



# **ProCube II Portable Fume Extractor**

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

*Model Number:  
PFE (Portable Fume Extractor)-120  
for Serial No. 30846 & higher  
©2023 RoboVent*



# **ProCube II**

## **Owner's Manual**

*Installation, Operation & Maintenance*

Manufactured by:

**RoboVent**

37900 Mound Road  
Sterling Heights, MI 48310 USA  
(888) 762-6836  
[www.robovent.com](http://www.robovent.com)

©2023 RoboVent Inc. All rights reserved.

**Model Number:**

PFE (Portable Fume  
Extractor)-120  
for Serial No. 30846  
& higher

# Congratulations!

---

## ***Dear Customer,***

Congratulations on your ProCube II purchase! ProCube II is a powerful portable high-vacuum extraction unit specifically designed for weld fume collection. ProCube II puts hi-vac dust collection and air filtration into a small, portable package that goes wherever you need it. The unit has 4 HP of hi-vac extraction power to support up to two fume guns for manual welding or a light-production robotic welder using tip extraction. The sturdy castors and handle make it easy for a single welder to move, so weld fume collection can go where you need it. That makes ProCube II ideal for manual welding applications requiring high welder mobility, including large weldments for infrastructure, shipbuilding, tanks and more. With proper operation and maintenance, we are confident that your ProCube II will provide efficient and reliable air filtration for years to come.

This manual will help you install, start up, commission, operate, maintain and troubleshoot your new portable hi-vac. Please take time to read this manual thoroughly before installing and/or operating your unit. The manual covers:

- Safe unpacking, handling and operation of your ProCube II
- Setup, testing and commissioning
- Operating instruction and controls
- Maintenance requirements, including filter changes, dust bin emptying, cleaning and inspection

Following these user instructions is essential for your safety and the continued performance of your ProCube II. If you have questions about your unit or need help with troubleshooting or repair, contact us at 888.ROBOVENT. Our dedicated technical support team is available 24/7 to assist you.

We look forward to working with you!

**The RoboVent Team**

---

## ***A Message from the President***



Thank you for trusting RoboVent with your dust and fume control needs! At RoboVent, we are committed to providing world-class equipment backed by exceptional service and support. Our goal is to ensure your 100% satisfaction with your ProCube II. The RoboVent team will continue to be here to support you over the lifetime of your unit. We are also here to help you with any additional air filtration and industrial ventilation challenges you may have in the future.

Thank you again for your purchase!

**Rick Kreczmer**  
President, RoboVent

---

# Table of Contents

---

Introduction .....Section 100 .....Page 6

Specifications .....Section 200 .....Page 12

Unpacking & Locating.....Section 300 .....Page 16

Testing & Commissioning .....Section 400 .....Page 18

Operating Instructions .....Section 500 .....Page 20

Preventative Maintenance.....Section 600 .....Page 22

Wiring Diagrams .....Section 700 .....Page 24

SECTION 100

# *Introduction*

## Introduction

---

Thank you for choosing the RoboVent ProCube II filtration machine. This high-vacuum unit is designed for industrial environments, collecting both fumes and dust at the source in welding and related processes. The energy-efficient motor is directly coupled to the regenerative blower and operated by onboard controls, combining what might otherwise be a very complex operation into a simple, user-friendly package. It ships completely assembled and pre-tested, making it easy to set up and use.

The ProCube II machine has been designed for production use and has a few standout characteristics:

**Regenerative blower:** The backbone of the machine, it requires little maintenance, and the advanced design provides the powerful suction required.

**Vertical cartridge filters:** Vertical cartridge filters have superior loading and cleaning performance; RoboVent Endurex filters improve on these inherent characteristics with proprietary design features that optimize performance and promote effective pulse cleaning.

**Pulsing system:** Manual and efficient, the pulse system ensures filter life is maximized. A quick pulse sheds dust from the filter, causing it to fall into the hopper area and collect in the dust containment bin. Effective pulsing is combined with a filter chamber designed to prevent re-entrainment of dust, resulting in maximum filter life.

**Intuitive controls:** Simple, intuitive controls are equipped with manual blower modes. Optional sensors integrate filtration with welding processes. Additional electronics monitor airflow and motor speeds to indicate operating condition with green and yellow lights.

With user-friendly electronics and only requiring connections to electricity and compressed air, the ProCube II Portable Weld Fume Extractor machine is simple to set up.

Additional details can be found in the section titled "Prerequisites for Use".

Persons involved with installing, operating, maintaining, and servicing this RoboVent ProCube II machine must read these instructions prior to use. Keep this manual in a safe and convenient place for reference. In the case of loss or damage, please contact RoboVent for replacement.

