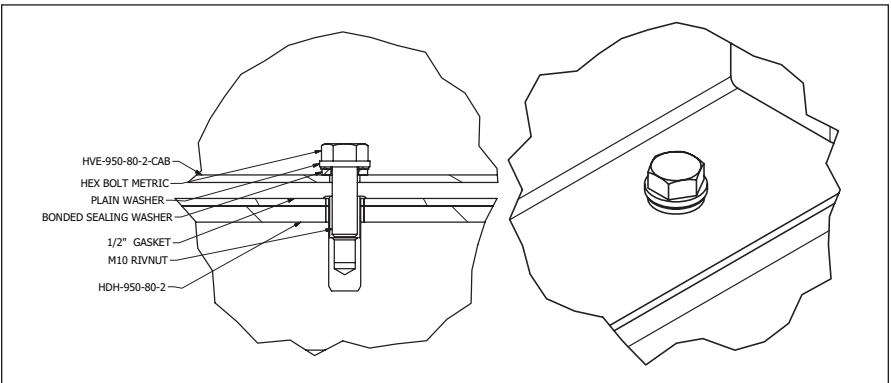
**Setting the Unit in Place**

The first step is to set the hopper in the designated area. Floor will need to be concrete (at least 4" thick) and fairly level. Bolt hopper to the concrete using concrete anchors (provided in install hardware kit). Make sure hopper is level and use shims as necessary.

Set unit onto top of hopper using crane or forklift (Figure 12). Open the filter door and remove filter to provide access to all bolt areas. Using provided bolts, washers and sealing washers bolt cabinet to hopper (Figure 13 and 14) through the filter door. Hook-up compressed air and electrical and mount HMI and your HVE H-Vac machine is ready to go!



**FIGURE 13**



**FIGURE 14**

*SECTION 600*

# *Start-up/ Commissioning*

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## ***Start-up/Commissioning***

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Once your RoboVent collector has been assembled at your facility, contact your RoboVent Project Manager to get the start-up/commissioning and balancing of your system scheduled. Dependent on the scope of the contract, this may or may not be included in your projects scope of work as it is a small additional charge.

In order to schedule start-up/commissioning and balancing, the following items must be completed:

1. The RoboVent collector must be assembled
2. The electrical must be connected to the collector
3. The compressed air must be connected to the collector
  - a. The compressed air line from the shop must go through the air regulator that RoboVent provides before it is connected to the collector.
  - b. Clean, dry air is essential for operation.
4. The ductwork from the RoboVent collector to the cell/station(s) must be installed and connected. Make sure the muffler/silencer is installed.

**Commissioning Your Unit**

The following items checked during the start-up/commissioning process, as applicable to your specific layout:

1. Check the electrical connection to the collector and ensure there are no loose wires.
2. Check the compressed air that was hooked-up to the RoboVent supplied regulator and confirm it is clean, dry, and set to 85 psi.
3. Check the blower rotation on each motor to confirm it is spinning correctly.
4. If commissioning a multi-cabinet installation, make sure the communication cable between cabinets are connected.
5. Perform basic system check to ensure it is functional:
  - a. Check to ensure blower turns on when touched on HMI
  - b. Perform a valve check (See maintenance guideline for more information on how to perform this check) to ensure that each pulse valve is operational.
6. Check to ensure the fire suppression (FM200) tubing is hooked up correctly, if applicable.
7. Check the FM200 gauge to ensure your suppression tank is charged, if applicable.
8. Check that the filter differential tubes (running from the control panel to the reading ports) are correctly connected; ensure the filter pressure is reading correctly on the HMI control screen.
9. Check to ensure every bolt was installed during the collector assembly.
10. Check and confirm operation of other custom equipment options (ex: Intake Dampers, etc.).
11. Check the ductwork and ensure it is connected and sealed correctly.
12. Check the filter and control door gaskets to ensure consistent seal during operation.
13. Check and ensure collector seams were properly sealed during the assembly process.
14. Verify and record the velocity (FPM) through the Delta3 spark arrestor, if applicable.
  - a. Specific velocity range is required through the Delta3 to prevent sparks from getting through.

# Start-up/Commissioning

15. Verify and record the velocity (FPM) and airflow (CFM) for the entire system
16. Set and record the hertz that the VFD is set at, if applicable.
  - a. The VFD will be set by using an airflow meter to measure and confirm the velocity (FPM) and airflow (CFM) within the ductwork.
17. Check the measured velocity (FPM) and airflow (CFM) vs. the designed velocity (FPM) and airflow (CFM). Verify the CFM at the fume guns.
18. Photos will be taken of the RoboVent Collector, RoboVent HMI, RoboVent Control Panel, Delta3 spark arrestor if applicable, ductwork install, and the customer's cell.
19. Record any parts that need to be fixed or replaced, if it cannot be done at that time.

**Congratulations! Your unit is now fully commissioned and ready for operation.**



*SECTION 700*

**System  
Balancing**

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Before fully releasing your new RoboVent into production, RoboVent recommends a system balance. Balancing is recommended to ensure the designed velocity and airflow is being pulled from each drop on the system.

The following process is a high-level view of how to balance an industrial ventilation experts. Balancing should only be completed by trained ventilation experts. If you interested in having your system(s) balanced or rebalanced, contact RoboVent at 1-888-ROBOVENT.

1. Prior to starting the Balancing Procedure ensure that all autogates/manual blast gates are fully open for the entire system.
2. Following the balancing print (engineering drawing showing airflow requirements at each air pick-up point on your system), locate the drop with the highest pressure draws.
3. Balancing should start at the highest static point.
4. Record the elevation of the plant, the temperature within the ductwork, and the static pressure within the ductwork. If these values stray from the standard (Standard: Elevation > 1000 FASL; Temperature > 90 F; Static Pressure 20" w.g.) you must do a density factor correction.

NOTE: To properly balance a high pressure system you **must** take SP into consideration when calculating the density factor because the system operates above 20" w.g.

5. Starting with the highest static point adjust the VFD until the required CFM is achieved (Blast Gate must be fully open).
6. Move to drop number 2 on the balancing print. Adjust the blast gate until the desired CFM is reached.
7. Repeat for the remaining drops in descending order.
8. Record all values (velocity and static pressure at each drop).
9. Once complete go back to the first drop and re-check the system. If the measurement is within 15% of the original value obtained at that location the balancing is complete. If the value strays more than 15% from the original value, then the system needs to be checked for changes, and/or re-balance the system.



**SECTION 800**

***Operating your  
FlexPro Collector  
using the  
ePad Controls***

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# ePad Controller Operation



## System Control Page

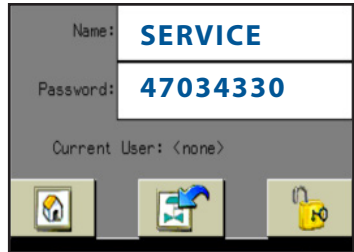


### System Control

Enables/Disables the system for blower control. "Off" is under security. A login is required to turn unit off.

### Login

Allows customers to login with their provided User Name and Password to change parameters.



### Auto Control

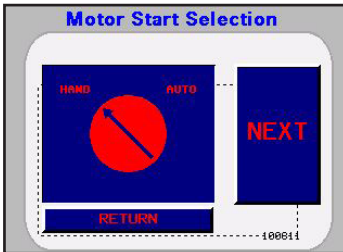
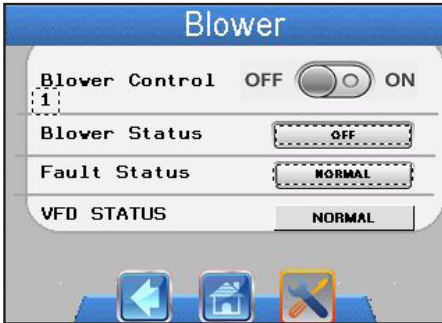
Enables RoboVent unit to be turned on or off from a connected machine.



# ePad Controller Operation



## Blower Control Page



### Blower Control

Enables/Disables the blower to run the collector.

### Blower Status

Message box which shows the current status of the blower.

### Fault Status

Message box which shows the current condition for the Motor overload.

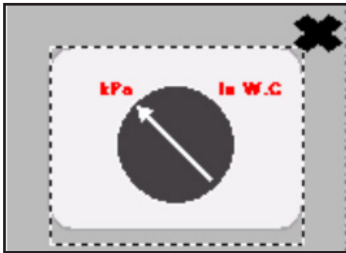
### VFD Status

Message box which shows the current condition of the Variable Frequency Drive (VFD). Also allows user to reset when there is a fault.

# ePad Controller Operation



## Pulsing Control Page



### Maint. Pulse Select

Allows User to switch from automatic pulsing and maintenance pulse down mode.

### Auto Online Pulse

Message box which shows the current status of the Auto Online Pulse Cycle (On/Off).

### Auto Offline Pulse

Message box which shows the current status of the Auto Offline Pulse Cycle (On/Off).

### Filter Pressure

Message box which shows the current status of Filter Pressure in the collector.

\*Use the Arrow button to change readout from kPa in W.C.

# ePad Controller Operation



## Unit Hours Page



### Total Machine Hours

Display showing the accumulated machine hours.

### Hours Since Service

Display showing the accumulated machine hours since service has been conducted on the collector.

### Service Hours Reset

Service Hours reset button. When pushed resets the Service Hours Meter to zero.

# ePad Controller Operation



## Service Messages Page



### Filter Service Message

Informs the operator that the filters need maintenance.

### Suppression Tank Message

Informs the operator that the Suppression Tank needs to be serviced.

### Collection Drum Message

For optional barrel sensor, informs the operator that the collection drum is full and needs to be emptied.

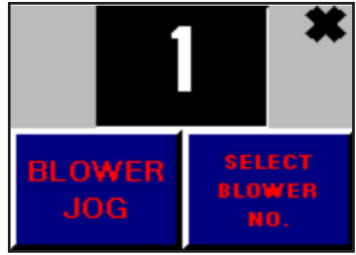
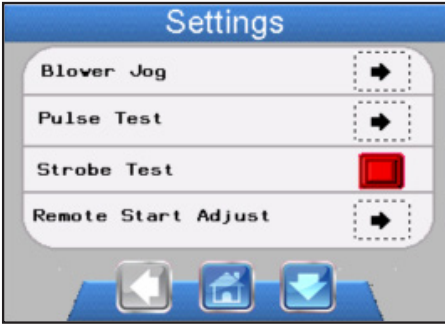




# ePad Controller Operation

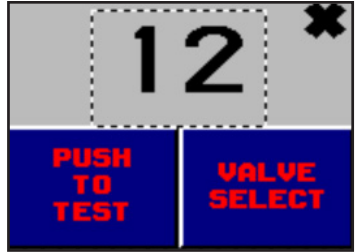


## System Settings Page



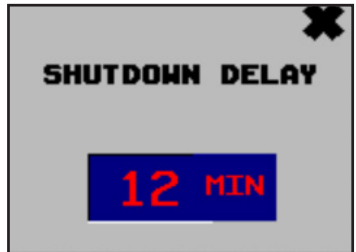
### Blower Jog

Momentary contact to test blower rotation, etc.



