



FARR

Air Pollution Control

Gold Series[®] Dust Collector



Installation, Operation and Maintenance

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Customer:

Location:

Job #:

Local Rep:

Rep. Phone #:

Document #C-1000-21 Rev. H



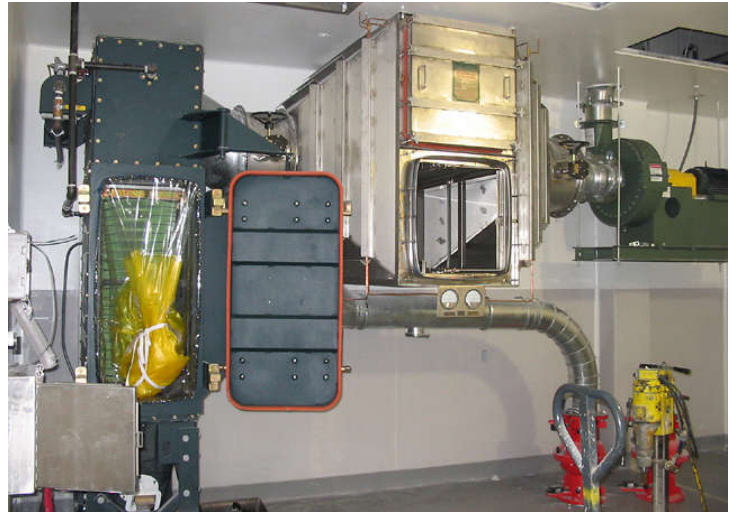
GS8 on Woodworking



GS48 on Automotive Welding Fume with Material Drop-out Section



GS108 on Paper Dust/Trim



Camtain™ GS2 on Pharmaceutical Dust



Multiple Gold Series on a mining rock crushing application.



GS16 on Plastic Powder Mixing



GS32 on Dried Food Ingredients



GS16 on Food Application



GS6 on Silica Powder



Multiple Gold Series on Soybean Seed Processing



GS16 on Fumed Zinc Oxide



GS48 on welding fume in Farr APC's own welding shop – Intake openings in the top of the duct every 20 feet facing upwards towards the ceiling actually use the ceiling as a capture plenum to help draw in the weld smoke. This is much more effective than facing the openings down.



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GOLD SERIES ACCESSORIES

Following is a list of common accessories to *Gold Series* collectors that are not covered in this manual. If your collector includes any of the accessories, the documentation title and/or number will be listed beside the accessory. The documentation will be included with this manual submittal.

| | |
|---------------------------------------|-------|
| Fan | _____ |
| Fan Silencer | _____ |
| SMF Kit | _____ |
| Automatic Timer Controller | _____ |
| Motor Starter | _____ |
| Air Lock | _____ |
| Screw Conveyor | _____ |
| Dust Level Indicator | _____ |
| High Hopper Level Probe | _____ |
| Support Structure | _____ |
| Determinator Remote Display Panel | _____ |
| Thermocouple | _____ |
| Magnehelic [®] Gage | _____ |
| Photohelic Gage | _____ |
| Flow Meter | _____ |
| Compressed Air Pressure Transducer | _____ |
| Emissions Monitor | _____ |

INTRODUCTION

Congratulations on your selection of Farr Air Pollution Control equipment! As the owner/operator of this equipment you have an important responsibility to see that it is operated and maintained in a safe manner. The unit will require moderate attention to keep it in good operating condition. This manual has been prepared to aid you in that effort. Throughout this manual, reference may be made to various components, which may or may not be part of your particular system. They are included in the interest of fully describing typical systems with all available options.

This manual covers the installation, operation and maintenance of the Gold Series dust collector. This air cleaning equipment is used to eliminate dust contaminants from the environment making the facility or plant a healthier and safer work place. This unit has been assembled using only quality materials and labor. This machine has been checked to make sure that it is operational for you at the time of installation.

Prior to installing your equipment, thoroughly read and understand this manual. Locate all parts and ensure that nothing is missing, suffered shipping damage or has been damaged during unloading. Familiarize yourself with each component of your system and its function using the contents of this manual as a guide. Refer to any local codes or ordinances relating to equipment of this type. They may affect the method or procedure used to install your system.

DO NOT DISCARD THIS MANUAL!

It contains information which when properly used will insure proper operation, continued high performance, and a long work life to your unit.



SECTION 100-SAFETY PRECAUTIONS

Farr relies on the skills and expertise of its customer and any consulting engineers and/or installing contractors hired by that customer to properly design and install the dust collection system of which Farr equipment is a part. It is the responsibility of the end user of this equipment to take the necessary precautions to minimize the inherent risks associated with combustible dust.¹ Refer to Section 340 of this manual if you have an explosive dust. Read this manual thoroughly and comply with the precautionary statements relative to worker safety. Precautions must be taken to ensure that all electrical/air connections and regulation devices are installed and operating properly.

100.1 Understand Signal Words and Symbols

The symbols shown below appear on the equipment to alert you of potential hazards. When you see these symbols you must read, understand, and heed the information that accompanies them.



Indicates an imminently hazardous situation, which, if not avoided may result in death or serious injury



Indicates a potentially hazardous situation, which may, if not avoided, result in minor or moderate injury and or property damage.



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



Indicates the presence of an electrical power source, which could result in death, personal and /or property damage.

100.2 Warning Decals and Guards

This piece of equipment contains several warning decals located in many different locations. It is the owner/operator's responsibility to maintain the integrity of these decals and to ensure that all operators of the equipment are aware of them and understand their meaning. Replacement decals are available free of charge from your Farr Service Representative, or by calling Farr direct at 1-800-479-6801. Part numbers for these decals are listed in the spare parts list in section 700.

This piece of equipment may contain one or more safety guards to protect the operator(s) from injury. It is the owner/operator's responsibility to maintain the integrity of these guards and ensure that they are in place when the equipment is in operation.

WARNING!

DO NOT attempt to operate or maintain this piece of equipment until you have read and thoroughly understood all of the safety information contained in this manual. All such information must be taken seriously. This piece of equipment contains moving parts and potential pinch points, which can cause serious injury or death. If you do not understand anything in this manual, seek assistance from your supervisor before operating this equipment. DO NOT attempt to operate this equipment with out factory-installed guards. Replace damaged guards.

¹ See NFPA 654 *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and handling of Combustible Particulate Solids*. And NFPA 68 *Guide for Venting of Deflagrations*.



Marks the location of an explosion relief vent. In the event of an explosion in the dust collector there is a potential for damage to personal property, injury, and /or death.

SEE SECTION 340



Indicates the hazard of being trapped inside a dust collector. If the main fan is activated the collector door would be sucked shut. The door would be very difficult to open against the negative pressure generated by the fan.



Identifies hazards associated with rotating machinery.



Identifies hazards associated with belt and chain drives.



Identifies equipment that will start without warning.



Identifies hazards associated with compressed air sources.



Identifies hazards associated with equipment that are considered confined spaces.

100.3 Lock-out/Tag-out Requirements

Control of this equipment must be in accordance with OSHA Standard 1910.147 "Control of Hazardous Energy (Lock-out/Tag-out)". This standard "requires employers to establish a program and utilize procedures for affixing appropriate lock-out/tag-out devices to energy isolating devices and to otherwise disable machines or equipment to prevent unexpected energizing, start-up or release of stored energy in order to prevent injury to employees".

For further information on Lock-out/Tag-out requirements, see your company's Safety Director or refer to OSHA Standard 1910.147.

Before inspecting or servicing this equipment perform an approved Lock-out/Tag-out procedure on the electrical service, the compressed air (or other gas) supply or any other energy source.

SECTION 200-RECEIVING YOUR EQUIPMENT

200.1 The Purchaser's Responsibility

A visual inspection of your equipment should be performed before it is removed from the truck. Dents, scratches and other damage should be noted and photographed. The structural integrity of the housing will be adversely affected by large dents. Farr should immediately be 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 your Farr representative.** The carrier is responsible for any damage to the equipment while it is in transit unless specific arrangements are made otherwise.

The *Gold Series* dust collector is shipped disassembled and must be reassembled by installation personnel. Unit assembly, with the exception of the electrical and air connections, can usually be accomplished by anyone with a basic understanding of common hand tools.

Besides a common set of hand tools, a crane, fork-lift and/or chain-fall will be required to position the fan and motor on top of the unit clean-air plenum and lift heavier components into position.

Farr must rely on the skill and expertise of its customers and the customer's installation contractor to ensure that all electrical connections are made correctly and air connections and regulation devices are installed and operating properly.

200.2 System Components

Your *Gold Series* dust collection system may consist of one or all of the following components:

- | | |
|-------------------------|-----------------------------|
| 1. Filter Module | 13. Discharge Drum(s) |
| 2. Hopper Section(s) | 14. Manual Cleaning Control |
| 3. Fan | 15. Automatic Timer Control |
| 4. Support Legs | 16. Fan silencer |
| 5. Cross Braces | |
| 6. Assembly Hardware | |
| 7. Motor Starter | |
| 8. Maintenance Platform | |
| 9. Maintenance Ladder | |
| 10. Rotary Airlock | |
| 11. Screw Conveyor(s) | |
| 12. Slide Gate Kit(s) | |

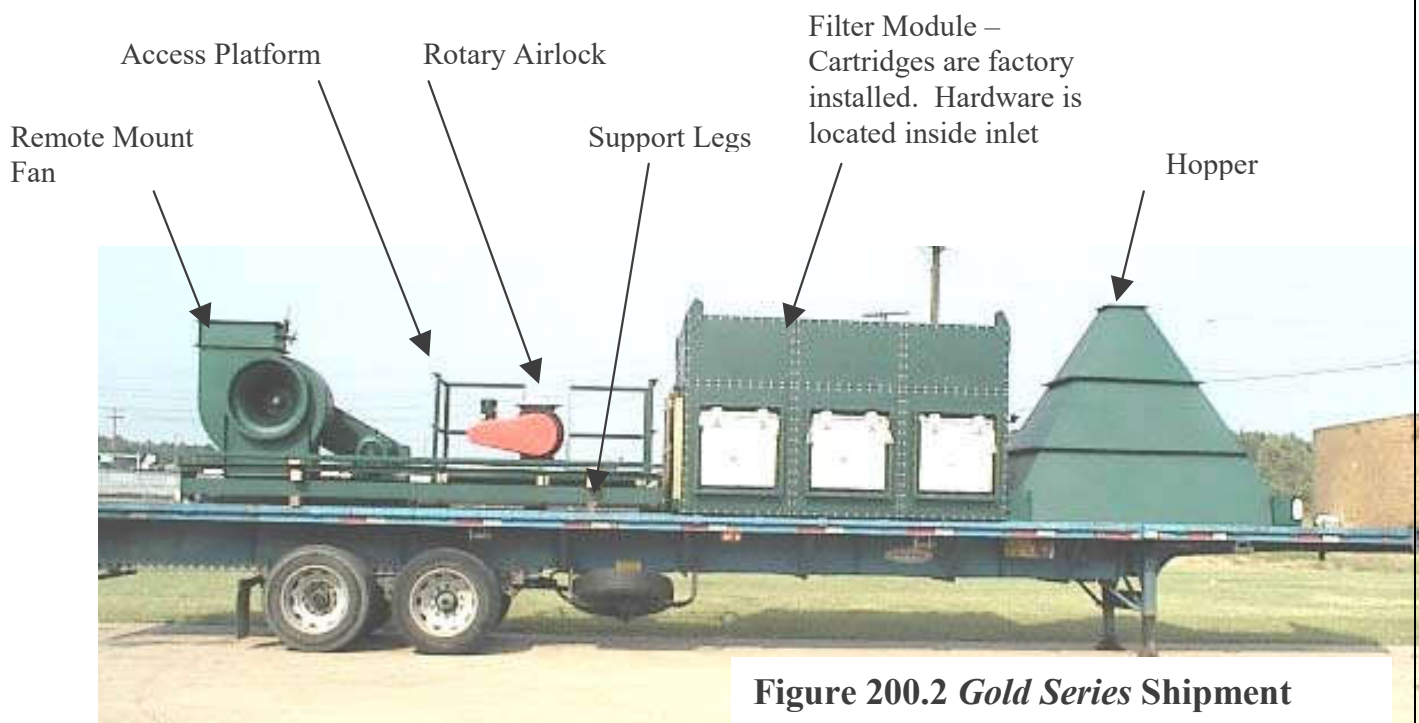


Figure 200.2 Gold Series Shipment

200.3 How Your Equipment Is Shipped

It is Farr's goal to ship our products as economically and practically as possible. In order to save our customers shipping costs, it is our goal to load your collector on as few trucks as necessary. The number and size of trucks required to transport your collector will depend solely on the size of your unit. The trucks are loaded to minimize damage to the collector while loading, shipping, and unloading. Typically, your collector will ship with the hopper, plenum, support structure, fan and other accessories disassembled. These items will be loaded on the trucks separately and placed on pallets for easy unloading. A fork-truck or crane may be needed to unload your collector depending on the size of the unit. **All assembly hardware will be located in a box that will be placed in the inlet of the plenum section of your collector.** A picture of a typical collector loaded on a flat bed trailer is shown in Figure 200.2

200.4 Uncrating and Inspection

Each *Gold Series* dust collector is normally shipped on two or more skids. One skid contains the filter module section. A second skid contains the hopper section and other skids will contain fans, support legs, safety monitoring filters, airlocks and custom accessories. **Typically, the filter cartridges, control box and any other user installed components are shipped inside the cartridge area of the bin-vent section.**

Use extreme care when handling the unit and components. Careless handling can damage delicate parts or affect assembly alignments. Compare the number of items received against the carrier's Bill of Lading. The project drawing has a listing of all loose components shipped with the job. A copy of this drawing is included with this manual submittal and can also be found in the small parts box located in the inlet of the collector. Inspect all items for apparent damage. Immediately report any shortages or obvious damage to the carrier and to your local Farr Representative or call Farr at 1-800-479-6801.

When all skids are completely unpacked, check all items received against the material list on the project drawing and or the packing list (if any) sent with the shipment. Further inspect the unit and components for hidden damage. Again, report any shortages or damage to the carrier and to your local Farr Representative.

Do not return any damaged components without first contacting your Farr Representative to obtain Returned Goods Authorization (RGA). Carefully inspect all packing material so that small parts are not inadvertently discarded.

200.5 Understand Your Serial Plate

Once you receive your equipment, it will be important to have the collector's serial, model, and part numbers. This information will be helpful when calling customer service or finding original equipment supplied with the collector. This information should be found on a silver plate on the door of your collector see Figure 200.5. You should write this information in this book for easy access. Here is what your serial plate will show.

Serial # – This represents the sales order number and will link the unit to the prints and engineering documents associated with your unit.

Model # – This will represent what size unit you have received. (Example: GS-24).

Part # – This number represents the module part number of the unit you have received.

Spare Filter P/N – This field represents the part number of the filters provided with the order.

| DUST COLLECTOR SERIAL NUMBER PLATE | | | |
|---|----------------------|---|----------------------|
| SERIAL# | <input type="text"/> | MODEL# | <input type="text"/> |
| PART# | <input type="text"/> | SPARE FILTER P/N | <input type="text"/> |
|  FARR Air Pollution Control | |  | |
| | | | |
| 3505 South Airport Road Jonesboro, AR 72401 Tel: 800-479-6801 Fax: 870-933-8048 www.farrapc.com | | | |
| MADE IN THE USA | | | |

Figure 200.5 Serial Plate

Note: You may have the laser cut serial nameplate as shown below.



SECTION 300-INSTALLATION OF YOUR EQUIPMENT

Table 300.1: Gold Series Assembly Tools

The following items may be required to install your equipment depending on configuration and installation requirements:

Only trained, authorized personnel should be permitted to service or maintain electrical or safety components. It is the buyers/installers responsibility to ensure that all applicable electrical and safety codes are met.

| | DESCRIPTION | INTENDED USE |
|----|--|---|
| 1 | SAE Socket Set | General tightening of fasteners |
| 2 | Common Screwdriver | Electrical connections |
| 3 | Phillips Screwdriver | Electrical connections |
| 4 | Electric Drill or Impact Wrench | Installation of self-tapping screws and fasteners |
| 5 | Hammer Drill | Anchoring to floor |
| 6 | Masonry Bit | Anchoring to floor |
| 7 | Hammer | Installing anchors |
| 8 | Pliers | General use |
| 9 | Wire Cutters | Electrical connections |
| 10 | Wire Nuts | Electrical connections |
| 11 | Electrical Tape | Electrical connections |
| 12 | Extension Cord | General use |
| 13 | Conduit | Electrical connections |
| 14 | ¾" or larger black iron pipe or equivalent | Compressed air connections |
| 15 | Fittings for items 13 & 14 | Compressed air and electrical connections |
| 16 | Thread Sealant | Compressed air connections |
| 17 | Alignment Punch | Aligning holes |
| 18 | Forklift or Overhead Hoist | Moving and positioning components |
| 19 | Electrical Cable (3 PH 230/460 VAC 10 HP) | Fan electrical connections |
| 20 | Electrical Cable (1 PH 120/240 VAC) | Control and lighting electrical connections |
| 21 | Wedge anchors or equivalent suitable for the application | Anchoring to floor |
| 22 | 230/460VAC, 3 Ph, 60Hz Electric Motor Starter * | Ventilation Fan * (If not supplied with unit) |
| 23 | Transit or Carpenters Level | Leveling Unit |

SECTION 310-ASSEMBLING YOUR GOLD SERIES

310.1 Hardware

Refer to Figure 310.1 for typical assembly points of a standard collector. Refer to the General Dimension drawings for specifics, such as item part numbers, inlet and outlet locations, foundation dimensions and accessories.

Locate the cartons containing the installation hardware. The cartons will be labeled with the part number and are normally located inside the inlet. The carton containing the hardware to be used for the support legs and cross braces will be labeled “hardware kit for structural support”. The carton(s) to be used to bolt the bin-vent to the hopper(s) will contain 3/8-16 thread cutter screws and roll(s) of gray rope caulk. Separate the hardware for ease of location during assembly.

310.2 Hoppers

Locate the hopper(s) and support legs. Remove the hopper(s) from the skid(s) and place on a flat, level surface. Note: GS24 and smaller units will ship with the support legs, cross braces and hopper(s) pre-assembled.

If your collector includes multiple hoppers place them in the correct configuration as shown on the General Dimensions drawing. Using a tape measure or string line, square the hopper(s) as necessary. Bolt the hopper(s) together using the corner support brackets and hardware as shown on Figure 310.2.

310.3 Support Legs and Braces

Refer to Figure 310.2 for general assembly and your support structure drawing for specific parts. Locate the support legs and bolt them to the corner support brackets. Locate the cross braces and bolt them to the support legs. If your collector contains knee braces, bolt one end to the support leg and the other end to the corner support bracket. **Note: Do not tighten any of the bolts until all bolts have been started.**

310.4 Hopper/Support Structure Assembly

Lift the completed hopper/support structure assembly with a forklift or chain hoist and carefully overturn into an upright position. Note: The slots for lifting in the corner support brackets –Figure 310.2.

Move the assembly into final position. Ensure that inspection panels or optional device connections are in the desired orientation. **Note: On GS6, 10 & 20 collectors, the bin-vent to hopper(s) bolt-holes are not symmetrical. Turn the hopper/support structure assembly so that when the “Match Line” label(s) on the hopper(s) line up with the “Match Line” label(s) on the bin-vent, the collector is in the desired orientation. The “Match Line” labels do not have to line up perfectly; they are intended only for general hopper to bin-vent orientation –Figure 310.3.**

Level the hopper flange(s) with a transit or carpenter’s level. Grout the support leg bases as necessary. Anchor the support legs to the floor using appropriate concrete anchors (by installing contractor).

310.5 Filter Module

If your collector is equipped with a top-mounted fan, locate the fan mount panel and clean the area around the fan flange that will be in contact with the rope caulk. If your collector is equipped with a remote

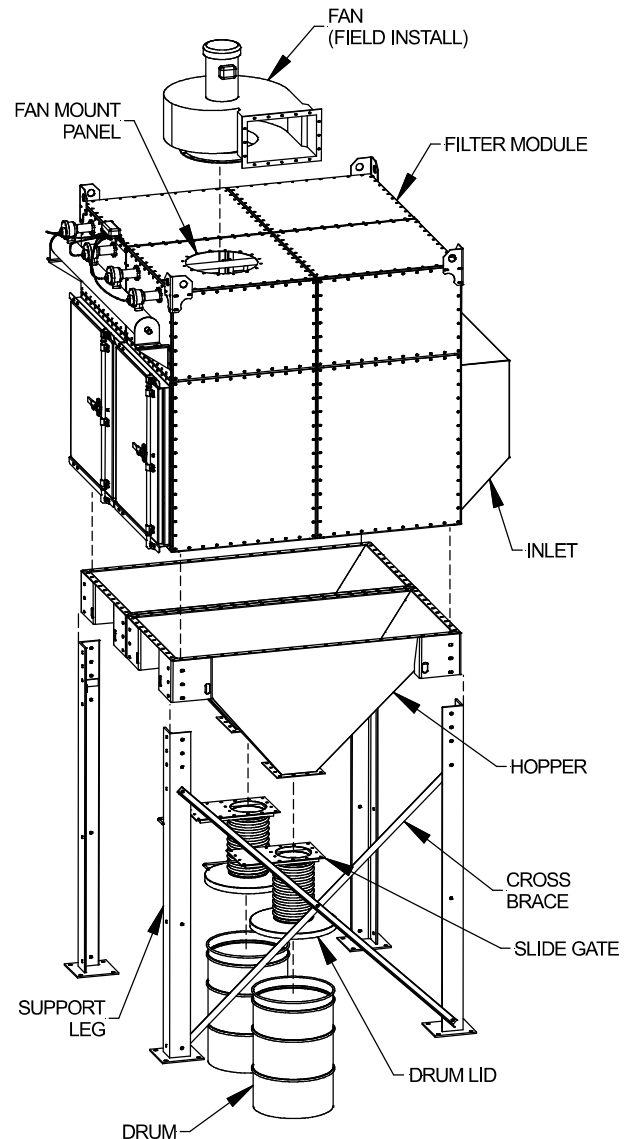
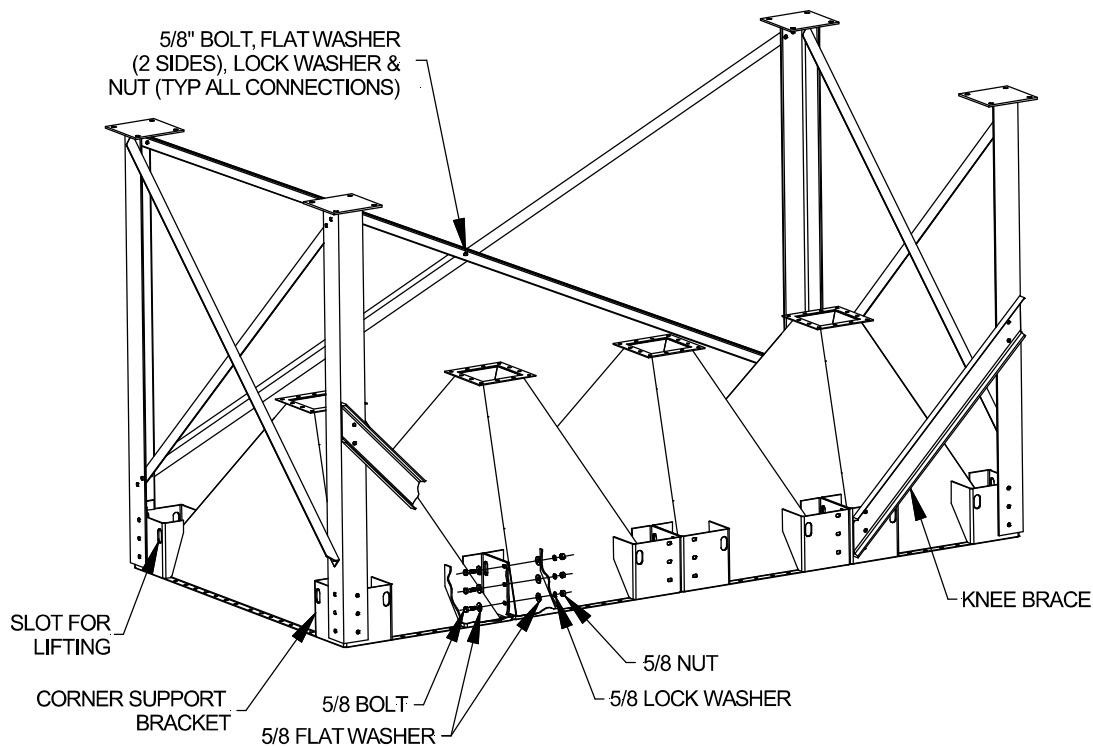


Figure 310.1



**FIGURE 310.2
(GS 32 SHOWN)**

mount fan, remove the upper side panel from the side you intend to make your fan duct flanged connection. Remove any old rope caulk that did not come off with the upper side panel.

Clean the fan flange and apply rope caulk, ensuring a continuous seal.

If you have a top mount fan, lift the fan onto the filter module roof. Bolt the fan to the fan mount panel using the hardware included –Figure 310.1. If you have a remote mount fan refer to section 320 (Remote mount fan discharges) for further instructions.

Remove any dirt or other accumulation from the hopper flange. Line the hopper flange with rope caulk as indicated in Figure 310.3 (page 18), an "s" (zigzag) pattern is recommended to ensure that there is a continuous seal on the flange.

Lift the filter module, using the lifting lugs provided and approved lifting equipment – Figure 310.3. Failure to connect lifting cable to all (4) lifting lugs may result in damage to the collector. On larger collectors, adequate cable length or a spreader bar is required to prevent damage to the collector.

