

BNM Trailer Sales, Inc.

757 N. Hollister Road

Elsie, Michigan 48831

989-862-5252

October 15, 2018

Attention: Julie Brunner P.E.

We are in the process of installing a dust collector & clean air recirculating system. I am sending information on the unit. Also Jeffrey Maurer is our electrician and he is working on that part and Victory Heating & Cooling is scheduled October 16, 17 to do the duct work. I am enclosing the bid for that work. Just a update on what we are doing. I will get it all together and send you the information requested by November 9.

Thank you,

Sandy Jones

VICTORY HEATING & COOLING

703 N. US-27
 ST. JOHNS, MI 48879
 (989)224-7171
 Victory@VictoryHeatingAndCooling.com
 www.VictoryHeatingAndCooling.com

Oct. 16-17



ESTIMATE

ADDRESS

BNM Trailers
 7577 N. Hollister Rd.
 Elsie, MI 48831 USA

ESTIMATE # 1391**DATE 09/07/2018****P.O. NUMBER**

9898625252

SALES REP

Brad

ACTIVITY	QTY	RATE	AMOUNT
Duct Work SGP-24X10-24 24"X10' 24GA GALV SPIRAL PIPE	12	220.69	2,648.28
Duct Work SGF-24-24-90 24" 24GA GALV SPIRAL 90 ELBOW	4	132.80	531.20
Duct Work SGF-24-CONN 24" 24GA GALV SPIRAL CONNECTOR	8	30.50	244.00
Threaded Rod Threaded Rod	12	7.98	95.76
3/8 nut THREADED ROD-HEX NUT 3/8" HEX NUT NIBCO # 113 T&B# E145 BOX OF 100	1	10.85	10.85
3/8 washer THREADED ROD-WASHER 3/8" FLAT T&B# E147 BOX OF 100	1	9.30	9.30
Straps DIV 710-001 1" 100' 26GA SOLID STRAP (SMM-HANGER-STRAP)	2	37.53	75.06
Sammy EMC 7165-25 1/4"x2" FOR 3/8" ROD WOOD HANGER VERTICAL WINDER (25 box) All of this is in stock with our distributor, we can have it within 24 hours.	2	27.44	54.88
Plenum 80x44x24 with 1" flange bottom and one 24" circle cut in one of the 44" sides. 18ga galvanized steel	2	820.00	1,640.00
Labor HOURLY LABOR	8	120.00	960.00

ACTIVITY

QTY

RATE

AMOUNT

*****CUSTOM PELNUMS HAVE BEEN
ORDERED AND CANNOT BE
RETURNED.*****

Victory wants your business and will not be undersold. If you have a
written estimate from a competitor with identical equipment and
services please bring to our attention and we will do everything we can
to earn your business.

TOTAL

\$6,269.33

we now offer full service plumbing and sewer cleaning please ask
about bundling for bigger savings.

Accepted By

Accepted Date

Subject: ^_Dust^_ ^_Collection^_ ^_Module^_ ^_Information^_

From: LMoore@grandnorthern.com

To: BJ4664@yahoo.com

Cc: BDykstra@grandnorthern.com; SCarpenter@grandnorthern.com

Date: Thursday, October 11, 2018, 8:42:33 AM EDT

Good morning Bill,

The info on your dust collection modules is 8,960 SCFM per module, since you have 2 modules the total airflow is 17,920 and the filters are MERV 13.

If you have additional questions please let me know and I will work with Steve or Ben to try and assist.

Thank you,

Liz Moore

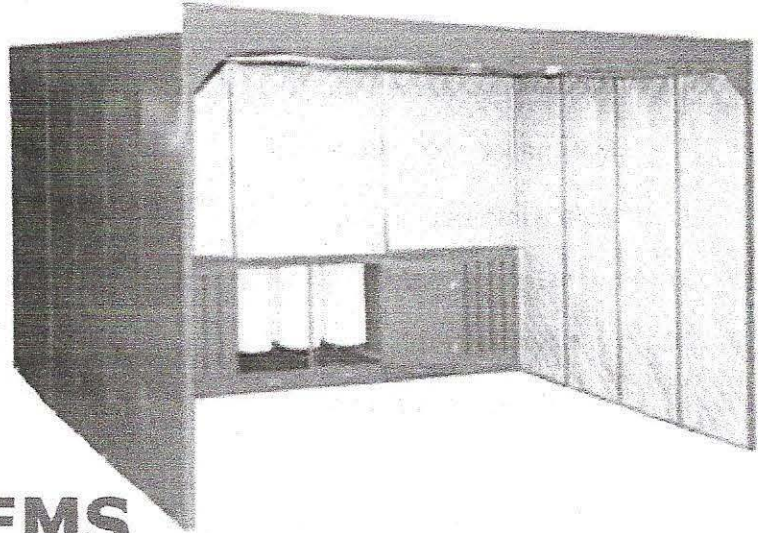
Grand Northern Products

9000 Byron Commerce Dr.

Byron Center, MI 49315

Phone (616) 583-5000

Fax (616) 583-9061



SAFE AIR SYSTEMS

Dust Collection & Clean Air Recirculating System

Installation, Operation, and Maintenance Manual

Customer: **BNM TRAILER SALES INC.**
Distributor: **GRAND NORTHERN PRODUCTS**
Model #: **DCM-7-SGLD**
Serial #: **U84722A**
P.O.#: **4144299**

Read and keep this manual for future reference.

All personnel operating the equipment described in this manual should review
and understand all instructions before use.