### Pulse Test

Momentary contact that energizes pulse valve. Helpful for diagnostics.



### Shut Down Delay

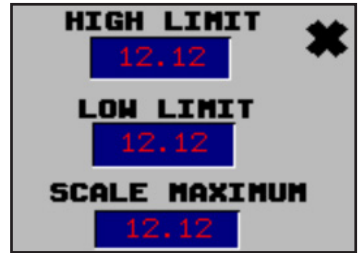
Amount of Time (in minutes) equipment continues to run after the remote start signal ends.



# ePad Controller Operation



## System Settings Page



### Bar Graph Control

**High Limit:** Controls the position of the top pointer.

**Low Limit:** Controls the position of the lower pointer

**Scale Maximum:** Sets the overall range of the display. Usually set at 4.00.

# ePad Controller Operation



## System Settings Page



### Pulse Control Settings

There are (3) different Pulse Modes. Online (while running), Offline (after shutdown) and maintenance ( at select times to maximize filter life).

**Online:** Filters are pulsed while unit is running.

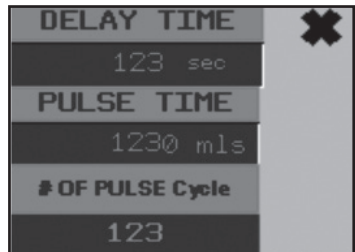
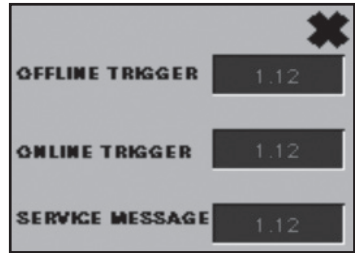
**Offline:** Filters are pulsing after the blower(s) are shut down

**Maintenance:** Filters are pulsed for an extended period, for maximum cleaning.

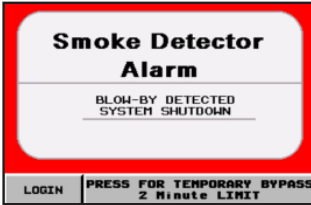
**Delay Time:** Amount of time (in seconds) between pulses.

**Pulsing Time:** Amount of time (in milliseconds) that pulse valve is open. Usually set at 200 msec. (Note: The right hand zero is fixed, so enter 200 for 200).

**Post Cycles:** Number of times each filter bank is pulsed after blower shutdown.



## Warning and Alert Messages



### Alarm Screen- Blow-By Detected

This feature is very important. It detects both when filters are 'leaking' as well as if there is smoke present.

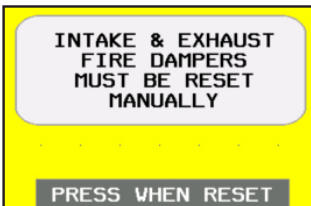
**Temporary Bypass:** Provides for unit operation, Bypasses detector for two minutes.



### Alarm Screen- Optional Equipment

Indicates the fire suppression tank is low or empty. Unit will operate without tank being full but it is not advised.

**Proceed Without Servicing:** When proceed without servicing button is pressed, screen is switched to screen #2.



### Alarm Screen- Optional equipment

Indicates the fire dampers have been deployed.

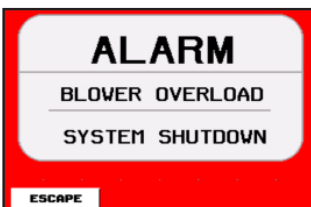
Unit will NOT operate properly until dampers are reset.

Only press **RESET** button when dampers have been reset.



### Alarm Screen- Emergency Stop Tripped

Indicates tripping of an E-stop. Unit controls are completely shutdown.



### Alarm Screen- Blower Overload

Electrical power overload Escape; transfers to screen #2.



*SECTION 900*

# *Maintenance*

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### Safety

When performing maintenance on your RoboVent, PPE is required to minimize exposure to metal dust. At a minimum it is recommended to wear disposable coveralls with hood, non-porous gloves, P100 filtered respirator and safety goggles. Consult your company's policies to develop MSDS and PPE related documentation and procedures.

Dust collected by your machine may be hazardous. Toxicity testing must be performed by your local waste service provider and dust must be disposed of in accordance with local, state and federal law.

When ladder or lift is required to access the machine disconnect and spark arrestor(s) during service, use proper fall protection equipment and follow all OSHA safety regulations.

### Special Safety Note

Stainless steel processes create a hexavalent chromium (hex chrome) dust which is a known carcinogen. Special care should be taken when servicing a in area that processes stainless steel. For more information regarding Hex Chrome, please visit OSHA's section on Occupational Safety and Health Standards-Toxic and Hazardous Substances-Chromium (VI).



## SECTION 900

# Maintenance



FIGURE 15

### Monthly Maintenance

On a monthly schedule, perform the following steps and checks to ensure proper machine function and performance.

Tools required for maintenance: (see Figure 15).

1. 8mm wrench
2. Lock Out set
3. Clean rag(s) and an industrial cleaner
4. Industrial cleaning brush (with extension is ideal)
5. Industrial vacuum with HEPA filter
6. Trash bags for disposal of particulate from cleaning process. Follow proper protocol for discarding contaminated waste.
7. Ladder or lift depending on unit location and placement



FIGURE 16

### Maintenance Procedure:

1. Start the machine and record the starting filter differential pressure once the blower reaches full speed. (see Figure 16).
2. Turn blower off (not system off-leave system on). (see Figure 17).
3. Offline pulse will start. Leave machine for a half hour to allow pulsing to finish. This will send a jet of pressurized air through the filters to knock the dust built up on the filters and into the dust containment. Allowing enough time for this procedure is necessary to ensure filters are thoroughly cleaned thus improving filter life. (see Figure 18).

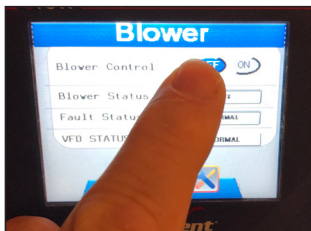


FIGURE 17



FIGURE 18

**SECTION 900**  
**Maintenance**



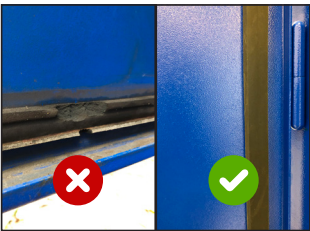
**FIGURE 19**



**FIGURE 20**



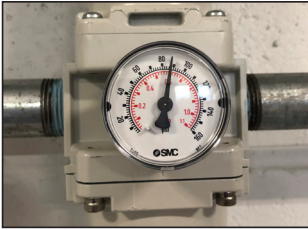
**FIGURE 21**



**FIGURE 22**

4. Check the function of each pulse valve from the diagnostics screen. Listen for the valve to fire or for air leaks. Failed pulse valves will fail open draining the air supply. If this happens, turn off the air supply and contact RoboVent tech support (1-888-762-6836) for assistance. (see Figure 19).
5. Ensure the system is off on the HMI (Figure 20). Then, turn power to the machine completely off at the disconnect for the unit. This is typically located near the HMI. You can trace the incoming power wires back to the disconnect if in doubt. Follow Lock out Tag out procedures to ensure unit is de-energized before opening it up. (see Figure 21).
6. Inspect inside filter cabinet for build-up. Brush the interior walls pushing the dust down into the containment area. **DO NOT BRUSH THE FILTERS.** Brushing the filters will cause unseen damage severely shortening the filter life and efficiency.
7. Visually inspect filter door gasket. Any damaged, torn, or loose gasket will need to be replaced. (see Figure 22).
8. Close filter door.
9. Open dust tray, record percentage full for reference to help estimate the frequency needed for proper maintenance.
10. Visually inspect machine to ensure there are no signs of leakage, and that the latches and hinges are tight.
11. Confirm air pressure on filter regulator located at rear of unit is set to 85 psi. Supplied air should be clean and dry. Oil and/or water in the supplied air will damage the filters. Check the regulator bowl for any build up. Blow out any build up found by depressing the button on the bottom. (see Figure 23).
12. Ensure all doors and access panels are closed and dust tray is secure.
13. Check floor for any dust that may have spilled, clean as needed.





**FIGURE 23**



**FIGURE 24**

14. Remove lock-out and turn power to machine back on at the disconnect. Start blower, listen for any abnormal vibration or excess noise.
15. Record differential pressure of filters once the machine is at full speed.
16. If the unit is equipped with a smoke detector (see Figure 24) call RoboVent tech support (1-888-762-6836) for assistance and instructions to locate and test.
17. Now that all checks have been completed, return to normal 'ready' condition by turning blower off (indicated by a steady blue light).



**FIGURE 25**

### Filter Change

Filter condition is the key to maintaining clean air and an efficient dust collector. Filters get loaded with particulate and either need to be pulsed cleaned or replaced. Filters should be replaced when the running filter pressure reads above 3 kPa after a full offline pulse cleaning.

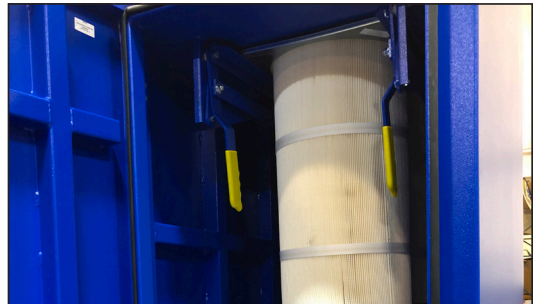
1. Turn blower and system off. (see Figure 25).
2. Turn power to the machine off using disconnect on the control panel door. Lock out. (see Figure 26).
3. Lay out protective floor covering below door area for simplified clean-up.
4. Open filter door. Brush any built up debris from the door area into the hopper. (see Figure 27).
5. Unlatch filters by pulling the two handles on either side of each row toward you. (see Figure 28).
6. Remove filters individually, properly containing each filter as they are removed. Dispose of according to local regulations and according to processes determined as a result of dust toxicity testing.
7. Use a long-handled brush to sweep inside wall of cabinet and debris down into drum. (see Figure 27).
8. Take care not to get dust into the clean air side.
9. Change the drum as detailed earlier in this maintenance section.