# Introduction

---

## Receiving & Inspection

The equipment will arrive on a pallet or in a crate. Perform a visual inspection before removing from the truck. If there is any damage, it should be noted on the shipping documents and photographed. It is the receiver's responsibility to file shortage reports and damage claims with the carrier. The carrier is responsible for any damage to the equipment while it is in transit. Notify RoboVent if any damage has occurred so repair can be arranged.

The filter cartridge will be shipped inside the machine.

Before discarding packing material, make sure no small parts are concealed within wrapping.

## Safety Signs & Symbols

Below are the safety symbols and meanings as used throughout this manual and on the machine itself. Specific hazards and labels are shown in the "Specifications" section.



**Warning Sign:** Yellow Triangle with black edging. Specific icon shown on the face for specific concerns, or exclamation mark (as shown) for generic safety alerts to hazardous conditions.



**Prohibition Sign:** White circle with red edging and crossbar. Specific icon shown on the face for specific concerns, or STOP (as shown) for generic alerts to conditions that may lead to damage to the job, machine or other factor.



**Mandatory Sign:** Blue circle with white icon. Specific icon shown on the face for specific concerns, for example as shown, it is mandatory to consult the manual before operating.



**Reference Sign:** This symbol indicates that the reader should refer to the specific section and read about this identified component, task or location and learn more before continuing. Where this sign is shown, DO NOT attempt to continue before reading the section as indicated.

# Introduction

---

## Purpose & Limitations

The ProCube II filtration machine is designed for use with fume extraction welding guns in production applications. Its powerful suction, simple controls, and small footprint are suited for use in many facilities, including fabrication shops, production facilities, shipbuilding, and large structures. Four smooth caster wheels and lifting handle enhance mobility for use in portable applications.

This machine is intended for filtration of airborne fumes and non-explosive dry dust captured at the source. The design and controls are optimized for welding processes, especially when used with fume extraction welding guns, but it can be used intermittently for related processes such as grinding or sanding.

Whilst it can perform in 'high-loading' applications, such as robotic welding, plasma cutting, and grinding applications, these processes generate more fume and particles than what is practical for the collection capacity of the ProCube II machine. Therefore, it is not recommended for use in such applications.

Some welding conditions or atmospheres can generate oily or sticky particulate that 'blinds' the filter media. Blinding occurs when the pores in the fiber of the media become blocked so that pulse cleaning does not remove the blockage, leading to diminished cleaning results, finally resulting in reduced filter life. If you notice decreased filter life, or if differential pressure of the filter does not drop after a cleaning cycle, it may indicate blinding. You can improve filter condition by welding clean material, reducing the amount of oil on parts, and/or limiting use of anti-spatter spray. Nozzle gel must not be used with fume extraction welding guns.

Metal particulate collected from welding or related processes can be flammable when built-up in the collector, on the filter, or in hoses. Combined with the presence of sparks in the incoming air stream, this presents a potential fire risk. Typically, turbulence in the hose extinguishes sparks; for additional protection, the machine is equipped with built in Spark Arrestor. Despite these features, it may be possible for a spark to get through. Observe the process periodically to ensure intake of sparks is not excessive. Often, the position of inlets can be adjusted to prevent a consistent intake of sparks or settings on the process can be adjusted to reduce sparks.

Follow all regulations applicable to your workplace and usage conditions. RoboVent or a consultant in your area can assist with compliance

If the intake becomes obstructed, shut the machine down and fix the issue to prevent overheating of the motor and blower. Overpressure is indicated by the red band on the airflow gauge.



# Introduction

---

The blower motor is designed for continuous duty. Starting the motor more than six times per hour can decrease its life. Pay attention to a typical production cycle: if there are breaks in welding process that will force you to exceed six starts per hour it is recommended to leave the unit on throughout the day.



Personal Protective Equipment (PPE) is required when servicing the machine. Specific requirements are to be determined by applicable regulations, dust toxicity testing and your workplace policies. As a general rule, gloves, dust mask and safety goggles are recommended to prevent exposure to or inhalation of dust.



Some dusts collected from welding and related processes can be hazardous. The factory is responsible to test for toxicity and determining precautions for emptying and disposing hazardous waste.



The ProCube II is not designed to filter gases, odors or noxious fumes.



This filtration machine is not approved for filtration of Carcinogenic, Mutagenic, or Reproductively-harmful (CMR) substances.



The ProCube II unit is not designed for use in explosive atmospheres, potentially explosive atmospheres, or for extracting substances from such atmospheres. Neither is it intended to process substance which could create an explosive or potentially explosive atmosphere inside the machine. If the dust to be extracted may create aforementioned conditions, it must be sampled and tested for explosivity. Responsibility lies with the factory to perform testing and ensure compliance with NFPA guidelines.

# Introduction

---

## Prerequisites for use

All users and maintenance personnel must read this manual before installing, operating, or servicing the RoboVent ProCube II. Maintenance personnel must thoroughly understand the troubleshooting and servicing sections of this manual.