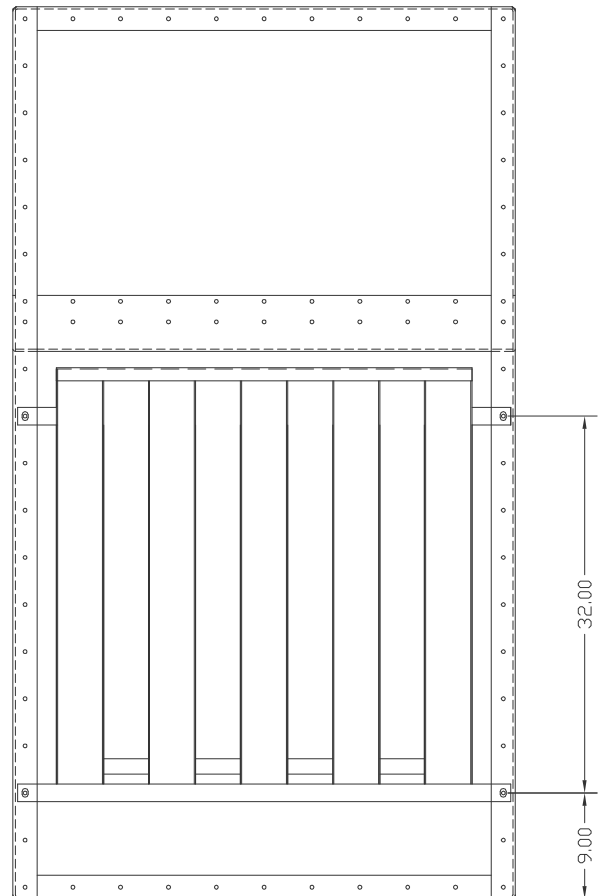
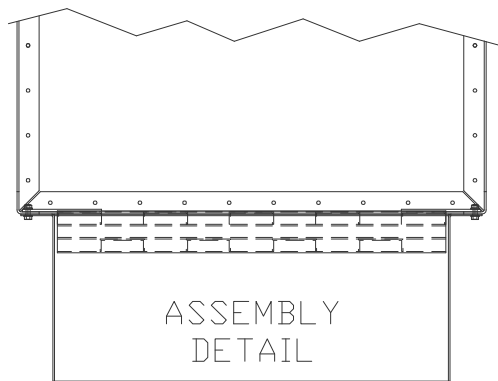
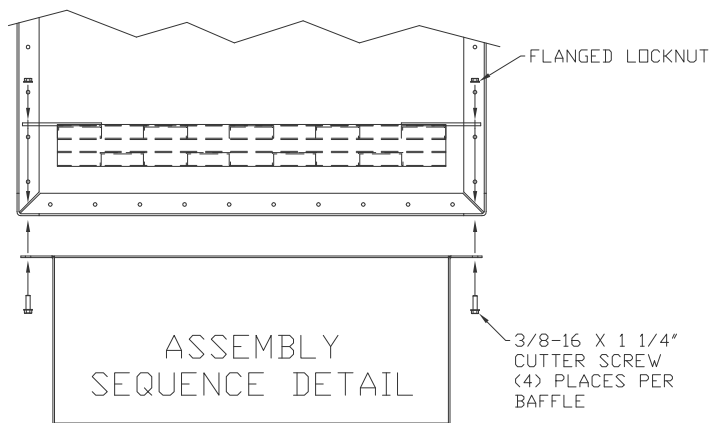
Clean the filter module flange and set onto the hopper flange, taking care not to damage the flanges or rope caulk. Ensure that the orientation of the collector is as desired for your installation. **Note: On GS6, 10 & 20 collectors ensure that the "Match Line" label(s) on the filter module, line up with the "Match Line" label(s) on the hopper(s) - Figure 310.3.**

Attach the filter module to the hopper, using 3/8-16 thread cutter screws – Figure 310.3. Use a drift or alignment pin to align holes as necessary. Insert bolts into each of the four corners without tightening them. Insert the bolts from the corners to the center of the collector. **Note: Do not tighten bolts when starting to align hopper. Wait until all bolts have been started before tightening.** This will allow you to move and adjust the filter module as necessary **Keep the weight of the collector fully supported by the crane or forklift until all hopper bolts have been installed and tightened.**

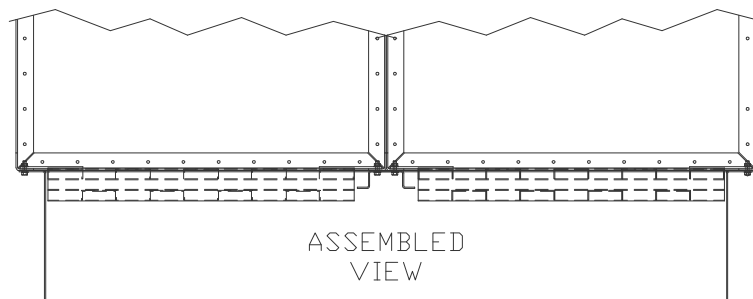
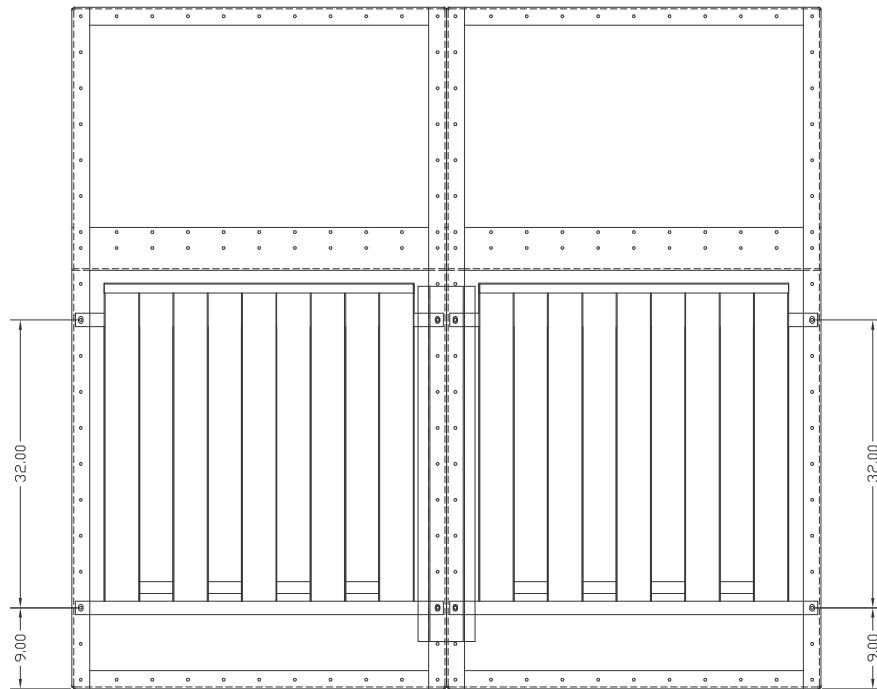
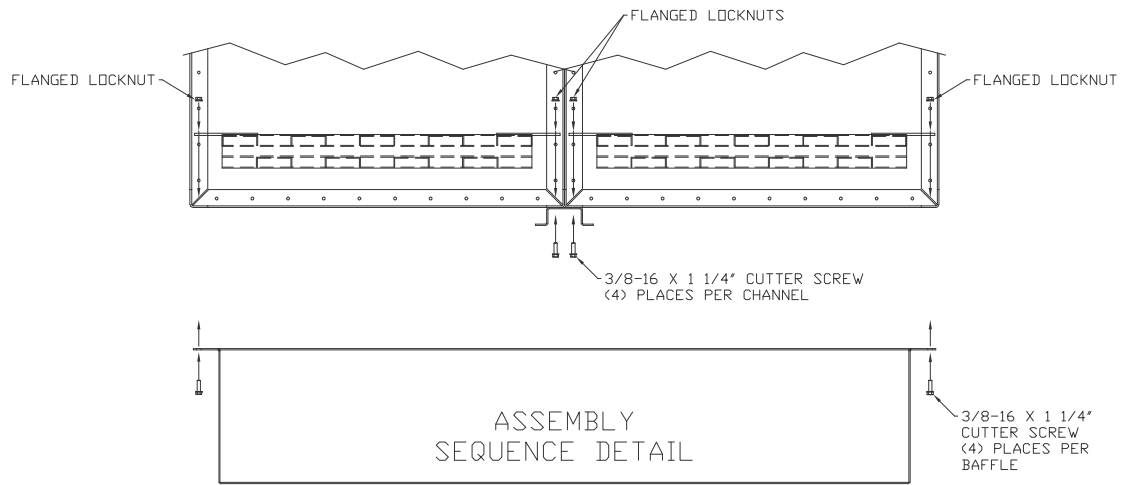
310.51 Channel Baffle Inlet

If your filter module is supplied with a louvered channel baffle assembly for the inlet, install at this time as follows:

1. Channel baffle tabs fit to the inside of the frame as shown.
2. Attach center baffle channel if required.
3. Apply rope caulking to exterior of frame. Position inlet(s) and secure at corners with 3/8-16 x 3/4" cutter screws.
4. Use 3/8-16 x 1-1/4" cutter screws in (4) places required for baffle.
5. Bolt inlet(s) in place with remaining 3/8-16 x 3/4" cutter screws.
6. Position channel baffle tabs over long bolts and secure with 3/8-16 flanged locknuts on inside of unit.



Single Inlet Configuration



Multiple Inlet Configuration

310.6 Discharge Accessories

Locate the hopper discharge accessory supplied with your collector. This will be a drum kit/slide gate, rotary airlock or screw conveyor. Install the accessory to the hopper discharge flange(s) using the General Dimensions drawing and Section 320 as a guide.

310.7 Drum Kit/Slide Gate

Clean and apply rope caulk to the top surface of the slide gate flange. Bolt the slide gate to the hopper discharge flange; making sure that the slide gate is oriented so that there is no interference when the handle is pulled out. Fasten one end of the flexible hose to the slide gate collar with a hose clamp. Slip the other end of the flexible hose over the collar of the drum lid and fasten with a hose clamp.

The clamp on the drum lid only goes on one way. Slip the drum ring over the top of the drum. Be sure that it is right side up. If it does not latch or the latch is too tight, then the ring is upside down—Figure 310.7.

310.8 Platform/Ladder

If equipped, lift the platform assembly into position and install using the hardware provided. Lift and install the access

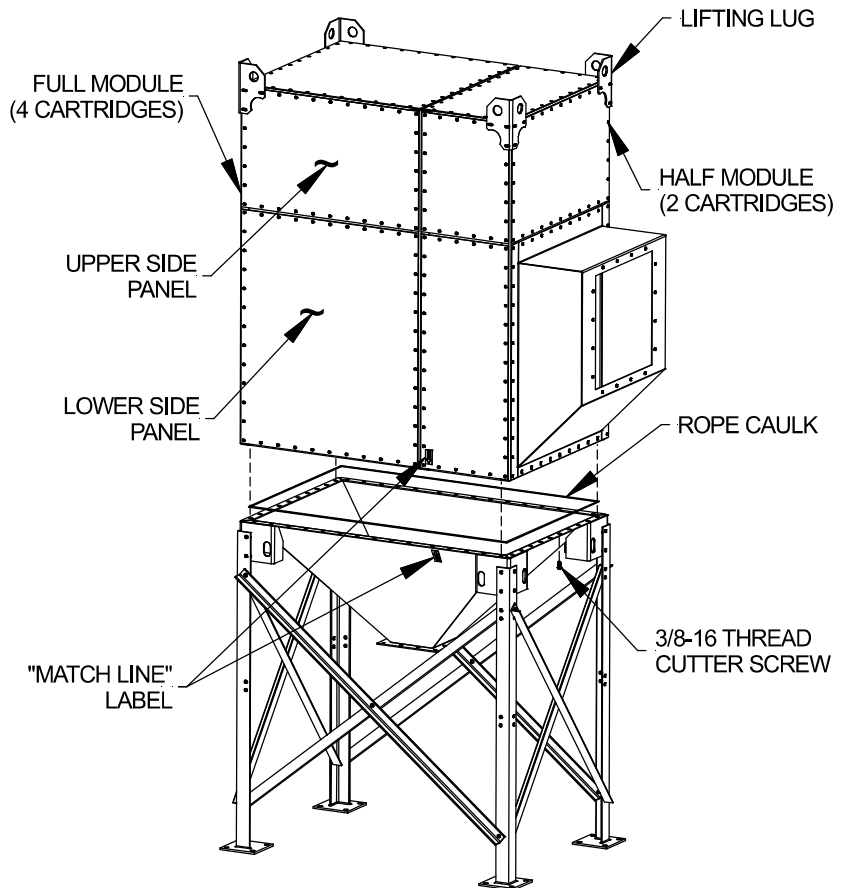


Figure 310.3
(GS6 shown)

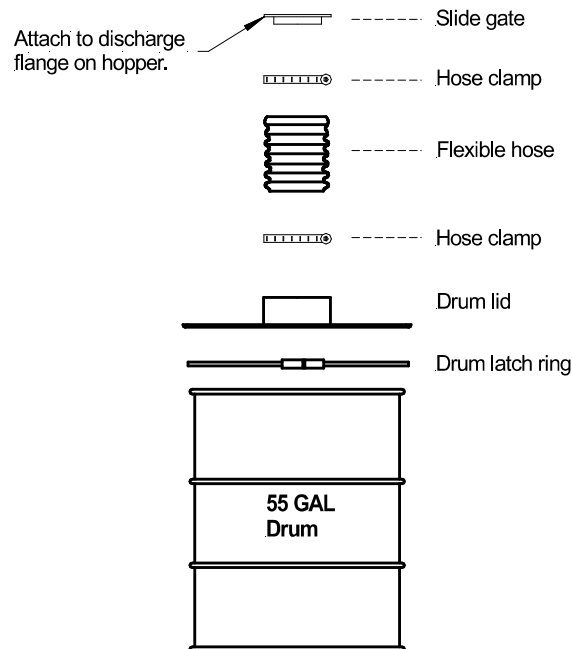


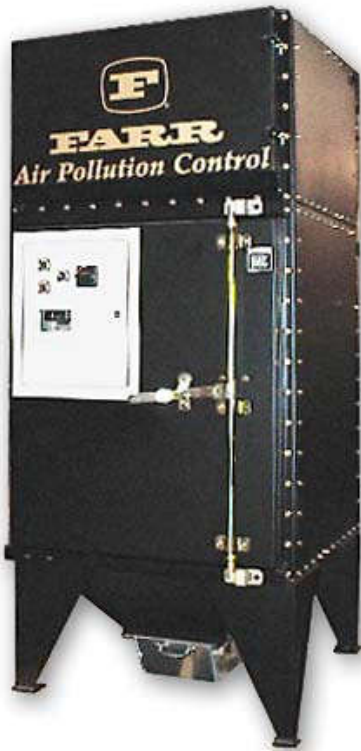
Figure 310.7

ladder using the hardware provided. Refer to the Platform/Ladder assembly drawing and General Dimensions drawing for specific instructions. It may be necessary to cut the ladder to the exact length.

Note: The installing contractor must brace the ladder properly.

310.9 Gold Series Package

The GS2P and GS4P Gold Series Package units are completely assembled and ready to run. Just plug it in! The fan, cleaning system, filters and controls are factory assembled. A low profile hopper drops dust into drawers that are easy to remove. Both models have HemiPleat™ HE fire-retardant cartridges, an automatic, reverse-pulse cleaning system, built-in spark trap to protect the cartridges, easy-open access door and tool-less cam-lock cartridge removal.



GS2P

- 2 Cartridge System
- 650 Total Sq. Ft. of Media
- 5 HP Fan – 1,000 CFM at 16" w.c.
- Weight: 2,250 lbs.



GS4P

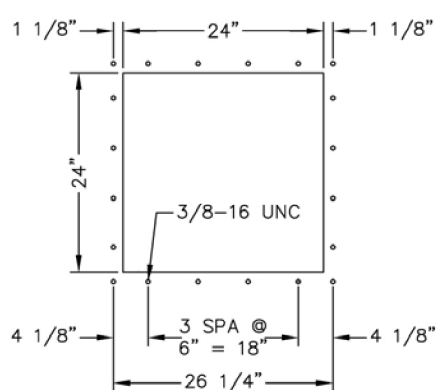
- 4 Cartridge System
- 1,300 Total Sq. Ft. of Media
- 7.5 HP Fan – 2,500 CFM at 16" w.c.
- Weight: 2,800 lbs.

Specifications

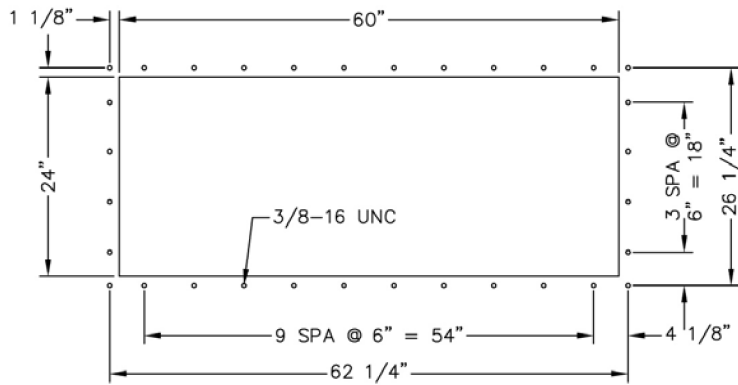
- NEMA 4 rating on electrical enclosures
- Cleaning system requires 10 CFM of clean, dry compressed air at 90 PSI
- Rugged 10 & 7 ga. Construction
- Housing rated for +/- 25" w.c.
- Efficiency: 99.999% on 0.5 micron
- Silencer designed for 75 dBA maximum

SECTION 320-ATTACHING DUCT WORK TO YOUR GOLD SERIES

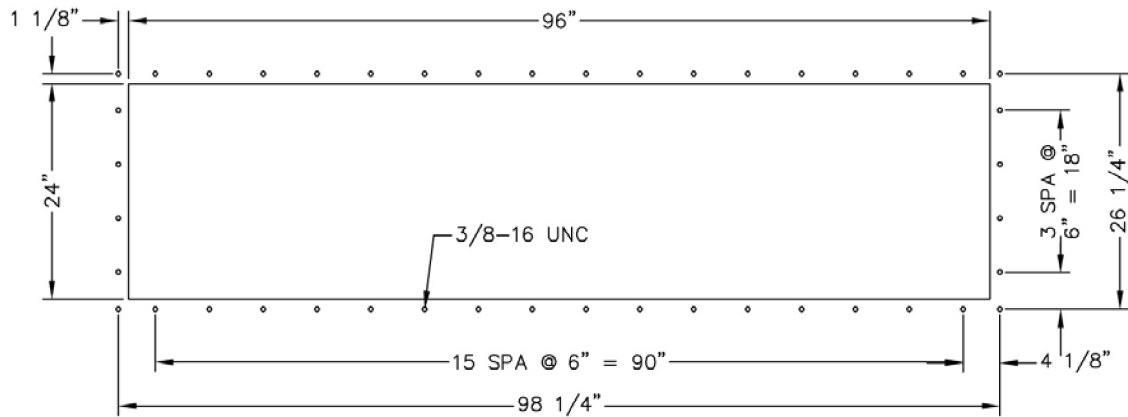
This section covers and design guidelines for ducting to your *Gold Series* dust collector. The following figures show the different sizes of inlet and outlet flanges.



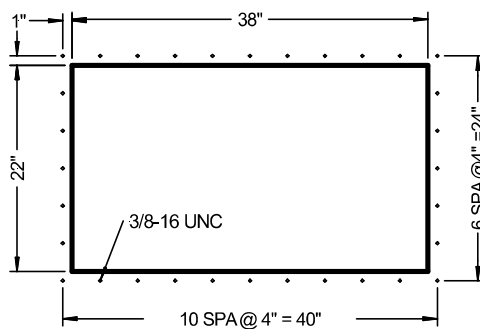
**Figure 320.1
SINGLE MODULE INLET**



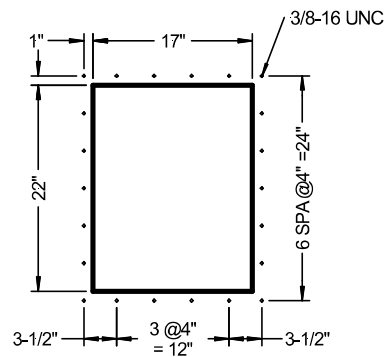
**Figure 320.2
DOUBLE MODULE INLET**



**Figure 320.3
TRIPLE MODULE INLET**



**Figure 320.4
SIDE OUTLET FLANGE**



**Figure 320.5
SIDE OUTLET FLANGE
(HALF PANEL)**

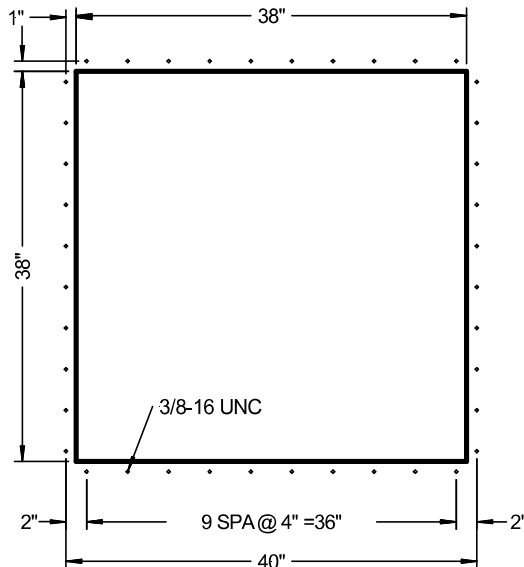


Figure 320.6
TOP OUTLET FLANGE
(FULL PANEL)

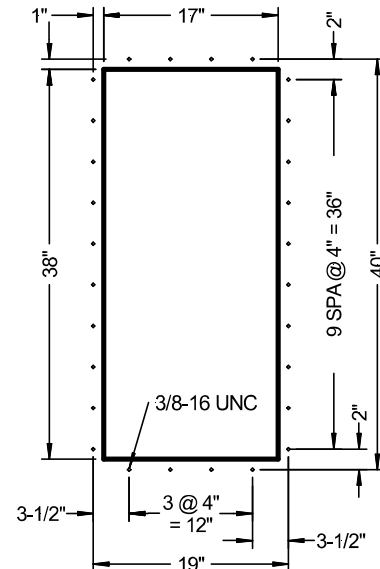


Figure 320.7
TOP OUTLET FLANGE
(HALF PANEL)

320.1 Inlet Duct Design

When you run ducting to your collector, it is important to follow these guidelines.

1. The straight length of duct entering the inlet should be a minimum of 2 duct diameters.
2. The transition angle from the duct to the inlet flange should be a minimum of 45°.

In figure 320.8, the “**RECOMMENDED**” design shows a vertical section of duct, a 90° elbow and a horizontal length of at least 2 duct diameters before entering the inlet. The air direction will cause the dust to be evenly distributed to the filters. In the “**NOT RECOMMENDED**” design, the duct enters the inlet at an angle. The air direction will force dust already in the hopper (previously pulsed off the filters), to be re-entrained into the air stream.

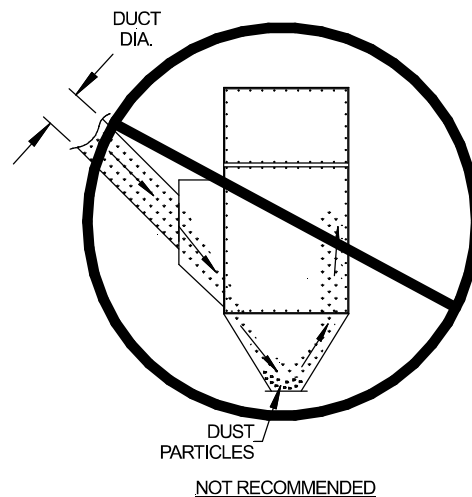
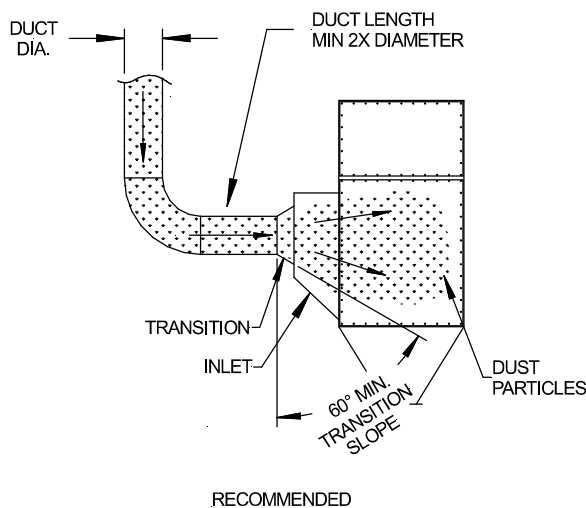


Figure 320.8 - Side View

In figure 320.9, the “**RECOMMENDED**” design shows a straight section of duct that is at least 2 duct diameters long, before entering the inlet. The air direction will cause the dust to be evenly distributed to all of the filters in the collector. In the “**NOT RECOMMENDED**” design, the duct is not long enough to allow the air to straighten out before entering the inlet. The air direction will force the dust to one side of the collector, resulting in uneven dust loading on the filters.

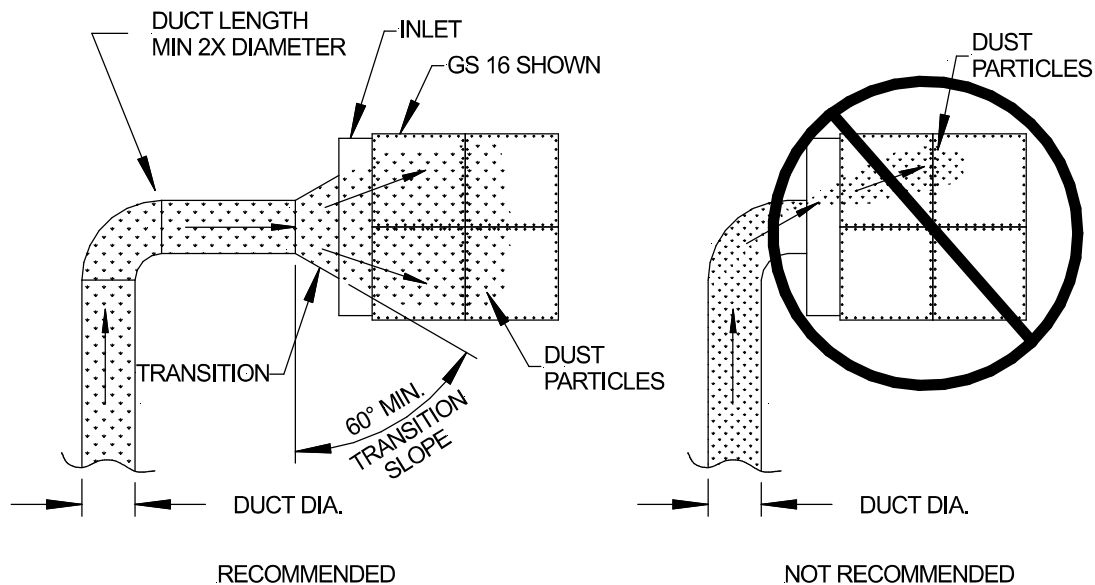


Figure 320.9 - Top View

320.2 Inlet Flanges

Depending on the size and orientation of your *Gold Series* collector, the inlet will have one or more of three inlet designs. These inlets are configured and classified with the number of modules that the collector uses to support the inlet plenum. Larger collectors may have more than one inlet plenum and vary in the size of the inlet. Figures 320.1, 320.2 and 320.3 show dimensions of the one, two, and three module inlets, respectively. When attaching ductwork to these flanges always be sure to caulk or place gasket material between the duct and collector before bolting them together.

320.3 Remote Mount Fan Discharges

Remote mount fans, provided by Farr, will be ducted to the collector by removing an upper panel and attaching the ductwork to the frame of the *Gold Series* dust collector. The ductwork will be attached to the flange details on Figures 320.4-320.7. These dimensions are the bolt patterns for the panel and frames. Either the side panels, on the upper section of the dust collector, or top panels can be removed. Figure 320.4, is the bolt pattern for the full sized side panel, while Figure 320.5, is for the half sized side panel. Figure 320.6 and 320.7 are for the full and half sized top panels respectively. When attaching ductwork to these flanges, always be sure to caulk or place gasket between the duct and collector before bolting them together.

320.4 Top Mount Fan Discharges

Top mount fans, provided by Farr, are field mounted on the top of the *Gold Series* collector. All Farr provided fans will have a fan damper supplied with the fan. When attaching ductwork to this flange, always be sure to caulk or place gasket between the duct and damper outlet before bolting them together.

320.5 Discharge Hopper Flange

Accessories will be attached to the hopper discharge flange. See your General dimensions drawing for the dimensions for your flange.

SECTION 330-FIELD UTILITY CONNECTIONS

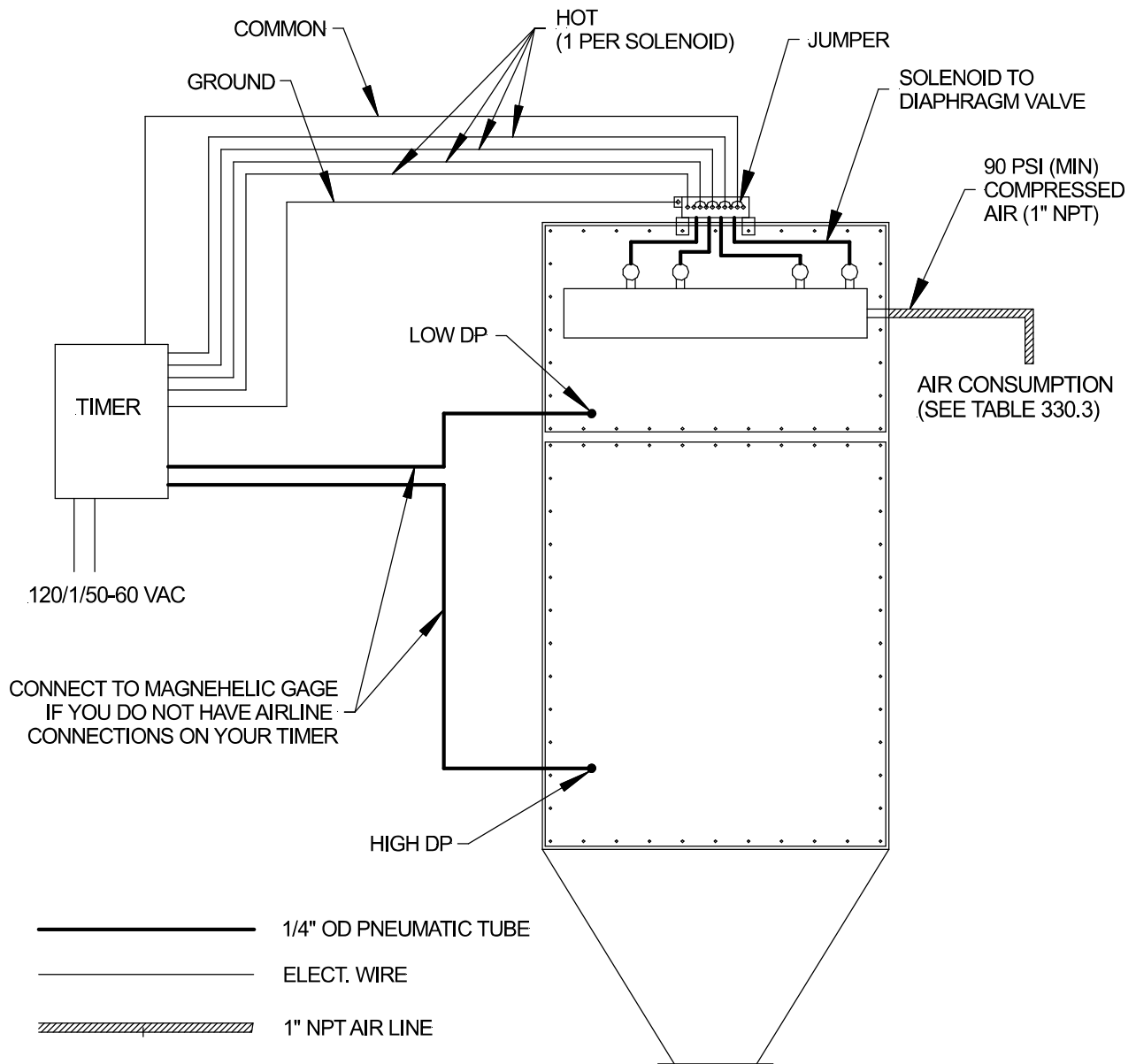


Figure 330.1
(Field Utility Connections)

330.1 Motor Connections

WARNING! Failure to perform an approved Lock-out/Tag-out procedure may result in a sudden release of energy resulting in property damage, personal injury or death! Ensure that the circuit you are working with is off before you make these or any other electrical connections. Serious injury may result if you do not take proper safety precautions!

Farr can supply the fan, motor starter, and rotary air locks (or other discharge devices) for our dust collectors. However, the customer or Farr representative may elect to supply the fan and other accessories. It is imperative that all equipment installed complies with your local electrical code. Check your paper work and information plates to determine electrical specifications for your equipment.

Mount the motor starter enclosure in a convenient location for operation. Use the enclosure as a template for marking and drilling mounting holes. Possible locations include a support leg or plant wall near the collector.