12731 Norway Road – Osseo, Wisconsin 54758 – (715)597-2193 fax

TABLE OF CONTENTS

> Warranty	3
> Information and Introduction	4
> Safety Information.....	5 - 6
• General Safety	
• Safety Notes	
• Safety Precautions	
> Pre-Assembly	7
> Assembly & Installation Instructions.....	8 - 10
> Operation Instructions.....	11
> Troubleshooting.....	12
> Department Reference Guide	13
> Mechanical Drawings	

LIMITED WARRANTY



Global Finishing Solutions (the Sellers) warrants to the original end-user buyer (the buyer) that the equipment manufactured by, and purchased from, the Seller (the Equipment), if properly installed in accordance with the Seller's Service Manual, operated, and maintained, and used under normal conditions, shall be free from defects in workmanship and materials for a period of one (1) year from the date the Equipment is shipped from the facilities of the Seller. The obligation of the Seller, and the Buyer's SOLE AND EXCLUSIVE REMEDY hereunder, shall be limited to one of the following, at the Seller's option:

(01) The repair or replacement of defective parts or components (collectively, the Parts) of the Equipment; provided, however, the Buyer shall be responsible for the payment of all labor costs associated with any such repair or replacement.

(02) In the event the Seller is unable to repair or replace the defective Parts, the Buyer shall be entitled to a refund of the cost of the Parts.

The Seller shall have no obligation under this Limited Warranty for ordinary wear and tear of the Equipment; if installation of the Equipment does not comply with local, state and federal requirements or laws; or if the Equipment is modified by any other person or organization. The Seller makes no warranty of any kind whatsoever with respect to Parts, which are manufactured or supplied by other persons or organizations (an OEM); provided, however, the Seller shall reasonably assist the Buyer in connection with warranties, if any, provided by an OEM.

Warranty Performance Procedures

In the event the Buyer believes the Seller may be responsible for the performance of any warranty obligation, the Buyer must immediately send written notice of a claimed defect, and must immediately refrain from any further use of the affected Equipment. No attempted repair of the claimed defect may be made without the prior written consent of the Seller. Before any Parts can be returned to the Seller, the Buyer must contact the Seller and request a Return Authorization. Upon the Buyer's receipt of the Return Authorization form, the Parts may be shipped, freight prepaid, to the facility designated on the Return Authorization. All Parts returned for repair, replacement, or refund (a refund may be made in the form of a credit to the Buyer's account), must be accompanied by the Return Authorization. All returned parts are subject to a thirty percent (30%) handling charge. Parts manufactured or supplied by an OEM are subject to the warranties, if any provided by such OEM's; and repair or replacement of such Parts are subject to the approval of the OEM. The Buyer shall be responsible for the payment of any handling or restocking charges associated with OEM Parts.

Disclaimers of Warranties

THE WARRANTIES CONTAINED HEREIN ARE EXPRESSLY IN LIEU OF ANY OTHER EXPRESSED OR IMPLIED WARRANTIES, OR ANY OTHER OBLIGATION ON THE PART OF THE SELLER, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY MODELS, DRAWINGS, PLANS, SPECIFICATIONS, AFFIRMATION OF FACT, PROMISES, OR OTHER COMMUNICATIONS BY THE SELLER WITH THE REFERENCE TO THE EQUIPMENT OR THE PERFORMANCE OF THE EQUIPMENT ARE SOLELY FOR THE CONVENIENCE OF THE BUYER AND SHALL NOT IN ANY WAY MODIFY THE EXPRESSED WARRANTIES AND DISCLAIMERS SET FORTH HEREIN. THE BUYER ACKNOWLEDGES IT IS PURCHASING THE EQUIPMENT SOLELY ON THE BASIS OF THE COMMITMENTS FOR THE SELLER AS EXPRESSLY SET FORTH HEREIN. NO AGENTS OR OTHER PARTIES ARE AUTHORIZED TO MAKE ANY WARRANTIES ON BEHALF OF THE COMPANY OR TO ASSUME FOR THE COMPANY ANY OTHER LIABILITY OR OBLIGATION IN CONNECTION WITH THE EQUIPMENT.

Consequential Damages

The Seller shall not be liable for any incidental or consequential damages arising from the use of the equipment by the Buyer, the breach of any warranties, the failure to deliver, delay in delivery, delay on nonconforming condition, or for any other breach of contract or duty between the Seller and the Buyer.

Limitation of Actions

Any action resulting from the breach of any warranty contained herein by the Seller must be commenced within one (1) year after the cause of action accrues. In no event shall the Seller's total liability for any or all breaches of any warranty exceed the actual purchase price paid by the Buyer for the Equipment.

12731 Norway Road - Osseo, Wisconsin 54758 - (800)848-8738 - (715)597-2193 fax

GENERAL INFORMATION

IMPORTANT!

Read and save these instructions before attempting to assemble, install, operate, or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage. Retain these instructions for future reference.

Introduction

A Message for the Purchaser

The management and employees at Global would like to thank you for selecting our product for your industry. Our product conforms to Occupational Safety & Health Administration (OSHA) and National Fire Prevention Association (NFPA) regulations for your safety. The employees of Global understand the importance of a quality system and strive to manufacture the best product on the market.

IMPORTANT!

This equipment is designed expressly for the removal of particulate matter only. Reduction of volatile organic compounds (VOCs) requires either coating reformulation or optional, additional equipment.

SAFETY INFORMATION

IMPORTANT!

This manual contains statements relative to worker safety. Read this manual thoroughly and comply as directed. Global Finishing Solution's Spray Booths and Dust Collection Systems conform to O.S.H.A and N.F.P.A. regulations, however this equipment is designed expressly for the removal of dust from the work environment and for the control of in-plant air pollutants and fine hazardous foreign materials from various manufacturing sources only. The equipment must be operated in accordance with the guidelines set forth in this operation and maintenance manual. It is impossible to list all potential hazards of dust control equipment and systems and it is imperative that all personnel involved with equipment be instructed in the safe conduct and operation of the system. Global recommends that only qualified personnel operate and maintain this equipment.