**FIGURE 26**



**FIGURE 27**



**FIGURE 28**

## SECTION 900 Maintenance



FIGURE 29



FIGURE 30

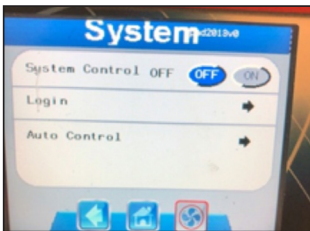


FIGURE 31

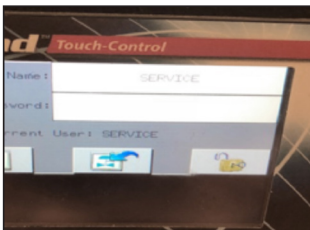


FIGURE 32

- Slide new filters into track and clamp down. Make sure filters are fully toward the rear by pushing on the top pans; the first filter should be behind the tabs in front of each row, marked with a label. Push levers forward to clamp and seal. Note – Improperly seated filters will cause dust to bypass into the clean air stream. (see Figure 29).
- Visually inspect filter door gasket. Replace any loose or damaged gasket.
- Close filter door.
- Turn power to machine back on.
- Turn system on and start blower.
- Record new filter differential pressure. The blower will need some time to ramp up to speed. Once CFM and pressure have stabilized, the value can be recorded.
- Reset the service hours on the control screen. (see Figure 30). You will need to login to reset.

To login:

**User Name: SERVICE**  
**Password: 4703430**

- Press the System icon, then on the System page, press the arrow to the right of Login. (see Figure 31).
- Press Name: enter user name, all caps, to ensure all caps you should see a green bar over the Cap button on left, third button down.
- After entering the User Name: **SERVICE**, press enter. (see Figure 32).

## SECTION 900

# Maintenance



FIGURE 33

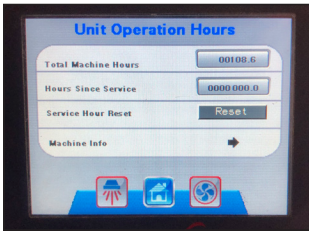


FIGURE 34

- d. Press Password, press the 123 button, third button down on right side. Enter password: **4703430**, press enter. (see Figure 33).
  - e. This will return you to the Name/Password page. Press the unlocked padlock with the key in it(on right side) to unlock the system. If entered correctly, in the center of the page, Current User will change from <none> to SERVICE depending on what you entered.
  - f. System will notify if data was incorrect.
  - g. Once logged in, press home button. Then Machine hours, then reset to reset service hours
- Questions Please call us at 586-698-1800 ask for tech support when in front of the touch screen and I will be happy to review your settings and help change them.
17. Return to normal 'ready' condition by turning blower off and making sure system is still on (indicated by a blinking green light). (see Figure 34).



FIGURE 35

### Motor Greasing

Motor bearing greasing frequency, type of lubrication and amounts will vary depending on the type and size of the motor in the unit. For more information, please contact RoboVent Tech Support at **(1-888-762-6836)** or email **customer.service@robovent.com**. Motor manuals can be sent upon request. As a general rule, RoboVent recommends greasing all motors over 20hp once annually. (see Figure 35).



FIGURE 36

### Fire Suppression Inspections

#### Dry Chemical: Monthly Inspection

Inspection by the owner or end user should verify the following:

1. The Suppression Unit is in its proper location as installed by the factory or factory certified technicians.
2. The Manual Actuators are unobstructed.
3. The Suppression Unit shows no physical damage or condition that might prevent operation.
  - a. This includes inspecting the detection tubing in the hazard area for abrasion, distortion, cuts, or dirt accumulation.
4. The Pressure Gauge is in the operable range. (see Figure 36).
5. The Nozzle Blowoff Caps are intact and undamaged. (see Figure 37).
6. Neither the Protected Equipment nor the Hazard has been replaced, modified, or relocated.

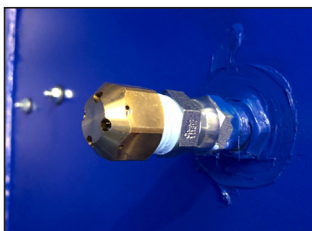


FIGURE 37



FIGURE 38

**Dry Chemical: Semiannual Inspection**

Semiannual Inspection is to be performed only by a Certified Firetrace Distributor.

1. Check to see that the hazard has not changed.
2. Inspect detection/actuation tubing, Manual releases, discharge piping, nozzles, signals, and all other auxiliary equipment.
3. Verify that the agent distribution piping is not obstructed.

**Dry Chemical Powder**

Examination of the Dry Chemical shall be conducted at an Authorized Firetrace Service Location at least once every 6 years. The powder will be examined for caking and may require replacement.

**FM-200****Monthly Inspection**

1. Ensure the Suppression Unit is in its proper location as installed by the factory or factory certified technicians.
2. Ensure the tank shows no physical damage or condition that might prevent operation.
  - a. This includes inspecting the detection tubing in the hazard area for abrasion, distortion, cuts, or dirt accumulation. (see Figure 38).
3. The pressure gauge is in the operable range. (see Figure 36).
4. The Nozzle Blowoff Caps are intact and undamaged. (see Figure 37).
5. Neither the Protected Equipment nor the Hazard has been replaced, modified, or relocated.

### **Annual Inspection**

Annual Inspection is to be performed only by a Certified Firetrace Distributor.

1. Remove the cylinder from the installation as follows:
  - a. Close the ball valve by turning the ball valve lever clockwise to the "OFF" position
  - b. Disconnect the detection tubing at the ball valve
2. Note: There will be a loss of nitrogen pressure out of the tubing
  - a. Disconnect the copper tubing and fittings from the cylinder valve discharge port(s)
  - b. Immediately install the safety plugs(s) into the valve discharge port(s)
  - c. Remove the cylinder from the bracket
2. Weigh the cylinder. Compare the measured weight with the weight found on the cylinder nameplate. If the container shows a loss in agent quantity of more than 5 percent or a loss in pressure (adjusted for temperature) of more than 10 percent, the cylinder shall be refilled or replaced.
3. Remove the nozzle(s) and inspect for obstructions. Reinstall the nozzles.
4. Reinstall the cylinder and re-pressurize the detection tubing with nitrogen following the applicable procedures outlined in Section 5.

# VFD Maintenance Procedure

## Periodic Inspection of VFD

Check the following items during periodic maintenance:

- The motor should not be vibrating or making unusual noises.
- There should be no abnormal heat generation from the Drive or motor.
- The ambient temperature should be within the Drive specification (-10°C to 40°C (14°F to 104°F)).
- The output current value shown in parameter U1-03 should not be higher than the motor rated current for an extended period of time.
- The cooling fan in the Drive should be operating normally.

Always turn OFF the input power before beginning inspection. Confirm that the digital operator indicators on the front cover have all turned OFF, and then wait an additional five minutes before beginning the inspection. Be sure not to touch terminals immediately after the power has been turned off. Doing so can result in electric shock.

**WARNING:** Prior to removing any protective cover or wiring any part of the Drive, remove all power sources, including main input power and control circuit power. Wait a minimum of 5 minutes after power removal, before removing any cover. The charge lamp located within the Drive should be off prior to working inside. Even if the charge lamp is off, one must measure the AC input, output, and DC Bus potential to insure safe levels prior to resuming work. Failure to adhere to this warning may result in personal injury or death.

**Table 8.1** Periodic Inspection With NO Power Applied

ITEM	INSPECTION	CORRECTIVE ACTION
External terminals, mounting bolts, connectors, etc.	Are all screws and bolts tight?	Tighten loose screws and bolts firmly.
	Are connectors tight?	Reconnect the loose connectors.
Cooling fins	Are the fins dirty or dusty?	Clean off any dirt and dust with an air gun using clean and dry air at a pressure between 55-85 psi.
Control PCB Terminal PCB Power PCB Gate Drive PCBs	Is there any conductive dirt or oil mist on the PCBs?	Clean off any dirt and dust with an air gun using clean and dry air at a pressure between 55-85 psi. Replace the boards if they cannot be made clean.
Input Diodes IPMs Output Transistors	Is there any conductive dirt or oil mist on the modules or components?	Clean off any dirt and dust with an air gun using clean and dry air at a pressure between 55-85 psi.
DC bus capacitors	Are there any irregularities, such as discoloration or odor?	Replace the capacitors or Drive.

Apply power to the Drive and conduct the following inspection.

**Table 8.2** Periodic Inspection With Power Applied

ITEM	INSPECTION	CORRECTIVE ACTION
Cooling fan(s)	Is there any abnormal noise or vibration, or has the total operating time exceeded 20,000 hours. Check UI-40 for elapsed cooling fan operation time.	Replace Cooling Fan



# VFD Maintenance Procedure

## Preventative Maintenance of VFD

Table 8.3 Preventative Maintenance				
INSPECTION POINT	ITEM	CHECK POINTS	EVERY 3-6 MONTHS	YEARLY
General	Environment	Ambient Temperature	<b>X</b>	
		Humidity	<b>X</b>	
	Equipment	Dust	<b>X</b>	
		Harmful Gas	<b>X</b>	
		Oil Mist	<b>X</b>	
	Equipment	Abnormal vibration or noise	<b>X</b>	
	AC Power Supply	Main circuit & control voltage	<b>X</b>	
AC Power Circuit & Devices	Conductors & Wire Connections	Loose lugs, screws & wires		X
		Hot spots on parts		X
	Corrosion		X	
	Bent conductors		X	
	Breakage, cracking or discoloration		X	
	Check spacing		X	
	Transformers & Reactors	Discoloration or Noise	<b>X</b>	
	Terminal Blocks	Loose, damaged		X
	DC Bus Capacitors	Leakage		X
		Ruptures, broken, expansion		X
		Capacitance & insulation resistance		X
	Relays & Contactors	Noisy		X
		Contact discoloration		X
	Soft Charge Resistors	Cracked		X
		Discoloration		X
Control Circuits	Operation	Speed reference voltage/current		X
		I/O contact operation		X
Cooling System	Cooling Fans/Fins & Heatsink	Abnormal fan noise	<b>X</b>	
		Loose connections	<b>X</b>	X
		Free of accumulation		
Keypad/Display	Digital Operator	LEDs	<b>X</b>	
		Monitor display values	<b>X</b>	
		Key functionality		X
		Clean		X

If the Drive is used under the following conditions, it may be necessary to inspect more often:

- High Ambient temperatures, humidity or altitudes above 3,300 feet
- Frequent starting and stopping
- Fluctuations of the AC power supply or load
- Excessive vibration and/or shock loading
- Poor environment, including dust, metal particles, salt, sulfuric acid, chlorine

**SECTION 900**

# Monthly PM Checklist

---

This guide is recommended to be followed and performed on a monthly basis. We recommend keeping these maintenance records in the event you need to make a warranty claim. If you have any questions or concerns, please call us anytime.