The machine requires compressed air and electrical connections:

- Compressed air must be regulated to 5.86 bar (85 PSI) and must be clean and dry according to ISO 8573-1 Class 7. It is recommended to connect to the machine with a quick-disconnect fitting and flex-ible hose for portability and easy disconnection when performing maintenance.
- Electrical supply must be 480 Volts (575 Volts in Canada) at 60 Hertz. The supply circuit shall be protected and capable of providing 6.2 Full Load Amps.
- Power cord and air connection are at rear of machine.

The machine will require adjustment of airflow to ensure effective capture; refer to the operating instructions. It is recommended to check airflow at the beginning of each shift to ensure fumes are being captured and set-tings are maintained.



When operating with both inlets, a two-inch ball valve may be required for balancing airflow. Refer to the "Testing & Commissioning" section.

The machine is limited by the amount of vacuum it can safely create. Too much resistance by such conditions as unsuitable hose, excessive hose length or constricted intake can overload the blower and prevent it from successfully capturing fumes. Changes can be made to setup if machine does not perform as expected. Review "Testing & Commissioning" section. If you need assistance with adjustment or setup, please contact RoboVent Customer Service & Tech Support at 888-ROBOVENT.

SECTION 200

# *Specifications*

# Specifications

## Specifications Chart

Empty Weight	270 lbs (122.47 kg)
Weight Full	285 lbs (129.27 kg)
Filtration Efficiencies	MERV16; 99.9% @ 0.3 micron
Equivalent Filter Area	76 ft <sup>2</sup> (7.06 m <sup>2</sup> )
Filter Material	B16 PTFE Laminated Polyester Media
Maximum Airflow	156 SCFM @ 120 in. w.c. (265 m <sup>3</sup> /hr @ 30 kPa)
Operating Temperature	50 – 120° F (10 – 50° C)
Cabinet Construction	14-gauge Steel, Polyester Powdercoat
Compressed Air Requirements	5SCFM (8.5 m <sup>3</sup> /hr) @ 5.86 bar (85 psi)
Compressed Air Connection	3/4" (19.05mm) NPT with Quick-Connect
Voltage Supply	480 Volts (230V + 575V in Canada), 60 Hertz, 6.2 Full Load Amps
Control Voltage	24 VDC

## Data Plate Info

Model No:

Serial No:

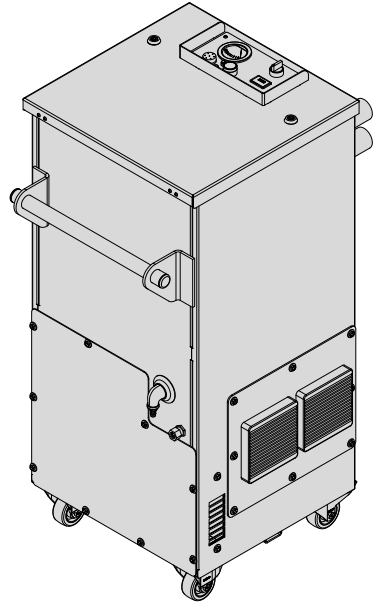
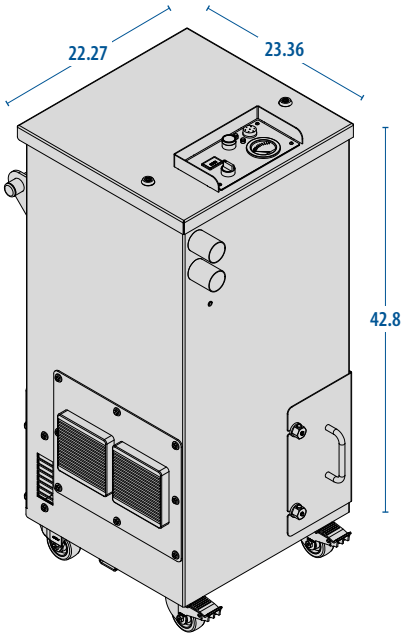
Manufacture Date:

Locate the data plate and record model number, serial number and manufacture date here for quick reference.