General Safety

Operation and maintenance of this product must be performed properly by qualified personnel who observe the warnings in all documentation and notes provided with and on the product.

Follow all general standards for installation and safety for work on installations. Follow all good practices for the proper use of lifting tackle and equipment. The use of protective equipment such as safety goggles and protective footwear must be considered.

If any pumps or compressors are included as part of this installation, they must be connected in compliance with data in the documentation provided.

Guards and covers that prevent contact with electrically energized or moving parts are required and must not be removed or left open during operation.

Sound pressure levels over 85 decibels may cause damage to your health. Where applicable, use earplugs or take other safety measures to protect yourself.

Safety Notes

- The product must be installed and serviced only by a trained, qualified service technician. Incorrect installation may void the warranty.
- All persons who will operate, service, inspect, or otherwise handle this product must read and understand the safe operating practices,

safety precautions, and warning messages in this documentation.

- Disconnect and lock out the main electrical service before installing, adjusting, or servicing the product.
- Ensure that all electrical components are grounded to a central ground.
- Become familiar with all controls.
- Electrical installation should be completed by a qualified electrician. Installation must meet all applicable national, state, and local electrical codes.
- Safety signs, panels, and labels that are normally affixed to the product must be replaced immediately if illegible or missing.
- New or replacement parts that are installed during repair or maintenance must include all safety signs, panels, and labels as specified by the manufacturer. These must be affixed to the new or replacement parts as specified by the manufacturer.
- If this product is a spray or powder coating booth, some activities may require the use of respiratory protection.

Safety Precautions

- Install the booth in compliance with the standards of the NFPA.
- Comply with all local electrical, safety, and fire codes and regulations, the National Electrical Code (NEC), and OSHA guidelines.
- If this product is a spray booth, turn the exhaust fan on before using the spray booth. Ensure that the exhaust fan is operating correctly before entering the booth.
- For spray booths, check local codes to see if a booth interlock is required. A booth interlock will prevent the spray devices from operating unless the booth fan is operating.
- The NFPA may require a fire suppression system (sprinklers or dry chemical) is product. A fire suppression system is not supplied with this product.
- For spray booths, the use of a solenoid valve is required by the NFPA. Solenoid valves are not supplied with this booth except by optional purchase.
- If spraying, use an OSHA-approved paint spray respirator for your safety.

- Do not operate the spray booth when the manometer indicates the filter pad needs to be replaced.
- Treat used arrestor filter pads and any other paint-contaminated items as flammable products and dispose of them properly and safely.
- If applicable, duct the exhaust air from the fan away from the working environment to the outdoors. (Do not operate the paint booth unless exhaust has been ducted properly.)
- If applicable, isolate the outdoor vent from air-conditioning intakes, windows, and any other equipment that may re-circulate the exhaust indoors.
- For products with a manometer: Do not overfill the manometer, allowing fluid to collect in the flexible plastic connecting loop in the back of the manometer. This could cause a serious reading error. If the manometer is subject to overflow, make sure that the fluid has not passed into the plastic connecting loop.

SAFETY HAZARD!

There are inherent hazards associated with the operation and service of this equipment. For your personal safety, observe all of the safety information. Failure to observe these safety practices can result in personal injury or death.

APPLICATION OF DUST CONTROL EQUIPMENT

1. Due to the potential fire hazard caused by sparks entering the dust collector, avoid mixing combustible materials such as buffing lint, paper, wood dust, aluminum, and magnesium with dust generated from grinding ferrous metals.
2. Under no circumstances should the operator be allowed to put lit cigarettes or any burning object into the hood or ducting of any dust control equipment.
3. When the dust collector is used to collect fire or explosion risk dust, the dust collector should be located outside the building. Consultation with an installer of fire extinguishing equipment, familiar with this type of fire hazard and local fire codes, is important. Recommendations for the proper fire extinguishing equipment are necessary. Dust collectors do not contain fire-extinguishing equipment.
4. The user of this equipment should consult and comply with all National and Local Fire Codes and other codes when the determination of location for and the operation of dust collector equipment is decided.

PRE-ASSEMBLY

For the best installation and operation results the Dust Collector should be installed on a flat surface. Modules are designed with pre-punched holes in mating sections to align for easy bolting. The roof sections in particular are sensitive to alignment. If the surface is not flat, the modules and booth walls must be shimmed to align the bolt holes.

For the installation of roof panels, a forklift would be recommended to aid in the installation. When choosing the location area for the Dust Collector, consideration should be given to the accessibility to compressed air, electrical components and easy access to empty the dust collection drawers located inside the dust collector modules. For precise assembly information, please use the product drawings provided at time of shipment.

Specification and Performance

Safe Air Modules

Application	Model	Performance Data				Specifications					
		Blower H.P.	# of Filters	Sq. Ft. Filters	SCFM	Width	Height	Depth	Dust Storage (cu. Ft.)	Air to Filter Ratio	Shipping Weight
Wood and Metal	GFS-4-SG	5	9	1719	5120	4'	8'2"	4'	4.8	3.0:1	1550
	GFS-7-SG	7.5	15	2865	8960	7'	8'2"	4'	8.4	3.1:1	2400
Fiberglass Lamin./Comp.	GFS-4-CO	5	9	1719	5120	4'	8'2"	4'	4.8	3.0:1	1550
	GFS-7-CO	7.5	15	2865	8960	7'	8'2"	4'	8.4	3.1:1	2400

Electrical Requirements: Blower 208-230/460V 60 HZ three phase, Control Power 120V 60 HZ single phase., Electric control panels are available to meet customer's voltage specifications. Fully assembled modules are shipped complete with fan, motor and cartridges.