- 1. Serial number \_\_\_\_\_
- 2. Service date \_\_\_\_\_
- 3. Starting filter pressure \_\_\_\_\_ (KPA)
- 4. Ending filter pressure \_\_\_\_\_ (KPA)
- 5. Total pulse time \_\_\_\_\_ (Mins)
- 6. Pulse type  Offline  Online
- 7. % Particulate accumulated in drum \_\_\_\_\_
- 8. Containment emptied?  Yes  No
- 9. Each valve checked to ensure operational?  Yes  No
- 10. Filter regulator clear of moisture?  Yes  No
- 11. Air pressure \_\_\_\_\_ (PSI)
- 12. Spark arresstance status (select one of three options)  
*Note the number change if applicable Mesh Baffles*
  - Delta3 was cleaned
  - System has no spark arresstance
  - Baffles and mesh were changed
- 13. Fire suppression tank (CO<sup>2</sup>, Dry Chemical, or FM200) pressure checked  Green  Yellow  Red
- 14. eStop function tested  Yes  No
- 15. Machine visually inspected for any signs of defect  Yes  No
- 16. Filter status  Changed this service  Needed for next service  Good condition
  
- 17. Hours on service meter \_\_\_\_\_
- 18. Hour meter reset  Yes  No
- 19. VFD operating \_\_\_\_\_ (Htz)
- 20. Total machine downtime while servicing \_\_\_\_\_
- 21. Service notes \_\_\_\_\_
- 22. Technician signoff \_\_\_\_\_

## Monthly Sign-off Sheet Instructions

<b>1. Serial number</b>	This is located on the rating tag.
<b>2. Service date</b>	Date of service.
<b>3. Starting filter pressure</b>	This is found on the control screen, and is the number that should be recorded PRIOR to servicing the piece of equipment.
<b>4. Ending filter pressure</b>	This is found on the control screen, and is the number that should be recorded AFTER servicing the piece of equipment.
<b>5. Total pulse time</b>	This should be the total time the service technician allowed the unit to pulse, in minutes.
<b>6. Pulse type</b>	This should be noted as OFFLINE if the machine was pulsed while the blower was OFF. If for some reason production was not able to allow the technician to turn off the blower, the pulse type should be noted as ONLINE.
<b>7. % Particulate accumulated in drum</b>	This should be the % the particulate containment was filled up. It can be a dust tray, hopper drum, etc. Look inside the containment source and estimate.
<b>8. Containment Emptied?</b>	This should be checked YES if the containment drum/drawer was cleaned out on the equipment. This should be checked NO if it was not cleaned out for some special reason.
<b>9. Each valve checked to ensure operational?</b>	This should be checked YES once each valve is individually tested from the controller.
<b>10. Filter regulator clear of moisture?</b>	This should be checked YES once the air-line regulator is visually checked for moisture. If there is an accumulation of moisture, check NO, and ensure that the moisture is released from the regulator.
<b>11. Air pressure</b>	The pressure gauge on the airline leading into the unit should read the current PSI flowing to the unit. Write down the actual PSI.
<b>12. Spark arrestance status (select one of three options)</b>	One of the following should be circled depending on the unit: baffles & mesh were changed OR Delta3 was cleaned OR System has no spark arrestance.

# Monthly Sign-off Sheet Instructions

---

**13. Fire suppression tank (CO<sup>2</sup>, Dry Chemical, or FM200) pressure checked**

Circle one of the following: Green, Yellow, Red OR unit does not have fire suppression.

**14. eStop function tested**

This should be checked YES once the emergency stop button has been pulled with the blower on. If it is working correctly, it should sound an alarm and shut down the system.

**15. Machine visually inspected for any signs of defect**

This should be checked YES once the unit has been given a visual inspection. Things to look for are visible cracks in welds, unusually loud noises coming from the motor/blower, controls screen damage, etc. Any damage that is found should not be written in this box, but should be included in the NOTES section below.

**16. Filter status**

One of the following should be circled: changed this service OR needed for next service OR good condition. KEY: Filters are in good condition if the ending KPA is under 2.70 KPA. The Filters should be marked needed for next service if the ending KPA is between 2.70-3.50.

**17. Hours on service meter**

This should be written down off of the service meter on the control.

**18. Hour meter reset**

This should be checked YES if the service meter clock has been reset from the control.

**19. VFD operating**

If the unit has a VFD, the hertz should be written down from the VFD screen when the unit is started back up when service is complete.

**20. Service notes**

ANY and ALL noted issues with the machine should be filled in here. If the machine is inactive, also note it here.

**21. Total machine downtime while servicing**

This should be the signature of the technician that serviced the machine.

*SECTION 1000*

# *Motor Greasing Guide*

***RoboVent***<sup>®</sup>  
A Nederman Company

**SECTION 1000**

# Motor Greasing Guide

Your RoboVent unit will have one of four motor manufacturers installed: **TECO**, **Marathon**, **Weg**, or **Baldor**.

These motors are created with anti-friction, grease-lubricated bearings. Grease is essential to your motor bearings because it creates an oil film that counteracts the abrasive metal-to-metal contact that can occur between rotating elements. Follow RoboVent's Motor Greasing Guidelines to properly lubricate your electric motor.

## Manual Grease Gun

Heavy Duty Lever Grease Gun w/ 18" Hose Ext & Coupler  
Fastenal Part No. (SKU) 0425881



**DELIVERY RATE = 1 OZ PER 28 PUMPS**

### Grease Conversion Chart for use with this grease gun

<b>OUNCES (OZ)</b>	<b>GRAMS (G)</b>	<b>GREASE GUN PUMPS</b>
0.1 oz	2.835 g	2.8 pumps
1 oz	28.35 g	28 pumps
2 oz	56.70 g	56 pumps
3 oz	85.05 g	84 pumps
4 oz	113.40 g	112 pumps
5 oz	141.75 g	140 pumps

NOTE: 1 Pump = 1 gram of grease

## Teco Motor Greasing Guidelines

### Lubrication Procedure

It is advisable to re-grease when the motor is running to allow the new grease to be evenly distributed inside the bearing. Before re-greasing, the inlet fitting should be thoroughly cleaned to prevent any accumulated dirt from being carried into the bearing with the new grease. The outlet of grease drainage should be opened to allow the proper venting of old grease. Use a grease gun to pump grease through grease nipple into the bearings. After re-greasing, operate the motor for 10-30 minutes to allow any excess grease to vent out.

### Approved Greases

- All motors with ZZ bearings will have SHELL Alvania R3 (lithium base grease).
- All motors with open bearings will have Polyrex EM (polyurea base grease).
- Certain T-frame models will utilize special grease and will be noted on the lubrication nameplate.

### Relubrication Time Interval & Amounts

\*Fill new grease until it overflows and the old grease is entirely replaced.

#### Relubrication Time Interval

BEARING SIZE	MOTOR HP	GREASE AMOUNT IN GRAMS	1800 RPM – HOUR CHANGE INTERVAL	3600 RPM – HOUR CHANGE INTERVAL
All motors listed are ODP				
DE & NDE: 6306ZZ	5	30 grams	3000 hours	2000 hours
DE & NDE: 6306ZZ	7.5	30 grams	3000 hours	2000 hours
DE: 6308ZZ	10	30 grams	3000 hours	2000 hours
DE: 6310ZZ	20	40 grams	3000 hours	2000 hours
DE: 6311ZZ & DE: 6212C3	30	40 grams	3000 hours	2000 hours
DE & NDE: 6213 & DE: 6212C3	40	50 grams	3000 hours	2000 hours
DE & NDE: 6213 & DE & NDE: 6213C3	50	50 grams	3000 hours	1000 hours
DE: 6314, NDE: 6213, DE: 6313C3 & NDE: 6213C3	75	80 grams	3000 hours	1000 hours
DE & NDE: 6317, DE: 6313C3 & NDE: 6213C3	100	120 grams	2000 hours	1000 hours
DE & NDE: 6317 & DE & NDE: 6313C3	125	120 grams	2000 hours	1000 hours

## Marathon Motor Greasing Guidelines

### Lubrication Procedure

1. Stop motor. Disconnect and lock out of service.
2. Remove contaminants from grease inlet area.
3. Remove filler and drain plugs.
4. Check filler and drain holes for blockage and clean as necessary.
5. Add proper type of amount of grease. See the relubrication amounts table for volume of grease required.
6. Wipe off excess grease and replace filler and drain plugs.
7. Motor is ready for operation.

### Approved Greases

- Chevron SRI #2
- Rykon Premium #2
- Exxon Polyrex EM
- Texaco Polystar RB

### Service Types

- **Seasonal Service:** The motor remains idle for a period of 6 months or more.
- **Standard Service:** Up to 16 hours of operation per day, indoors, 100° F max ambient temp.
- **Severe Service:** Greater than 16 hours of operation per day. Continuous operation under high ambient temp (100 to 150° F), dirty moist locations, high vibration, heavy shock loading or where shaft extension end is hot.



# Motor Greasing Guide

## Relubrication Time Interval

SERVICE CONDITIONS	NEMA FRAME SIZE (IN RPMs)					
	140-180		210-360		400-510	
	1800 RPM OR LESS	OVER 1800 RPM	1800 RPM OR LESS	OVER 1800 RPM	1800 RPM OR LESS	OVER 1800 RPM
Standard	3 yrs	6 months	2 yrs	6 months	1 year	3 months
Severe	1 yr	3 months	1 yr	3 months	6 months	1 month
Seasonal	The motor remains idle for a period of 6 months or more					

## Relubrication Amounts

NEMA FRAME SIZE	MOTOR HP	VOLUME OF GREASE
140	5 HP	4 grams
180	7.5 HP	8 grams
210	10 HP	12 grams
250	20 HP	16 grams
280	30 HP	19.5 grams
320	40 HP-50 HP	23.5 grams
360	60 HP-75 HP	27.5 grams
400	100 HP	34 grams
440	125 HP	42.5 grams

## Weg Motor Greasing Guidelines

### Lubrication Procedure

#### Machines without Grease Nipples

Motors up to frame size 215T are normally fitted without grease fittings. In these cases the regreasing shall be done during preventive maintenance service paying attention to the following aspects:

1. Take motor apart carefully.
2. Take all the grease out.
3. Wash the bearing with kerosene or diesel.
4. Dry the bearings
5. Regrease the bearing immediately.

#### Motors Fitted with Grease Fitting

It is strongly recommended to grease the machine while running. This allows the grease renewal in the bearing housing. When this is not possible due to rotating parts by the grease device (pulleys, bushing, etc.) that offer some risk to physical integrity of the operator, proceed as follows:

1. Clean the area near the grease nipple.
2. Put approximately half of the total grease and run the motor for 1 minute at full speed.
3. Then turn off the motor and pump in the rest of the grease.