Run conduit and wiring (supplied by others) from the motor starter to the fan motor and from the power source to the motor starter. The wiring diagram for the motor will be either on the motor or inside the motor junction box. Connect the wiring from the motor starter to the fan and from the power source to the motor starter. A qualified electrician should only make these connections.

| Farr APC Motor Starters | | | | | | | | | | | | |
|-------------------------|-----------|------------|----------|---------------------------|-------|-----------|-------------|---------|-------------|-------------|-------------|-----------|
| NEMA 4 | | | | MOTOR LOAD SPECIFICATIONS | | | | | | | | |
| | ENCLOSURE | | | 230 V | 208 V | CONTACTOR | | RELAY | | | | |
| Farr APC P/N | SIZE | P/N | PANEL BK | HP | HP | AMPS | AB P/N | AMPS | AB P/N | | | |
| 207267401 | 12X12X6 | A1212CHNF | A12P12 | 1.5 | 1.5 | 12 | AB100C12L10 | 3.7-12 | 193-EA1FB | | | |
| 207267402 | | | | 2 | 2 | | | | | | | |
| 207267403 | | | | 3 | 3 | | | | | | | |
| 207267404 | | | | | | 5 | NA | 16 | AB100C16L10 | 12-32 | 193-EA1GB | |
| 207267405 | | | | | | 7.5 | 5 | 23 | AB100C23L10 | | | |
| 207267406 | | | | | | 10 | 7.5 | 30 | AB100C30L10 | 12-37 | 193-EA1HC | |
| 207267407 | | | | | | 15 | 10 | 43 | AB100C43L10 | 14-45 | 193-EA1JD | |
| 207267408 | 16X12X8 | A16148CHNF | CP1612 | 20 | 15 | 60 | AB100C60L10 | 26 - 85 | 193-EA1KE | | | |
| 207267409 | | | | | | 25 | 20 | | | 72 | AB100C72L10 | |
| 207267410 | | | | | | 30 | 25 | | | 85 | AB100C85L10 | |
| | | | | 460V | | | | | | | | |
| 207267411 | 12X12X6 | A1212CHNF | A12P12 | 1.5 | | 9 | AB100C09B10 | 1.6 - 5 | 193-EA1EB | | | |
| 207267412 | | | | 2 | | | | 1.6 - 5 | | | | |
| 207267413 | | | | 3 | | | | 3.7-12 | 193-EA1FB | | | |
| 207267414 | | | | 5 | | | | 3.7-12 | | | | |
| 207267415 | | | | | | | | 7.5 | 12 | AB100C12B10 | 12-32 | 193-EA1GB |
| 207267416 | | | | | | | | 10 | 16 | AB100C16B10 | 12-32 | |
| 207267417 | | | | | | | | 15 | 23 | AB100C23B10 | 12-32 | |
| 207267418 | | | | | | | | 20 | 30 | AB100C30B10 | 12-37 | |
| 207267419 | | | | | | | | 25 | 37 | AB100C37B10 | 12-37 | |
| 207267420 | | | | | | | | 30 | 43 | AB100C43B10 | 14-45 | 193-EA1JD |
| 207267421 | | | | 16X12X8 | | | A16148CHNF | CP1612 | 40 | 60 | AB100C60B10 | 26 - 85 |
| 207267422 | | | 50 | | | | | | 72 | AB100C72B10 | 26 - 85 | |
| 207267423 | | | 60 | | | | | | 85 | AB100C85B10 | 26 - 85 | |

Table 330.1.1

330.2 Timer Control

This discussion refers to standard equipment that uses 120/220 VAC, single phase, 50/60 Hz power. Refer to your General Dimensions drawing to confirm the electrical requirements of your equipment. Connection instructions are the same regardless of the voltage source. Refer to the documentation attached to this manual and the timer control box for further information regarding the installation of your specific control.

If equipped, mount the Automatic Timer Control on a wall or stand close to the collector. It is important to mount the timer near the collector so that you can monitor the performance. Keep in mind that both pressure gage and electrical connections need to be made to the timer control. **Note: Do not mount the timer control to the dust collector side panels! Vibration from the pulsejets may damage the sensitive electronic equipment. The timer can be mounted to structural members such as the legs or the skeletal frame of the modules as shown on the front page picture.**

330.3 Solenoids

The solenoid cover is removed by loosening the two brass Phillips head screws on the bottom of the housing. (The screws have a retaining ring on them and will not fall out.) The cover can then be removed by lifting straight up. To wire your solenoids, follow Figures 330.1 and 330.3.1. Each solenoid will have two wires attached – one specific for the numbered row of cartridges and a second wire that will be attached to all of the solenoids (called the Common). The Common is factory pre-wired on the solenoids, therefore only one connection will need to be made. Once the solenoid has been wired, the corresponding wires will then be attached to the control board as shown in Figure 330.3.2. The Common will share a terminal with the L2 terminal (120 volt “return” power line). **Note: The Controllers will have a separate Common connection terminal on the board; this terminal is internally connected to the L2 power terminal and has the same effect as wiring into the L2.** Connect the first wire (other than the Common) from a solenoid on a row of cartridges, to the corresponding numbered terminal on your control board. Once this is done for all of the rows, you can connect the L1 and L2 Terminals (L1 is “Hot”, L-2 is “Return”) to your 120-volt power source. Solenoids can be manually tested by inserting a small screw driver or paper clip into the bottom of the solenoid and pushing upwards. This opens the solenoid valve port, causing the diaphragm valve to pulse. For more information on the diaphragm and solenoids see the attached specification sheets.

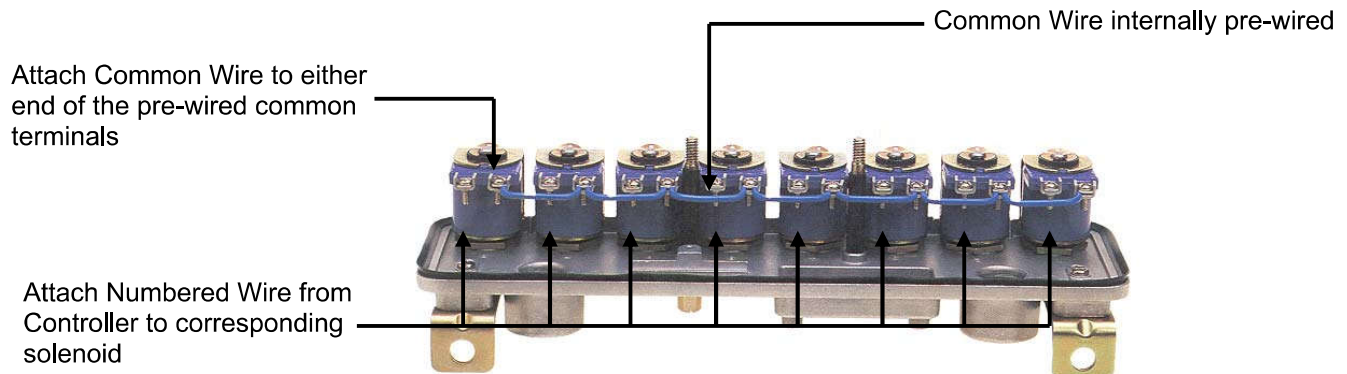


Figure 330.3.1 – Solenoid Wiring Diagram

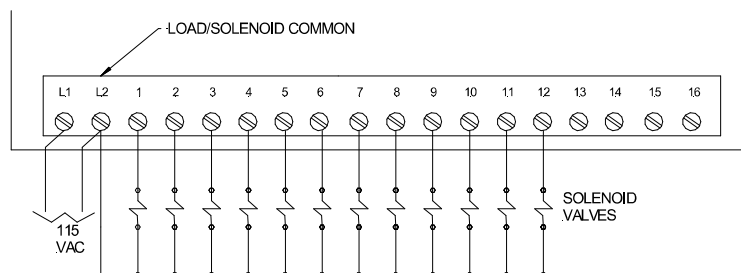


Figure 330.3.2 - Controller Wiring Diagram

Table 330.3.1 shows the number of solenoids and automatic timer controller outputs for the standard *Gold Series* models. For GS2 through GS60 models, there are at least as many timer outputs as there are solenoids. Each timer output connects to an individual solenoid. For GS72 through GS120 models, there are more solenoids than timer outputs. These models also have two headers (compressed air reservoirs). If your collector is one of these models, you must connect some of the timer outputs to two solenoids. When you connect a timer output to two solenoids, make sure the solenoids are connected to diaphragm valves on different headers, as shown in Figure 330.3.3.

Note: On units where double timer outputs are required, the timer outputs are connected to two solenoids each. Do not connect a timer output to two diaphragm valves on the same header; connect the timer outputs to valves on different headers.

| GOLD SERIES TIMER REQUIREMENTS | | | | | |
|--------------------------------|------------------------------|----------------------|--------------|---------|----------------------|
| Model Designation | No. of Solenoids/ Diaphragms | No. of Timer Outputs | | | Double Timer outputs |
| | | Dwyer | Determinator | T4 & P4 | |
| GS2 | 2 | 10 | 10 | 10 | N |
| GS4 | 4 | 10 | 10 | 10 | N |
| GS6 | 6 | 10 | 10 | 10 | N |
| GS8 | 4 | 10 | 10 | 10 | N |
| GS10 | 5 | 10 | 10 | 10 | N |
| GS12L | 6 | 10 | 10 | 10 | N |
| GS12 SQ | 4 | 10 | 10 | 10 | N |
| GS16L | 8 | 10 | 10 | 10 | N |
| GS16 SQ | 8 | 10 | 10 | 10 | N |
| GS20 | 10 | 10 | 10 | 10 | N |
| GS24 | 12 | 10 | 10 | 10 | Y |
| GS32 | 16 | 22 | 20 | 20 | N |
| GS36 | 12 | 10 | 10 | 10 | Y |
| GS40 | 20 | 22 | 20 | 20 | N |
| GS48 | 16 | 22 | 20 | 20 | N |
| GS48L | 24 | 22 | 20 | 20 | Y |
| GS56 | 28 | 22 | 20 | 20 | Y |
| GS60 | 20 | 22 | 20 | 20 | N |
| GS64 | 32 | 22 | 20 | 20 | Y |
| GS72 | 24 | 22 | 20 | 20 | Y |
| GS84 | 28 | 22 | 20 | 20 | Y |
| GS96 | 32 | 22 | 20 | 20 | Y |
| GS108 | 36 | 22 | 20 | 20 | Y |
| GS120 | 40 | 22 | 20 | 20 | Y |

Table 330.3.1

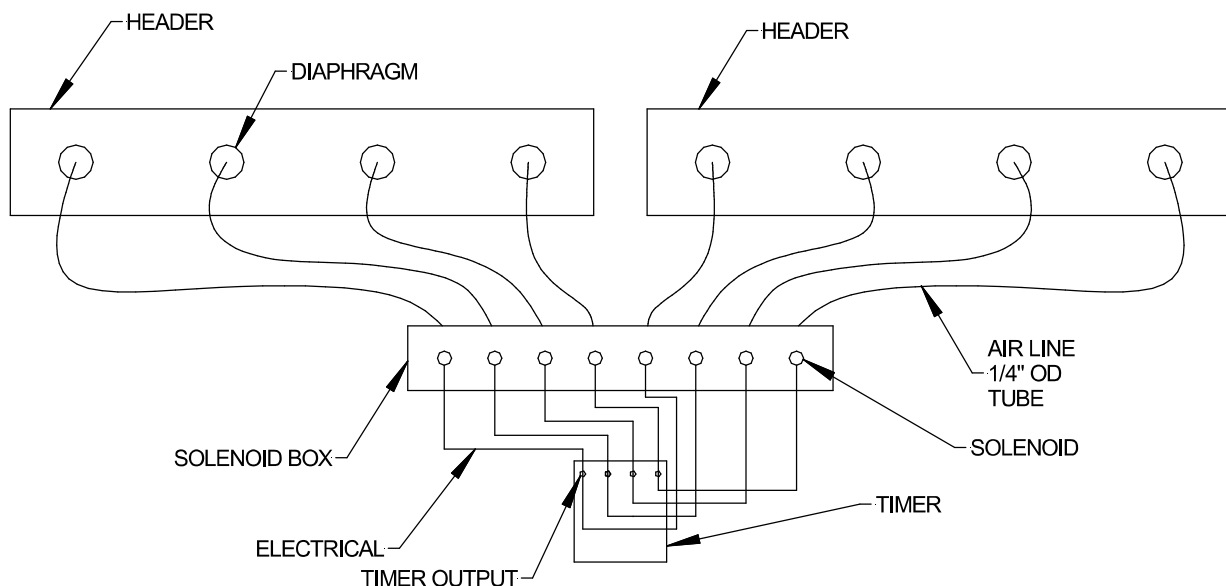
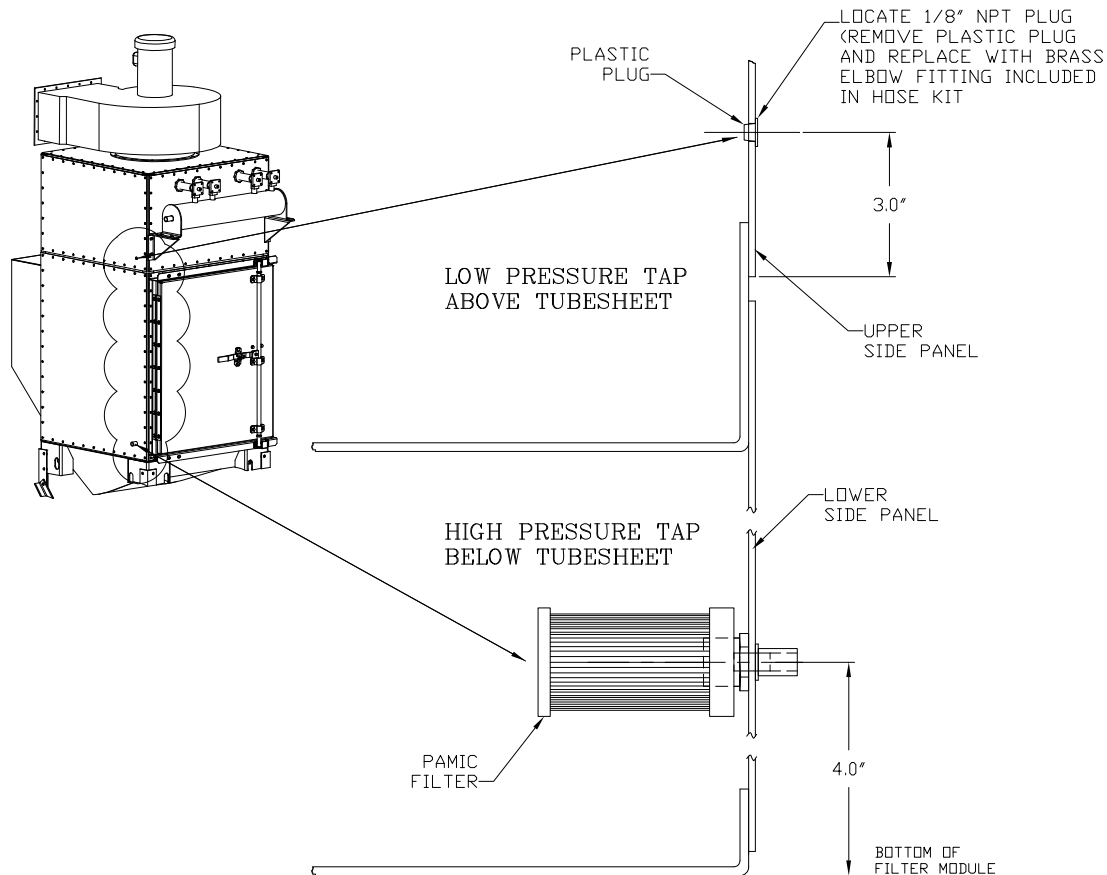


Figure 330.3.3 - DOUBLE UP TIMER OUTPUTS

330.4 Differential Pressure (DP) Connections

Your collector is equipped with an Automatic Pressure Sensing Timer Control or a Magnehelic gauge accessory. Locate the 1/8" NPT brass elbow fittings included in the control package. Install these elbows into the factory supplied, 1/8" NPT clean-air and dirty-air pressure taps on the collector. Refer to Figure 330.1 and your General Dimensions drawing for the location of these taps.

Using the black 1/4" OD black plastic tubing, connect the clean-air plenum pressure tap to the **LO** or **Clean Air Plenum** connection on the device. Connect the dirty-air plenum pressure tap to the **HIGH** or **Dirty Air Plenum** connection on the device – Figure 330.4.



330.5 Compressed Air Connection

Supply the header (compressed air reservoir) with clean, dry compressed air between 90 and 105 psi. Oil or water in the compressed air lines will cause the filter media to fail. The airline should be equipped with a manual shut-off valve, a filter/separator, an air regulator and a pressure gauge, all located close to the unit. Farr recommends that the compressed air supply be kept at a dew point of -35° F. Make provisions for draining any condensate from the air reservoir with an automatic tank drain or by other means.

Total air consumption is variable and is dependent on the type and concentration levels of airborne dust and the set points used for determining the cleaning cycle. See Table 330.5.1 for your compressed air volume requirement. If your "On Time" or "Off Time" set points are not listed on the table, use either graph 330.5.1 or 330.5.2 to determine your compressed air requirement. Use Graph 330.5.1 if you have 1" Diaphragm Valves and 330.5.2 if you have 1-1/2" Diaphragm Valves.

Connect an air hose or hard plumbing from the compressed air source to the 1" NPT coupling on either side of the header (3/4" minimum air supply line for GS2 – GS10, 1" supply line for anything larger than a GS10). A shut-off valve is recommended between the compressed air source and the header.

Slowly open the shut-off valve, allowing pressure to build in the tank.

When the header has reached full line pressure of 90 to 105 psi, close the shut-off valve.

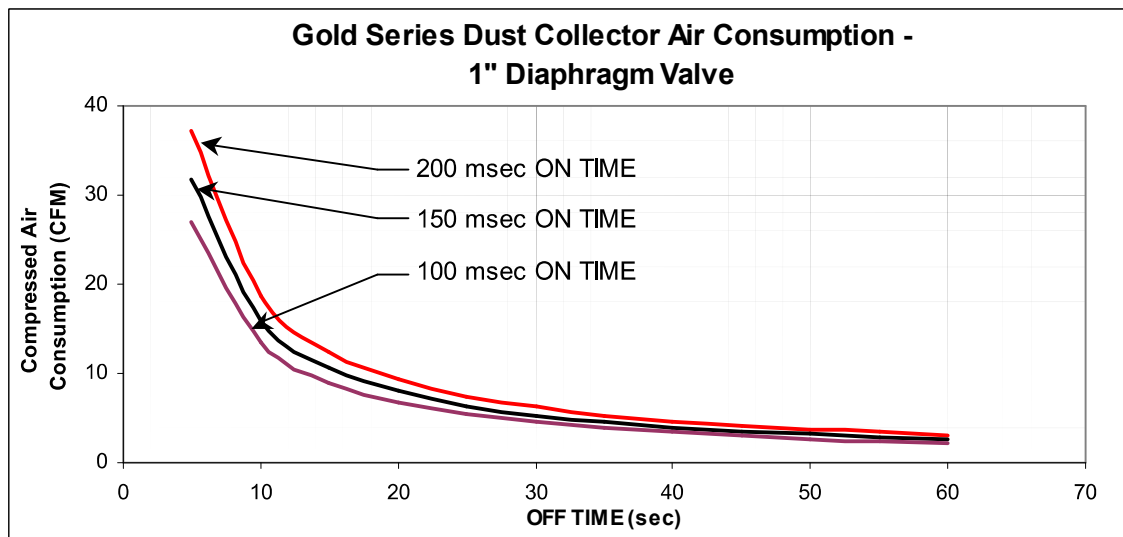
Inspect the header, valves, fittings and solenoid valves for air leaks.

Tighten all fittings and clamps as required.

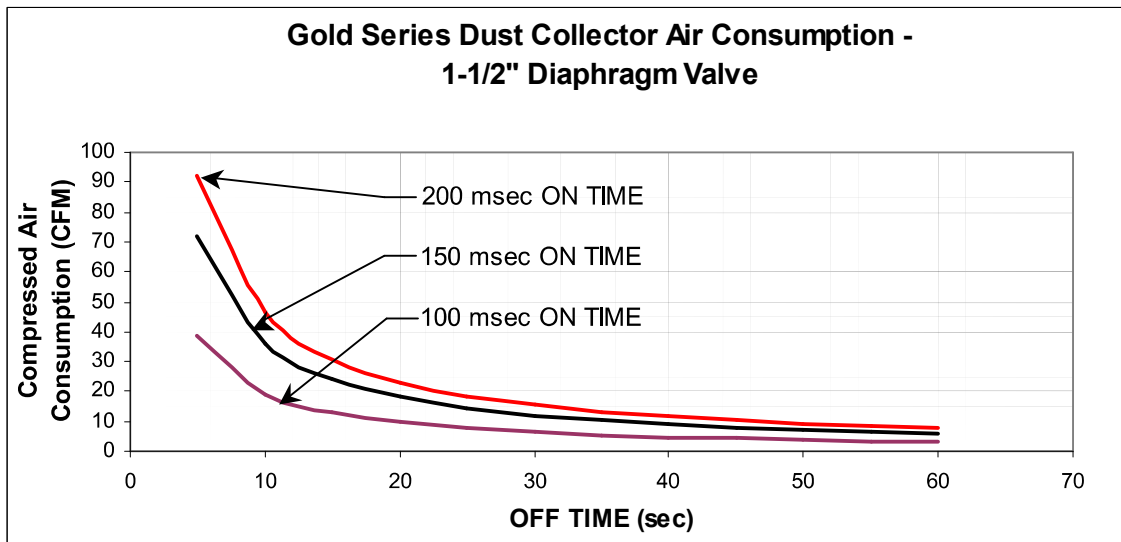
Re-open the air shut-off valve.

| Gold Series Dust Collector Air Consumption (For any size GS collector based on diaphragm size) | | | | | | | |
|---|----|--|------|------|------------------------|------|------|
| | | 1" Diaphragm Valve | | | 1-1/2" Diaphragm Valve | | |
| On Time (msec) | | 100 | 150 | 200 | 100 | 150 | 200 |
| | | Compressed Air Consumption (ft ³ /min.) | | | | | |
| Off Time (sec) | 5 | 27.0 | 31.8 | 37.2 | 38.4 | 72.0 | 92.4 |
| | 10 | 13.5 | 15.9 | 18.6 | 19.2 | 36.0 | 46.2 |
| | 15 | 9.0 | 10.6 | 12.4 | 12.8 | 24.0 | 30.8 |
| | 20 | 6.8 | 8.0 | 9.3 | 9.6 | 18.0 | 23.1 |
| | 25 | 5.4 | 6.4 | 7.4 | 7.7 | 14.4 | 18.5 |
| | 30 | 4.5 | 5.3 | 6.2 | 6.4 | 12.0 | 15.4 |
| | 35 | 3.9 | 4.5 | 5.3 | 5.5 | 10.3 | 13.2 |
| | 40 | 3.4 | 4.0 | 4.7 | 4.8 | 9.0 | 11.6 |
| | 45 | 3.0 | 3.5 | 4.1 | 4.3 | 8.0 | 10.3 |
| | 50 | 2.7 | 3.2 | 3.7 | 3.8 | 7.2 | 9.2 |
| | 55 | 2.5 | 2.9 | 3.4 | 3.5 | 6.5 | 8.4 |
| | 60 | 2.3 | 2.7 | 3.1 | 3.2 | 6.0 | 7.7 |

Table 330.5.1



Graph 330.5.1

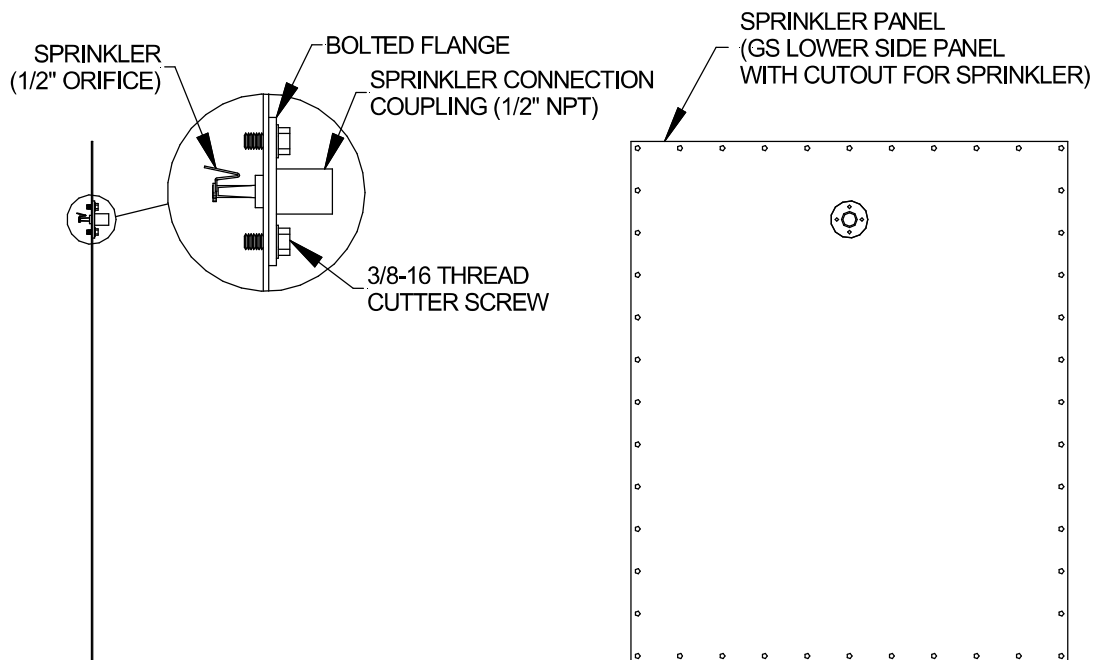


Graph 330.5.2

330.6 Sprinkler Connections

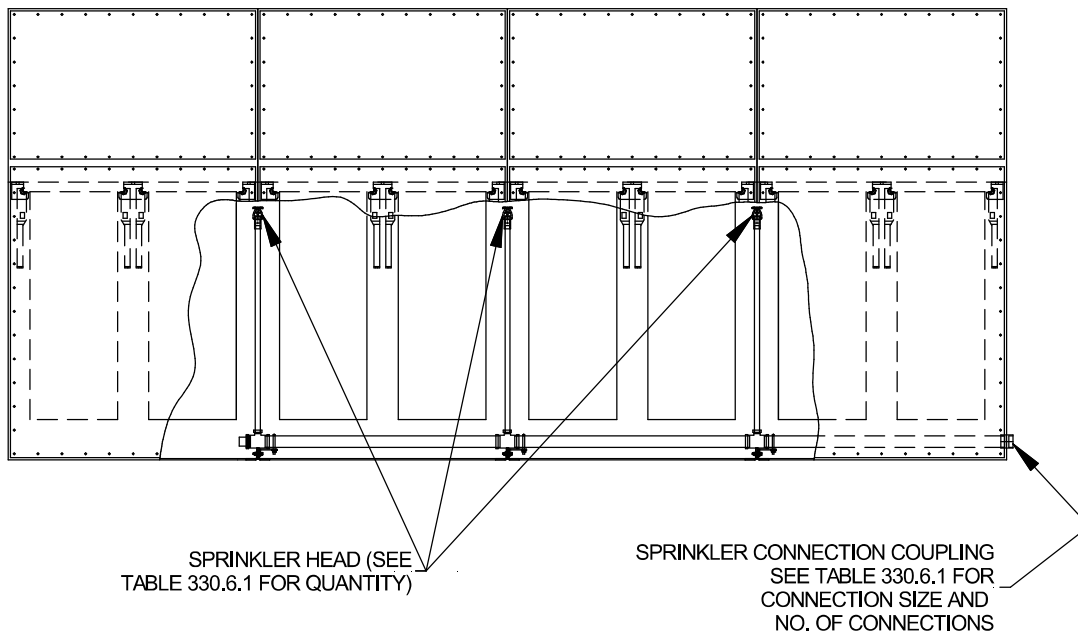
If your collector is equipped with a sprinkler system, locate the sprinkler connection coupling(s). Refer to the General Dimensions drawing for locations.

Figure 330.6.1 shows a single sprinkler head system. A single 1/2" orifice sprinkler is screwed into a 1/2" coupling. The coupling is welded to a circular plate, which is bolted to a lower side panel. The plate can be unbolted in order to replace the sprinkler. There is one pipe connection for each sprinkler head.



(Figure 330.6.1)

Figure 330.6.2 shows an internal sprinkler system, which is used on large GS collectors, where necessary. Two or more sprinkler heads connect to vertical pipes, which are connected to a pipe that runs along the bottom of the filter module. All sprinkler heads are supplied through a single coupling, welded near the bottom of a lower side panel.



(Figure 330.6.2)

Refer to Table 330.6.1 to determine the water flow rate and the size and number of couplings required for your system. **Note: If you are supplying more than one sprinkler connection coupling with a single supply pipe, the supply pipe must be sized to accommodate the required flow rate. Check local codes and NFPA for requirements.**

| Model Designation | No. Sprinkler Heads | Flow Rate (Gal/Min) | Size & No. of Connections |
|--|---------------------|---------------------|---------------------------|
| GS2-GS10* | 1 | $5.3\sqrt{P_w}$ | 1/2" NPT (1) |
| GS12-GS24* | 2 | $10.6\sqrt{P_w}$ | 1/2" NPT (2) |
| GS32-GS60** | | $11.2\sqrt{P_w}$ | 1-1/2" NPT (1) |
| GS72-GS84** | 3 | $16.8\sqrt{P_w}$ | |
| GS96-GS108** | 4 | $22.4\sqrt{P_w}$ | |
| GS120** | 5 | $28\sqrt{P_w}$ | |
| Pw- Water Pressure (psi) at Sprinkler See Fig.(330.6.1) for GS2 through GS24 Sprinkler Instructions. See Fig.(330.6.2) for GS32 through GS120 Sprinkler Instructions. *k factor for wall mount sprinkler is 5.3 gpm/psi ^{1/2} **k factor for vert mount sprinkler is 5.6 gpm/psi ^{1/2} | | | |

(Table 330.6.1)

Apply Teflon tape to the supply pipe and connect it to the sprinkler connection coupling(s). Turn on water supply and inspect all connections for leaks. **Note: Water leaks in the collector will cause cartridge failure and hopper flow problems.**

SECTION 340-EXPLOSION VENTS

Many common dusts used or generated by industrial processes are combustible. Solid particles smaller than 420 µm (capable of passing through a U.S. No 40 standard sieve) are classified as dusts². Special precautions should be taken to protect against injury, loss of life, and property damage when conveying, collecting and processing explosive dusts. The National Fire Protection Agency (NFPA) provides comprehensive guidelines for dealing with explosive dusts. Following is a list of publications that are highly recommended by Farr for use in determining if the installation of your dust collection system meets all of the NFPA recommendations with regards to conveying, collecting and processing explosive dusts.