# Specifications

---

## Dimensions



**Dimensions:** 23.36"D X 22.27"W X 42.8"H

**Weight:** 270 lbs

**Max Airflow:** 156 CFM

**Max Vacuum:** 120 in WG

**Regenerative Blower:** 4 HP (2.98 kW)

**Voltage and Current:** 480V, 3-Phase, 6.2 FL Amps

**Compressed Air Connections:** 3/4" NPT (19.05 mm)

**Intake:** (2) 2- Inch (5.1 cm) Hose Ports

**Sound Level:** 82 dBA

**Filter Cartridge:** (1) EX3-11D18-B16

**Media Area:** 76 sq. ft.

# Specifications

## Airflow Schematic



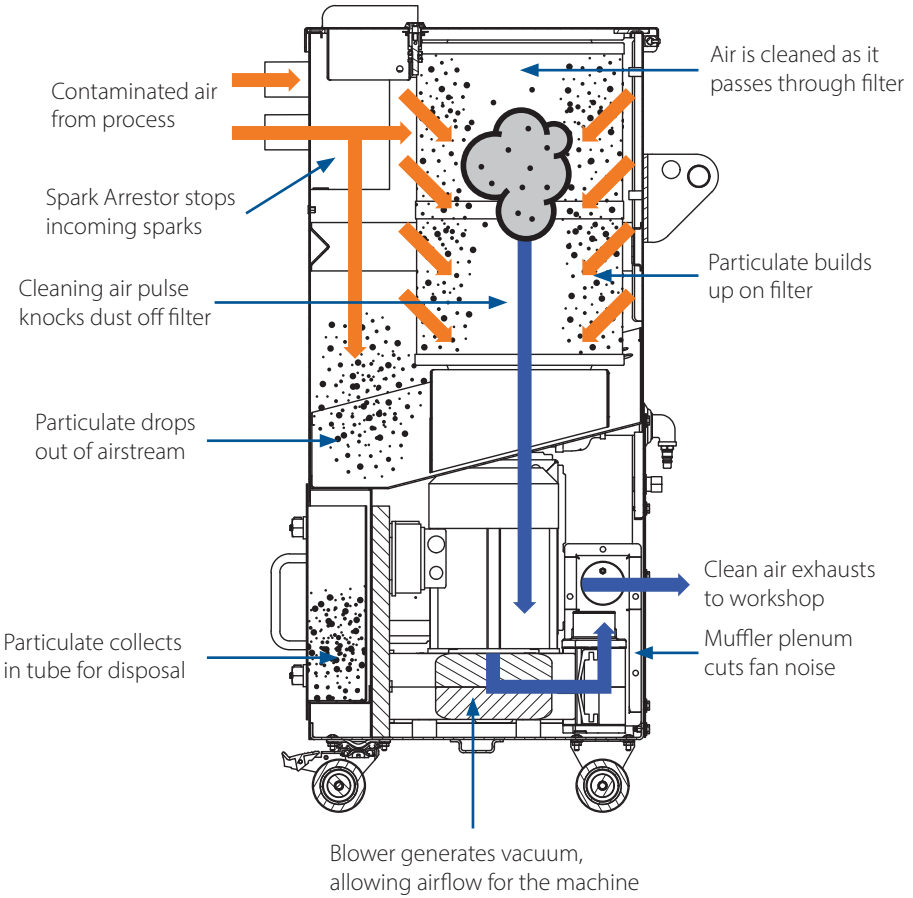
Contaminated air



Clean air



Particulate



SECTION 300

# *Unpacking & Locating*

# Unpacking & Locating

---

Follow workplace safety guidelines when handling and unpacking this machine. Gloves, safety glasses and safety footwear are recommended.

Set aside a 3 m (9 ft) work area to allow adequate space for shipping material and lifting from pallet. Consider cordoning off to prevent traffic from entering the area.

## Environmental Requirements & Constraints

This machine is designed to operate in an environment with temperature 10 – 50° C (50 – 120° F) and relative humidity 40-70% (non-condensing).

The ProCube II machine is designed for use indoors. Floor surface must be hard, flat, level, and capable of supporting 1.2 kg/cm<sup>2</sup> (17.6 psi) in order for the unit to remain safely stable. Atmosphere must be mostly free from contaminants such as dust, oil mist, water and airborne chemical solvents.

If outdoor use is required, the machine must be sheltered from wind, blown dust and precipitation. Storage must be indoors to prevent condensation in control panel and motor areas.



## Explosive Atmospheres

The machine is neither certified nor designed for use in explosive atmospheres, potentially explosive atmospheres or for collecting explosive dusts. The user is therefore strictly prohibited from using it in such applications and conditions. Do not attempt to modify this machine for the purposes of use in any explosive environment.

**Lighting:** The machine's work area must be illuminated so that the control panel, power cord connection and gauges are clearly visible without the need for additional local lighting. When servicing, additional temporary lighting may be needed by maintenance personnel.

**Vibration:** This machine has been assessed and determined, that in normal design use parameters, this machine offers no appreciable vibration hazards and as such, does not require any remedial or secondary action to reduce vibration.

**Noise:** The machine is designed in such a way as to offer reduced acoustic sound pressure levels. The machine noise level has been measured and does not exceed 82 dB(A).

## 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. Roll the machine to designated area. Connect to process with 50mm. flexible hose.