Clean Air Modules

Application	Model	Inside			Outside			Safe Air Modules				
		Width	Height	Depth	Width	Height	Depth	Size	Quantity	SCFM	# Light Fixtures	Shipping Weight
Wood Metal	GFS-888-SG	8'	8'	8'	8'4"	8'6"	12'	4'	2	10240	2	4000
	GFS-1288-SG	12'	8'	8'	13'	8'6"	12'	4'	3	15360	4	4800
	GFS-1588-SG	15'	8'	8'	16'	8'8"	12'	7'	2	17920	4	7000
	GFS-2288-SG	22'	8'	8'	23'	8'8"	12'	7'	3	26880	5	9000
Fiberglass Laminate Composite	GFS-888-CO	8'	8'	8'	8'4"	8'6"	12'	4'	2	10240	2	4000
	GFS-1288-CO	12'	8'	8'	13'	8'6"	12'	4'	3	15360	4	4800
	GFS-1588-CO	15'	8'	8'	16'	8'8"	12'	7'	2	17920	4	7000
	GFS-2288-CO	22'	8'	8'	23'	8'8"	12'	7'	3	26880	5	9000

Depth of each booth can be increased in 2ft. modules at a nominal cost. Shipped with fully assembled modules complete with fan, motor and cartridges. Booth panels require assembly on site.

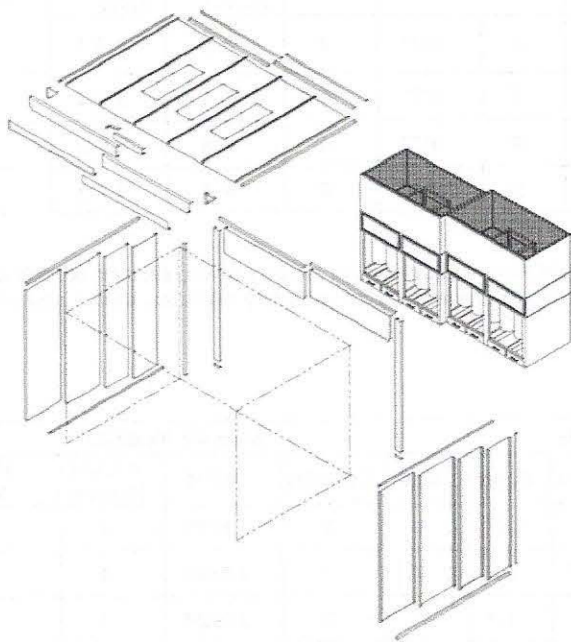
ASSEMBLY & INSTALLATION INSTRUCTIONS

Tools required: Screwdriver, wrenches, socket set, hammer, drift pin, caulking gun, and drill with 1/8", 3/8", and 1/2" bits.

IMPORTANT!

Do not attempt to assemble the booth until you have read these instructions carefully. Study all drawings thoroughly. Each component is shown by part number on the assembly drawings. This will help you determine where to install the various components.

NOTE: Follow the assembly steps in order and refer to the assembly drawings. Double-check the procedure before you continue. If it has not already been done, sort all the panels and channels by size and number before assembly.



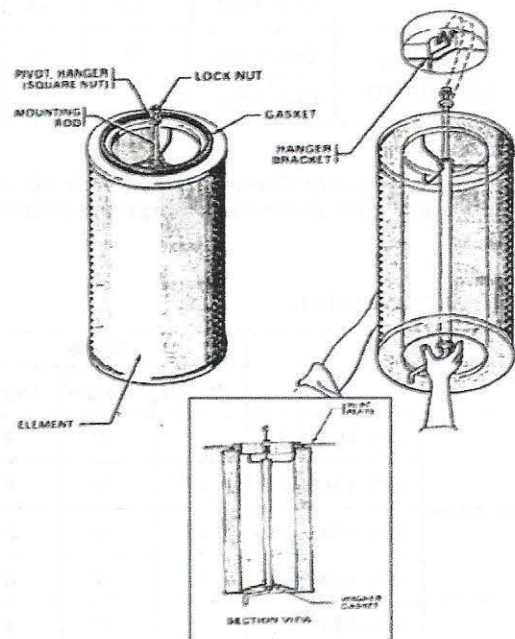
Dust Module Installation

The Dust Module is pre-assembled, but the filters have been removed for shipping. The Dust Module is pre-drilled for accurate on-site alignment. Refer to the included assembly drawings for details.

NOTE: Allow three feet between the fan motor and any obstruction for maintenance and removal of the fans and final filters.

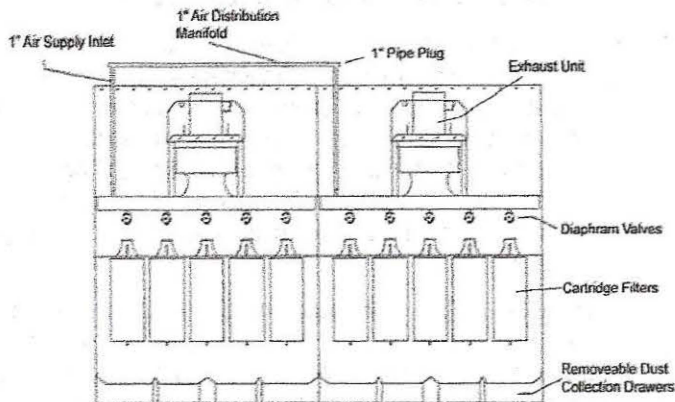
Cartridge Replacement

- Remove all filter elements starting with those nearest doors by turning crank clockwise until hanger is loose enough to remove hanger bracket.
- Disassemble hanger rods from elements and install in new elements as shown. Always replace outside washer gasket when replacing filter elements.
- Install elements by unscrewing hanger pivot until it touches lock nut on end of mounting rod. Hang element assembly on hanger brackets as shown. Turn crank counter-clockwise until the element bottom out on stops. **TIGHTEN BY HAND ONLY - DO NOT USE WRENCHES.**
- Install elements at back of cabinet first and work towards the doors.