- NFPA 654 –Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and handling of Combustible Particulate Solids
- NFPA 69 – Standard on Explosion Prevention Systems
- NFPA 68 –Guide for Venting of Deflagrations
- NFPA 664 – Standard for the Prevention of Fires and Explosion in Wood Processing and Woodworking Facilities
- NFPA 651 – Standard for the Machining and Finishing of Aluminum and the Production and Handling of Aluminum Powders
- NFPA 77 – Recommended Practice on Static Electricity

This is not a complete comprehensive list of NFPA publications that may apply to your application and NFPA publications cited in these publications should also be referenced when applicable.

340.1 Important Note Concerning Explosion Vents:

Farr provides dust collectors that constitute only one component of a complete dust collection system. In many cases the installation of an explosion vent on the dust collector is insufficient in meeting the current NFPA recommendations. NFPA 654 states “Systems that handle combustible particulate solids shall be designed by and installed under the supervision of qualified engineers who are knowledgeable of these systems and their associated hazards”³. The complete dust collection system should be designed in a manner that conforms to the NFPA standards and recommendations in order to minimize the risks associated with a deflagration. Farr does not participate in the design of the dust collection system and makes no guarantee that the inclusion of an explosion vent on the dust collector will satisfy the requirements of the NFPA recommendations.



The following is a list of safety precautions that have been paraphrased from the referenced NFPA publications. These are provided to you solely for the purpose of demonstrating some of the conditions that NFPA recommends when dealing with explosive dusts. The inclusion of this list in this manual does not relieve the owner/operator of the responsibility to assure that the complete system is designed and installed in accordance with the NFPA standards and recommendations.

340.2 General Explosion Vent Guidelines

- It is important to note that venting does not prevent a deflagration; venting can, however, minimize the destructive effects of a deflagration.
- Refer to NFPA 654 Standard for design requirements for the complete dust collection system.
- Systems that handle combustible particulate solids shall be designed by and installed under the supervision of qualified engineers who are knowledgeable of these systems and their associated hazards.
- Several methods are available for the design of explosion protection for equipment. Explosion venting is one acceptable method and can be combined with others. See NFPA 68, Section 3.1.1
- Where an explosion hazard exists, isolation devices shall be provided to prevent deflagration propagation from air-material separators upstream to the work areas. Isolation devices include, but are not limited to, those listed in NFPA 654 section 3.1.3.1(1) through (5).

² NFPA 68, 2-3.4.1

³ NFPA 654, 2.1.1

- The choice of the most effective and reliable means for explosion control should be based on an evaluation that includes the specific conditions of the hazard and the objectives of protection. Venting of deflagrations only minimizes the damage that results from combustion.
- Substances other than oxygen can act as oxidants. NFPA 68 vent calculations apply only where the oxygen in air is the only oxidant. If chemical oxidants are present as either solid particulate or gas then explosion suppression and isolation equipment is required as recommended in NFPA 69.
- Situations can occur in which it is not possible to provide calculated deflagration venting as described in NFPA 68. Such situations do not justify the exclusion of all venting. The maximum practical amount of venting should be provided, since some venting should reduce the damage potential. In addition, consideration should be given to other protection and prevention methods.
- It is not possible to successfully vent a detonation.

340.3 Explosive Dusts

- Solid particulates smaller than 420 μm (0.017 in.) (capable of passing through a U.S. No. 40 standard sieve) are classified as dusts. The fineness of a particular dust is characterized by particle size distribution. The maximum pressure and K_{st} increase with a decrease in the dust particle size.
- The combustion properties of a dust depend on its chemical and physical characteristics. The use of published dust flammability data can result in an inadequate vent design if the dust being processed has a smaller mean particle size than the dust for which data are available, or if other combustion properties of the dust differ. Particle shape is also a consideration in the deflagration properties of a dust. The flammability characteristics of a particular dust should be verified by test. (See NFPA68 Section B-5.)

340.4 Explosion Vents Operation

- Venting is one means of limiting the pressure generated in an enclosure by a deflagration. By releasing expanding gases through an opening engineered for the purpose, it is possible to limit the pressure generated to a reduced maximum pressure, P_{red} , that is below a pressure that can cause unacceptable damage to the enclosure.
- An explosion vent is a pressure-relieving device designed to open at a specific pressure to reduce the maximum pressure rise during a deflagration in an enclosed vessel to an acceptable level.
- Vent closures shall be directed toward a restricted area, and the vent closure shall not be a missile hazard.
- Vents are provided on an enclosure to limit pressure development, P_{red} , to a level acceptable to the user and the authority having jurisdiction. The level of pressure development can be considered acceptable where no damage to the enclosure is likely, or where some degree of permanent deformation is tolerable.
- Shields that deflect the gas and pressure waves exiting a vent during a deflagration are not permitted.
- Vents should function dependably. Closures should not be hindered by deposits of snow, ice, paint, corrosion, or debris, or by the buildup of deposits on their inside surfaces. Closures should not be bonded to the enclosure by accumulations of paint. The materials that are used should be chosen to minimize corrosion. Clear space should be maintained on both sides of a vent to enable operation without restriction and without impeding a free flow through the vent.
- Vent closures should be maintained in accordance with Chapter 10 of NFPA 68 and the manufacturers' recommendations. The occupant of the property in which the deflagration vent closures are located is responsible for inspecting and maintaining such devices.
- The vent opening should be free and clear and should not be impeded. If the vent discharges into a congested area, the pressure inside the vented enclosure increases. A major blast pressure can be caused by the ignition of unburned gases or dusts outside the enclosure.
- Appropriate signs should be posted to provide warning as to the location of a vent. Replacement decals are available from Farr and are listed in the spare parts section of this manual.
- A vent closure should be inspected and properly maintained in order to ensure dependable operation. In some cases, ensuring dependable operation can necessitate replacing a vent closure.

340.5 Return of Filtered Air to the Building

- Recycling of dust collector exhaust to buildings shall be permitted if the system is designed to prevent both return of dust with an efficiency of 99.9 percent at 10 microns and transmission of energy from a fire or explosion to the building. Exceptions apply. Consult the NFPA 68, Section 2 and ACGH chapter 7. When recirculating air inside, Farr recommends a safety monitoring filter (SMF) after the dust collector such as a Camfil Farr Riga-Flo® or HEPA Absolute® filters.

340.6 Location of Vents and Vented Equipment

- The fireball and blast pressure that are created by the venting process shall not impinge upon unrestricted personnel pathways.
- Where an explosion hazard exists, dust collectors shall be located outside of buildings. Exceptions include isolation and suppression systems as listed in NFPA 654 section 3.1.1
- Flames and pressure waves that emerge from an enclosure during the venting process can injure personnel, ignite other combustibles in the vicinity, result in ensuing fires or secondary explosions, and result in pressure damage to adjacent buildings or equipment
- Deflagration vents should not be located in positions that allow the vented material to be picked up by air intakes.

- The material discharged from an enclosure during the venting of a deflagration should be directed outside to a safe location. Property damage and injury to personnel due to material ejection during venting can be minimized or avoided by locating vented equipment outside buildings and away from normally occupied areas. (See NFPA 68 SECTION 3-2.3.)

340.7 System Ducting on Combustible Dusts

- Ducts that handle combustible particulate solids shall conform to the requirements of NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*, except as amended by the requirements of chapter 3 of NFPA 68.

340.8 Ignition Sources

- Some types of ignition sources include electric (arcs, sparks, and electrostatic discharges), mechanical (friction, grinding, and impact), hot surfaces (overheated bearings), and flames (welding torches, and so forth).

340.9 Vent Discharge Ducts

- If a dust collector is located inside a building it should be located near an external wall and the exhaust from the vent ducted to the outside.
- The addition of a vent discharge duct can substantially increase the pressure developed in a vented enclosure. (See NFPA 68 Section 5-4.) Sizing of the vent should take this into consideration.
- Ducts that are used to direct vented gases from the vent to the outside of a building should be of non-combustible construction and should be strong enough to withstand the expected P_{red} . Ducts should be as short as possible and should not have any bends. (See NFPA 68 Section 5-2.9.)
- The duct should be less than 20ft long, have a cross-sectional area larger than the vent, and should not interfere with the operation of the vent.
- Bird screens or weather hoods must be low restriction and their affect should be taken into consideration when sizing the vent area.

340.10 Vent Inspection and Maintenance

Farr incorporates rupture diaphragm style explosion vents on their dust collectors. Explosion vents should be inspected every three months. The inspection and maintenance points are outlined below.

- Remove obstructions such as snow, ice, dust inside and out if present.
- Safety Decal – Replace if missing or illegible.
- Bolts are tight – tighten and replace if missing.
- Area around vent is free and clear of obstructions.
- Check that flammable materials are not stored near the vent.
- Rupture diaphragms have no moving parts and should be inspected for tears rips or cracks, replace if present.

SECTION 350-FILTER INSTALLATION/REPLACEMENT

New units ship with filter cartridges installed. We have many types of replacement filters available for a wide range of applications. Refer to section 700 - *Replacement Parts List* for replacement filter and various parts identification. Care should be taken to make sure the correct Farr original equipment replacement filters are used to insure continued satisfactory performance of the unit. For genuine Farr replacement parts call 800-479-6801.

1. Disconnect electrical power to the fan and control box. Disconnect compressed air service from the compressed air header. Bleed all air from the air header. Perform an OSHA approved lock-out/tag-out procedure on these and any other energy sources (Refer to Section 100.3 of this manual for more information).
2. Open the access doors at the front of the unit, swinging them out of the way.
3. Unlatch the clamp bars as shown in Figures 350.1-350.4. With your left hand, rotate the right-hand clamp bar clockwise or up and pull it toward you, until its locking tab clears the rectangular cut-out on the left-hand clamp bar. With your right hand, rotate the left-hand clamp bar counter-clock-wise or up and push it away from you until its locking tab clears the rectangular cut-out on the right-hand clamp bar. Rotate the right-hand clamp bar counterclockwise or down, until it is clear of the cartridge removal path – Figure 350.2. Rotate the left-hand clamp bar clockwise or down, until it is clear of the cartridge removal path also – Figure 350.3. Figure 350.4 shows the cartridges ready to be removed.
4. Remove the dirty filter cartridges by sliding them off the clamp bar channels. Clean the surface of the tube sheet in the areas where the filter gasket forms a seal.
5. Remove a new cartridge from the shipping carton, taking care not to cut or otherwise damage the filter media. Make sure the clamp bar handles are fully opened and will not interfere with the cartridge during installation - Figure 350.5. Grasp the new cartridge by the top metal pan and set it onto the clamp bar channels. Holding the cartridge level, slide it forward, *pushing on the cartridge pan, do not push the media*, taking care not to drag the gasket along the tube sheet. Push the cartridge in just far enough to leave room for the next cartridge to rest on the clamp bar channels. Repeat steps 4 and 5 until the row is full.
6. To seal the new cartridges, repeat the instructions in step 3 in reverse order. With your left hand, rotate the left-hand clamp bar counter-clock-wise or up to between 80° and 90°. While pushing the left-hand clamp bar away from you, rotate the right-hand clamp bar clockwise or up, with your right hand. Insert the locking tab on the left-hand clamp bar when it lines up with the rectangular cut-out on the right-hand clamp bar. Release the left-hand clamp bar. With both hands rotate the right-hand clamp bar clockwise or up and pull it toward you, until the locking tab inserts into the rectangular cut-out on the left-hand clamp bar – Figure 350.2. The clamp bars must be bent slightly if the locking tabs do not stay inserted in the rectangular cutouts.
7. Repeat the above procedure until all the rows of cartridges are full.



Figure 350.1 – Clamp bars closed



Figure 350.2



Figure 350.3



Figure 350.4 - Clamp Bars Open

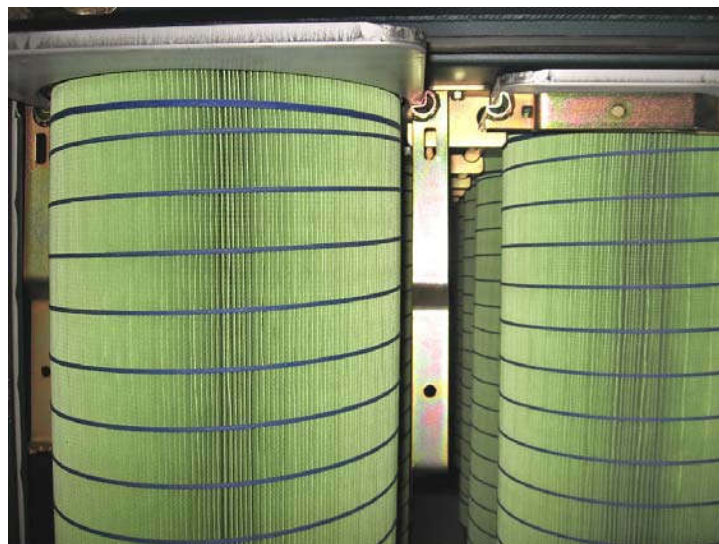


Figure 350.5

SECTION 360-PRECOATING OF FILTERS

In applications where the dust concentration is high and/or the dust particles are large (more than 0.5 microns), pre-coating of the filters is not required. In applications where the dust concentration is low and/or the dust particles are small (less than 0.5 microns), pre-coating will result in a higher initial efficiency and extended filter life. Maximum efficiency of the filter is not achieved until a dust cake is formed on the media, which may take weeks without pre-coating. By applying a suitable pre-coat dust, maximum efficiency can be attained in a few hours. This is desirable if the air is to be re-circulated through Safety Monitoring Filters (SMF), or if the dust is toxic. Also, if the collected dust contains a considerable content of hydrocarbons or similar substances, the life of the filters can be greatly increased by pre-coating.

Pre-coating Procedure

1. Ensure the filter cartridges are correctly installed.
2. Install a clean, empty discharge container under the unit.
3. If a Safety Monitoring Filter (SMF) is installed, it must first be removed from the system.
4. Disable the dust collector so that it does not pulse while the pre-coat is being applied. This can be done by shutting off the compressed air and bleeding the compressed air reservoir or turning off the power to the timer control.
5. Weigh out the appropriate amount of pre-coat dust according to Table 360.1.1.
6. Start the collector and feed the pre-coat dust into the collector. The dust can be fed into any suction hood in the duct system or through the hopper discharge.
7. Dust will be observed from the fan outlet. This is normal and should stop when all the pre-coat dust is applied.
8. When all the dust has been applied, collect the dust from the discharge container and repeat the above procedure.
9. Record the Magnehelic gauge reading and set the fan damper to correspond to the system design airflow. Airflow can be measured by means of a Pitot tube, anemometer or similar device.
10. Remove any remaining pre-coat dust from the outlet ducting, SMF housing and discharge container. Discard according to local codes and procedures.
11. Re-enable the collector by either opening the compressed air line or turning on the power to the timer control (see step 4).
15. The system is now ready for operation.

| Model Designation | Pre-coat Amount Expanded Perlite (Lbs.) | Pre-coat Amount Limestone (Lbs.) |
|--------------------------|--|---|
| GS-2 | 4 | 18 |
| GS-4 | 8 | 36 |
| GS-6 | 12 | 54 |
| GS-8 | 16 | 72 |
| GS-10 | 20 | 90 |
| GS-12 | 24 | 108 |
| GS-16 | 32 | 144 |
| GS-20 | 40 | 180 |
| GS-24 | 48 | 216 |
| GS-36 | 72 | 324 |
| GS-48 | 96 | 432 |

Table 360.1.1 - Cartridge Pre-coat Data

Note: Expanded perlite is only product Farr APC provides.

SECTION 400-OPERATION OF YOUR EQUIPMENT

Farr has prepared this proprietary user's manual for the exclusive use of its customers. The recommendations contained herein are based on proven techniques and on test data believed to be reliable. It is intended that personnel having specialized training in accordance with currently accepted practice and normal operating conditions use this manual. Variations in environment, changes in operating procedures or extrapolation of data, may cause unsatisfactory results. Since Farr has no control over the conditions of service, it expressly disclaims responsibility for the results obtained or for any consequential or incidental damages of any kind incurred.

The *Gold Series* dust collector described in this manual is designed for the collection of welding fumes and/or the capture of airborne particles generated from mixing, sanding, grinding and cutting operations involving wood, metal, fiberglass, plastics, advanced composites or similar materials.

400.1 System Operation

Incoming dust-laden air enters the inlet plenum where a baffle forces large or heavy particles to drop out of the air stream and fall into the hopper. The clean air passes through the filter media from the outside to the inside of the filter cartridge and exits through the open top of each filter cartridge. The air then flows from the filters into the clean-air plenum, where it enters the fan inlet and is exhausted. The dust is captured on the outside surface of the filter media.

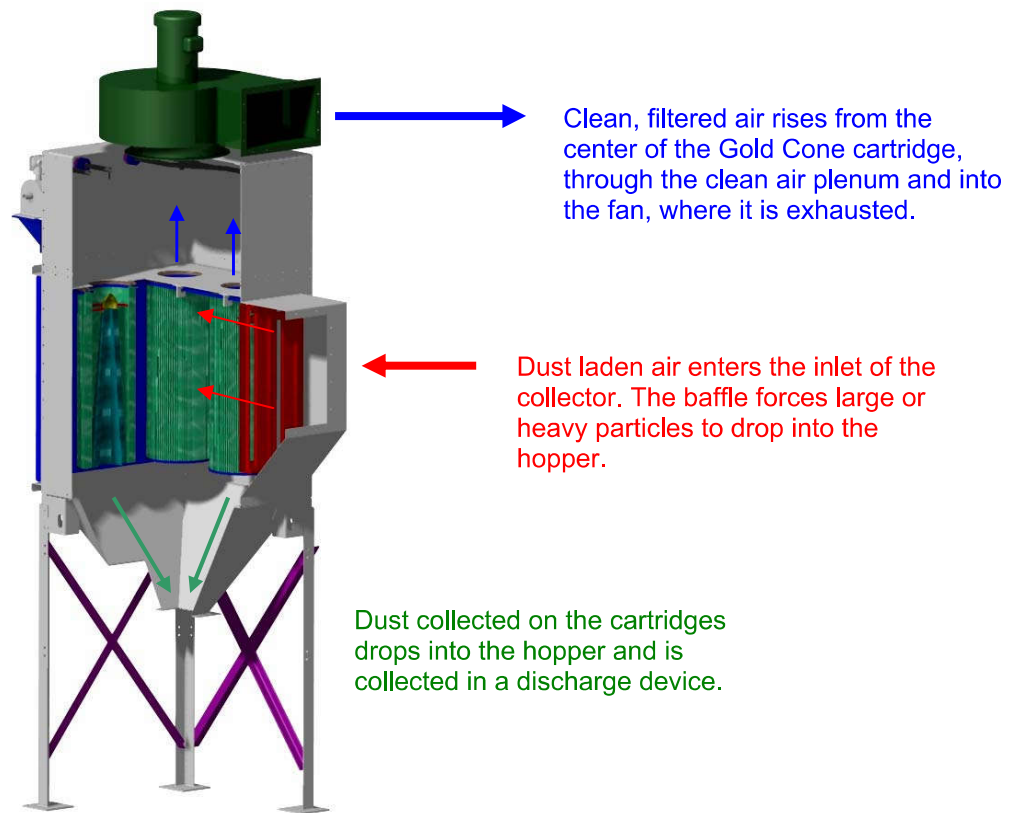


Figure 400.1.1 – GS Operation

The filter media can be made of several different fabrics and materials depending on the application. However, the high efficiency of these cartridges is due to the dust layer or “cake” formed on the surfaces of the media. The media primarily provides a surface on which dust particles collect through the following four mechanisms:

- **Inertial Collection** – Dust particles strike the fibers placed perpendicular to the airflow direction instead of changing direction with the air stream.

- **Interception** – Particles that do not cross the fluid streamlines come in contact with fibers because of the fiber size.
- **Brownian Movement** – Sub-micron particles are diffused, increasing the probability of contact between the particles and collecting surfaces.
- **Electrostatic Forces** – The presence of an electrostatic charge on the particles and the filter can increase dust capture.

A combination of these mechanisms results in formation of the dust cake on the filter, which eventually increases the resistance to air flow. The filter must be cleaned periodically. A balance must be maintained between having some dust cake formation to improve efficiency and an acceptable increase in pressure drop. A timer controller or Magnehelic gauge, monitoring the differential pressure (DP) and pulsing accordingly, can maintain the dust cake with minimal increase in pressure. By pre-coating your filter with a special dust at start-up, you can increase initial efficiency of your collector (see Section 360 – PRECOATING OF FILTERS).

400.2 Filter Cleaning

The *Gold Cone* cartridge elements are sequentially cleaned by back flushing with air. This momentary airflow reversal is induced by a short burst of compressed air. The air is released from the compressed air reservoir by a fast-acting, high-flow diaphragm valve. This “pulse” of air dislodges the accumulated dust from the filter element. The dislodged dust then drops into the hopper or collection drawers. Each pulse cleans one row of filter cartridges leaving the remaining cartridges available to continue filtering the ventilation air. This allows the cleaning to take place without the need to stop the ventilation system. Figure 400.2.1 shows a *Gold Cone* cartridge in normal operation. Figure 400.3.1 demonstrates the pulse of compressed air cleaning a cartridge.

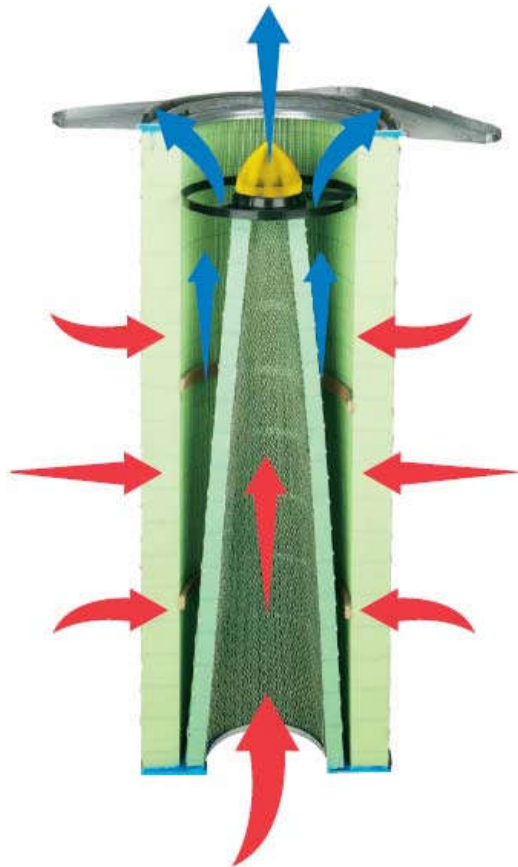


Figure 400.2.1 – Normal Gold Cone Operation

400.3 Cleaning System Components

HEADER (COMPRESSED AIR PRESSURE RESERVOIR)

A header is provided with a 1 in. NPT coupling at each end. Supply the header with clean, dry compressed air between 90 and 105 psi. The air supply line should be equipped with a manual shut-off valve, a filter/separator, an air regulator and a pressure gauge, all located near the unit.

SOLENOID/DIAPHRAGM VALVES

Solenoid-operated valves on the collector operate one (1) diaphragm valve each. Diaphragm valves on the collector operate one (1) pulsejet blowpipe each. The automatic timer control energizes the solenoid, which causes the plunger in the solenoid to move. When the plunger moves, air in the upper chamber of the solenoid is released to the atmosphere. The resulting difference in air pressure between the upper chamber and the compressed air reservoir allows the diaphragm valve to open. This allows the air in the header to be released into the pulsejet blowpipes. The size of the diaphragm valves is 1" or 1-1/2", depending on the size of the collector. See Section 700 - Replacement Parts Lists for the size of diaphragm valves on your collector.

PULSEJET BLOW PIPE

Each pulsejet blowpipe contains one (1) nozzle for each cartridge. These nozzles are positioned above, and directed into, the opening of the filter cartridge. As the pulse of air reaches the nozzle, it is accelerated through the smaller diameter. The resulting shock wave travels down the length of the inside of the filter cartridge, dislodging the dust from the filter cartridge.

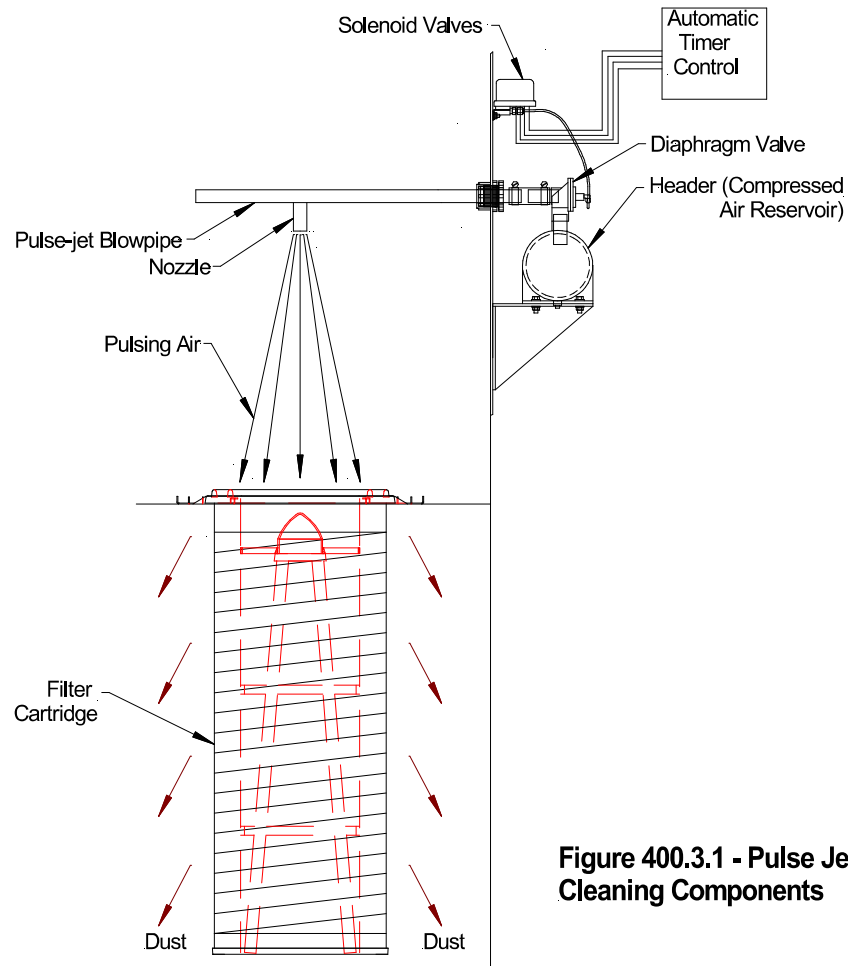


Figure 400.3.1 - Pulse Jet Cleaning Components

Use caution when working near an operating collector. Wear appropriate ear and eye protection! Hearing damage can result from high noise levels generated during filter cleaning or “pulsing” and collected debris, near the diaphragm valve discharge, may become a projectile, creating the potential for eye injury. Do not operate with access doors open! See Section 100.3.

400.4 Dwyer DCT1000 Automatic Timer Controller

The DCT1000 was designed for on-demand or continuous cleaning applications. Continuous cleaning applications do not require external inputs and can be used for time based “on-demand” cleaning through use of the cycle delay feature. For on-demand applications, the plug-in pressure module can be used to take full advantage of all the DCT1000 features.

Master Controller Panel Features

Last Output Setup

The Last Output Setup selects the last channel to be activated. When first selected, the display will flash the last output available in the system. With single board installations, this will be the number of channels installed, typically 10 or 22. This value becomes more important when multiple modules are installed. The last output value flashed will be the sum of all channels available in the system.

After the last available channel indication has completed, the currently programmed last channel value is displayed. This value may be changed using the Up and Down buttons. The minimum value is one while the maximum value is the maximum number of installed channels, including all expansion modules. You may restore the factory default setting by pressing both Up and Down simultaneously and holding for about four seconds. The default value is the maximum number of channels. Pressing Select will change the setup mode to Time Off Setup.

Time Off Setup

Time Off defines the period of time between solenoid activations when no channels are enabled. This may be set between one second and 255 seconds. The factory default is 15 seconds. The display will show the current time off setting when the time off setup mode is entered. The value may be changed using the Up and Down buttons. Pressing both Up and Down simultaneously and holding for approximately four seconds will restore the default value of 15. Pressing the Select switch will change the setup mode to Time On Setup.

Time On Setup

Time On Setup sets the solenoid on time. The display will indicate the currently programmed time on setting. This is measured in milliseconds. Using the Up and Down buttons, the value may be changed. The value may be set between 10 msec and 600 msec in 10 msec increments. Pressing the Up and Down buttons simultaneously for approximately four seconds will restore the factory default value of 150 msec. Pressing the Select button will advance the setup mode to the High Limit setup if the pressure module is installed. With no pressure, it will step to Cycle Delay Setup.

High Limit Setup

The High Limit Setup, available only with a pressure module installed, sets the pressure at which the cleaning cycle will begin. This value may be between zero and the pressure module calibration pressure. Normally, the High Limit should be above the Low Limit. If, however, the High Limit pressure is set below the Low Limit, the cleaning cycle will begin when the High Limit is exceeded and stop when the pressure falls below the High Limit. The Low Limit in this case will have no effect. Pressing both Up and Down buttons simultaneously and holding for about four seconds will restore the factory setting for High Limit to 2.0” w.c. **The high limit should never be set higher than 2.0” w.c. This value should only be used on light loadings and is not recommended for fibrous dusts.** Pressing Select will change the system to the Low Limit Setup mode.

Low Limit Setup

The operation of the Low Limit, available only with a pressure module installed, is identical to the High Limit except that the default Low Limit pressure is 1.5” w.c. **The low limit should never be set higher than 1.5” w.c. This value should only be used on light loadings and is not recommended for fibrous dusts.** The upper settable value is the calibration pressure of the pressure module and the lower limit is zero. Pressing Select will change the system to the High Alarm Setup mode.

High Alarm Setup

The operation of the High Alarm Setup is identical to the High and Low Limit Setup and is only available when a pressure module is installed. The High Alarm default is 6.0” w.c. The upper settable value is the calibration pressure of the pressure module and the lower limit is zero. Pressing Select will change the system to the Low Alarm Setup mode.