SECTION 400

# *Testing & Commissioning*

## Testing & Commissioning

---

Once unit has been connected to power and compressed air, it is important to verify the machine is operating correctly and adjust airflow to ensure effective capture.

Record details of setup and settings through pictures and notes. Keep these on file with a logbook for daily checks.

### Verify Machine Operation

Perform these quick checks to verify machine is running correctly:

1. Turn unit to the one-gun position. Listen for blower to ramp up and level off at running speed. Watch that gauges operate.
2. Flip switch to the two-gun position. Listen for a change in motor speed.
3. In PFE (Portable Fume Extractor) the unit turns on a yellow light and a beeper alarm when you exceed 3" of water column filter differential. The alarm turns off when the unit drops below 2.9" of water column or when you turn the motor off. When the alarm goes off the user is to press the pulse button. The pulse sequence is one pulse every ten seconds for five pulses.  
*Note: The differential pressure no longer turns off the unit.*
4. Press the pulse button, listen for a rush of air inside the filter cabinet indicating the pulse valve has opened.
5. Once the function has been confirmed, testing and adjustment can be performed.

### Fume Guns

Fume guns are a delicate balance between having enough airflow to cap-ture the fume and not drawing away shielding gas. Below are a few tips:

- Areas of a weldment that are tight or partially enclosed can allow the suction to project throughout that volume or along the material and begin to draw away shielding gas. Changing the nozzle to a design suited for these applications is recommended if porosity occurs consistently.
- On right angles, a different nozzle is typically not necessary. Often, adjusting the angle of the nozzle during so intake ports are further away from the material is enough to correct porosity issues.
- Gas flow should be within recommendation specified by the fume gun manufacturer. Outside of this range can cause inconsistencies in the weld or capture.

SECTION 500

# *Operating Instructions*

# Operating Instructions

Refer to diagram below for callouts of the control interface located on top of the filter access. Below are descriptions of the simple control modes.

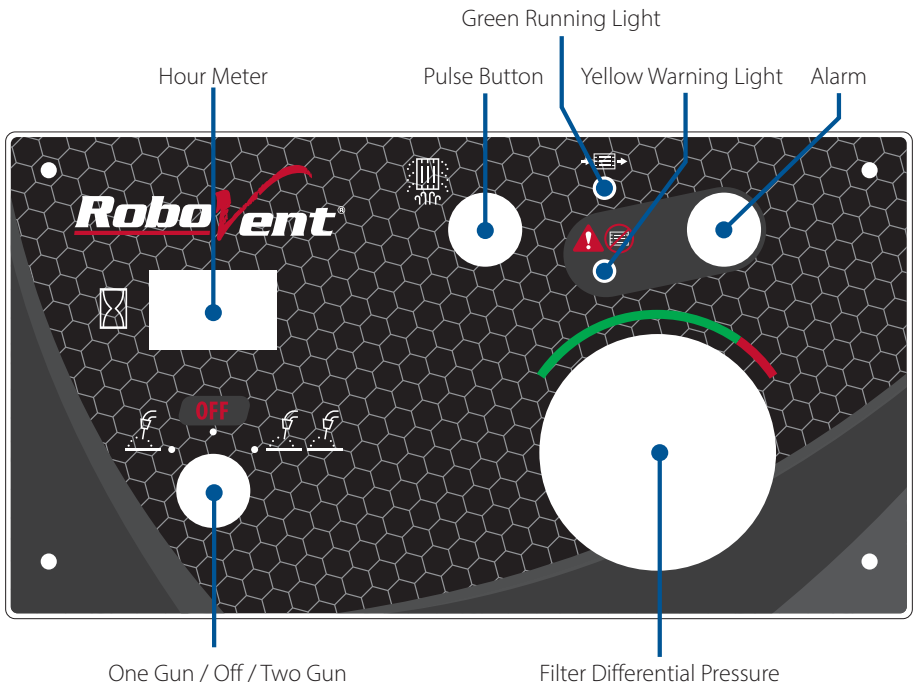


More than six starts of the motor in one hour can be harmful. Refer to the "Purpose & Limitations" section for a detailed description.

## Pulse Cleaning

The ProCube II machine is equipped with electronic pulse cleaning.

Online cleaning pulses the unit once the pulse button on the control panel is pressed. It is recommended to activate the pulsing cycle before and after each use, and could also be needed between cycles depending on use.



SECTION 600

# *Preventative Maintenance*

# Preventative Maintenance

---

## Safety

Emptying the dust containment bin, performing monthly service or changing filters requires PPE to minimize exposure to metal dust. It is recommended to wear disposable coveralls, non-porous gloves, dust mask and safety goggles when performing these procedures. Follow company MSDS and PPE guidelines.

Dust collected by this machine may be hazardous. Toxicity testing must be performed by your local waster service provider and dust disposed of according to local disposal and workplace safety regulations.