*Note: The injection of all the grease with the motor in standstill can make the grease penetrate into the motor, through the bearing housing inner seal.*

#### Approved Grease

- Mobile Polyrex EM Grease

#### Special Note

The table below is specifically intended for relubrication with MOBIL Polyrex EM grease and bearing absolute operating temperature of:

- 70°C (158°F) for 254/6T to 324/6T frame size motors
- 85°C (185°F) for 364/5T to 586/7T frame size motors
- For every 15°C (59°F) above these limits, relubrication intervals must be reduced by half.
- Shielded bearing (ZZ) are lubricated for bearing life as long as they operate under conditions and temperature of 70°C (158°F).

**\*\*\*When motors are used on the vertical position, their relubrication interval is reduced by half if compared to horizontal position motors.\*\*\***

On applications with high or low temperatures, speed variation etc., the type of grease and relubrication intervals is given on an additional nameplate attached to the motor.

# Motor Greasing Guide

## Relubrication Time Interval & Amount of Grease

FRAM SIZE	MOTOR HP	GREASE AMOUNT IN GRAMS	3600 RPM	1800 RPM
254 / 6T	20 HP	13 grams	15700 hours	20000 hours
284 / 6T	30 HP	18 grams	11500 hours	20000 hours
324 / 6T	40 HP	21 grams	9800 hours	20000 hours
364 / 5T	60 HP	27 grams	3600 hours	9700 hours
404 / 5T	100 HP	27 grams	3600 hours	9700 hours
444 / 5TS	125 HP	27 grams	3600 hours	9700 hours
<b>RELUBRICATION INTERVALS IN HOURS</b>				
324 / 5T	40 HP	21 grams	9800 hours	20000 hours
364 / 5T	60 HP	27 grams	4800 hours	9700 hours
404 / 5T	100 HP	34 grams	3000 hours	6000 hours
444 / 5T	125 HP	45 grams	2300 hours	4700 hours

# Motor Greasing Guide

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## Baldor Motor Greasing Guidelines

### Lubrication Procedure

**\*\*\*Lock off and tag out power at the disconnect before servicing\*\*\***

**\*\*\* Motor should be warm prior to greasing\*\*\***

1. Locate the grease inlet, clean the area, replace the pipe plug with a grease fitting.
2. Remove grease drain plug.
3. Add recommended amount of grease. Stop when new grease appears at shaft hole in the endplate or grease outlet plug.
4. Replace grease inlet plug and run the motor for 15 minutes.
5. Replace the grease drain plug.

### Correct Grease Gun Procedures

1. Use hand-operated grease gun, not a pneumatic grease gun. Pump grease slowly, taking 10 to 12 seconds to complete each stroke.
2. Apply quantity of grease called for. Over-lubrication can be as damaging as under-lubrication.
3. Do not over-lubricate motors. Over-lubrication of a motor can seriously damage it by forcing grease into motor windings. Over-lubrication of the extract motor can force grease into the centrifugal switch causing it to malfunction.

### Approved Grease

- Shell Dolium R (factory installed)
- Chevron SRI (standard service conditions)
- Darmex 707 (high temp conditions)
- Arrowsell 7 (low temp conditions)

# Motor Greasing Guide

## Service Types

SEVERITY OF SERVICE	HOURS OF OPERATION PER DAY	MAX AMBIENT TEMP	ATMOSPHERIC CONTAMINATION	INTERVAL MULTIPLIER
Standard	8	104 F (40 C)	Clean, little corrosion	1
Severe	16 +	122 F (50 C)	Moderate dirt, corrosion	0.5
Extreme	16 +	>122F (>50 C) (NOTE 1)	Severe dirt, abrasive dust, corrosion	0.1
Low Temp		-22 F (-30 C) (NOTE 2)		1

Note 1: Use high temp grease

Note 2: Use low temp grease

## Relubrication Time Interval

NEMA (IEC) FRAME SIZE	MOTOR HP	3600 RPM	1800 RPM	1200 RPM	900 RPM
Up to 125 (132)	5 HP	5500 hours	12000 hours	18000 hours	22000 hours
254 to 286 (160-180)	25 HP-30 HP	3600 hours	9500 hours	15000 hours	18000 hours
324 to 365 (200-225)	40 HP-50 HP	2200 hours	7400 hours	12000 hours	15000 hours
404 to 5000 (280-315)	100 HP-125 HP	2200 hours	3500 hours	7400 hours	10500 hours

Note: For vertically mounted motors and roller bearings, divide the relubrication interval by 2.

## Relubrication Amounts

NEMA (IEC) FRAME SIZE	MOTOR HP	LARGEST BEARING IN SIZE CATEGORY	OD D MM	WIDTH B MM	VOLUME OF GREASE
Up to 215 (132)	5 HP-15 HP	6307	80	21	4.5 grams
254 to 286 (160 - 180)	25 HP-30 HP	6311	120	29	9 grams
324 to 365 (200 - 225)	40 HP	6313	140	33	12 grams
404 to 5000 (280 - 315)	100 HP-125 HP	NU322	240	50	31.5 grams



SECTION 1100

# *Troubleshooting*



**HVE Hi-Vac Machine is making excessive noise.**

1. Check for correct motor rotation. Motor running in the correct direction will produce high static pressure vacuum. If running in reverse the airflow will be reversed.
2. Check that all HVE Machine mounting bolts are secure and not loose.
3. Make sure motor bearings are good. (Amperage rating will be higher than normal if bad.)
4. Blower could be out of balance. If this is the case call 1-888-ROBOVENT for assistance.
5. If the noise is an electrical hum in the control panel, it could be a defective VFD.

**PowerFlex Pulse Cleaning System not operating. Check the following.**

1. Verify that the airline is connected to the air tank and that there are no pinched or clogged airlines.
2. Check air tank pressure. The Power Flex works best when pressurized at 85 PSI.
3. Check setting of ePad Controller Settings (Page 11).
4. Check diaphragm on solenoid valve. If optimum pressure is supplied to the air tank and the controller is operational then this would indicate a problem with the diaphragm.
5. Check for leaks in the air tank or fittings around the solenoids.
6. Check for voltage at the firing solenoid. Note that this will be a very quick firing voltage for less than 300 ms.

**Little or no suction across intake. Check the following:**

1. Check motor rotation. When the unit is powered down note the rotation of the motor shaft. Motor rotation should be as specified in the HVE Hi-Vac Machine manual for that particular motor. If the rotation direction is incorrect, switch the position of two of the three power supply conductors on the terminals.
2. The cartridge filters may be full or blinded. Perform a Maintenance or Manual Cleaning cycle on the eTell controller as specified on page 10 of this manual (check differential pressure value). This is to be done with the motor in the off position. Restart the system and check your differential pressure value again on the controller. If the pressure did not drop below 3 kPa then replace the filters.
3. Check the frequency feeding into the HVE Hi-Vac Machine from the VFD (frequency reading is displayed on the VFD screen). If there is not enough suction at the inlets the VFD setting may need to be increased. This is done by increasing the B5-19 setting on the VFD. Follow the instructions in the VFD manual.
4. Check the safety valve spring setting to ensure the spring is set at the correct location to ensure that proper static pressure can be reached without the safety valve flap opening.



**HVE Hi-Vac Machine shuts down.**

1. If all intakes are closed the HVE Hi-Vac Machine may go into fault mode. In this case the VFD will need to be reset. This is an amperage overload fault to protect the turbine from burning up. Note that your turbine will always need air going into the intake to allow blower cooling. If not, the turbine will shut down the whole system. Make sure the inlet Surge Filter is clean.
2. If equipped, check the Safe Sensor. If there is excessive particulate or smoke present in the clean air side of the collector the Safe Sensor will go off and shut down the system. Check for a cartridge filter fire or a hole or gap in the filter. If particulate passes the filter media the Safe Sensor will go off, shutting down the system.

**Cartridge Filter loads up but no dust in the dust tray.**

1. Check that the PowerFlex is working properly and that the parameters on the ePad Controller are set properly.
2. Check for oil or moisture on the filter media. If oil or moisture exists in the air supply it will transfer to the cartridge.
3. In some cases high oil content is introduced in the welding process causing the oil to vaporize. This will cause the cartridge filters to load up prematurely. In this situation a specialized filter may be needed. Call the RoboVent Service Department at 1-888-ROBOVENT.
4. Check for re-entrainment. Run a Manual Pulse-Down Cycle on the ePad Controller. When finished record how much particulate is in the 20 gallon bucket. Replace the bucket and run the system for one minute. Shut off the HVE Hi-Vac Machine with the Power Disconnect. Remove the 20 gallon bucket and compare the particulate level. If the level has reduced by 30-40% then there could be an air leak in or around the flex hose or bucket cover. Check for leaks and plug with Vulkem. Allow to fully dry before restarting the HVE Hi-Vac Machine.

**Differential Pressure Gauge consistently displays a high reading.**

1. Check for a pinched line in the blue plastic tubing from the Minihelic Gauge.
2. Make sure the hoses to the Differential Pressure Monitor on the back of the ePad have not been switched or removed. There should be 2 hoses.
3. Check for loaded cartridge filters. Clean or replace if needed.