Low Alarm Setup

The operation of the Low Alarm Setup is identical to the High and Low Limit Setup. The Low Alarm default is 0" (zero) w.c. The upper settable value is the calibration pressure of the pressure module and the lower limit is zero. Pressing Select will change the system to the Cycle Delay Setup mode.

Cycle Delay Setup

The Cycle Delay inserts a delay time between the end of the last cycle and the beginning of the first cycle. This may be set to between zero and 255 minutes. The factory default is zero. Setting the value to zero will disable the delay. Pressing Select will change the system to the Down Time Cycles Setup mode.

Down Time Cycles Setup

The Down Time Cycles Setup will select a value between zero and 255 minutes. The factory default is one minute. Selecting zero will disable the operation. When the down time cycles is activated by shorting the down time cycles input to the common terminal, the system will enter a forced cleaning mode for the programmed duration. The cycle delay, if one is programmed, will not be inserted in the timing cycle. Pressing Select will change the system to the Auto Alarm Reset Setup mode, if a pressure module is installed, or to Process when no pressure module is available.

Auto Alarm Reset Setup

The Auto Alarm Reset Setup, available only when a pressure module is installed, allows the auto alarm reset time to be selected. This value may be set between zero and 255 seconds. The factory default value is five seconds. When the auto alarm reset is enabled by shorting the auto alarm reset terminal to a common terminal, the alarm will be reset after the pressure returns to the normal range and the timeout has expired. Pressing Select will change the system to Process mode.

Restoring Factory Defaults

The DCT1000 has been programmed with factory default values that meet most industry operating conditions. In the event that you want to restore all of the parameters to the original factory default values:

- (1) Return the master controller to the process mode.
- (2) Press and hold both UP and DOWN buttons.

The display will indicate a 10-second countdown, at the end of which all parameters will be restored to factory defaults. Releasing the switches prior to the end of the count will stop the process and no modification will be made. Likewise, in each of the parameter setup modes, pressing and holding the UP and DOWN buttons simultaneously will reset the individual default value, leaving other settings unchanged.

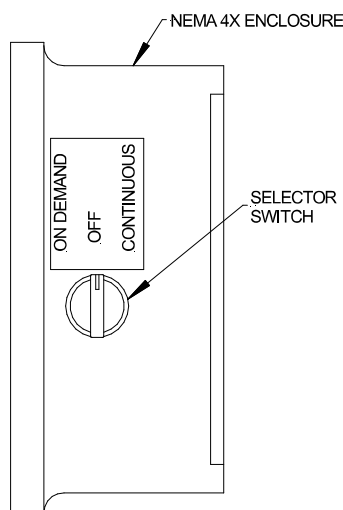


Figure 400.4.1
Dwyer DCT1000
Timer Enclosure

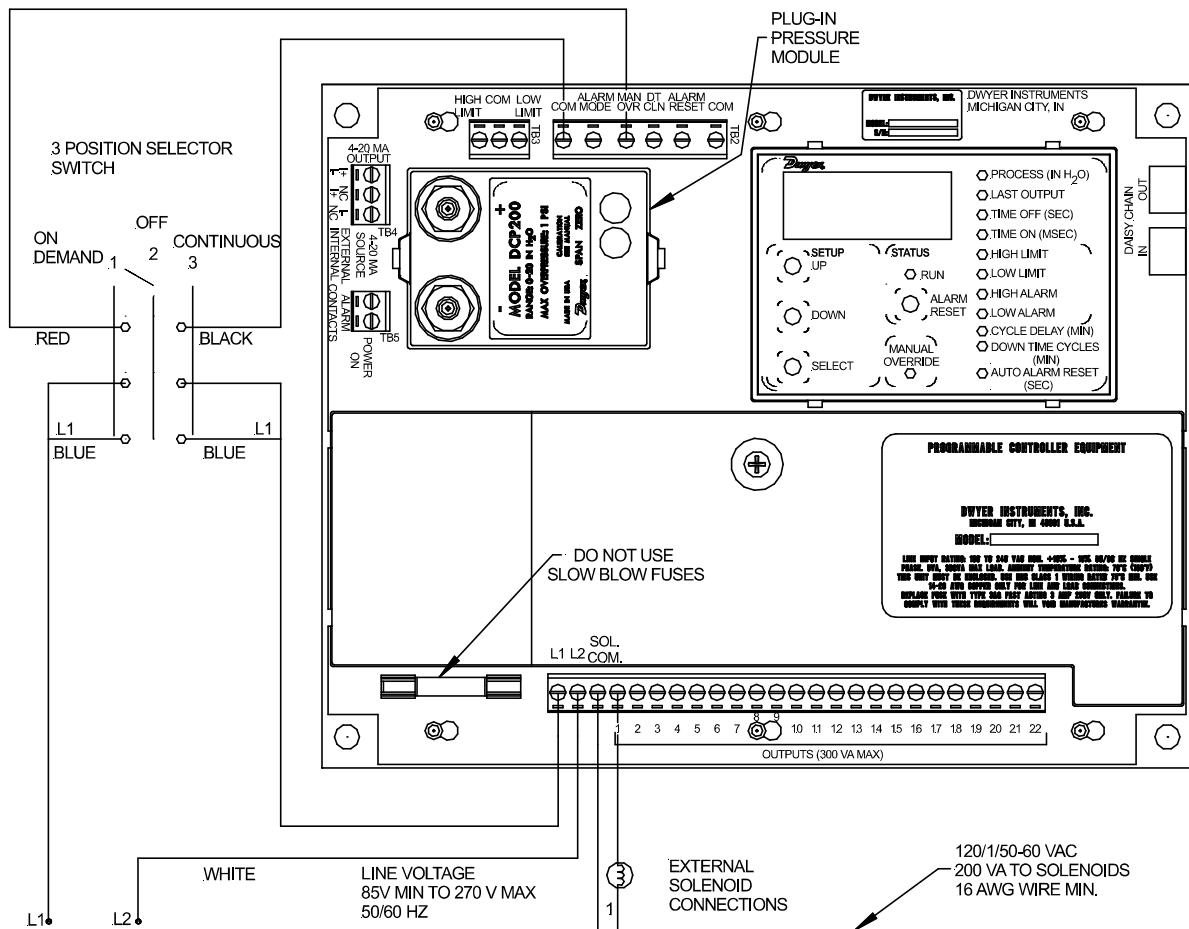
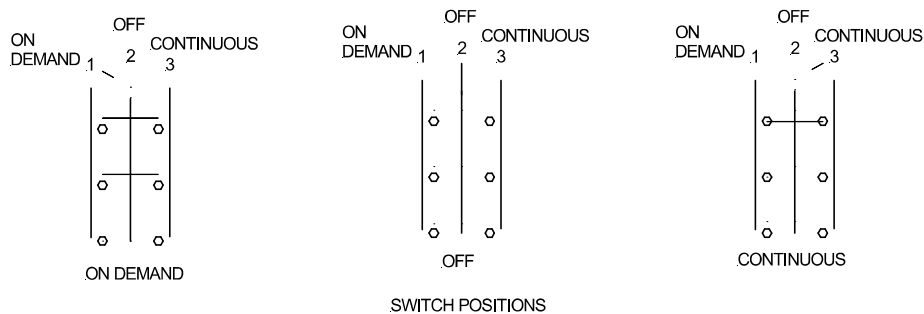


Figure 400.4.2
Dwyer DCT1000
Timer wiring diagram



400.5 NCC DT-10 (Determinator) Automatic Timer Controller

The DT-10 (Determinator) Automatic Timer Controller uses a differential pressure transmitter connected to a solid state timer control to initiate the cleaning cycle at user input differential pressure points. When the differential pressure across the filter elements reaches the high set point, the control will begin the cleaning sequence until the low differential pressure set point is obtained. The control will then end the cleaning cycle until the high set point is reached again. At this point, the control will re-initiate cleaning beginning with the next to last row cleaned.



Following is the programming schematic for the DT-10.

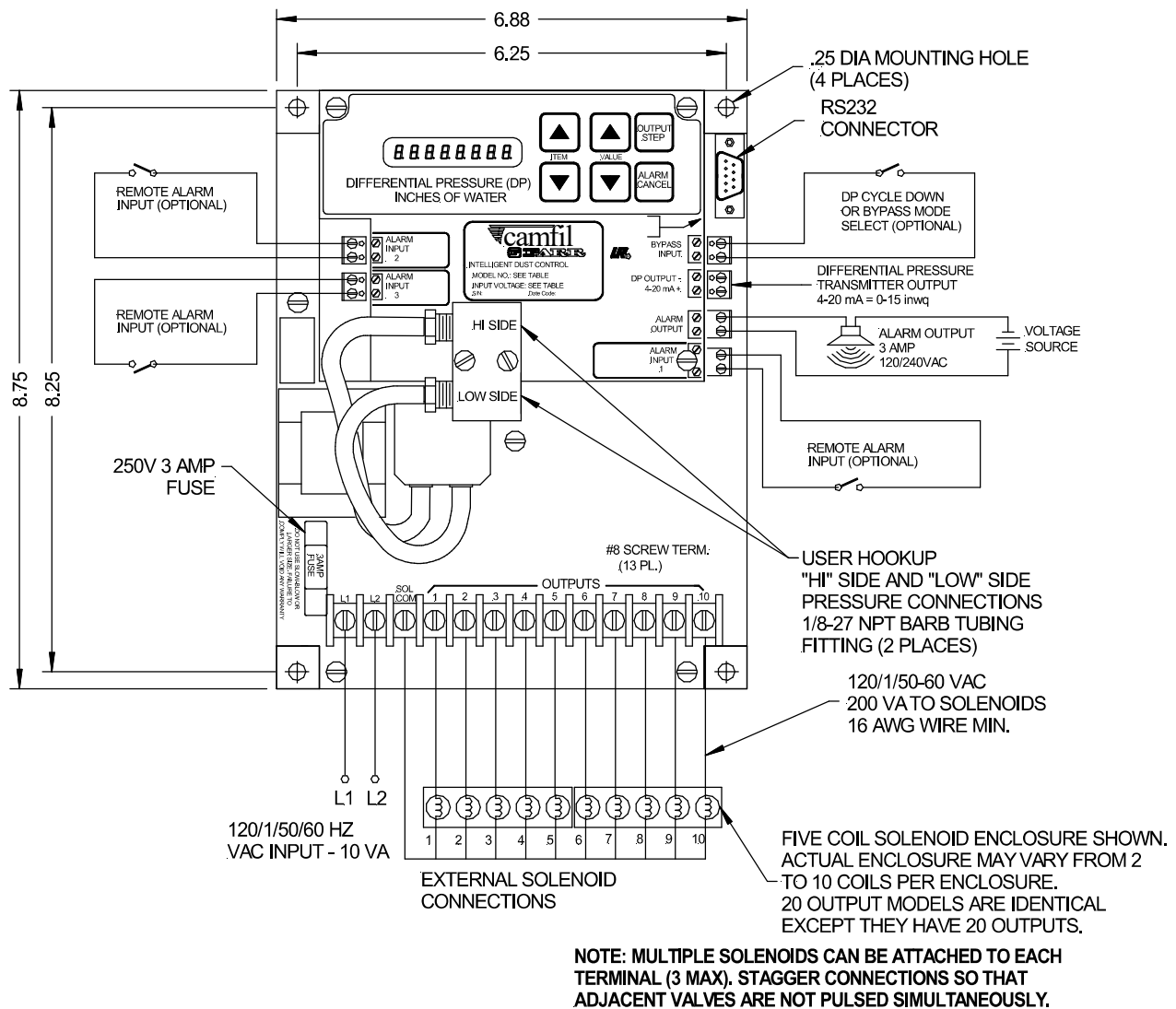


Figure 400.5.1
DT-10 Determinator

400.6 Goyen T-4 and P-4 Automatic Timer Controller

The T-4 Automatic Timer Controller uses a solid-state timer control to continuously clean the cartridges with the user inputting the length of pulse and the interval between pulses. The P-4 Automatic Timer Controller uses a differential pressure transmitter connected to a solid-state timer control to initiate the cleaning cycle at user input differential pressure set points. When the differential pressure across the filter elements reaches the high set point, the control will begin the cleaning sequence until the low differential pressure set point is obtained. The control will then end the cleaning cycle until the high set point is reached again. At this point, the controller will re-initiate cleaning, beginning with the next to last row cleaned.



Installation

Connect Line Input Power, AC voltage to the terminals marked L1 and L2, DC voltage to the Negative (-) and Positive (+) terminals.

Connect the output terminals to the pilot valve solenoid coils. Connect common side of the coil, AC voltage to terminal L2, DC voltage to the Positive (+) terminal. Note: Line voltage must match coil voltage.

Blowdown: If the blowdown feature is used, disconnect the jumper between terminals B1 and B2 and connect them to the auxiliary contacts on the fan motor starter. The contacts are to open when the fan is stopped.

Ground: Connect the circuit ground to the green terminal. Ground the control enclosure separately using the grounding stud inside the box.

Connect the high and low pressure taps on the bottom of the control housing to the collector pressure taps, using 1/4" diameter metal or other tubing (not provided). The "high" tap connects to the "dirty" side of the tube sheet and the "low" to the "clean" side.

Set the high and low-pressure drop settings using the right and left hand knobs, respectively, on the face of the gauge. The timer will initiate pulsing of the valve solenoids when the collector pressure drop rises to the “high” set point and continue until the collector pressure drop is lowered to the “low” set point.

Zero the Photohelic® gauge using the adjustment screw on the face of the gauge.

Separate box penetrations are recommended for the line power and output lines. **Note: Metal shavings from the penetrations should be cleaned from the face of the timer board.**

Establish power to the board and adjust the “ON” time, “OFF” time, number of outputs used and number of blowdown cycles required. See programming instructions for details.

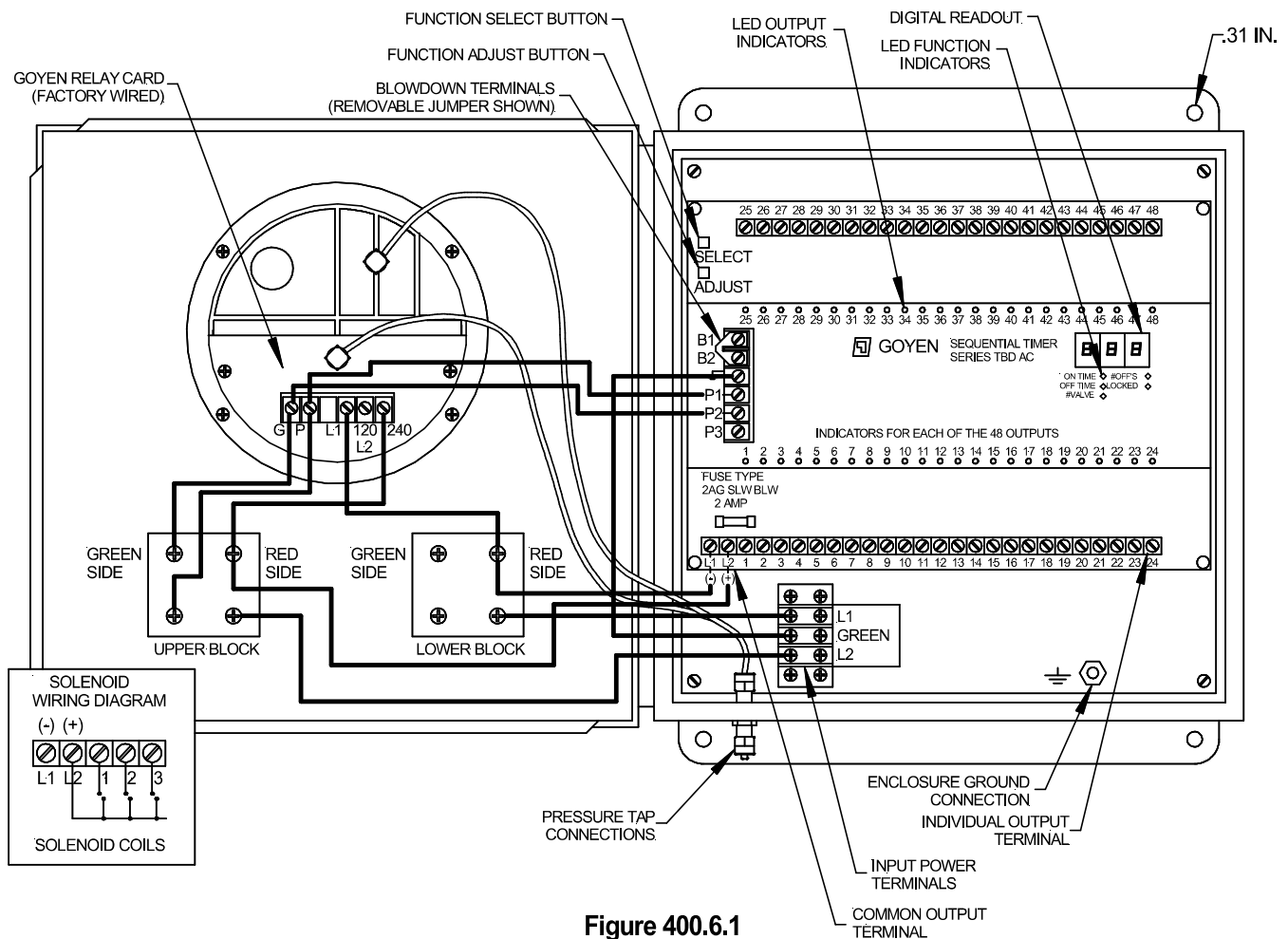


Figure 400.6.1
Goyen P4 Timer

Programming Instructions

Press the “Select” button to illuminate the LED indicator adjacent to the function required, then press the “Adjust” button to the required setting which will be displayed on the Digital Readout. After all functions have been set, push the “Select” button to the Locked LED indicator. In the locked position, the Digital Readout will display the last setting, which is the number of blowdown cycles programmed.

To check a specific function setting, push the “Select” button to illuminate the desired function LED, the setting is then shown on the Digital Readout.

Programming Example

STEP 1 – ON TIME – Press the “Select” button until the “ON TIME” LED indicator is illuminated, then press the “Adjust” button until the required ON TIME in milliseconds is shown on the Digital Readout (100 milliseconds illustrated).

| | | |
|---|---|---|
| 1 | 0 | 0 |
|---|---|---|

ON TIME ● #OFF'S ○
OFF TIME ○ LOCKED ○
#VALVE ○

STEP 2 – OFF TIME – Press the “Select” button until the “OFF TIME” LED indicator is illuminated, then press the “Adjust” button until the required OFF TIME in seconds is shown on the Digital Readout (15 seconds illustrated).

| | | |
|---|---|---|
| 0 | 1 | 5 |
|---|---|---|

ON TIME ○ #OFF'S ○
OFF TIME ● LOCKED ○
#VALVE ○

STEP 3 – NUMBER OF VALVES CONNECTED – Press the “Select” button until the “# VALVE” LED indicator is illuminated, then press the “Adjust” button until the required NUMBER OF VALVES CONNECTED is shown on the Digital Readout (30 valves illustrated).

| | | |
|---|---|---|
| 0 | 3 | 0 |
|---|---|---|

ON TIME ○ #OFF'S ○
OFF TIME ○ LOCKED ○
#VALVE ●

STEP 4 – BLOWDOWN CYCLES – Press the “Select” button until the “# OFF'S” LED indicator is illuminated, then press the “Adjust” button until the required number of BLOWDOWN CYCLES is shown on the Digital Readout (6 cycles illustrated). Note: Blowdown will not occur if the collector is operating at below the high-pressure drop setting unless the controller is in the continuous cleaning mode.

| | | |
|---|---|---|
| 0 | 0 | 6 |
|---|---|---|

ON TIME ○ #OFF'S ●
OFF TIME ○ LOCKED ○
#VALVE ○

STEP 5 – SETTINGS LOCKED – Press the “Select” button until the “LOCKED” LED indicator is illuminated. All settings are now locked in and the Digital Readout will display the last setting, which is the number of blowdown cycles programmed (6 cycles illustrated).

| | | |
|---|---|---|
| 0 | 0 | 6 |
|---|---|---|

ON TIME ○ #OFF'S ●
OFF TIME ○ LOCKED ●
#VALVE ○

400.61 Integrated Control Panel

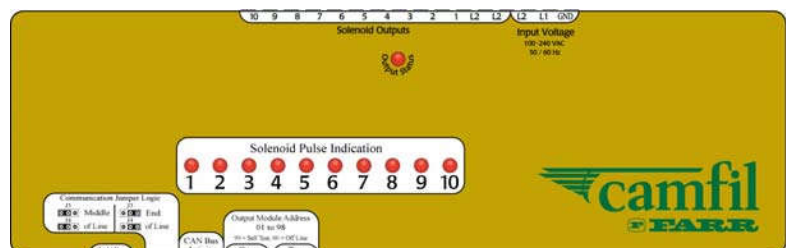
The Integrated Control Panel is a pre-engineered pulse control system which includes a motor starter and main disconnect. The pulse controller is the Dwyer DCT1000 Automatic Timer Controller. Please see section 400.4 of this manual for wiring diagram and operating instructions. A custom wiring diagram is created for each project application and is included inside the motor starter enclosure.



400.62 Dust Collector Controller (DCC)



Timer Board



Expander Board

Core-10 Specifications

Inputs:

Supply: 100-240 VAC, 50/60Hz, 4 VA max @ 240 VAC w/o loads
 Fuse: 3A fast, 5x20mm
 Δ Pressure Sensor Input: 4 to 20mA, sink/source, programmable 10.0", 15.0", 25.0" w.c.
 Δ Pressure Switch Input: Dry contact, 4mA @ 13 VDC maximum
 Cycle Down Switch Input: Dry contact, 4mA @ 13 VDC maximum

Outputs:

Solenoid Outputs: 10
 Output type: Triac
 Output rating: 150 VA (@ max ON, min OFF, 1 output selected). Timing Accuracy: -2mS, +10mS or +/- 1% (whichever is greater), ON-time synchronized to AC line
 Timing Accuracy: -2mS, +10mS or +/- 1% (whichever is greater), ON-time synchronized to AC line
 Alarm Relay: Form-A contact, 3A @ 250 VAC/30 VDC, programmable n.o. or n.c.

Display Indicators:

3-digit 7-segment LED display, 0.56" red
 17 green LEDs: program parameters, display status, CANbus status
 1 red/yel LED, Alarm
 1 red/grn LED, Output status

Parameter Ranges:

ON Time: 0.050 - 600 seconds
 OFF Time: 1 - 999 seconds
 Timing Accuracy: -2mS, +10mS or +/- 1% (whichever is greater),
 On time synchronized to AC line
 Cycle Down Cycles: 1-20, none
 Cycle Down Delay: 60-600 seconds

Δ P High Setpoint: 0-10/15/25" w.c., none / Δ P Low Setpoint: 0-10/15/25" w.c., none
 Δ P High Alarm: 0-10/15/25" w.c., none / Δ P Low Alarm: 0-10/15/25" w.c., none

Communications:

CANbus architecture

Terminations:

Screw terminals, #12 to #28 AWG, finger safe

Mechanical:

6.875" w x 4.75" h x 2.00" d, steel chassis

Operating Temperature:

-40° to 150°F (-40° to 65°C)

Environmental Protection:

Conformal coating for humidity and vibration

Expander-10 Specifications

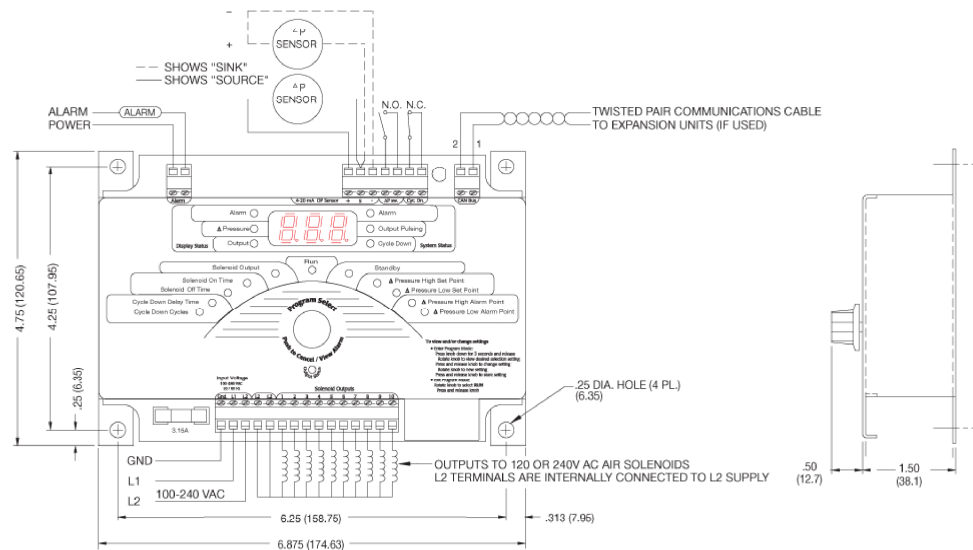
Indicators:

Solenoid Pulse Indication - 10 green LEDs
 CANbus status - 1 green LED
 Output Status1 - 1 red/grn LED

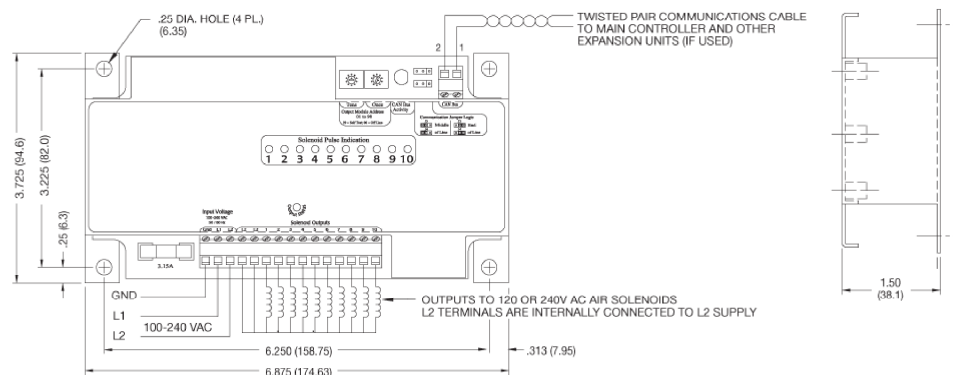
Outputs:

Solenoids: 10 per Expansion Module
 Output type: Triac
 Output rating: 150 VA (@ max ON, min OFF, 1 output selected).
 Timing Accuracy: -2mS, +10mS or +/- 1% (whichever is greater), ON-time synchronized to AC line

CORE-10



EXPANDER-10



Important Notice to Users:

Our timers are capable of use in a wide array of devices and in various applications. Any device or system incorporating a timer should be so designed that, in the event of failure, malfunction or normal wear-out of the timer, the system will become inoperative in a manner which will prevent property damage or bodily injury.

Caution:

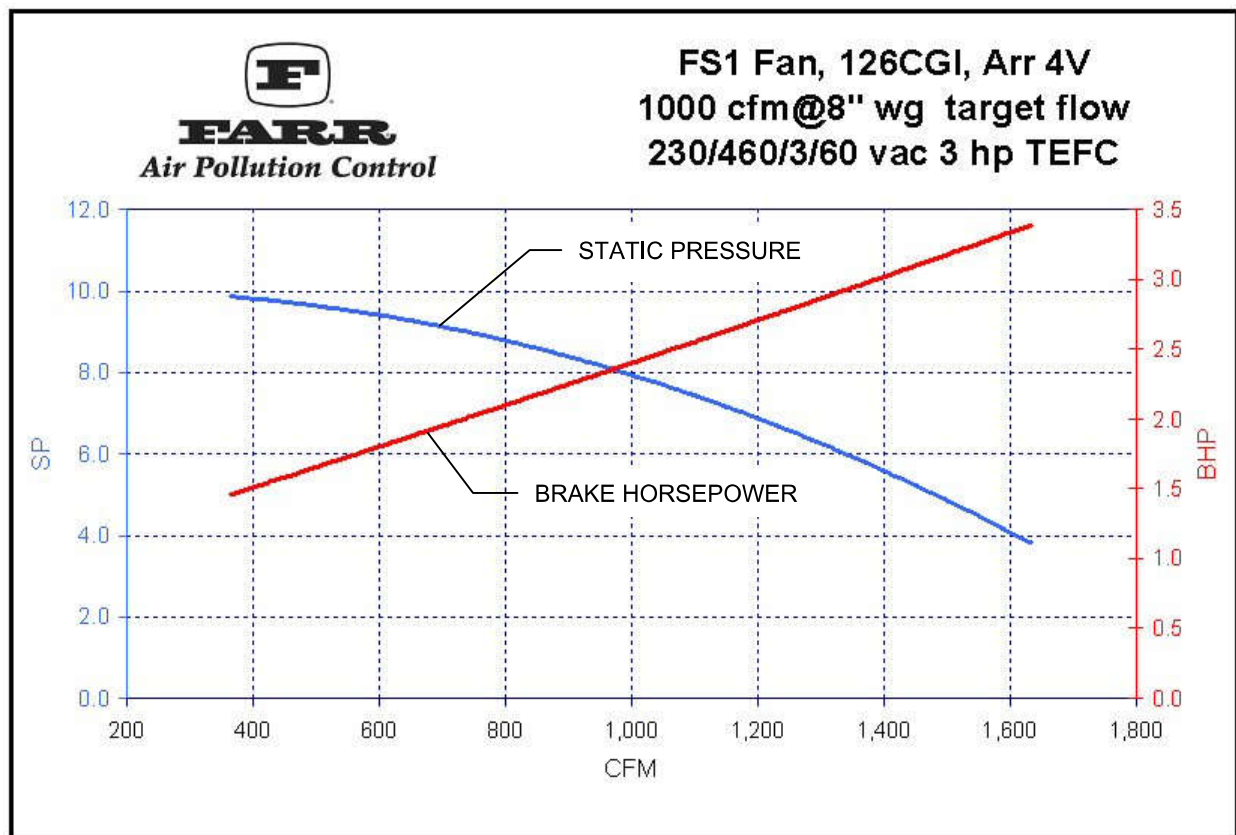
1. Do not mount controls in high vibration areas without shock mounts.
2. Do not mount controls in areas of high dust or corrosive atmospheres without a protective enclosure.
3. Do not use a converter or inverter for the power source.
4. Do not mount control in high transient voltage areas without an isolation transformer
5. Do not leave control box open.
6. Do not allow a local repair shop to repair the controls, as we employ some very sophisticated components that could be further damaged. For service, call us.