## Cleaning the Dust Containment Bin

Empty the bin as soon as it is full. The time between cleanings will vary with production schedules, processes or other factors. A good estimate of time required between the cleanings can be determined after a few cycles; record percentage full and hours each time to help you estimate when the next cleaning is needed.

To clean the dust containment bin, follow these steps:

1. Open filter lid, make sure no piles of dust are built up at the bottom that will fall out when dust bin is removed. Dust bin level can also be checked here using a flashlight.
2. Remove the (4) push button flanged nuts securing the dust bin.
3. Grasp handle and pull bin straight out.
4. Use a vacuum to pick up any dust that spills.
5. Record machine hours and service action.
6. Reinstall dust bin and (4) flanged nuts.

## Monthly Maintenance

On a monthly schedule, perform the following steps and checks:

1. Start machine, allow it to ramp up. Record machine hours and filter differential pressure.
2. Press the pulse to enact cleaning cycle.
3. Once pulsing has finished turn off the machine, open filter cabinet and brush any piles of dust into containment bin at bottom.
4. Inspect the inside of cabinet and vacuum out large buildup of dust.
5. Inspect hoses for leaks and damage.
6. Close filter compartment and start machine again.
7. Record post-cleaning filter differential pressure.

## Filter Change

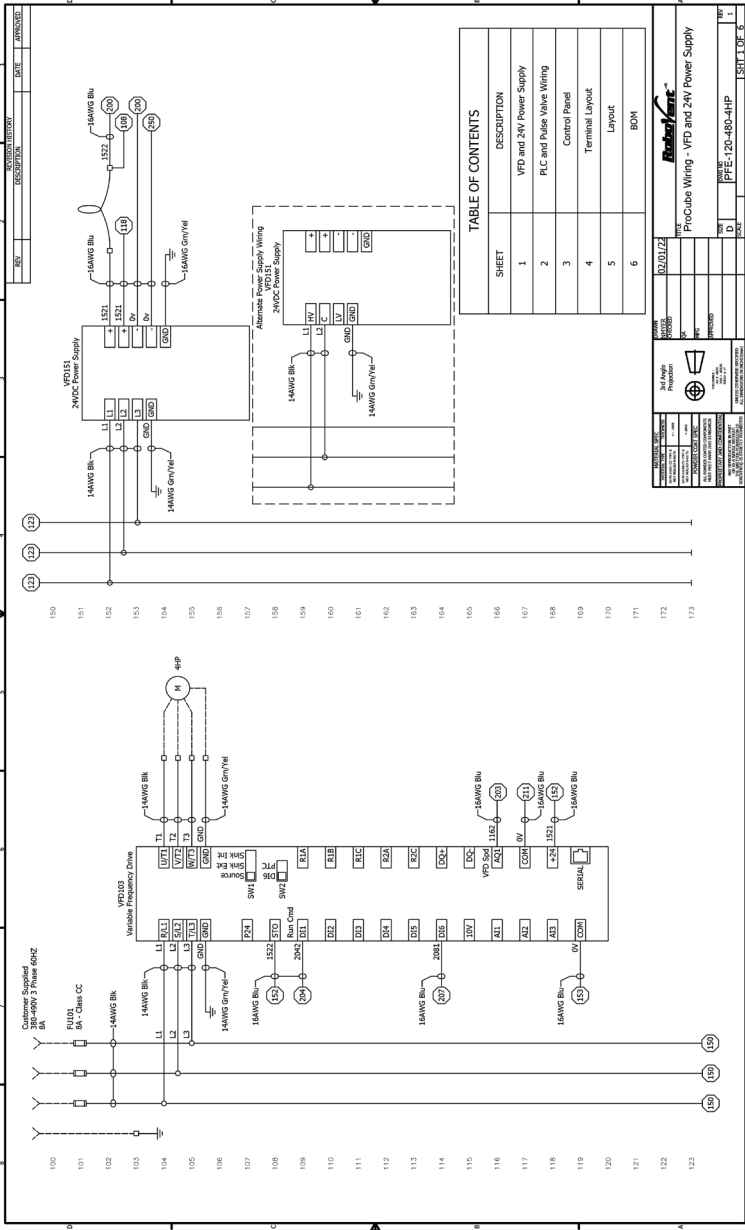
Once the filter differential pressure gauge has reached the red zone (indicated by the green & red) above the gauge it is time to replace the filter.