Air Supply Installation

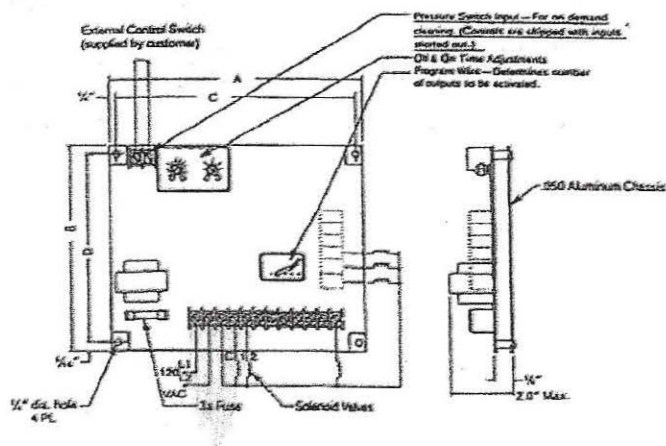
Air supply requirements are 6 CFM at 50-100 PSI, not to exceed 125 PSI. Includes airline filter for moisture and particulate removal. Optional regulator may be required. Remove pipe plug from end of dust collector manifold and connect air supply line. Use pipe sealant on all air connections. Air valves, bleed-type regulator and gauge, filter and automatic condensate valve should be incorporated in the air supply line.



These components should be accessible for easy servicing and be sized adequately to meet system requirements.

CAUTION: Purge airlines to remove debris before connecting to air manifold.

Electrical Timer Board (Standard)



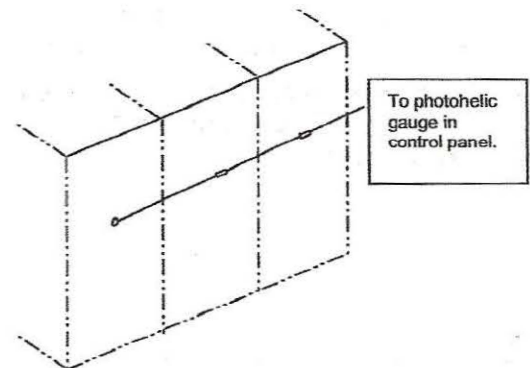
Operating Logic: Input power is applied to the control at all times. For "On Demand" cleaning, closure of isolated control contacts (pressure switch) initiates the "Off" time. At the end of the off time the control energizes solenoid no. 1 to

provide a cleaning pulse; it then transfers to the next compartment initiating the off time again. This cycle continues until the control contacts open. The control remembers the last output activated and will activate the next one in line when the control contacts re-close. For "continuous" cleaning the pressure switch terminals should be shorted together. A program wire allows for field selection of number of outputs required.

NOTE: Refer to schematic for further information included with equipment upon shipment.

Optional Deluxe Control Panel

includes a PHOTOHELIC™ GAUGE



- Remove 1/8 NPT pipe plugs and screw 1/8 NPT elbow and 1/8 NPT Tees as supplied into coupling on the back of dust collector modules.
- Install 1/2" OD plastic tubing and connect to Photohelic Gauge which is located outside of module. For proper operation of the Photohelic gauge it is important that connection and filter are installed as shown.
- Electrical wiring for the Photohelic gauge is provided with the Wiring Diagram.

Optional Deluxe Control Panel

- This control panel houses a main disconnect switch, control/lighting transformer, motor starter(s) with fuse and overload protection per NEC requirements, sequencing module, Photohelic switch, gauge, push buttons, selector switches and operating pilot lights.
- All standard units are factory wired for 480 volt 3 phase, 60 Hz unless otherwise requested at the time of purchase. The operating voltage

may be converted to either 208 volt, 3 phase or 240 volt 3 phase. Consult your factory representative if this is required.

- The control panel may be mounted on the dust collector or adjacent wall. Under no conditions should the panel be mounted inside the dust collector enclosure.
- The electric motor requires wiring to the main control panel. Located in each module in the exhaust section is a remote electrical box which houses pilot solenoid valves for the filters. These valves operate at 120 volt and are wired to a terminal strip. This electrical box must be wired back to the main control panel with the proper amount of wires.
- Pneumatic tubing is factory installed from the main pulse valves located in the filter chamber, to the pilot valves. Pneumatic tubing and fittings are supplied to connect the static pressure sensor or sensors (located in the exhaust section) to the main control panel.
- When more than one module is used, all static pressure sensors are hooked together in a series circuit.

Cartridge Filters

High-efficiency cartridge filters are available for two alternative applications:

- The non-fibrous filter model is recommended for non-fibrous applications: Sanding and grinding. These filters feature a pleat design that holds the pleats open and even for improved long-term air performance and service life. The non-fibrous filter has a 99.8% filtration efficiency for .5 micron particles. The filter area per cartridge is 226 sq. ft.
- The fibrous filter model is recommended for fibrous applications: Fiberglass, laminates and other composites. These filters have wide pleat spacing and the absence of an outer liner to permit a thorough pulse cleaning. The fibrous filter has a 99.7% filtration efficiency for .5 micron particles. The filter area per cartridge is 110 sq. ft.