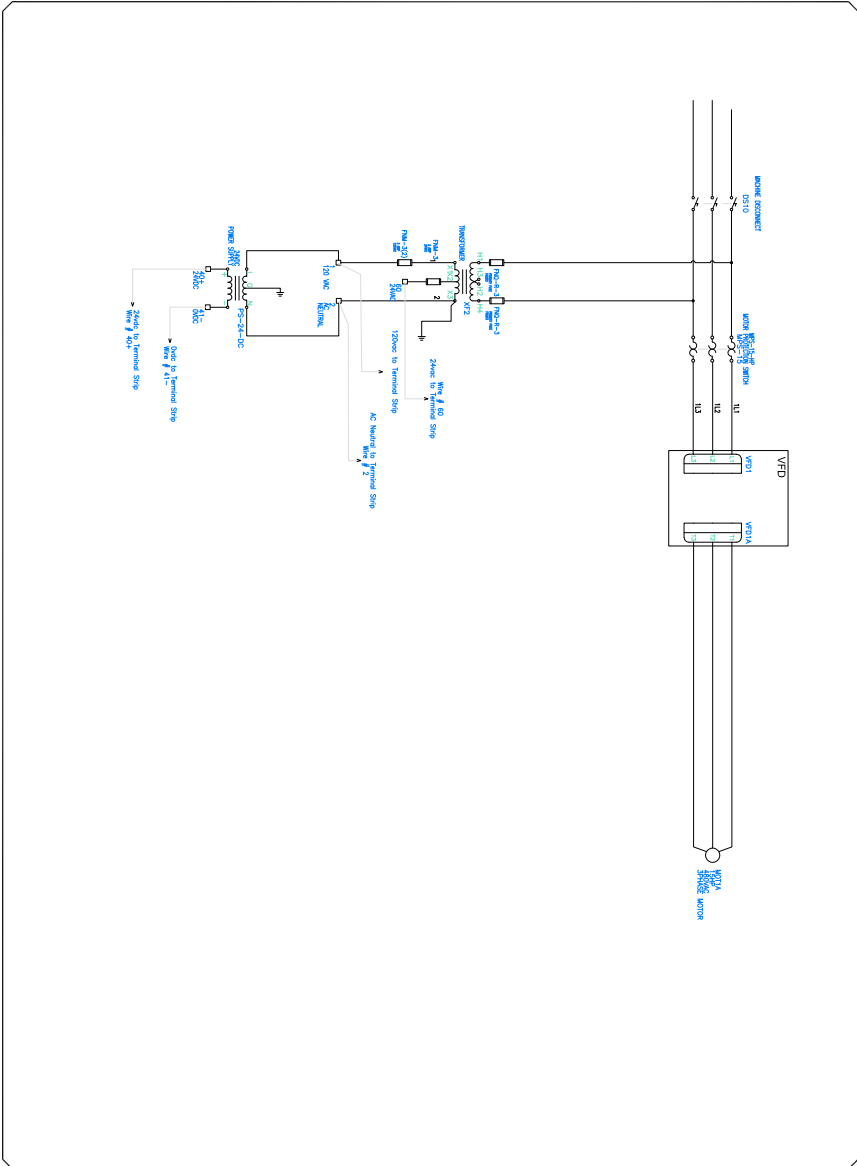


*APPENDIX A*

# *General Wiring Diagrams*

# APPENDIX A Wiring Diagram

## ePad Wiring Primary Wiring



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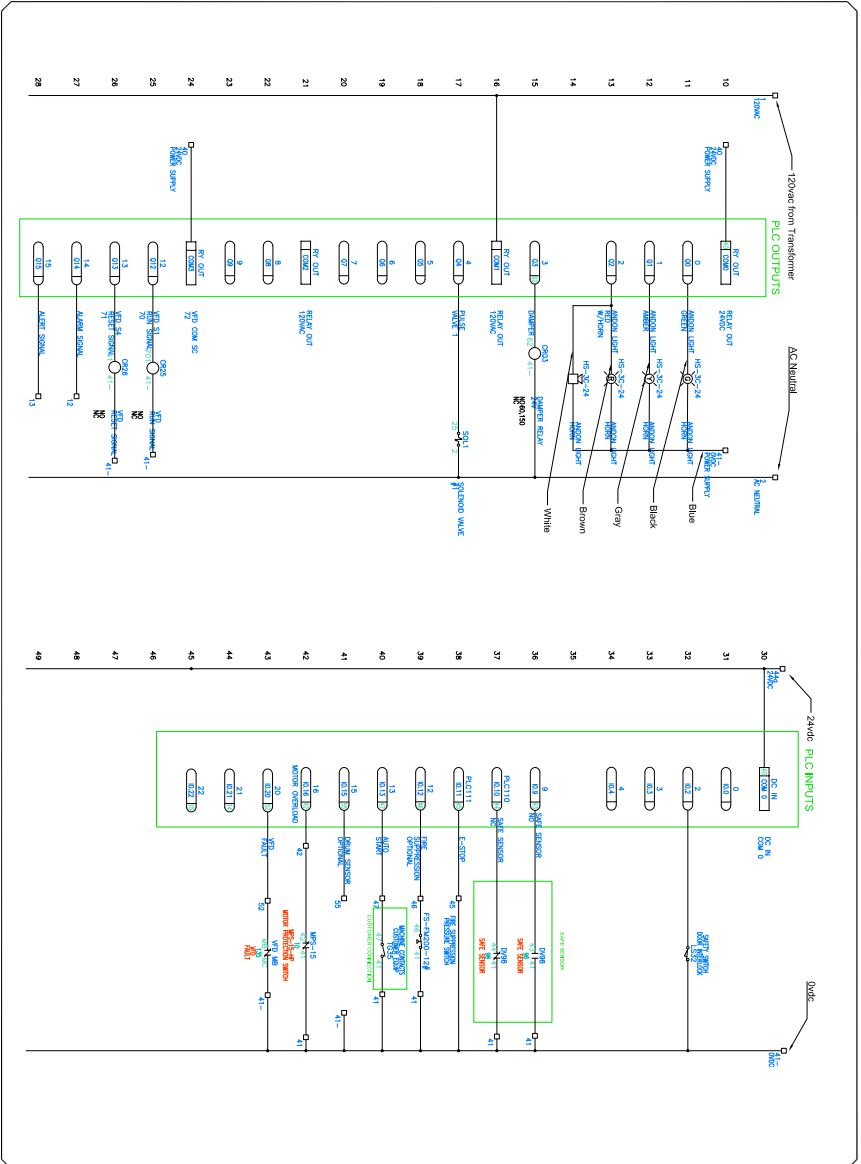
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3					Final Design
4					Final Design
5					Final Design

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# Wiring Diagram

## ePad Wiring Schematic PLC Wiring



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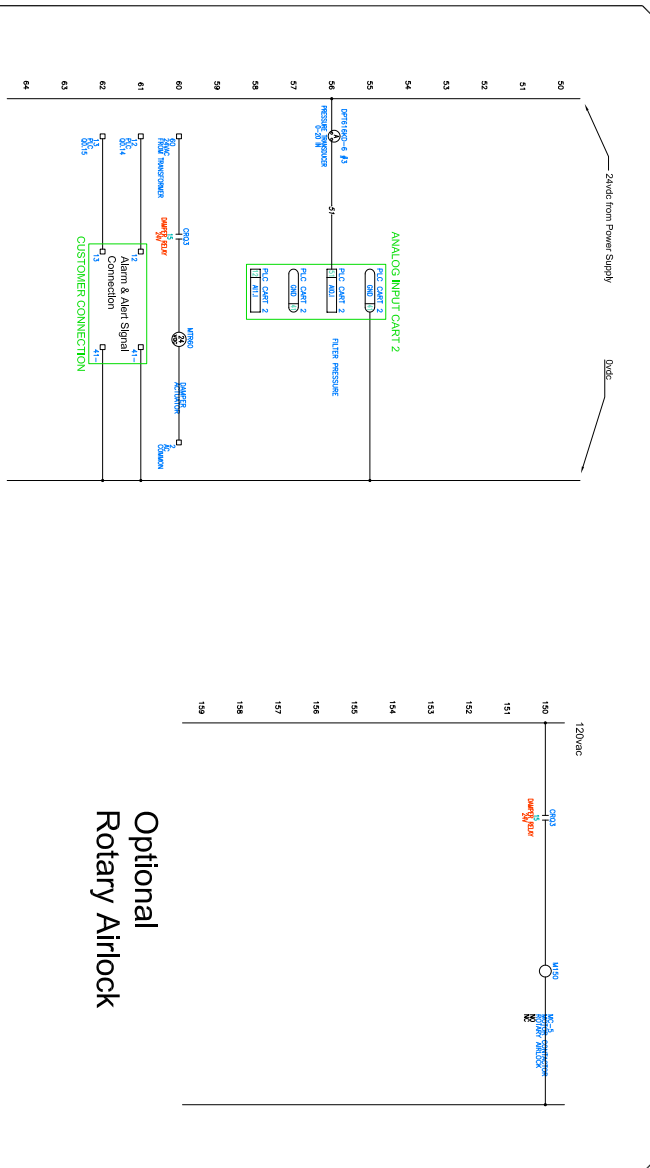
2 OF 8

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# APPENDIX A Wiring Diagram

## ePad PLC Wiring



Optional  
Rotary Airlock

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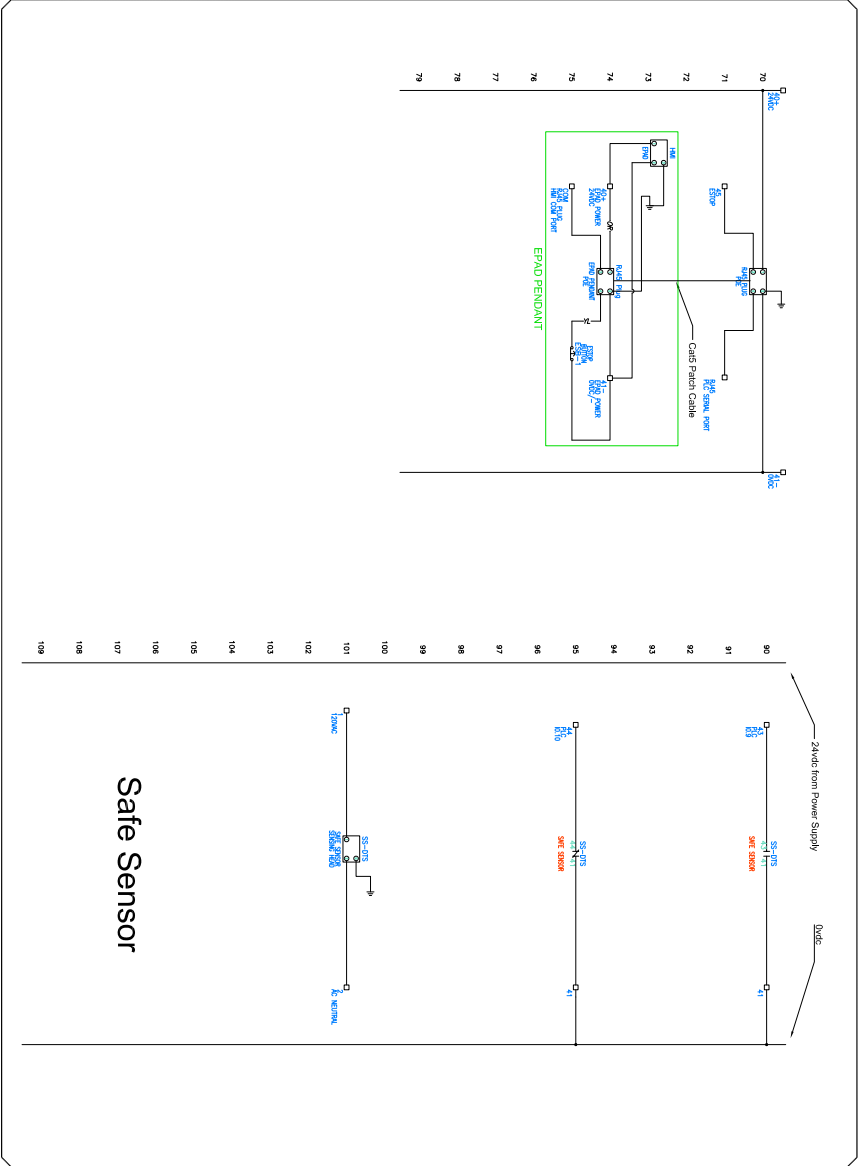
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3	07/08/15	Final Drawing		