Perform the procedures outlined in monthly maintenance. While filter compartment is open, and once cleaning of dust build-up is complete, replace the existing filter (Filter Part Number: EX3-11D18-B16)

SECTION 700

# *Wiring Diagrams*

# Wiring Diagrams



**REVISIONS**

NO.	DATE	DESCRIPTION
1	01/11/2013	Initial Issue

**PROJ. NO.** PFC-120-400-4HP  
**REV.** 02  
**DATE** 01/11/2013

**PROJ. NAME** ProCube Wiring - VFD and 24V Power Supply

**DESIGNER** [Signature]  
**CHECKED** [Signature]  
**APPROVED** [Signature]

**SCALE** 1:1

**DATE** 01/11/2013

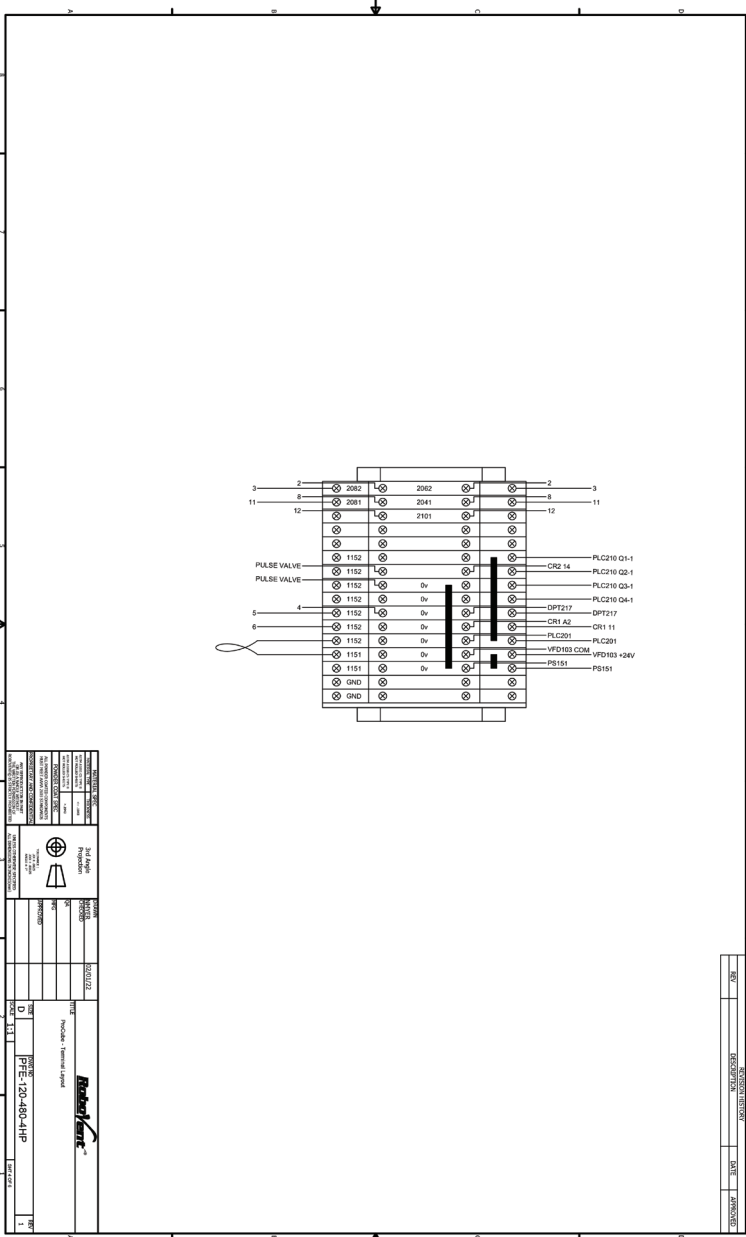
**SHEET** 1 OF 6



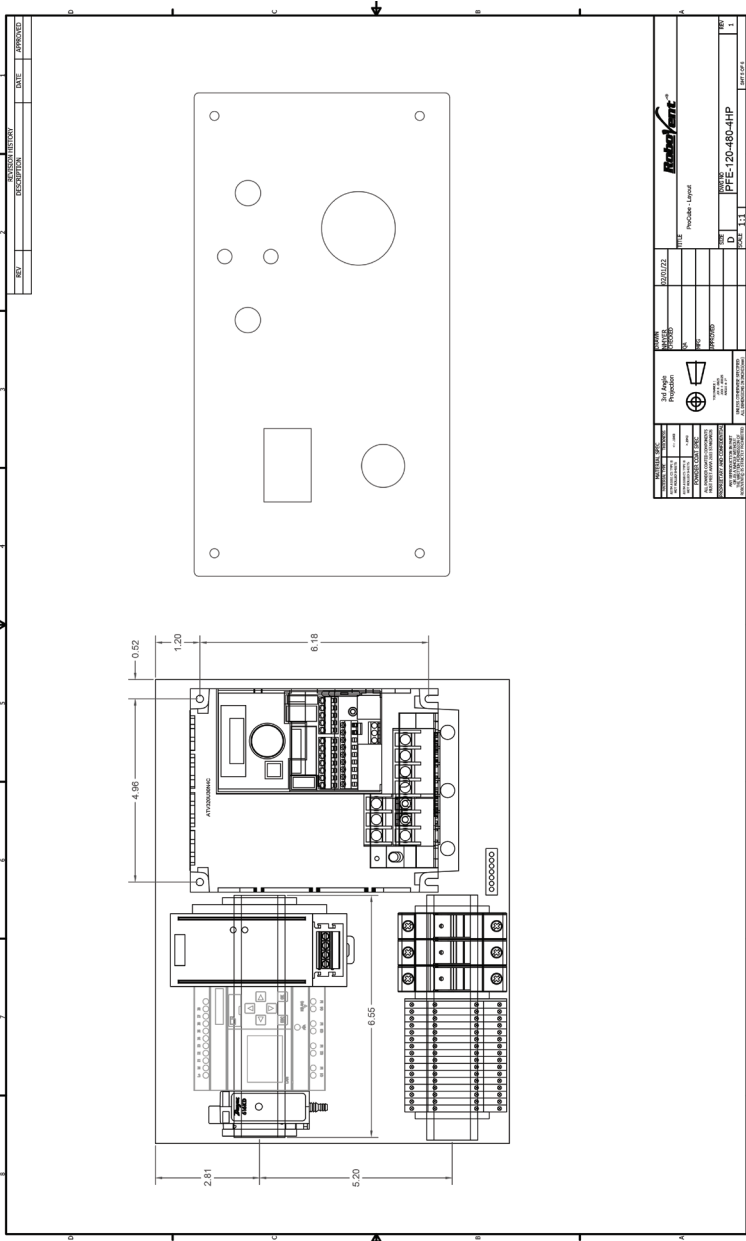




# Wiring Diagrams



# Wiring Diagrams



# Wiring Diagrams

Item	Robovent Part Number	Manufacturer Part Number	Description	Manufacturer	Device	Qty
Subplate						
1	ELEC-031	PK5GTA	Ground Bar	Schneider Electric		1
2	ELEC-003	SQDN5YTRAAAB35	End Anchor	Schneider Electric		5
3	ELEC-771-002	WAG20022791	Terminal End Barrier	Wago		1
4	ELEC-770-002	WAG20022701	Terminal Block	Wago		14
5	ELEC-774-002	WAG20022707	Terminal block Grounding	Wago		2
6	ELEC-773-001	WAG2002400	Jumper	Wago		13
7	ELEC-094	DN-R35S1	Din Rail	Automation Direct		1
8	HVP-PC-24	FL1F-H12RCE	Smart Relay	IDEC	PLC201	1
9	VFD-4-480-C	ATV320U30N4C	VFD 4HP 480VAC 3phase	Schneider Electric	VFD103	1