Cartridge filters are supported by expanded metal retainers constructed of 18-gauge galvanized steel. The 98% open configuration promotes cleaning during the pulse cycle. All components are made with G60 galvanized corrosion resistant material.

Safe Air Replacement Cartridge Filters							
Application	Part #	Dimensions			Filtration Efficiency (Microns)	Filter Area per Cartridge	Shipping Weight
		OD	Height	ID			
Wood & Metal	216-202	12 3/4"	26"	8 3/8"	99.8% to .5	226 sq. ft.	18 lb.
Fiberglass/Laminate/Composite	216-204	12 3/4"	26"	8 3/8"	99.7% to .5	110 sq. ft.	14 lb.

OPERATION

1. Turn on air supply to air manifold. Pressure should be 80-100 psig. Experience indicates 90 psig to be the most typical setting for satisfactory cleaning performance. See operating adjustments below.
2. Turn on blower. At initial start up, visually check blower rotation to be sure it is correct.

Operation Checks

1. Monitor exhaust. Exhaust should remain visually clean. If a leak develops it will first be noticed as a puff of dust immediately after a cleaning pulse. Check installation of filters if this occurs.
2. Monitor pressure drop. Equilibrium of pressure drop across filter elements is generally 3 fi inches.

Pulse Jet Collectors

In pulse jet collectors, the cleaning process not only removes the collected dust - it rearranges the remaining dust cake structure on the filter, resulting in a change in differential pressure.

In a unit with high upward gas velocities, mechanical separation of the fine sub-micron dust can occur, creating a dust cake structure that is very dense. A dense dust cake creates a resistance to airflow, and higher differential pressures.

Pulse Sequence

(Feature available only with optional Deluxe Control Panel)

The pulsing sequence can play an important role in lessening the entrainment of material. Pulsing one row right next to another row (sequential order) can cause the fine sub-micron material to migrate to the cleaning row. Staggering the order of rows can improve the dust cake for optimum filtration.

Pulse Setting

(Feature available only with optional Deluxe Control Panel)

The photohelic initiates the reverse pulse cleaning cycle at the 3" S.P. needle and pulses until the pressure drop reaches the lower 2" S.P. needle. A "ONE CYCLE CLEANING" push button is provided as a method to thoroughly clean the filters without the blower running. This cycle should be run several times a day when the system is not in operation.

Higher than desired pressure drop across filter elements can often be lowered by increasing the frequency of cleaning, minimum dwell time between pulses is 3 seconds. Additional cleaning energy may be obtained by adjusting pressure up to a maximum of 100 psig.

DO NOT increase the length of each pulse beyond the nominal .2 seconds factory setting. Longer pulsed do not aid cleaning, they simply waste compressed air. DO NOT increase air pressure beyond 125 psig. Filter damage may result, a low-pressure drop across filter elements can be raised to design levels by increasing dwell time between pulses.

TROUBLESHOOTING

Checklist

Pulse valve malfunctions are usually caused by diaphragm failure or dirt and /or moisture getting into the valve body. These problems can be identified by disassembling the valve and inspecting it. Before checking valves, verify that tubing and fittings between diaphragm (pulse) valves are not leaking, and that the tubing is connected to the inlet port on the solenoid valve.

Prior to servicing the diaphragm valve, the solenoid pilot valve needs to be checked for proper operation. If malfunctioning, refer to the steps below.

If the solenoid valve will not open:

1. Confirm adequate electrical connection.
2. Check continuity of coil. If a metallic click is heard when the coil is energized, the coil is not the source of the problem.
3. Depressurize the system, check solenoid valve for dirt or wear - clean or replace.

If the solenoid valve will not close:

1. Disconnect the electrical source to ensure the coil is not continuously energized.
2. Depressurize the system. Check solenoid valve for dirt or wear - clean or replace.

If the pulse valves and solenoid valves are all in operation order, the next step is to inspect the cleaning system controller, following the procedure listed below:

3. Check power supply to the timer board to ensure it is correct.
4. If present, check the fuse on the timer board. Replace if it is blown.
5. Turn power on and observe output signals to ensure each output is supplying a signal. Look for any outputs that may be supplying a continuous signal. If no signal, replace board.
6. If the timer board is working properly, check the wiring between the timer and the solenoids for any discontinuity and/or short circuits.
7. If the signal is controlled by a signal from a pressure switch, check to ensure that the jumper between terminals on the timer board used to tie in the pressure switch has been removed. Also check the pressure switch itself to ensure that its airlines are not plugged. Its signaling capability can be checked by manually adjusting the differential pressure set points to a position that causes the relays in the switch pressure to activate.

DEPARTMENT REFERENCE GUIDE

Use the following guide to help you determine whether to contact the Parts Department or the Customer Service Department with your questions. To contact either department, call **(800) 848-8738**. Then follow the voice prompts for the correct department. You may leave a message on the voice mail system, and someone will get back to you as soon as possible. If you prefer to send a fax, dial (715) 597-2193. Be sure to address the correct department on your fax.

When you order replacement parts for your product, it is important to know the following information BEFORE ordering:

- Model Number
- Serial Number
- Part Number & Description
- Quantity
- Purchase Order Number or Credit Card Number
- Preferred Shipping Method (UPS, Federal Express, Truck, Air, etc.)
- Complete Shipping and Billing Address.

You can find the Model Number and Serial Number of your product on the ID Plate located on your product.