3 OF 8

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APPENDIX A  
**Wiring Diagram**  
 ePad PLC Wiring



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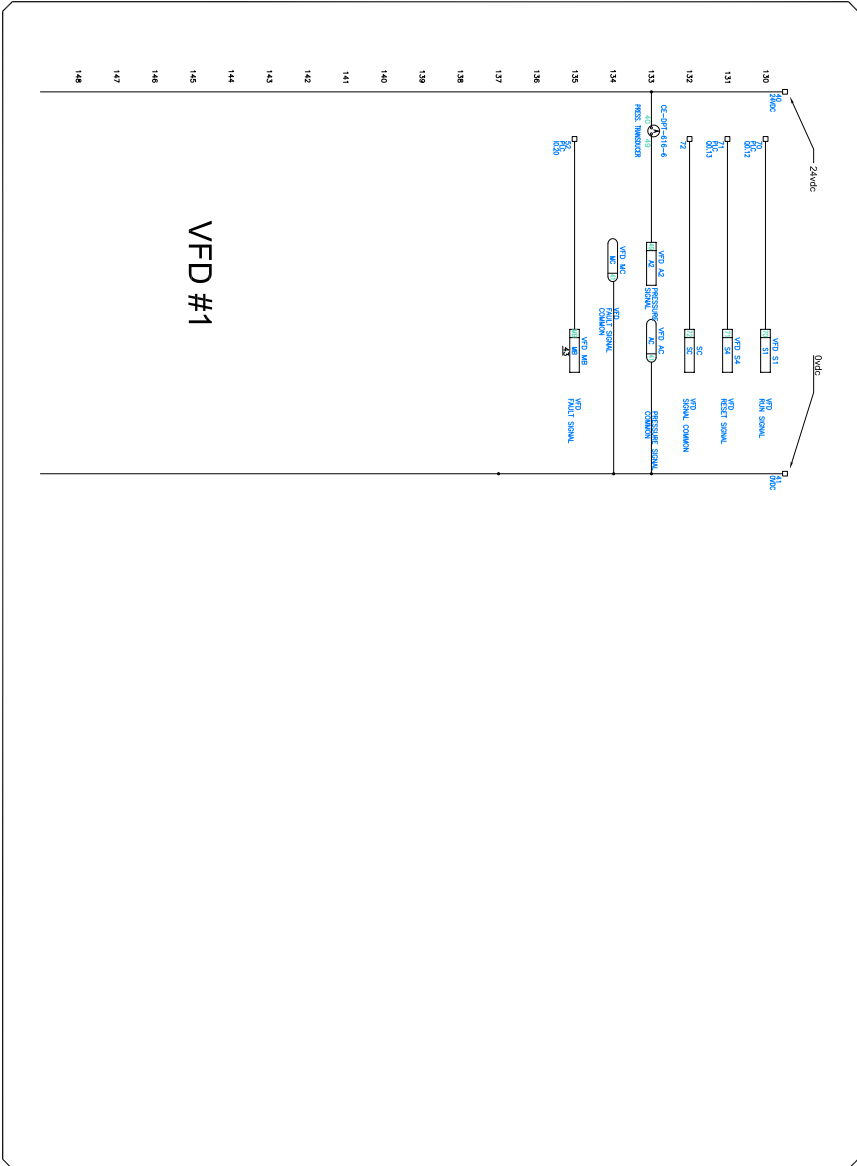
4 of 8

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# APPENDIX A Wiring Diagram

## ePad VFD Wiring



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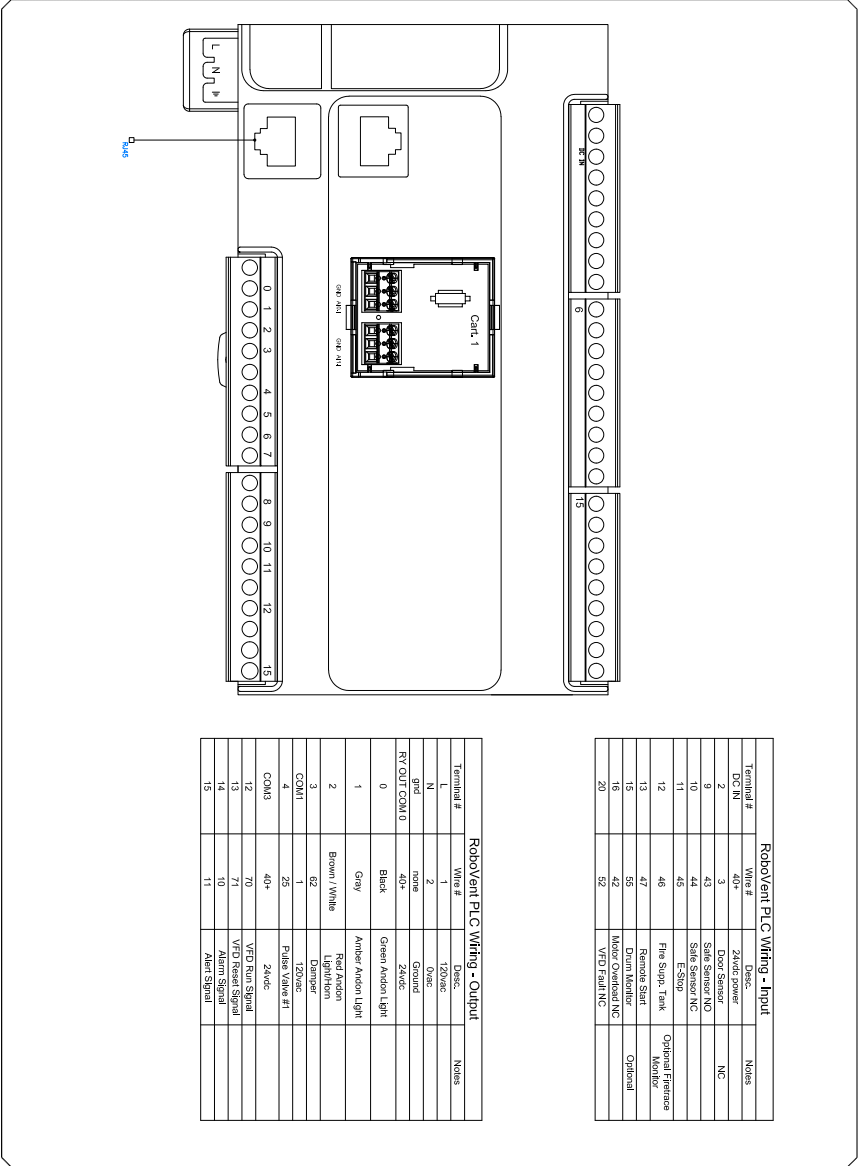
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**APPENDIX A**  
**Wiring Diagram**  
**ePad Control PLC Wiring**



68 000 Rev. C \USERS\JLRELL\DOCUMENTS\AUG 2014\AUG24\PROJ\AUG24\AUG24.DWG

**RoboVent**  
**PLC Wiring**

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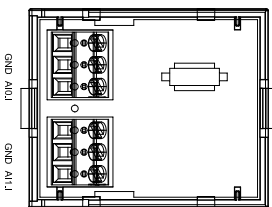
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# APPENDIX A Wiring Diagram

## ePad Control Panel Cartridge Wiring

### Analog Input Cartridge



Terminal #	Wire #	Desc.	Notes
AI01V	N/A	No Wire	Not Used
GND	41-	0-5c	
AI01	51	4-20ma	Filter Pressure

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# APPENDIX A Wiring Diagram

## ePad Wiring Notes

5 Wire Auto Start Cable		
Wire Color	Diasec	Terminal Label
White	0vdc (-24vdc)	41-
Black	Auto Start	47
Red	Alarm Signal	12
Orange	Test Signal	13
Green	Ground	Ground

4 Wire Auto Start Cable		
Wire Color	Diasec	Terminal Label
Gray	0vdc (-24vdc)	41-
Black	Auto Start	47
Brown	Alarm Signal	12 & 13
Green (in Yellow)	Ground	Ground

RoboVent BOM				
Part Number	Reference Number	Location	Description	Qty
BND30			30amp Disconnect	1
T-3500-10/24			Transformer/Power	1
DPF-416/QC-04			Differential Pressure Transmitter	4
HM/H-C17S			ePad Touch Screen Assembly 3.5	1
HM/E-NC-XE			ePad HMI Enclosure	1
ESB-1			Strip Boxes	1
ES-24-100			Strip Spacers/Plates	1
ES-24-100			Strip Spacers/Plates	1
W-CBL-3			Cable for EPMD	1
CP-C-002			Control Panel Z Bracket	1
BP-16x21			Sub Panel- 16x21	5
ELC-CV79			Secondary Fuse - 3amp FNMA3	2
ELC-CV78			Primary Fuse - FNMA-C3	2
ELC-C108			Secondary Fuse Holder	2

RoboVent Electrical Ratings			
Serial Number	Model Size	Amperage	Voltage
	15hp	21 FLA	480VAC
			3 Phase