400.7 Fan Operation

Consult the information packet attached to your fan before proceeding with installation and wiring. If your fan does not include an information packet contact the fan supplier. If Farr supplied your fan, contact Farr Customer Service at (1-800-479-6801).

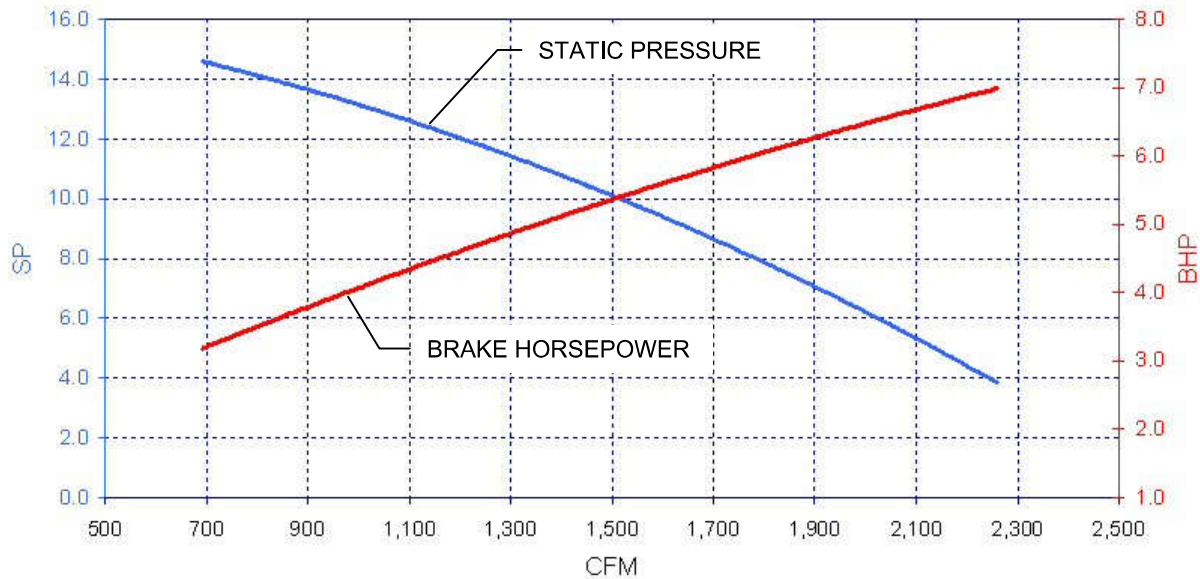
Trained and experienced personnel should make the selection of the fan that you require. The selection of fan size is usually made from a fan performance table or a fan curve published by the fan manufacturer. Refer to your General Dimensions drawing to determine the airflow rate and static pressure required for your application. A performance table (Table 400.7.1) and fan curves (Figures 400.7.1-400.7.9) for the standard fans provided by Farr have been included for reference when making changes to your system. The static pressure performance curve (bold) designates the static pressure (left axis) at a given airflow rate (horizontal axis). The brake horsepower curve (light) designates the actual horsepower (right axis) required from the fan.

| FAN PERFORMANCE DATA | | | | | | | | | | | | | |
|----------------------|---------------------|-----|---------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| FARR SERIES | MODEL DESIGNATION | HP | | STATIC PRESSURE (INCHES OF WATER) | | | | | | | | | |
| | | | | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| FS1 | NYB 126GI-1.0-60-8 | 3 | AIR FLOW RATE (CFM) | NA | 1320 | 1173 | 989 | 769 | 360 | | | | |
| FS2 | NYB 146GI-1.5-60-10 | 5 | | | | | | | | 1367 | 1228 | 1069 | 810 |
| FS3 | NYB 15PLR-2.0-60-9 | 5 | | 2750 | 2580 | 2440 | 2231 | 2022 | 1639 | | | | |
| FS4 | NYB 15PLR-3.0-60-9 | 7.5 | | 4100 | 3894 | 3683 | 3368 | 3052 | 2473 | | | | |
| FS5 | NYB 18PLR-4.0-60-9 | 10 | | 4500 | 4415 | 4225 | 4158 | 4000 | 3850 | 3600 | 3491 | 3234 | 2926 |
| FS6 | NYB 18PLR-6.0-60-9 | 15 | | 6800 | 6622 | 6420 | 6237 | 6000 | 5775 | 5500 | 5236 | 4851 | 4389 |
| FS7 | NYB 18PLR-8.0-60-9 | 20 | | 9075 | 8829 | 8575 | 8316 | 8000 | 7700 | 7300 | 6982 | 6468 | 5852 |
| FS8 | NYB 18PLR-10.0-60-9 | 25 | | 11100 | 10816 | 10500 | 10187 | 9850 | 9433 | 9000 | 8552 | 7924 | 7169 |
| FS9 | NYB 20PLR-12.0-60-9 | 30 | | 13400 | 12800 | 12500 | 12200 | 11886 | 11550 | 11200 | 10750 | 10350 | 9830 |
| FS10 | NYB 30PLR-14.0-60-9 | 30 | | 19000 | 18200 | 16100 | 15800 | 14000 | | | | | |
| FS11 | NYB 30PLR-16.0-60-9 | 40 | | 21200 | 20200 | 19000 | 17800 | 16100 | 12800 | | | | |
| FS12 | NYB 30PLR-18.0-60-9 | 40 | | 24000 | 23000 | 21600 | 20100 | 18200 | 15000 | | | | |
| FS13 | NYB 33PLR-20.0-60-9 | 50 | | 23975 | 22900 | 22100 | 21200 | 20050 | 18790 | 17111 | 14590 | | |
| FS14 | NYB 33PLR-22.0-60-9 | 50 | | 26300 | 25300 | 24350 | 23300 | 22050 | 20620 | 18775 | 16000 | | |

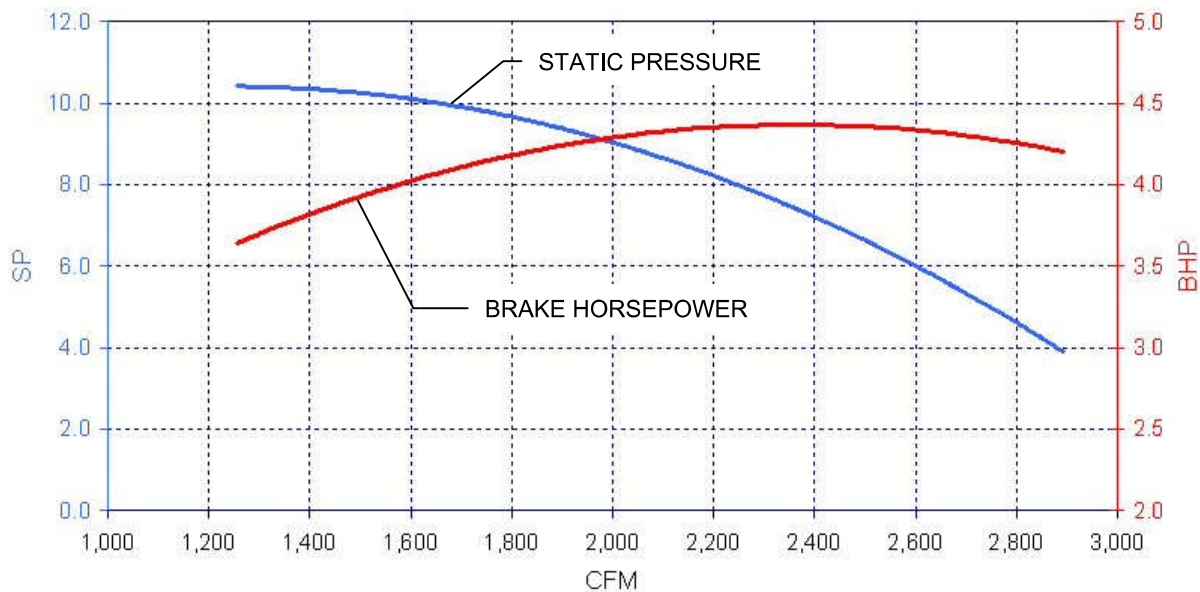




FS2 Fan, 146CGI, Arr 4V
1500 cfm@10" wg target flow
230/460/3/60 vac 5 hp TEFC

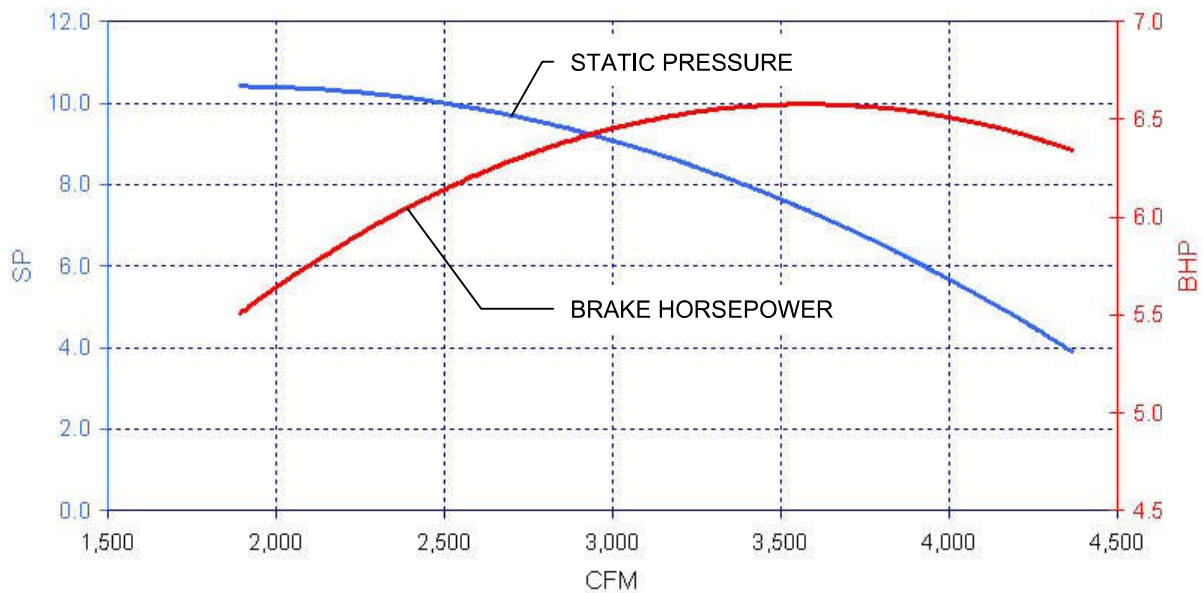


FS3 Fan, 15 PLR -53%, Arr 4V
2000 cfm@9" wg target flow
230/460/3/60 vac 5 hp TEFC

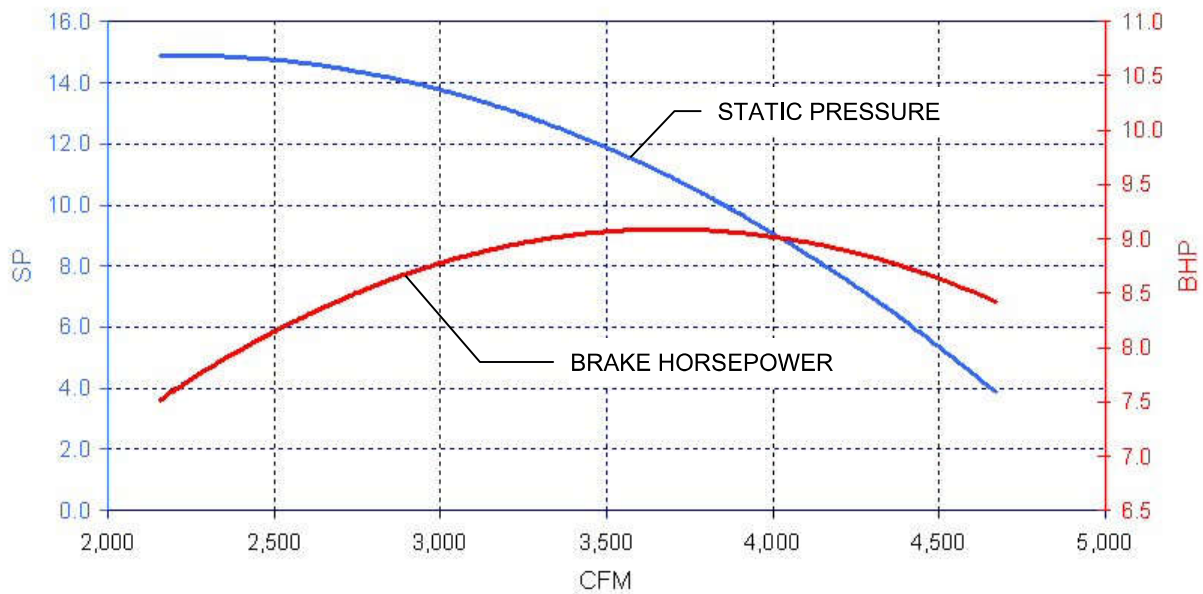




FS4 Fan, 15PLR-80%, Arr 4V
3000 cfm@9" wg target flow
230/460/3/60 vac 7.5 hp TEFC

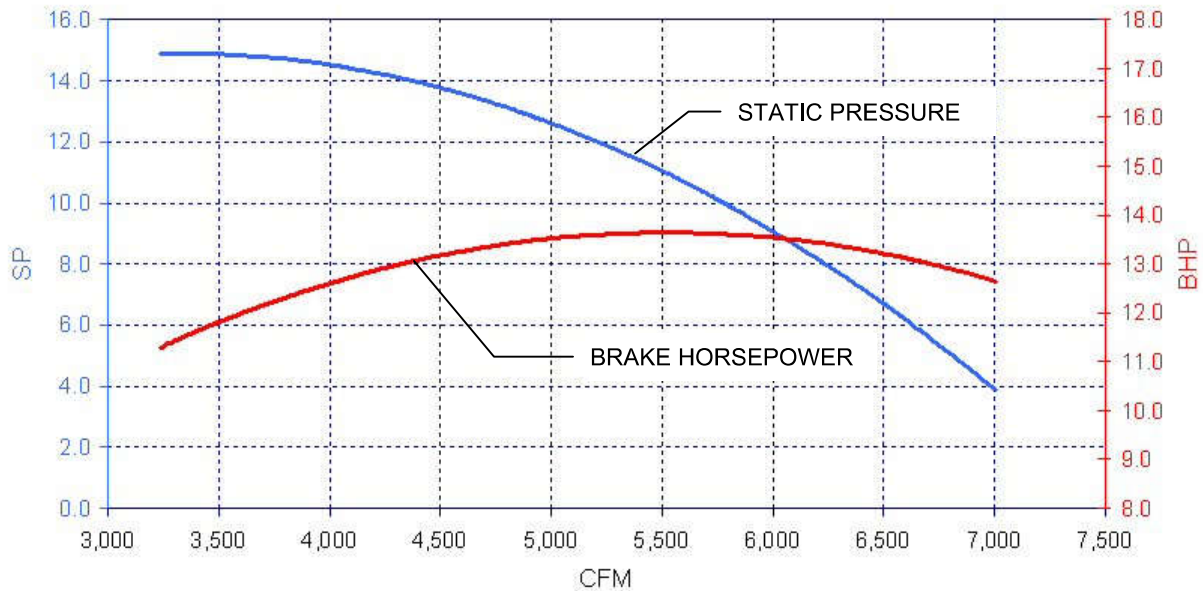


FS5 Fan, 18PLR-40%, Arr 4V
4000 cfm@9" wg target flow
230/460/3/60 vac 10 hp TEFC

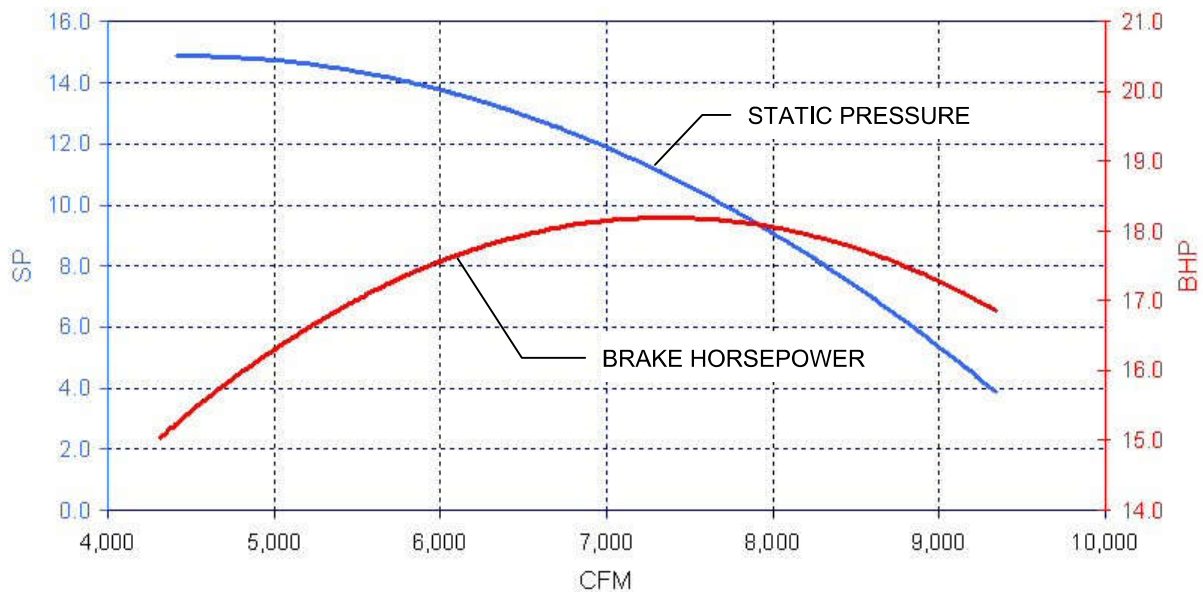




FS6 Fan, 18PLR-60%, Arr 4V
6000 cfm@9" wg target flow
230/460/3/60 vac 15 hp TEFC

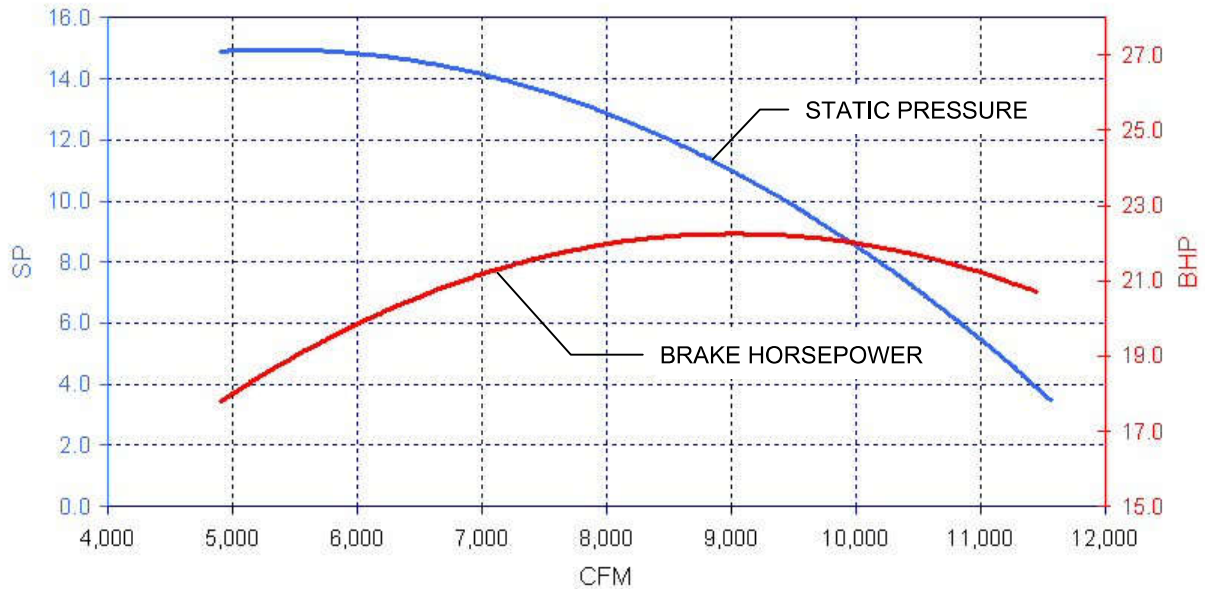


FS7 Fan, 18PLR-80%, Arr 4V
8000 cfm@9" wg target flow
230/460/3/60 vac 20 hp TEFC

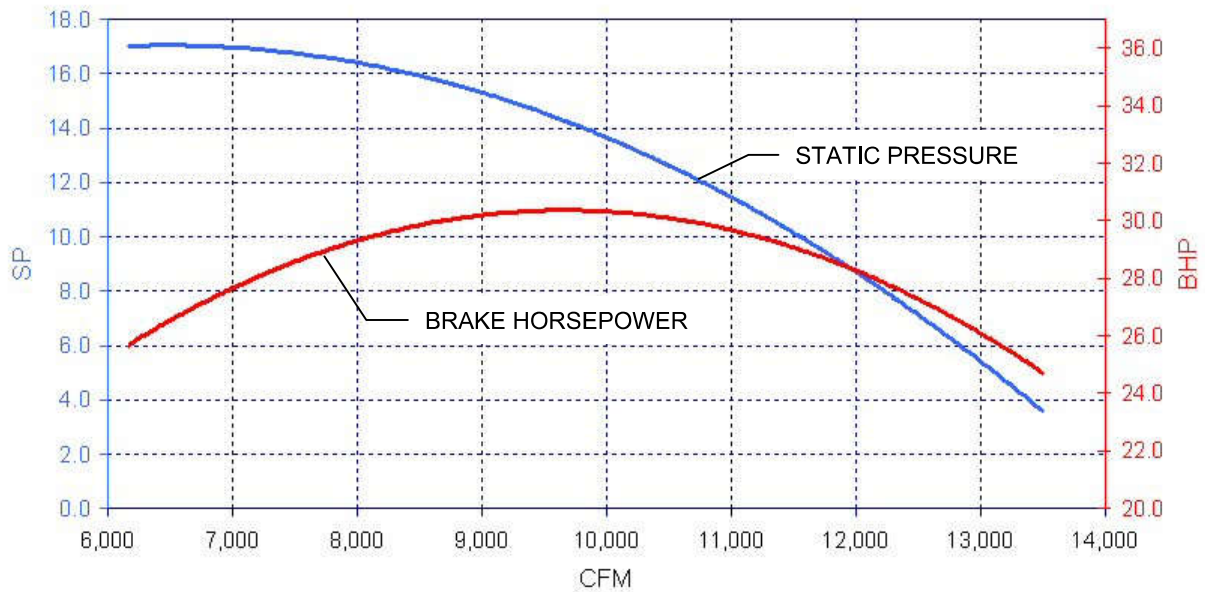




FS8 Fan, 18PLR-98%, Arr 4V
10000 cfm@9" wg target flow
230/460/3/60 vac 25 hp TEFC

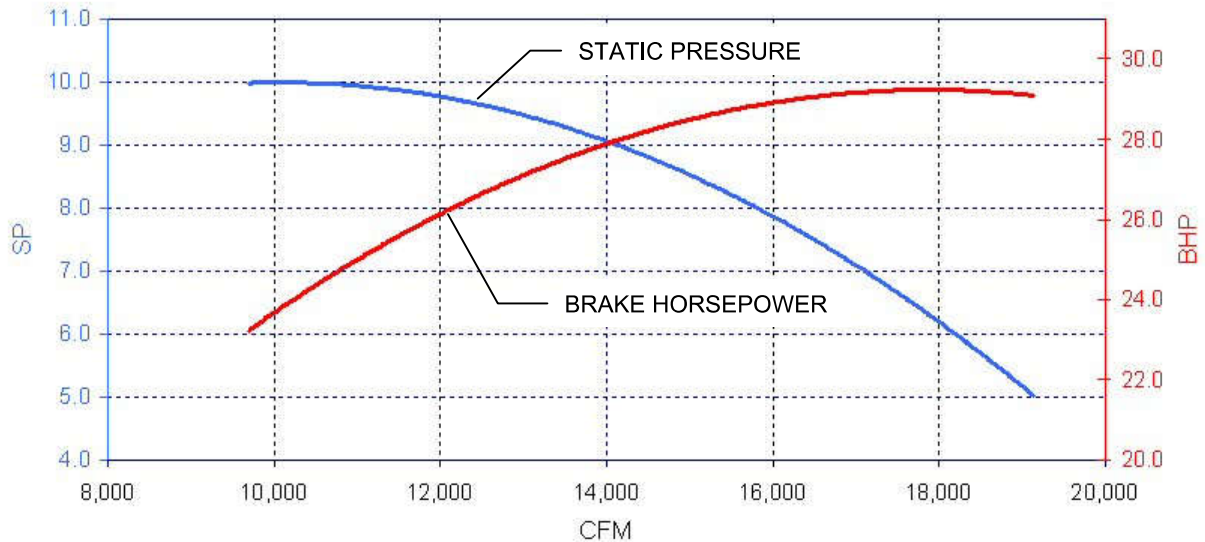


FS9 Fan, 20PLR-80%, Arr 4V
12000 cfm@9" wg target flow
230/460/3/60 vac 30 hp TEFC

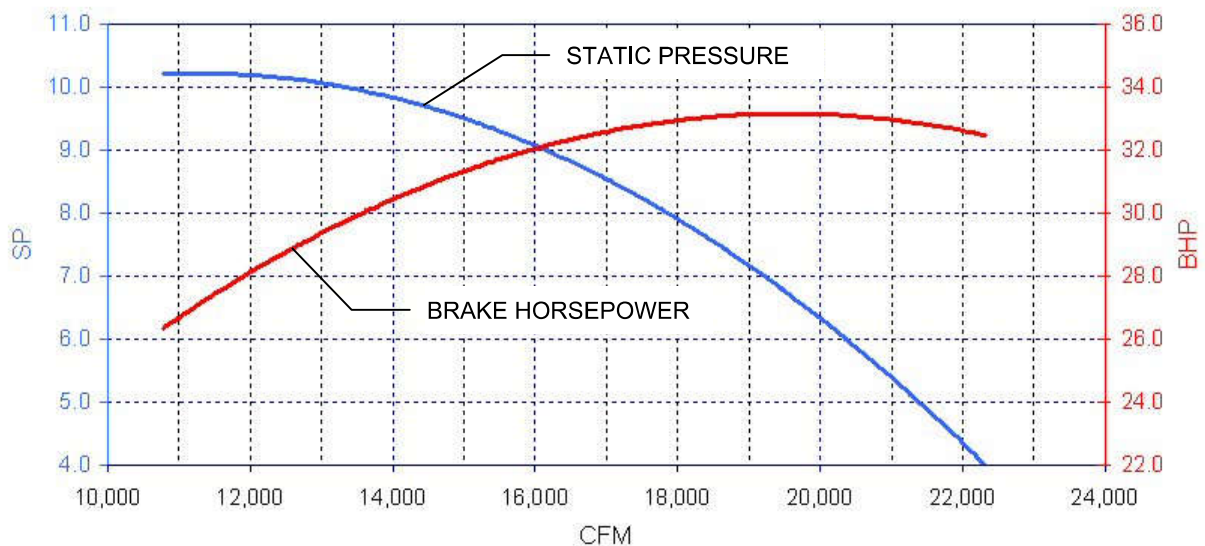




FS10 Fan, 30PLR-81%, Arr 4V
14000 cfm@9" wg target flow
230/460/3/60 vac 30 hp TEFC

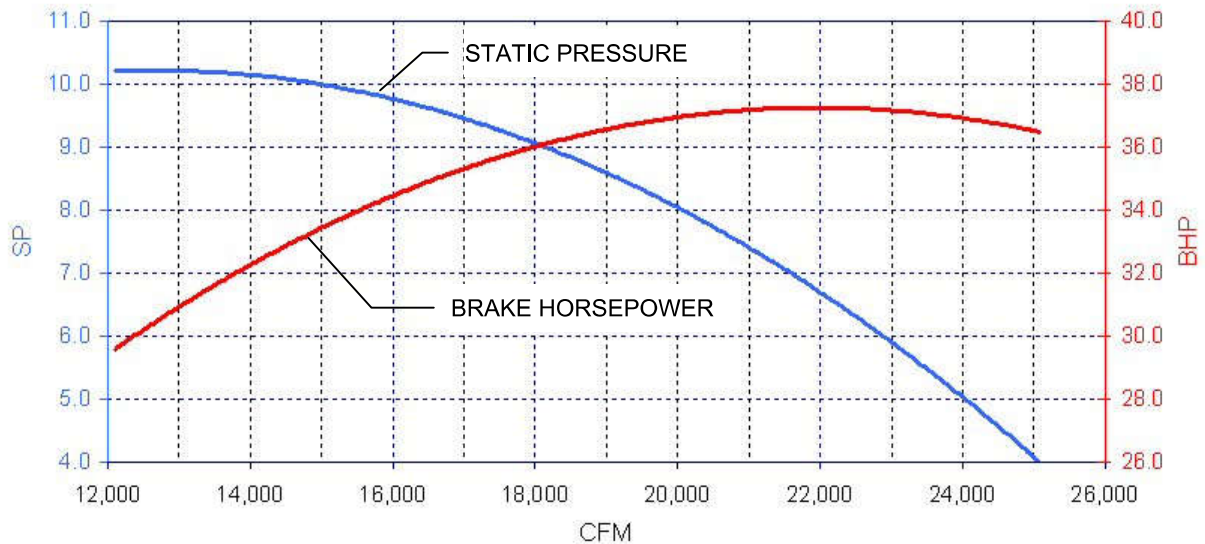


FS11 Fan, 30PLR-89%, Arr 4V
16000 cfm@9" wg target flow
230/460/3/60 vac 40 hp TEFC