Parts & Filters Department	Customer Service
<p>All standard and custom products are designed and built by GFS. All parts are retained on file for immediate reference, replacement, and availability.</p> <p>Pricing for Parts Current prices and delivery costs will be quoted F.O.B. from Osseo, Wisconsin, Postal Code 54758.</p> <p>Supplier to Stock New/Replacement Parts For replacement parts and supplies, contact the Parts Department. We will help you locate your nearest distributor.</p>	<p>GFS provides ongoing customer and technical support for its customers. You can reach a customer service representative during regular business hours.</p> <p>Returning Parts All goods to be returned for credit or exchange must be accompanied by a Return Goods Authorization form. Call GFS to request form. Goods are subject to a 30% handling charge.</p> <p>Special non-stock items can be accepted only with the approval of our suppliers and are subject to any additional handling and restocking charges.</p>
<p><i>Note: If you have questions about the warranty, please contact your distributor PRIOR to contacting GFS.</i></p>	<p>Availability and Service Critical operational parts for productions and customer safety will be shipped overnight when possible.</p> <p>Operation and Maintenance Manuals GFS includes an electronic copy of the operation & maintenance manual with each job. You may purchase additional electronic or printed manuals by contacting customer service.</p> <p>Other Services</p> <ul style="list-style-type: none"> • Installation questions • Arrange for an installation • Arrange for a service call • Notify GFS of undelivered parts or other shipment problems



PREVENTIVE MAINTENANCE SERVICES

Why is preventive maintenance service important?

- > Extends the life of the equipment
- > Minimizes unscheduled downtime that can cause major problems in production
- > Maintains consistency in your product quality

Preventive Maintenance can be defined as a program in which wear, tear, and change are anticipated, and continuous corrective actions are taken to ensure peak efficiency and performance to minimize premature deterioration. Minimize downtime by correcting minor problems before they become major repairs. A detailed service record is instrumental tracking booth performance, a service report baseline of booth performance can be established as all of the critical set points and readings are recorded.

Preventive Maintenance involves a planned and controlled program of systematic inspections, adjustment, lubrication, and replacement of components, as well as performance testing and analysis. However, we realize that equipment grows old, uses change, and techniques vary. Our experienced staff takes these circumstances into consideration so an effective maintenance program is performed to keep your equipment running safely and efficiently.

THE PROGRAM

Servicing Packages

Tailored to meet your needs, service engineers will provide maintenance and cleaning to ensure that your equipment maintains optimal performance. The program can include anything from the general maintenance of the booth to cleaning, and the replacement of filters.

Filter Packages

The key to optimal spraybooth performance is the regular monitoring and changing of filters. GFS can supply flexible filter packages that will accommodate all types of spraybooths. Based on your projected demands, GFS will provide scheduled "Just in Time" delivery, reducing your management time and storage space needs, while keeping your booth running efficiently and providing superior finishes!

Periodic Assessments

Complying with health and safety regulations is very important to your business. Our service engineers will assess your equipment to help you avoid costly down times and keep your operation running smoothly.

THE BENEFIT

Reduced Operating Costs

GFS' Preventive Maintenance program helps keep fuel costs down by maintaining a paintbooth that is clean and runs at its optimum performance all year long. The program also provides regularly scheduled maintenance visits that will result in a reduction of emergency service calls throughout the year, therefore reducing the amount of down time and increasing productivity.

Improved Quality Finishes

Poorly maintained spraybooths are usually full of contaminants and do not produce a good quality finish. Scheduled filter changes along with preventive maintenance will maintain quality and reduce costly repaints.

Complete Service

GFS Technicians can provide services for Spraybooths, Paintbooths, Large Equipment and Large Vehicle Booths, Body Shop Refinishing Spraybooths, Finishing Systems, Aviation Paintbooths, Industrial Finishing Equipment including Ovens and Washers.



Preventive Maintenance Checklist

Preventive maintenance programs insure safe and reliable operation and contribute to the longevity of the equipment. The following is a suggested routine maintenance program broken down into lists of periodic tasks.

It is the responsibility of the end user to develop an inspection, testing, and maintenance program to ensure that the equipment is in safe working order. Hours of operation and work environment should be considered when establishing frequency of maintenance.

It is suggested that logs are kept so that any variation from normal readings can uncover trouble areas and help prevent serious problems from developing.

It is imperative that all personnel involved with this equipment be instructed in the safe conduct and operation of the system. Routine maintenance and safety checks should be performed by qualified personnel only. Contact the GFS Technical Service Group for availability of Preventive Maintenance Contracts and Other Services.