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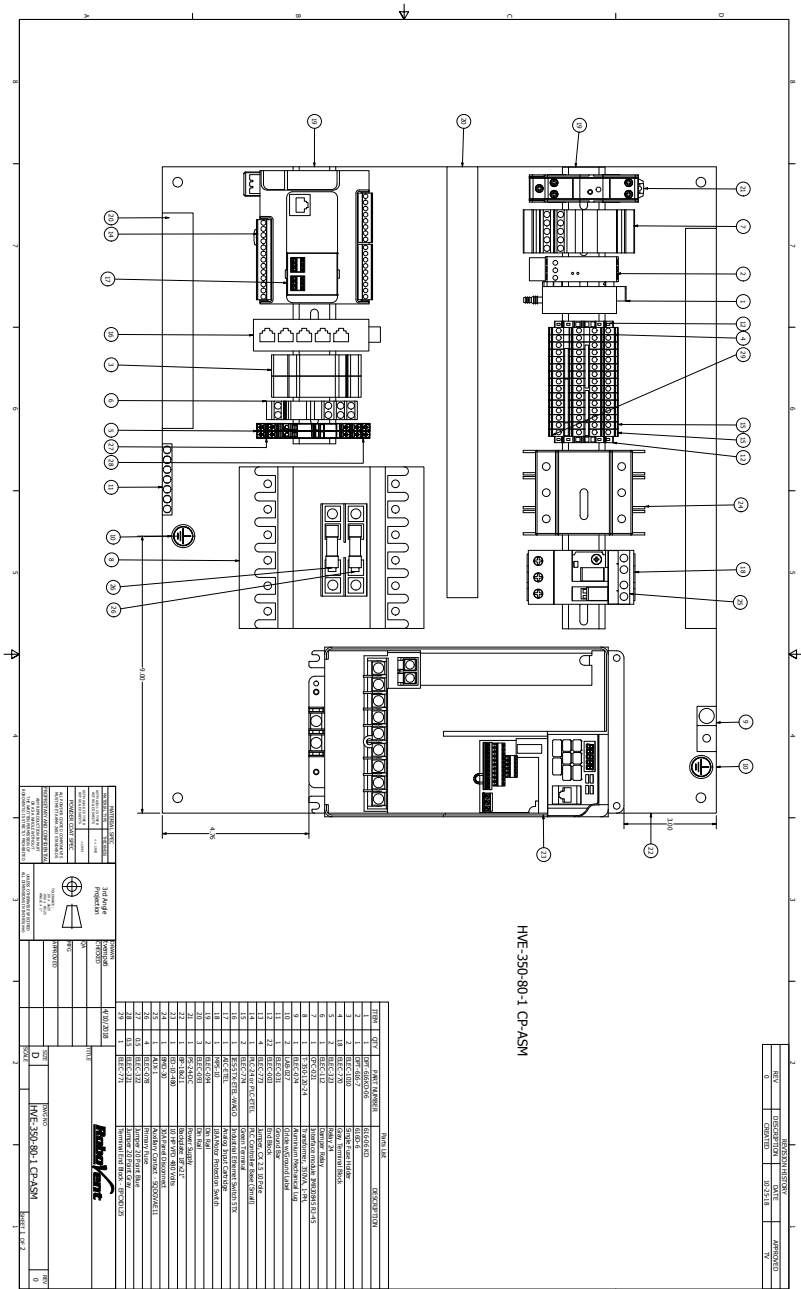
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# APPENDIX A Wiring Diagram

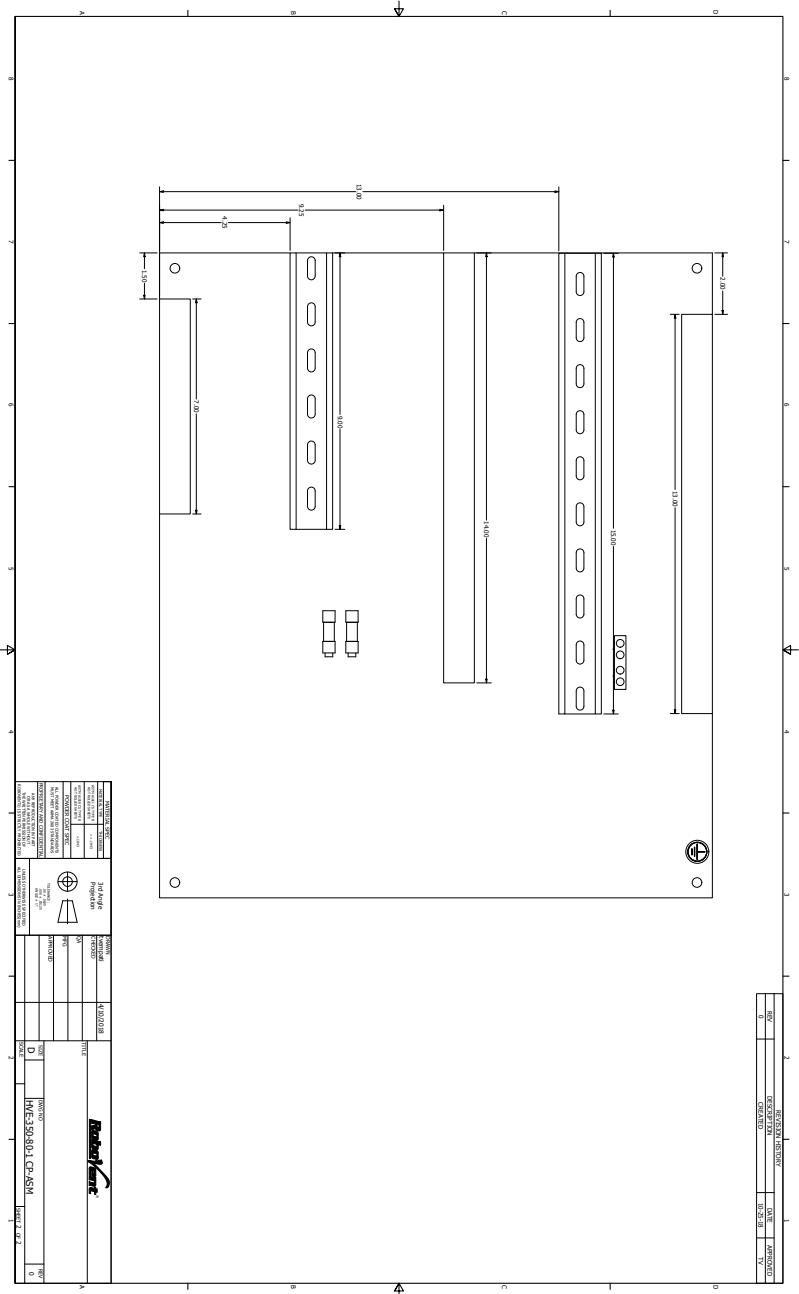
## HVE-350-80-1 Wiring



APPENDIX A

# Wiring Diagram

## HVE-350-80-1 Wiring





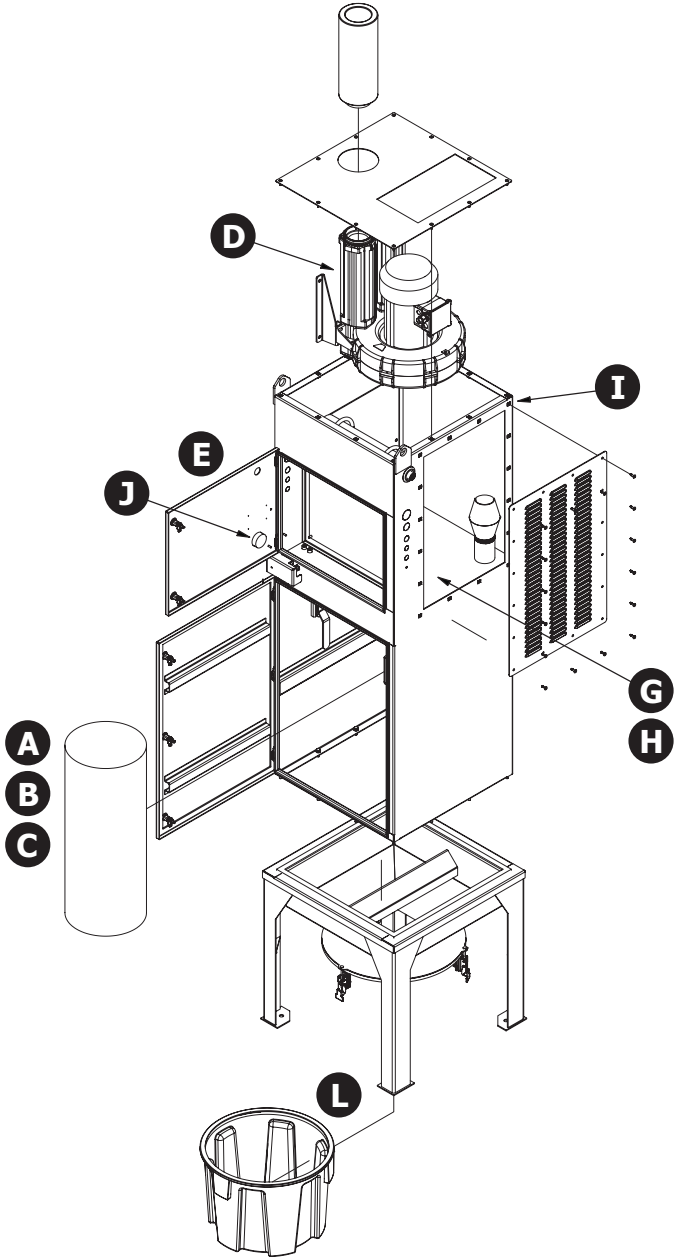
**APPENDIX B**

# ***Parts List***



APPENDIX B  
**Parts List**

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## APPENDIX B

# Parts List

### HVE-350-80-1

ITEM	QTY	PART NUMBER	DESCRIPTION
A	1	PL-14D36-M11-SF	Cartridge Filters
B	1	PL-14D36-A15-SF	Cartridge Filters
C	1	EX-14D36-B16-SF	Cartridge Filters
D	1	HVE-BLR-10HP	High Pressure Blower
E	1	HS-3C-24	Andon Light
F	1	HMI-DTS	HMI Screen (not shown)
G	1	DV-10-TU	Pulse Valve
H	1	NS-SPR-200	Pulse Nozzle
I	1	FR-34	Filter Regulator - 3/4"
J	1	MHG-2-RV-100	Minihelic Gauge
L	1	DR-HDH-20-004	20 Gallon Drum

### HVE-550-80-2

ITEM	QTY	PART NUMBER	DESCRIPTION
A	1	PL-14D36-M11-SF	Cartridge filters
B	1	PL-14D36-A15-SF	Cartridge filters
C	1	EX-14D36-B16-SF	Cartridge filters
D	1	HVE-BLR-15HP	Motor & Blower Wheel Combo
E	1	HS-3C-24	Andon Light
F	1	HMI-DTS	HMI Screen
G	1	DV-10-TU	Pulse Valve
H	1	NS-SPR-200	Pulse Nozzle
I	1	FR-34	Filter Regulator - 3/4"
J	1	MHG-2-RV-100	Minihelic Gauge
L	1	DR-HDH-20-004	20 Gallon Drum

### HVE-950-80-2

ITEM	QTY	PART NUMBER	DESCRIPTION
A	2	PL-14D52-M11-SF	Cartridge filters
B	2	PL-14D52-A15-SF	Cartridge filters
C	2	EX-14D52-B16-SFO	Cartridge filters
D	1	HVE-BLR-40HP	Motor & Blower Wheel Combo
E	1	HS-3C-24	Andon Light
F	1	HMI-DTS	HMI Screen
G	2	DV-10-TU	Pulse Valve
H	2	NS-SPR-200	Pulse Nozzle
I	1	FR-34	Filter Regulator - 3/4"
J	1	MHG-2-RV-100	Minihelic Gauge
L	1	DR-HDH-20-004	20 Gallon Drum

### RoboVent Customer Service:

For replacement parts, service or to speak to a representative, contact RoboVent at:

**Phone:** 888.ROBOVENT

**Email:** [customer.service@robovent.com](mailto:customer.service@robovent.com)



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