10	PS-HVP	PSGG0F24RM	Power Supply 380-575V to 24VDC	Eaton	PS151	1
11	ELE-323	RV8H-L-AD24-IDEC	Relay	IDEC	CR1	1
12		616KD-03-V	Differential Pressure Transmitter 0-SinWC	Dwyer	DPT217	1
13	ELEC-104	6650T22	Cordset, 12 wire 18awg colored	McMaster Carr		1
14	FUSE-PORTABLE	FNQR-8	8A Fuse			3
15	Elec-1010	DFCC1V	Fuse Holder with indicator			3
16						
17						
Control Panel						
18		04-CCL3120-NTE	CABLE CLAMP 5/16in. BLACK, PK/100 Black nylon	NTE		2
19		ZB4BD3	22mm selector switch head, 3 position, maintained, black	Schneider Electric		1
20	HVP-MC	ZB4BZ009	22mm Mounting Collar	Schneider Electric		2
21	ELEC-223	ZBE102	22mm Contact Block NC	Schneider Electric		0
22	CB-1NO	ZBE101	22mm Contact Block NO	Schneider Electric		2
23	HVP-Buzzer	XB5K5B	Buzzer, 12-24VAC/VDC, 85db	Schneider Electric		1
24	HVP-PLY	XB6AV5BB	Pilot Light, 16mm, 12-24VAC/VDC, LED, Round, Yellow	Schneider Electric		1
25	HVP-PLG	XB6AV3BB	Pilot Light, 16mm, 12-24VAC/VDC, LED, Round, Green	Schneider Electric		1
26	HVP-PB	XB7NA21	Pushbutton, 22mm, XB7, 1NO, Black	Schneider Electric		1
27	HM-HVP	732-0002	Hour Meter	Galco		1
28						
29						
30						

# Notes

---

# Notes

---



***Making a Difference One Breath at a Time.***

*37900 Mound Road, Sterling Heights, MI 48310 USA*

**ROBOVENT.COM • 888.ROBOVENT**