- Exhaust Fan(s)**
 - A) Lubrication: Fan & Motor Bearings.....
 - B) Belts: Check Condition (replace if needed), Adjust Tension.....
 - C) Sheave: Check Set-screws and Record setting.....
 - D) Impeller: Inspect (clean as needed), Check Set-screws.....
- Air Make-up Unit(s)**
 - A) Lubrication: Fan & Motor Bearings.....
 - B) Belts: Check Condition (replace if needed), Adjust Tension.....
 - C) Sheave: Check Set-screws and Record setting.....
 - D) Blower: Inspect (clean as needed), Check Set-screws on Bearings and Blower(s).....
 - E) Burner:
 - 1) Clean as needed - Manifold ports, Flame rod, Igniter & Pilot assembly.....
 - 2) Set Airflow SWITCH(ES).....
 - 3) Check / Adjust: Pilot Flame, Low fire, High fire - Temp. Rise.....
 - F) Controls: Flame Safety Relay - Test Flame Failure Shutdown, Note Fault History, Current Run Hours & Cycle #.....
 - G) Dirty Filter Switch: Check Operation & Adjust Trip Point as needed.....
 - H) Terminal Strips: Check / Tighten All Terminations.....
 - I) Damper: Check Operation, Clean and Adjust as needed.....
- Filters**
 - A) Intake: Inspect & Replace as needed.....
 - B) Exhaust: Inspect & Replace as needed.....
 - C) Manometer(s)/Filter Draft Gauge(s): Adjust/Set Zero, Fill Gauge Oil as needed.....
- Booth Balance**
 - A) Check Booth / Building Balance.....
 - B) Check Booth Airflow.....
 - C) Check Current Draw: Exhaust Motor(s) & AMU(s).....
 - D) Adjust Sheaves and / or VFD Settings to Achieve Proper Booth Airflow & Balance.....
- Control Panel**
 - A) Pilot / Indicator Lights: Check Operation & Replace any Burned Out Bulbs.....
 - B) Temperature Control: Verify Operation (adjust as needed).....
 - C) Operation: Observe System Start Sequence (adjust Timers as needed).....
 - D) Photohelic (Auto-balance & Consta-flow): Set Zero, Verify Operation, Adjust Setpoints for Optimum Control.....
 - E) Ventilation (VFD Systems Over 7.5 HP): Verify Fan Operation & Inspect Filters (Clean as needed).....
 - F) PLC (Paint/Bake Systems Serial 30000 & Newer): Verify Auto Reset is Enabled.....
- Misc. & Optional Items**
 - A) Air Solenoid Valve: Verify Operation.....
 - B) Light Lens Switches: Verify Operation & Adjust as needed.....
 - C) Door Switches: Verify Operation & Adjust as needed.....
 - D) Dirty Filter Shutdown: Verify Operation & Adjust as needed.....
 - E) Air flow Switches: Verify Operation & Adjust as needed.....

OVERVIEW OF MAINTENANCE TRAINING

Upon request GFS can also provide your operating and maintenance personnel with hands-on training, or technical assistance, during our visit.



Operators

Controls: Main Disconnect, Pilot /Indicator Lights, Switches and Pushbuttons, Temp. Selector/Controller, Photohelic, Bake Cycle Timer

Manometer: Setting Zero, Reading Filter Loading

Safeties: Air Solenoid Valve, Light Lens Switches, Door Switches and Dirty Filter Shutdown

Maintenance Training

System Overview: Start-up Sequence, Electrical Schematic, Interlocks

Resets: Exhaust Overload, VFD Faults

AMU: Blower Motor Overload, High Temp Limit, Flame Failure, High/Low Gas Pressure limit

Questions or Requests

We will be glad to discuss your service needs and help determine which program is a good choice for you.

GLOBAL FINISHING SOLUTIONS

techservices@globalfinishing.com

(800)848-8738



© 2009 Global Finishing Solutions®. All Rights Reserved.

Notes:

- 1) All times are estimates
- 2) Labor rates include travel time.
- 3) Travel time may be divided between multiple customers in one area.
- 4) Additional expenses including but not limited to:
 - 5) Replacement belts and filters can be provided by GFS for additional cost. This must be requested in advance.
 - 6) Customer must supply means to access equipment. Ladders, manlifts, etc...
 - 7) Equipment must be shut down to perform service.

SPARE PARTS LIST

Part Number	
242-005	STATIC PRES TIP FOR .25 STEEL TUBE
242-007	TUBING POLYETHYLENE .250 OD .170 ID
208-040	DOOR PULL STANDARD ZINC
208-089	DOOR LATCH RUBBER T-HANDLE
206-350	FAN PLUG AEROVENT CPG 251 DIRECT DRIVE
216-202	CARTRIDGE 8IN ID O.E.O. 26 IN LG
216-210	CRANK ARM 8IN ID CARTRIDGE FILTER
216-211	CENTER BRKT 8IN ID CARTRIDGE FILTER
248-002	SEAL TAPE .50 X .75 OPEN CELL
248-003	SEAL TAPE .50 X .25 CLOSED CELL
248-026	INSULATION - DUCT LINER 1.0 X 36 W
248-077	NEOPRENE GLASS HI TEMP 250 DEG F.
238-711	VENTURI 4.0 ID - CONED INLET
U84722-A-C01 RJ2S-C-D12 12V RJ SERIES RELAY	U84722-A-C01 RJ2S-C-D12 12V RJ SERIES RELAY
NOTES: JIM KUEHL	NOTES: JIM KUEHL
Control Panel	
103-083	FUSE 250V 3 AMP MIDGET
103-219	FUSE 600V 2 AMP CC KLDL TRANS
105-019	SQD TRANS 250VA OPEN 1PH 480-240/12 FB
106-026	TERMINAL BLOCK SCREW CLAMP ZS6 FEED-THROUGH GREY
106-027	TERMINAL BLOCK END STOP BAM3 DARK GREY
106-028	TERMINAL BLOCK END SECTION ES4 DARK GREY
106-029	TERMINAL BLOCK GROUND SCREW CLAMP ZS6-PE GREEN/YELLOW
111-060	RELAY BASE 2-POLE DIN IDEC
111-063	RELAY DPDT 120VAC COIL IDEC
111-281	PILOT LIGHT 22MM 120VAC GREEN LED
111-282	PILOT LIGHT 22MM 120VAC RED LED
127-228	9001KA2 CONTACT BLOCK NORMALY OPEN
127-229	9001KA3 CONTACT BLOCK NORM. CLOSED
127-234	9001KR1U PUSH BUTTON
127-236	9001KS11B SELECTOR SWITCH
127-405	GROUND BAR 7 SPACE
242-178	PHOTOHELIC GAUGE RANGE 0-6 W/C
248-124	GASKET C SHAPE RUBBER EDGE TRIM