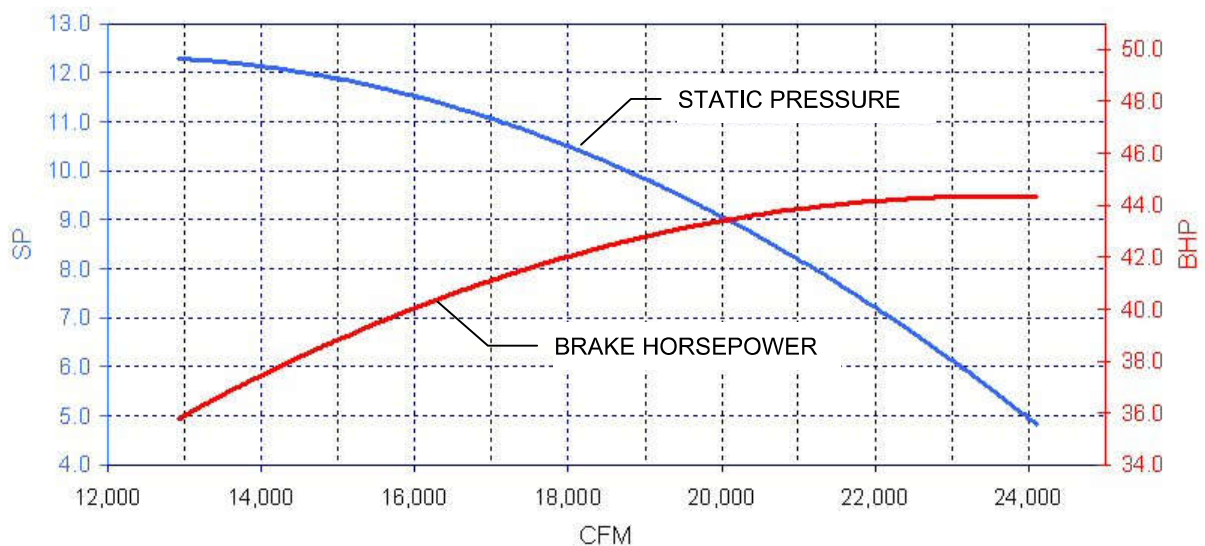




FS12 Fan, 30PLR-100%, Arr 4V
18000 cfm@9" wg target flow
230/460/3/60 vac 40 hp TEFC

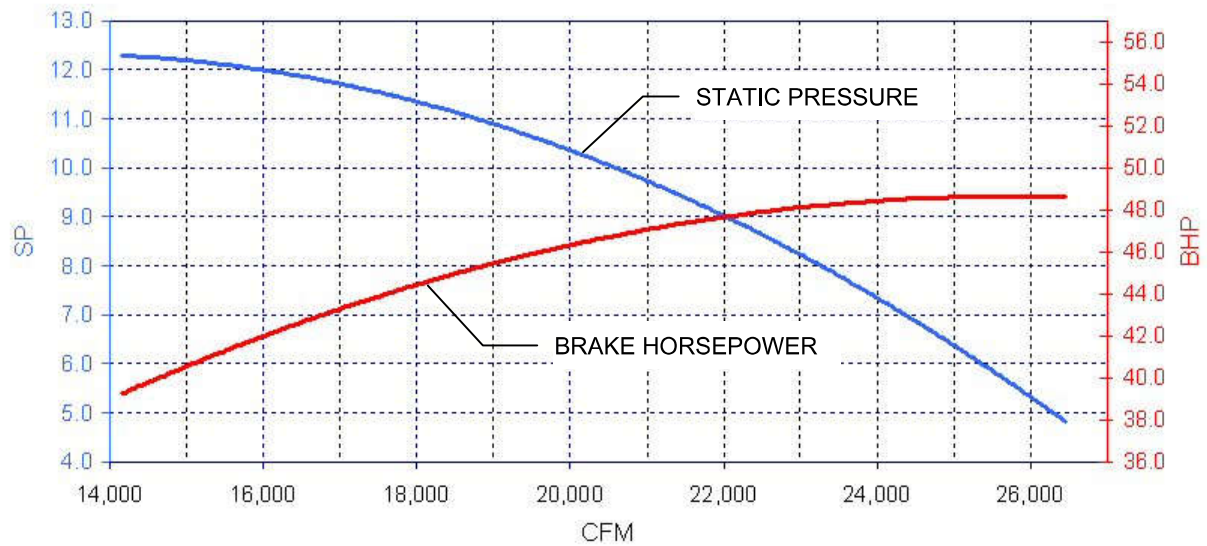


FS13 Fan, 33PLR-72%, Arr 4V
20000 cfm@9" wg target flow
230/460/3/60 vac 50 hp TEFC





FS14 Fan, 33PLR-79%, Arr 4V
22000 cfm @ 9" wg target flow
230/460/3/60 vac 50 hp TEFC



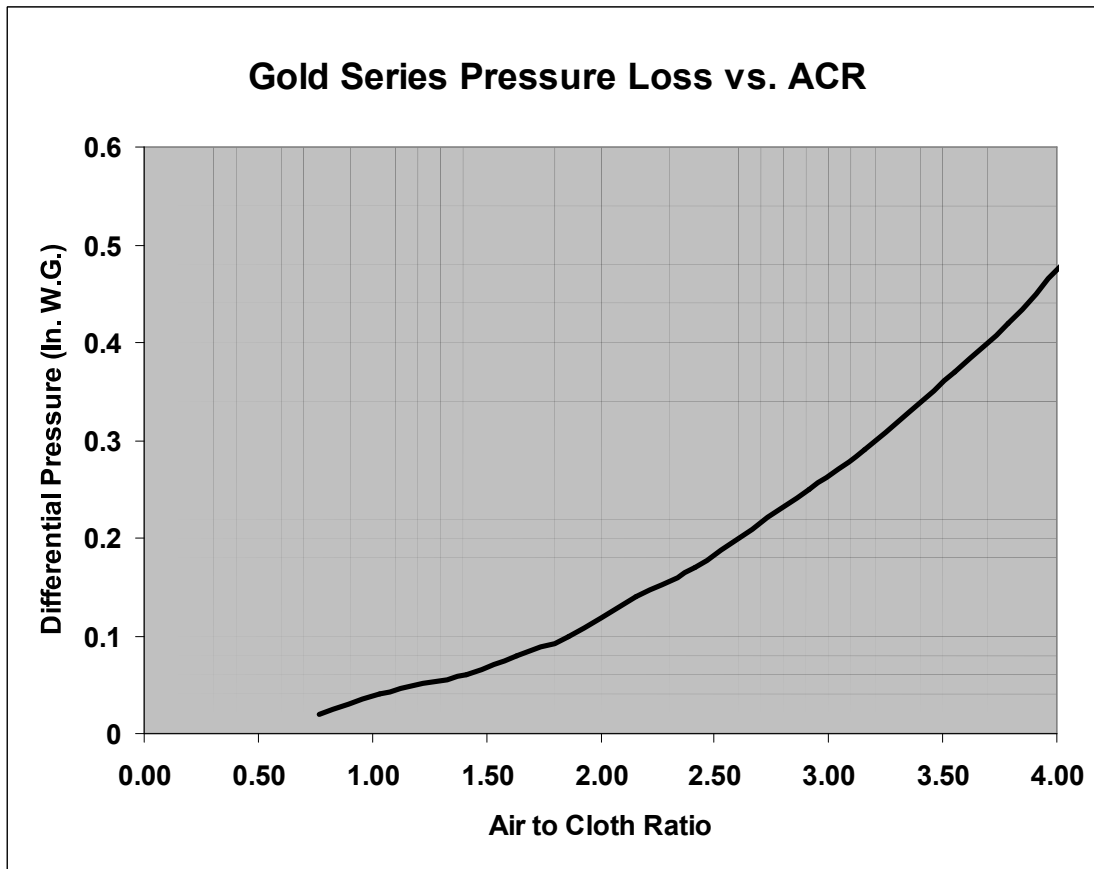


Figure 400.8.1

Make a routine check of the fan belt, discharge devices, ductwork, electrical wiring, cartridges and compressed air connections.

Make sure the collector doors are closed and latched and the slide gate is in the open position.

Close the fan damper to approximately 25% of its designed operational setting.

Restore compressed air and electrical power to the collector. Be sure to follow all lock-out/tag-out procedures. Compressed air should be regulated between 90 and 105 psi. Power requirements may vary and will depend on what equipment was provided with the collector.

For processes generating hot or moist gases, preheat the collector to prevent moisture condensation, even if the collector is insulated.

Activate the collector fan and dust removal devices. Make sure the fan rotates in the direction indicated by the wheel rotation arrows on the fan.

Refer to your General Dimensions drawing for the Air to Cloth Ratio (ACR) for your collector. Use the graph (Figure 400.8.1) to determine the pressure drop. Adjust the damper until the Magnehelic gauge registers the pressure drop obtained from the graph. **Note: Operating the collector above the designed airflow will cause the collector to plug.**

Lock the damper in position.

If the elements are to be pre-coated, refer to Section 360 of this manual.

Perform a routine system check to be sure all systems and components are operational. The system is now ready for operation.

400.9 Shutdown Procedure

1. Shutdown the process or dust generating operation to which the dust collector is installed.
2. Continue operation of the fan, dust removal device, and cleaning mechanisms for at least 20 minutes to assure good removal of the collected dust. This will also purge much of the process moisture that may be still in the collector.
3. Shut off the fan and perform the necessary lock-out/tag-out procedures.
4. If the cartridges are going to be replaced with this shutdown, it will be necessary to continue to pulse the collector for an additional 20 minutes after the fan is shut down. This will assure that the cartridges are clean and much lighter for removal. (Note – if the cartridges are not to be removed do not pulse the unit after the fan is turned off, as this will remove the filter cake already formed on the cartridges)
5. Close the compressed air line valve and perform the necessary lock-out/tag-out procedures.
6. Turn off power to the controller, discharge devices, or other electrical equipment. Perform the necessary lock-out/tag-out procedures.
7. The collector is now ready for replacement of the cartridges, maintenance, or storage.
8. If the collector is located outside or is subject to condensation formation, install a heater or allow a warm air stream to flow through the collector while it is shutdown.

400.10 Recommended Timer Settings

The following settings apply to any model timer that is shipped with a Gold Series Dust Collector. These settings represent a recommended starting point and the optimum operation settings may vary for your application.

| | | |
|-----------------------------------|------------------|---|
| Pulse Duration (on time) | 150 milliseconds | Increasing this will increase the cleaning energy to the filters and consume more compressed air. Decreasing this value will have the opposite affect. You would increase this value if your application involves high dust loads and dust that does not easily release from the cartridge. On applications with light dust loads this value can be reduced to conserve compressed air. |
| Pulse Frequency (off time) | 15 seconds | Increasing this value will decrease compressed air consumption. Decreasing this value will increase compressed air consumption. You would decrease this value if your application involves high dust loads and dust that does not easily release from the cartridge. On applications with light dust loads this value can be increased to conserve compressed air. |
| High DP Set Point | 2 in w.g. | Initiates differential pressure cleaning. |
| Low DP Set Point | 1.5 in w.g. | Stops differential pressure cleaning. |
| High Alarm | 6 in w.g. | This value will protect the cartridges from damage due to high differential pressures. |

If your system is set to operate on differential pressure cleaning then the cleaning system will automatically use the minimum amount of compressed air to maintain stable operation of the dust collector. Adjusting the settings above would only be necessary on the most aggressive applications. If your system is set to clean continuously then it would be beneficial to take the time to adjust the settings to achieve stable operation with the least amount of compressed air consumption. This will also result in longer cartridge life.

To optimize the cleaning system operation for continuous cycle cleaning, perform the following procedure:

1. Make sure the timer is set at the recommended settings above at start up.
2. Monitor the pressure on the collector for 4 weeks. If the pressure is less than 2 in w.g. after this period, the cleaning system can be adjusted to reduce air consumption.
3. Increase the pulse frequency by 2 seconds or reduce the pulse duration by 10 milliseconds.
4. Repeat steps 2 and 3 until the dust collector stabilizes at 2 to 3 in w.g..

Note, these adjustments may have to be reversed as the filters age.

CAUTION: Over cleaning the cartridges will result in higher emissions, shorter cartridge life, and higher energy costs.

SECTION 500-PREVENTIVE MAINTENANCE AND TROUBLESHOOTING

Your *Gold Series* Dust Collection system requires very little maintenance to achieve maximum life and efficiency. The following items should be periodically serviced:

500.1 Filter Elements

Pressure drop across *Gold Cone* filter elements normally increases rather rapidly when the filter elements are new and clean, but then climbs much more slowly throughout the rest of their service life. Typically, when the *Gold Cone* elements cannot be cleaned below a differential of 6 inches water gauge or greater, they have reached the end of their service life and require replacement. Other indications for replacement are cartridges that have been in service over 2 years or cartridges that have been damaged by moisture, high heat or other perilous conditions.

500.2 Hopper

At the start/end of each shift, check the hopper or discharge container at the bottom of the unit. Locate the handle on the front of the slide gate (if equipped) and pull to ensure that the gate is open. Dispose of any waste accumulation according to federal, state and local environmental regulations. Check the tracks located on either side of the gate for dust accumulation. Remove any buildup to maintain free operation of the gate. During operation, the gate should remain open allowing the collected material to flow freely into the discharge container. Under no circumstances should the hopper be used to store collected material. Empty and replace full collection containers frequently. Do not over fill containers, as this will inhibit performance of the collector.

500.3 Fan Motor Lubrication

The most common cause of premature bearing failure is improper lubrication. The fan motor provided with *Gold Series* dust collectors may vary. Farr often provides the fan with the collector, but many times the fan is provided by other sources. If Farr provided the fan, it will be one of two types. One type has sealed-for-life bearings and requires no maintenance. The other type motor provided with the fan has grease fittings on the top and bottom of the motor. If safety permits, the initial lubrication may be done while the motor is running until some purging occurs at the seals. Hours of operation, temperature and environmental conditions will affect the lubrication frequency. Adjust frequency depending on the condition of the purged grease.

Use extreme caution when working around rotating machinery. Remove all jewelry, loose clothing or anything that could encounter rotating components. Failure to follow these precautions may result in serious injury such as the loss of limbs or death!

Lubricate the grease fittings with a high quality NLGI No. 2 or No. 3 multi-purpose ball bearing grease having rust inhibitors and anti-oxidant additives.

Lubricate bearings prior to an extended shutdown or storage period. Rotate the motor shaft monthly to prevent corrosion.

Suggested greases are:

- Shell Alvania No. 2
- Mobil Mobilith 22
- Gulf Gulfcrowd No. 2
- American-Rykon Premium 2

500.4 Solenoid and Diaphragm Valves

The solenoid and diaphragm valves may require periodic maintenance depending on the quality of the compressed air supplied to the unit. Check each valve periodically to see that it is operating properly and if required, refer to Appendix A & B for maintenance of the valves.

500.5 Automatic Timer Control (if equipped)

The automatic timer control does not require any routine maintenance. Check periodically to verify that the board is operating properly and the user-defined settings have not been tampered with. Dirt and moisture can damage the timer board. Check the enclosure periodically to ensure that no condensation is forming on the inside and that dust has not collected on the circuit board or inside the enclosure. Refer to Appendix C, D, or E for additional information regarding the Automatic Timer Control.

500.6 Cleaning and Repair

The external and internal surfaces of the unit should be treated as any other painted metal surface subject to corrosion. Examine the unit for any damage to the surface coating and repair as necessary. Keep the external surfaces clean to prevent the possibility of hidden damage occurring. Periodic application of a quality automotive wax will prolong the life of painted surfaces and make them easier to clean.

500.7 Inspection Log

An inspection log should be maintained to assure that a proper maintenance routine is followed. The following page is an example of a commonly used inspection log. Copy and use this inspection log or contact Farr, Customer Service Department (1-800-479-6801) for a copy.

INSPECTION LOG

| | | | | | |
|---------------------------------------|-------|-------|-------|-------|-------|
| Date | | | | | |
| Time | | | | | |
| Inspector | | | | | |
| Daily | | | | | |
| Record Differential Pressure (dP) | "w.c. | "w.c. | "w.c. | "w.c. | "w.c. |
| Is timer sequencing, row by row? | Y / N | Y / N | Y / N | Y / N | Y / N |
| Are solenoids operating? | Y / N | Y / N | Y / N | Y / N | Y / N |
| Are Diaphragm valves firing? | Y / N | Y / N | Y / N | Y / N | Y / N |
| *Hopper discharge device operating? | Y / N | Y / N | Y / N | Y / N | Y / N |
| Any visible stack emissions? | Y / N | Y / N | Y / N | Y / N | Y / N |
| Weekly | | | | | |
| Record compressed air pressure. | PSIG | PSIG | PSIG | PSIG | PSIG |
| Clean compressed air filter tap. | () | () | () | () | () |
| Check tube sheet for filter leaks. | () | () | () | () | () |
| Check that hopper is empty. | () | () | () | () | () |
| Monthly | | | | | |
| Are there leaks in access doors? | () | () | () | () | () |
| Check door seals for deterioration. | () | () | () | () | () |
| Check air lines & fittings for leaks. | () | () | () | () | () |
| Semi-Annually | | | | | |
| Record pulse duration. | () | () | () | () | () |
| Record pulse delay. | () | () | () | () | () |
| Check pulse pipe alignment. | () | () | () | () | () |
| *Check fan, belt tension, etc. | () | () | () | () | () |
| Annually | | | | | |
| Check case/support for corrosion. | () | () | () | () | () |
| Check all bolts and welds. | () | () | () | () | () |
| Check ductwork for build up of dust. | () | () | () | () | () |
| Bag dye penetrate test. | () | () | () | () | () |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Notes/Comments: _____

Figure 500.7.1 – Typical Inspection Log

500.8 Suggested Preventative Maintenance Schedule

| <u>Frequency</u> | <u>Procedure</u> |
|-------------------------|---|
| Daily | Check controller and pressure drop |
| | Observe stack (visual or with opacity meter) |
| | Walk through system, listening for proper operation |
| | Check for unusual occurrences in process |
| | Observe control panel indicators |
| | Assure that dust is being removed from system |
| Weekly | Inspect screw conveyor/airlock bearings for lubrication |
| | Check packing glands |
| | Operate damper valves |
| | Check compressed air lines, including line filters and dryers |
| | Check that valves are opening/closing properly in sequence |
| | Spot-check cartridge appearance |
| | Verify accuracy of temperature-indicating equipment |
| | Check pressure drop indicating equipment for plugged lines |
| Monthly | Inspect fans for corrosion and material buildup |
| | Check drive belts for wear and tension |
| | Inspect and lubricate appropriate items |
| | Spot check for filter cartridge leaks |
| | Check hoses and clamps |
| | Check accuracy of indicating equipment |
| | Inspect housing for corrosion |
| Quarterly | Inspect inlet baffle for wear |
| | Inspect filter cartridges thoroughly |
| | Check duct for dust buildup |
| | Observe damper valves for proper seating |
| | Check gaskets on doors |
| | Inspect paint, insulation, etc. |
| | Check screw conveyor and/or airlock for wear or abrasion |
| Annually | Check fan belts |
| | Check welds |
| | Inspect hopper for wear |
| | Check explosion vents, see Section 340 |

SECTION 510-TROUBLESHOOTING GUIDE

| Symptom | Cause | Solution |
|---------------------------|--|--|
| High Pressure Drop | End of cartridge service life | Replace cartridges (service life is determined by the application) Consult Customer Service (1-800-479-6801) |
| | Cleaning mechanism not properly adjusted | Increase cleaning frequency Pulse for longer duration Perform off-line cleanings Check performance of diaphragm and solenoids (repair) Check performance of timer/controller (adjust or repair) Check compressed air supply (90-105 psi) Increase filter media area Change filter media type Install overbags to prevent blinding Consult Customer Service (1-800-479-6801) |
| | Compressed air pressure too low | See sections following Low Pressure / Compressed Air Increase pressure (85-105 psi) Decrease duration and frequency of the pulse events Check compressed air dryer and clean if necessary Check for obstructions in piping Consult Customer Service (1-800-479-6801) |
| | Pulsing valve failure | Check wiring between controller and pilot valves Check tubing between solenoid valves and diaphragms Check diaphragms (replace or repair) Check solenoid valves (replace or repair) Consult Customer Service (1-800-479-6801) |
| | Controller timer failure | See sections following Timer / Controller Failure Verify controller is operational Check for appropriate power connections Check to see if timer is indexing to all contacts Check output on all terminals Check accuracy of Magnehelic gauge (if applicable) Consult Customer Service (1-800-479-6801) |
| | Moisture in collector | See sections following Moisture in Collector Check for leaks in collector or ductwork Insulate collector Purge system after shutdown Preheat unit before operation Check compressed air dryer (-85 degree dew point) Locate collector indoors Consult Customer Service (1-800-479-6801) |
| | Inlet baffle plugging, causing high inlet velocities | Check to find type of baffle (channels, abrasion resistant plate, or none) Remove plugged baffle Replace baffle with the appropriate style for application Reduce moisture in the collection system – see above Consult Customer Service (1-800-479-6801) |
| | Heavier dust loading than design (scalping of product) | Check designed airflow against actual airflow, adjust accordingly |

| Symptom | Cause | Solution |
|---------------------------------------|--|--|
| High Pressure Drop (continued) | Heavier dust loading than design (scalping of product) continued | Check collection point vs. suggested collection points – adjust |
| | | Minimize excess airflow, use appropriate ducting |
| | | Minimize overfeeding of process equipment |
| | | Increase filter media area |
| | | Change filter media type |
| | | Install overbags to prevent blinding |
| | | Perform off-line cleaning |
| | | Add more compartments or modules |
| | | Consult Customer Service (1-800-479-6801) |
| | Blinding of filter media | Check designed airflow against actual airflow, adjust accordingly |
| | | Check collection point vs. suggested collection points, adjust |
| | | Minimize excess airflow, use appropriate ducting |
| | | Increase filter media area |
| | | Change filter media type |
| | | Install overbags to prevent blinding |
| | | Perform off-line cleaning |
| | | Add more compartments or modules |
| | | Evaluate dust to find correct Air-to-Cloth Ratio (Farr Lab) |
| | | Consult Customer Service (1-800-479-6801) |
| | Temperature too high | Measure air temperature in collector and compare to design |
| | | Use dilution air to reduce temperature in collector (change fans) |
| | | Install alternate media that can tolerate higher temperature |
| | | Consult Customer Service (1-800-479-6801) |
| | Improper start-up of collector | Restart collector using suggested procedure in manual |
| | | Damper fan and slowly open as system starts up |
| | | Preheat the collector before start up |
| | | Use pre-coat dust to season the cartridges |
| | | Consult Customer Service (1-800-479-6801) |
| | Collector undersized (high air to cloth ratio) | Check fan damper and fan speed, adjust accordingly |
| | | Minimize excess airflow, use appropriate ducting |
| | | Confirm appropriate location of pickup points and hoods |
| | | Increase filter media area |
| | | Change filter media type |
| | | Install overbags to prevent blinding |
| | | Perform off-line cleaning |
| | | Add more compartments or modules |
| | | Evaluate dust to find correct air-to-cloth ratio (Farr Lab) |
| | | Consult Customer Service (1-800-479-6801) |
| Moisture in Collector | Insufficient preheating | Run the system with hot air before process gas flow is introduced |
| | | Insulate the collector if it is to be located outside |
| | | Install a by-pass line to allow pre-heating of the collection system |
| | | Install a heating system inside the collector |
| | | Move collector indoors |
| | | Install moisture resistant or washable cartridges |

| Symptom | Cause | Solution |
|-----------------------------------|---|---|
| Moisture in Collector (continued) | Insufficient preheating (continued) | Consult Customer Service (1-800-479-6801) |
| | | |
| | System is not purged after shutdown | Keep fan running for 5 to 10 minutes after process is shut down |
| | | Insulate the collector if it is to be located outside |
| | | Install a bypass line to allow pre-heating of the collection system |
| | | Install a heating system inside the collector |
| | | Move collector indoors |
| | | Install moisture resistant or washable cartridges |
| | | Consult Customer Service (1-800-479-6801) |
| | | |
| | Wall temperature below dew-point | If the collector is located outside, it must be insulated |
| | | Preheat collector before operation |
| | | Purge collector after process shutdown |
| | | Move collector indoors |
| | | Install a bypass line to allow heating of the system while off-line |
| | | Install a heating system inside the collector |
| | | Install moisture resistant or washable cartridges |
| | | Consult Customer Service (1-800-479-6801) |
| | | |
| | Cold spots through insulation | Locate cold spots and repair insulation |
| | | Eliminate direct metal line through insulation |
| | | Move collector indoors |
| | | Install moisture resistant or washable cartridges |
| | | Consult Customer Service (1-800-479-6801). |
| | | |
| | Water / moisture in compressed air | Open drain valve on air header to see if water comes out |
| | | Check to see if compressed air supply has an air dryer installed |
| | | Verify air dryer is rated for –85 degree dew point |
| | | Replace desiccant in the dryer |
| | | Replace dryer |
| | | Install moisture resistant or washable cartridges |
| | | Consult Customer Service (1-800-479-6801) |
| | | |
| | Leaks in the collector and ducting | Check ductwork on inlet and outlet to assure good caulking |
| | | Check ductwork on inlet and outlet to assure tightened bolts |
| | | Check frame and panels caulking (re-caulk if necessary) |
| | | Check frame and panels for tightened bolts (replace or tighten) |
| | | Check ductwork for any leaks or punctures (repair or replace) |
| | | Check door gasket for leaks (repair or replace) |
| | | Install moisture resistant or washable cartridges |
| | | Consult Customer Service (1-800-479-6801) |
| | | |
| | Scalping of process moisture (processes using water – i.e. Banbury Mixer) | Check designed capture velocity of hood vs. actual (adjust) |
| | | Check designed location of collection point vs. actual (re-locate) |
| | | Reduce airflow at collection point |
| | | Minimize water overflow in process equipment if possible |
| | | |
| | | Move the collection point of process if possible |
| | | Install moisture resistant or washable cartridges |
| | | Consult Customer Service (1-800-479-6801) |

| Symptom | Cause | Solution |
|--------------------|---|--|
| Low Air Pressure | Regulator set too low | Adjust regulator to 90-105 psi of compressed air |
| | | Install a regulator or gauge on the air header if possible |
| | | Consult Customer Service (1-800-479-6801) |
| | Compressed air consumption too high (see Table 330.5.1) | |
| | | Look for leaks in the compressed air system (repair) |
| | | Check to make sure air header drain valve is closed |
| | | Check to make sure diaphragm is not stuck in open position |
| | | Check hose connection on purge pipes and air headers (repair) |
| | | Compressor too small for total plant air requirements (replace) |
| | | Consult Customer Service (1-800-479-6801) |
| | Restrictions in compressed air piping | Check compressed air line to be sure it is clean |
| | | If a hose is run to the air header, be sure there are no kinks |
| | | Check all valves in the line to be sure they are opened completely |
| | | Consult Customer Service (1-800-479-6801) |
| | Compressed air dryer plugging | Replace desiccant in the dryer |
| | | Bypass dryer temporarily |
| | | Replace dryer |
| | | Consult Customer Service (1-800-479-6801) |
| | Compressed air supply line too small | 3/4" minimum supply line for GS10 and under |
| | | 1" minimum supply line for everything larger than GS10 |
| | Diaphragm valves not working | Consult Customer Service (1-800-479-6801) |
| | | Check diaphragm, replace or repair |
| | | Check pilot valves, replace or repair |
| | Compressor worn out | Consult Customer Service (1-800-479-6801) |
| | | Replace rings in compressor |
| | | Check for worn components |
| | | Rebuild compressor or consult compressor manufacturer |
| | | Upgrade to compressor which can handle larger air volume |
| | Compressor too small (for total plant requirements) | Consult Customer Service (1-800-479-6801) |
| | | Perform a compressed air audit, reduce usage where possible |
| | | Repair leaks and reduce unnecessary loss of air |
| | | Replace compressor with larger unit |
| | | Add another compressor to system |
| Controller Failure | Lack of power | Consult Customer Service (1-800-479-6801) |
| | | Confirm that power is supplied to board, correct if necessary |
| | | Confirm that power supplied matches board requirements |
| | | Confirm all breakers and switches are in the 'on' position |
| | | Check fuse, replace if necessary |
| | | Check controls 'on / off' switch, turn it to 'on' |
| | Fuse blown | Replace control board |
| | | Consult Customer Service (1-800-479-6801) |
| | | Replace Fuse |
| | | Replace control board |
| | | Consult Customer Service (1-800-479-6801) |

| Symptom | Cause | Solution |
|--------------------------------|---|--|
| Controller Failure (continued) | Improper programming | Confirm the type of controller used and refer to appropriate section in manual and controller manual |
| | | Confirm accurate number of terminals wired into the control board |
| | | Confirm designed High and Low set points (adjust accordingly) |
| | | Consult Customer Service (1-800-479-6801) |
| | Improper wiring | Check to see if timer is indexing to all contacts (if not, replace) |
| | | Check output on all terminals (if one is not functioning, replace) |
| | | Check wiring between controller and solenoid valves (repair) |
| | | Check diaphragm and solenoid valves (repair if necessary) |
| | | Check power connections to board (correct if necessary) |
| | | Confirm the type of controller used and refer to appropriate section in manual and controller manual |
| | | Consult Customer Service (1-800-479-6801) |
| | | |
| | Moisture or contamination in controller | Confirm that the controller housing door has been shut |
| | | Confirm NEMA-3 rating of housing and upgrade if necessary |
| | | Remote mount controller away from dust collector |
| | | Build water-tight box for controller |
| | | Locate controller indoors |
| | Vibrations causing failure | Remote mount controller away from dust collector |
| | | Consult Customer Service (1-800-479-6801) |
| | Bad control board | Replace board – consult replacement parts list for appropriate type & part # |
| | | Consult Customer Service (1-800-479-6801) |
| | Bad Magnehelic gauge (if applicable) | Confirm accuracy of the gauge, and adjust as necessary |
| | | Sensor hoses are backwards, switch connections of tubing |
| | | Replace Magnehelic gauge – see replacement parts list for correct type & part # |
| | | Consult Customer Service (1-800-479-6801) |
| | | |
| Dust Bridging in Hopper | Moisture in collector | See sections following Moisture in Collector |
| | | Assure that only dry compressed is used, install air dryer |
| | | Insulate collector if it is located outside |
| | | Preheat the collector before operation |
| | | Purge the collector of all high humidity process air after operation |
| | | Inspect and repair any leaks in the collector or ducting |
| | | Prevent scalping of moisture from process |
| | | Move collector indoors |
| | | Install compressed air purge (air sweep) equipment |
| | | Install bin-level indicator |
| | | Consult Customer Service (1-800-479-6801) |
| | | |
| | Dust stored in hopper | Remove dust continuously |
| | | Keep the slide gate or discharge orifice open at all times |
| | | Keep rotary airlock and screw-conveyors running |

| Symptom | Cause | Solution |
|--|-----------------------------------|--|
| Dust Bridging in Hopper (continued) | Dust stored in hopper (continued) | Store collected dust in drums, bags, or bins instead of hopper |
| | | Install bin-level indicator |
| | | Consult Customer Service (1-800-479-6801) |
| | Hopper slope insufficient | Install compressed air purge (air sweep) equipment |
| | | Install hopper with increased hopper angle |
| | | Install bin-level indicator |
| | | Consult Customer Service (1-800-479-6801) |
| | Discharge opening too small | Install compressed air purge (air sweep) equipment |
| | | Install hopper with larger discharge opening |
| | | Install bin-level indicator |
| | | Consult Customer Service (1-800-479-6801) |
| | Screw conveyor malfunction | Confirm screw conveyor speed for application, make adjustment |
| | | Increase the conveyor opening by making it wider and flared |
| | | Lubricate bearings or motor if applicable |
| | | Replace bearings or motor if applicable |
| | | Replace gasket or caulk on hopper flange |
| | | Confirm correct application of conveyor, replace if necessary |
| | | Refer to screw conveyor manual for further information |
| | | Consult screw conveyor manufacturer |
| | | Consult Customer Service (1-800-479-6801) |
| | Rotary airlock malfunction | Confirm the screw airlock speed for application, make adjustment |
| | | Check for correct rotation of blades, reverse direction if necessary |
| | | Lubricate bearings or motor if applicable |
| | | Replace bearings or motor if applicable |
| | | Replace gasket or caulk on hopper flange |
| | | Confirm correct application of airlock – replace if necessary |
| | | Refer to airlock manual for further information |
| | | Consult airlock manufacturer |
| | | Consult Customer Service (1-800-479-6801) |
| Media Failure | End of cartridge service life | Replace cartridges (service life determined by application) |
| | | Consult Customer Service (1-800-479-6801) |
| | High pressure drop | See sections following High Pressure Drop |
| | | Check and adjust cleaning mechanism |
| | | Increase air pressure to cleaning mechanism |
| | | Check and repair diaphragm valves |
| | | Check, program, and repair timer / controller |
| | | Check and correct any inlet plugging |
| | | Check and reduce moisture present |
| | | Check temperature, use appropriate media or use dilution air |
| | | Change media area or media type |
| | | Perform off-line cleaning |
| | | Check fan speed and damper accordingly |
| | | Install overbags to prevent blinding |
| | | Confirm appropriate location of pickup points and hoods |
| | | |
| | | |

| Symptom | Cause | Solution |
|---------------------------|--|--|
| Media Failure (continued) | High pressure drop (continued) | Add more compartments or modules Consult Customer Service (1-800-479-6801) |
| | | |
| | Channel baffle worn or missing | Replace channel baffle Replace channel baffle with abrasion resistant material Consult Customer Service (1-800-479-6801) |
| | | |
| | Inlet air not properly baffled | Install correct baffle (channel, abrasion resistant plate) Replace channel baffle with abrasion resistant material Consult Customer Service (1-800-479-6801) |
| | | |
| | Compressed air too high during pulsing | Regulate pressure to 90-105 psi of compressed air Install a pressure gauge on air header to monitor supply pressure Consult Customer Service (1-800-479-6801) |
| | | |
| | Conveying velocity too great | Reduce airflow, damper fan if possible Confirm appropriate location of pickup points and hoods Minimize excess air flow, use appropriate ducting Change media area or media type Perform off-line cleaning Change inlet baffle design (solid strike plate, perforated, etc.) Add more compartments or modules Consult Customer Service (1-800-479-6801) |
| | | |
| | Application too abrasive | Replace baffle plate with abrasion resistant material Reduce velocity of inlet air, damper fan Install filter cartridges of different media type Increase media area of filter cartridges Install additional modules to reduce Air-to-Cloth ratio Confirm appropriate location of pickup points and hoods Install pre-filter to collect larger particles (Cyclone) Consult Customer Service (1-800-479-6801) |
| | | |
| | Temperature too high | Measure air temperature in collector and compare to design Use dilution air to reduce temperature in collector (change fans) Install alternate media that can tolerate higher temperatures Consult Customer Service (1-800-479-6801) |
| | | |
| | Moisture / water present | See sections following Moisture in Collector Assure that only dry compressed is used, install air dryer Insulate collector if it is located outside Preheat the collector before operation Purge the collector of all high humidity process air Inspect and repair any leaks in the collector or ducting Prevent scalping of material from process by adjusting the system Move collector indoors Consult Customer Service (1-800-479-6801) |
| | | |
| Poor Efficiency | End of cartridge service life | Replace cartridges (service life determined by application) Consult Customer Service (1-800-479-6801) |
| | | |
| | Leaking of cartridges | Check for puncture in media, see sections following Media Failure |

| Symptom | Cause | Solution |
|-----------------------------|------------------------------------|--|
| Poor Efficiency (continued) | Leaking of cartridges (continued) | Perform a colored trace dust test to discover the source of leak |
| | | Check for leaking gaskets, clean tube sheet to assure good seal |
| | | Check temperature, use appropriate media or use dilution air |
| | | Change media type or total area in cartridges |
| | | Consult Customer Service (1-800-479-6801) |
| | Insufficient filter cake formation | Use pre-coat dust for start-up |
| | | Check for adequate airflow at collection points and hoods (adjust) |
| | | Allow more time for collector to build dust cake; it may take weeks |
| | | Reduce cleaning time and frequency |
| | | Change media type or surface area in filter cartridge |
| | | Use pre-coat to assist in the capture of other forms of dust |
| | | Consult Customer Service (1-800-479-6801) |
| | Cleaning cycle too frequent | Check programming on controller and adjust accordingly |
| | | Check and calibrate Photohelic or Magnehelic gauge |
| | | Increase the amount of time between pulse events |
| | | Decrease the duration of pulse events |
| | | Remove bypass setting of controller |
| | | Increase the "High" set point on the controller |
| | | Refer to the appropriate section in manual for your type of controller |
| | Temperature too high | Consult Customer Service (1-800-479-6801) |
| | | Measure air temperature in collector and compare to design |
| | | Use dilution air to reduce temperature in collector (change fans) |
| | Wrong filter media used | Install alternate media that can tolerate higher temperature |
| | | Consult Customer Service (1-800-479-6801) |
| | Leaking gaskets | Replace cartridges with correct filter media for application |
| | | Consult Customer Service (1-800-479-6801) |
| | | Confirm correct placement of cartridges, prevent ramping of filters |
| | | Confirm locking mechanism is in the closed position |
| | | Remove filters and clean tube sheet to assure a good seal |
| | | If cam-bars are bent, replace cam-bars |
| | Cartridge cam-bars not sealing | If cam-bars are not bent, replace support brackets for cam-bars |
| | | Replace cartridges |
| | | Consult Customer Service (1-800-479-6801) |
| | | Confirm correct placement of cartridges, prevent ramping of filters |
| | | Confirm locking mechanism is in the closed position |
| | | If cam-bars are bent, replace cam-bars |
| | | If cam-bars are not bent, replace support brackets for cam-bars |
| | | Consult Customer Service (1-800-479-6801) |
| Poor Airflow | Air leaks in the collection system | Repair or replace any damaged ductwork or collection hoods |

Poor Airflow (continued)

| Symptom | Cause | Solution |
|--------------------------|--|---|
| Poor Airflow (continued) | Air leaks in the collection system (continued) | Replace missing screws, bolts, gaskets, or caulk |
| | | Seal any holes or punctures in the system |
| | | Damper any unused collection points |
| | | Consult Customer Service (1-800-479-6801) |
| | Fan sized incorrectly | Take airflow readings and compare to the design of application |
| | | Evaluate fan performance (fan curve) vs. design of application |
| | | Damper fan accordingly |
| | | Increase/decrease fan wheel width to achieve desired performance |
| | | Replace fan with larger or smaller unit, depending on application |
| | | Consult Customer Service (1-800-479-6801) |
| | Duct sized incorrectly | Perform a system balance to discover possible problems |
| | | Review duct design, adjust blast gates to designed settings |
| | | Rework ducts to achieve desired performance |
| | | Poor inlet or outlet design, redesign for optimal performance |
| | | Install new blower to compensate for poor airflow |
| | | Consult installer of ductwork |
| | | Consult Customer Service (1-800-479-6801) |
| | Collection point incorrectly positioned | Reference: <i>Industrial Ventilation-A Manual of Recommended Practice</i> |
| | | Resize duct according to industrial standard |
| | | Change hood type to improve collection performance |
| | | Reposition collection point or hood to improve performance |
| | | Consult installer of ductwork |
| | | Consult Customer Service (1-800-479-6801) |
| | Fan malfunction | Check to see if the fan is turned to the “on” position |
| | | Check required fan power requirement vs. what is supplied |
| | | Check that power supply is “hot” |
| | | Incorrect wheel rotation, correct motor wiring |
| | | Damage to fan wheel – replace wheel |
| | | Wheel mounted backwards on shaft, rotate wheel orientation |
| | | Temperature too high, replace motor for one better suited |
| | | Bent shaft, replace shaft |
| | | Broken or damaged belt; adjust, repair, or replace belt |
| | | Build-up of dirt or dust, clean fan |
| | | Bad or damaged bearings; lubricate, repair or replace bearings |
| | | Confirm correct motor starter is used |
| | | Check condition and repair the motor starter |
| | | Check that all fuses and switches are operational |
| | | Check for faulty wiring or shorts in wiring |
| | | Consult the fan manufacturer |
| | Motor overloads | Replace fan/motor if necessary |
| | | Refer to appropriate fan manual |
| | | Consult Customer Service (1-800-479-6801) |
| | Motor overloads | Speed set too high on motor, slow motor down |
| | | Fan over capacity, replace with larger fan |
| | | Density of gas/dust above design, replace with larger fan |

| Symptom | Cause | Solution |
|--------------------------|---|---|
| Poor Airflow (continued) | Motor overloads (continued) | Wrong direction of wheel rotation, rotate wheel orientation |
| | | Shaft bent, repair or replace |
| | | Poor alignment, realign motor and housing |
| | | Bind on wheel in housing, repair and realign motor and housing |
| | | Bearing wear; lubricate, repair, or replace bearings |
| | | Temperature too high, replace motor for one better suited |
| | | Build-up of dirt or dust, clean fan |
| | | Short in wiring, repair or rewire fan |
| | | Defective motor, replace |
| | | Consult fan manufacturer |
| | | Consult Customer Service (1-800-479-6801) |
| | Plugged cartridges | |
| | | See sections following High Pressure Drop |
| | | End of cartridge service life, replace cartridges |
| | | Check and clean pulsing mechanisms |
| | | Increase compressed air pressure or volume |
| | | Eliminate moisture in collector |
| | | Check and repair the timer / controller |
| | | Inspect and clean inlet baffles |
| | | Perform off-line cleaning of filter cartridges |
| | | Install overbags |
| | | Add more compartments or modules |
| | | Increase filter media area or change filter media type |
| | | Consult Customer Service (1-800-479-6801) |
| Abnormal Noise | Fan impeller hitting the inlet of the fan | |
| | | Tighten wheel of fan |
| | | Replace wheel of fan |
| | | Balance or adjust fan wheel |
| | | Consult manufacturer of fan |
| | | Consult Customer Service (1-800-479-6801) |
| | Bad bearings in the fan | |
| | | Lubricate bearings |
| | | Replace bearings |
| | | Consult manufacturer of fan |
| | | Consult Customer Service (1-800-479-6801) |
| | Housing of fan vibrating | |
| | | Damaged wheel, replace or repair wheel |
| | | Damaged housing, replace or repair housing |
| | | Broken or loose belt, repair or replace belt |
| | | Worn coupling, replace coupling |
| | | Broken or loose bolt or screws, replace or tighten bolts and screws |
| | | Unstable foundation or supports, tighten or shim housing |
| | | Consult Customer Service (1-800-479-6801) |
| | Electric "Humming" sound | |
| | | Defective starting relay, replace relay |
| | | Replace motor starter |
| | | Consult manufacturer of motor starter |
| | | Consult Customer Service (1-800-479-6801) |
| | Constant "Hissing" sound | |
| | | Compressed air being lost, check compressed air line connection |
| | | Diaphragm stuck open, check and repair diaphragm |
| | | Check hose connection on purge pipes and air headers (repair) |
| | | Check drain valve on air header, close if necessary |
| | | Consult Customer Service (1-800-479-6801) |

| Symptom | Cause | Solution |
|----------------------------|--|---|
| Abnormal Noise (continued) | | |
| | Rotary airlock or screw conveyor noise | Tighten screw or blade on device |
| | | Tighten screw trough or airlock to hopper discharge flange |
| | | Re-apply caulk or gasket to flanges |
| | | Lubricate bearings in device |
| | | Replace bearings in device |
| | | Consult manufacturer of rotary airlock or screw conveyor |
| | | Consult Customer Service (1-800-479-6801) |
| | | |
| | Vibrating or resonance of ductwork | Support and brace ductwork, or improve existing supports |
| | | Tighten flanges between the collector and the ductwork |
| | | Tighten flanges between the fan and the ductwork |
| | | Re-apply gaskets or caulk all the flanges |
| | | Place rubber padding between ductwork and support structures |
| | | Adjust fan speed and setting to minimize vibrations |
| | | Consult ductwork installer |
| | | Consult Customer Service (1-800-479-6801) |
| | | |
| | Normal noise level of fan operation | Most Farr provided fans range from 89 to 99 decibels |
| | | To reduce sound levels, install a fan silencer – see replacement parts list |
| | | Enclose fan in a foam lined housing |
| | | Enclose the entire collector inside a separate room |
| | | Relocate the collector away from production areas |
| | | Consult manufacturer of fan |
| | | Consult Customer Service (1-800-479-6801) |
| | | |
| Repeat Fires or Explosions | Dust is explosive | Install explosion vents |
| | | Replace all blown or open vents, not reusing or adjusting latches |
| | | Install a spark arrester to stop sparks before entering collector |
| | | Install a high efficiency Cyclone to catch sparks |
| | | Install a sprinkler system inside the collector |
| | | Install a fire protection system in the ductwork |
| | | Install fire resistant cartridges |
| | | Use only explosion resistant fan & discharge devices (NEMA-7/9) |
| | | Controller housing should be rated NEMA 7/9 |
| | | |
| | Dust is flammable | Minimize flame or sparks in process |
| | | Consult Customer Service (1-800-479-6801) |
| | | Install a sprinkler system inside the collector |
| | | Install a spark arrester to stop sparks before entering collector |
| | | Install a high efficiency Cyclone to catch sparks |
| | | Install a fire protection system in the duct work |
| | | Use only explosion resistant fan & discharge devices (NEMA-7/9) |
| | | Controller housing should be rated NEMA 7/9 |
| | | Install fire resistant filter cartridges |
| | | Minimize flame or sparks in process |
| | | Consult Customer Service (1-800-479-6801) |
| | | |
| | Process generates sparks | Install a spark arrester to stop sparks before entering collector |

| | | |
|--|---|---|
| Repeat Fires or Explosions (continued) | Process generates sparks (continued) | Install a high efficiency Cyclone to catch sparks |
| | | Install a sprinkler system inside the collector |
| | | Install a fire protection system in the ductwork |
| | | Use only explosion resistant fan & discharge devices (NEMA-7/9) |
| | | Controller housing should be rated NEMA 7/9 |
| | | Minimize flame or sparks in process |
| | | Install fire resistant filter cartridges |
| | | Consult Customer Service (1-800-479-6801) |
| Installation Problems | Plenum flange doesn't match hopper | Plenum or hopper misaligned, rotate plenum 180 degrees |
| | | Wrong assembly procedure, insert bolts in corners, work to center |
| | | Use alignment pins to match flanges during assembly |
| | | Drill and tap new holes to match corresponding flange |
| | | Flange bent during shipping, replace hopper |
| | | Consult Customer Service (1-800-479-6801) |
| | Fan flange doesn't match top panel flange (top mount fans only) | Wrong top panel, replace panel (if Farr provided fan) |
| | | Drill or cut flange into blank top panel (if other than Farr fan) |
| | | Use alignment pins to match flanges during assembly |
| | | Fan misaligned, rotate fan until flanges match |
| | | Consult Customer Service (1-800-479-6801) |
| | Missing Parts | Reference packing slip and inventory items (report missing items) |
| | | Loose parts will be shipped in a box placed inside the inlet plenum |
| | | Thoroughly check all boxes before discarding |
| | | Consult Customer Service (1-800-479-6801) |
| | Collector leaks dust | Locate and seal any dust leakage points in the collector |
| | | Caulk any leaking flanges or panels |
| | | Insert any missing bolts or fittings |
| | | Replace door gaskets if leaking |
| | | Check and repair door lock mechanism if necessary |
| | | Weld or caulk any holes or gaps in welded seams |
| | Controller does not operate | Consult Customer Service (1-800-479-6801) |
| | | See section following Controller Failure |
| | | Check for correct power supplied to control board (correct) |
| | | Check for off switches, breakers, or blown fuses (replace or correct) |
| | | Check for improper wiring, correct as needed |
| | Hopper flange doesn't match discharge device flange | Bad control board, replace if necessary |
| | | Consult Customer Service (1-800-479-6801) |
| | | Discharge device misaligned, rotate to match hopper flange |
| | | Wrong assembly procedure, insert bolts in corners, work to center |
| | | Use alignment pins to match flanges during assembly |
| | | Drill and tap new holes to match corresponding flange |
| | | Flange bent during shipping, replace hopper |
| | | Consult manufacturer if other than a Farr discharge device |
| | | Consult Customer Service (1-800-479-6801) |

| | | |
|--------------------------------------|--|--|
| Installation Problems (continued) | Legs & cross-braces do not match holes | Consult manufacturing drawings for correct arrangement |
| | | Re-drill braces to match leg bolt holes |
| | | Re-drill legs to match cross-brace bolt holes |
| | | Contact Farr to replace cross-braces |
| | | Consult Customer Service (1-800-479-6801) |
| | Air header leaks | |
| | | Check drain plugs, close if open |
| | | Check hoses in-between headers and purge pipes (replace) |
| | | Check and repair diaphragm valves |
| | | Check connection to compressed air supply line, repair if necessary |

SECTION 600-DEFINITIONS

Abrasion Resistance

The ability of a fiber or fabric (media) to withstand surface wears.

ACFM

Actual cubic feet of gas per minute. The volume of gas flowing per minute at the operating temperature, pressure, elevation and composition.

Air-to-Cloth Ratio

The ratio between ACFM flowing through a dust collector and the square feet of filter area available (ACFM/Ft^2). Sometimes referred to as the velocity of air through the cloth.

Blinding

Blockage in a fabric or media by dust that cannot be discharged by the cleaning mechanism, resulting in a reduced gas flow and an increased pressure drop across the media. Once enough material has built up, airflow is severely restricted and the bags have to be cleaned or replaced.

Bridging

Material handling problem characterized by the particulate forming a cavity over the discharge or opening of a hopper or storage vessel. Also, the accumulation of collected dust between two or more filter elements.

Can Velocity

In a dust collector with the filter elements suspended from the tube sheet, "can velocity" is the upward air stream speed calculated by dividing the open cross sectional area of the dust collector (less the area of the filter bottom) into the full volume of the exhaust fan ($\text{ACFM}/\text{Ft}^2 = \text{Feet per Minute}$), *Ref. Interstitial Velocity*. *Note: This does not apply to the Gold Series because of the cross flow design.*

Clean Air Plenum

The dust collector area, through which gases are directed, located on the clean side of the filter media.

Collection Efficiency

The measure of a dust collector's ability to remove particulate from the inlet gas, typically expressed in percent or emission rate (grains per cubic foot).

Dew point

The temperature at which condensation begins to form as the gas is cooled.

Diaphragm Valve

A compressed air valve operated by a solenoid valve that opens to allow a pulse to a row of filters.

Differential Pressure

The change in pressure or the pressure drop across a device. The difference between static pressures measured at the inlet and outlet of a device, *Ref. Pressure Drop*.

Dust Cake

A dust build-up on the filter elements that increases the efficiency of the filter media.

Dust Loading

The weight of solid particulate suspended in an air stream, usually expressed in grains per cubic foot (or grams per cubic meter).

Emissions

Particulate that escapes through or around a dust collector into the atmosphere.

Fan

A device for moving air and dust through a ventilation system. If the fan is on the dirty air side of the collector, it is called a positive system. If the fan is on the clean air side of a collector, it is called a negative system.

Filter Media

The air permeable material utilized in a dust collector, which provides a barrier to remove dust from the air stream.

Hopper

The section of a dust collector located below the dust collector housing utilized for the accumulation and discharge of the collected dust.

Impingement

The physical contact of a dust-laden gas flow against a filter media. Typically referred to the abrasive wear caused by this impact.

Inches of Water

A unit of pressure equal to the pressure exerted by a column of water one inch high at standard conditions (70°F @ sea level), usually expressed as inches water gauge ("w.g.) or inches water column ("w.c.).

Interstices

The openings or voids in a filter media. In addition, the openings or voids between filter elements.

Interstitial Velocity

Velocity of a gas as it passes between a compartment of filter elements calculated at its highest value, Ref. "Can Velocity" for formula. *Note: This does not apply to the Gold Series because of the cross flow design.*

Magnehelic Gauge

An instrument used to measure differential pressure drop.

Manometer

A U-shaped tube filled with a specific liquid. The difference in height between the liquid in each leg of the tube gives the difference in pressure on each leg of the tube. Used to monitor differential pressure.

Micron (μm)

A unit of length, $1/1000$ of one millimeter ($1/24,000$ of an inch).

Negative Pressure System

A system where the fan is located after the dust collector on the clean air side, pulling air through the system.

OEM

Original Equipment Manufacturer.

Particulate

Any airborne solid material.

Permeability

A measure of fabric porosity or openness, expressed in cubic feet of air per minute per square foot of fabric at a 0.5" w.c. pressure differential.

Photohelic Gauge

An instrument used to measure the differential pressure drop and to initiate the cleaning system by means of adjustable "high" and "low" set points for automatic actuation of a sequential timer.

Positive Pressure System

A system with a fan located prior to a dust collector on the dirty side, pushing air through the system.

Precoat

Material added to the air stream at start-up to aid in establishing the initial dust cake on the filter media.

Pressure Drop

A measure of the resistance the gas stream encounters as it flows through the system. It may be referred to as pressure differential across the media, across the dust collector, or the pressure drop across the entire system, depending upon the points of measurement.

Pulse Cycle

The interval of time between pulsing one row of filters and pulsing that row again.

Pulse Duration (On-Time)

The length of time a pulse lasts, generally described as the length of time the electrical signal holds the solenoid pilot valve open.

Pulse Delay (Off-Time)

Elapsed time between pulses in a dust collector cleaning system.

Pulse Clean Dust Collector

A dust collector using short intermittent pulses of compressed dry air to clean dust from the filter media.

Re-entrainment

The phenomenon where dust is collected from an air stream and is then returned to the air stream. This occurs when dust is dislodged from a filter media during cleaning and is again captured by the same or an adjacent filter media.

Rotary Airlock Valve

Device having a star wheel (rotor) designed to provide an air tight seal between the negative or positive pressures of the collector and the outside atmosphere.

Screw Conveyor

A revolving screw operating in a fixed trough for conveying material from one point to another. Note: Should a screw conveyor be used in a dust collector system, an airlock is still required to ensure ventilation air does not pass through the conveyor.

SCFM

Standard cubic feet per minute. The volume of gas flow per minute at standard temperature and pressure conditions (70°F @ sea level).

Solenoid Valve

An electromechanical plunger device that is either "normally open" or "normally closed". In use with a dust collector, it is for the relief of air pressure to activate a compressed air device such as a diaphragm valve.

Timer, Sequential

An electrical mechanism that activates a dust collector's cleaning system.

Tube sheet

A steel plate on which the open end of the filter elements are connected. This wall separates the clean air and dirty air plenums of the dust collector.

SECTION 700- REPLACEMENT PARTS LIST

Following is a list of common replacement parts and equipment that you will need to keep your dust collector operational in the future. To know what specific filters and components match your specific collector and application, refer to your bill of lading or original packing slip. This information should be recorded in this manual for future reference. If this information is not available to you, please contact your Farr Representative or Farr Customer Service at 1-800-479-6801 for genuine Farr replacement parts.

| Farr Part No. | Description |
|----------------------|--|
| | FILTER CARTRIDGES WITH TOP PANS |
| | 325 Square Foot Cartridges - HemiPleat |
| 211497001 | PTS - Poly-Tech Standard |
| 211497002 | PTC - Poly-Tech Carbon Impregnated (Static Drain) |
| 211497004 | PTF - Poly-Tech Fire Retardant Treatment |
| 211497005 | PTU - Poly-Tech Ultra High Efficiency |
| 211497006 | PTUF - Poly-Tech Ultra High Efficiency Fire Retardant Treatment |
| | 225 Square Foot Dura-Pleat Cartridges |
| 205637001 | DPS – Dura-pleat Standard Spun-Bond Polyester |
| 205637002 | DPA – Dura-pleat Aluminized Finish (Static Drain) |
| 205637003 | DPO – Dura-pleat Oleophobic Treatment |
| 205637004 | DPT – Dura-pleat with Teflon Membrane <i>(200 Square Feet)</i> |
| | FILTER ACCESSORIES |
| 208721001 | Cartridge Removal Tool |
| | AFTER FILTERS |
| 049880005 | 30/30 Pre-filter, 24x24x2 |
| 049880006 | 30/30 Pre-filter, 12x24x2 |
| 096026003 | Riga-Flo 200 Filter, 24x24x12 |
| 096026007 | Riga-Flo 200 Filter, 12x24x12 |
| 49745G016 | Absolute 2000 HEPA Filter, 24x24x12 |
| 50125G016 | Absolute 2000 HEPA Filter, 12x24x12 |
| 49833G016 | HEPA 23-3/8x23-3/8x11-1/2 (Top SMF) |
| 52449G016 | HEPA 23-3/8x11-3/8x11-1/2 (Top SMF) |
| 51042G001 | HEPA 11-3/8x23-3/8x11-1/2 (Top SMF) |
| 49572G016 | HEPA 24x24x12 (Remote SMF) |
| | AFTER FILTER FASTENERS |
| 114353000 | C-99 Spring Fastener <i>(for Riga-Flo 200 filters)</i> |
| 063159002 | Swing Bolt <i>(for Absolute 2000 HEPA filters)</i> |
| 043911002 | Wing Nut <i>(for Absolute 2000 HEPA filters)</i> |
| 063343000 | Clamp <i>(for Absolute 2000 HEPA filters)</i> |
| | AFTER FILTER GAGE & PNEUMATICS |
| 033988003 | Magnehelic Gage, 0-4" |
| 033988025 | Gage Accessory Kit |
| 048624005 | 1/4" Black Plastic Tubing |
| 067401000 | Elbow Restrictor - 1/8" NPT to 1/4" Tube |
| | PRECOAT EQUIPMENT |
| 072416000 | Dust Feeder Kit |
| 203774001 | Pre-Coat Dust, Expanded Perlite, 20 Lb. Bag |
| | OVERBAGS |
| 207087001 | Overbag, NYLON, for Gold-Cone Cartridge |
| | AUTOMATIC TIMER CONTROLLERS |
| 208028010 | Dwyer DCT1010 (10 output) Automatic Timer Controller without pressure module |

| | |
|--|--|
| 208028022 | Dwyer DCT1022 (22 output) Automatic Timer Controller without pressure module |
| 208029010 | Dwyer DCT1010 (10 output) Automatic Timer Controller with pressure module |
| 208029022 | Dwyer DCT1022 (22 output) Automatic Timer Controller with pressure module |
| 208027010 | Dwyer DCP100 Pressure Module 10" w.g. |
| 208027020 | Dwyer DCP200 Pressure Module 20" w.g. |
| 203180001 | NCC DT-10 NEMA 4X Determinator Timer Kit |
| 203180002 | NCC DT-20 NEMA 4X Determinator Timer Kit |
| 203180003 | NCC DT-10 NEMA 9 Determinator Timer Kit |
| 203180004 | NCC DT-20 NEMA 9 Determinator Timer Kit |
| 122943004 | Goyen T4-10 Complete Kit - NEMA 4 |
| 122361011 | Goyen T4-10 Replacement Box - NEMA 4 |
| 122361001 | Goyen P4-10 Replacement Box - NEMA 4 |
| 123060001 | Goyen T4-10 Complete Kit - NEMA 7/9 |
| REPLACEMENT AUTOMATIC TIMER CONTROLLER BOARDS | |
| 208026010 | Dwyer DCT1010 Replacement Board without pressure module - 10 Terminal |
| 208026022 | Dwyer DCT1022 Replacement Board without pressure module - 22 Terminal |
| 208220006 | Dwyer DCT1006 Replacement Board with pressure module - 6 Terminal |
| 208220010 | Dwyer DCT1010 Replacement Board with pressure module - 10 Terminal |
| 208220022 | Dwyer DCT1022 Replacement Board with pressure module - 22 Terminal |
| 203187001 | NCC DT-10 Replacement Board - 10 Terminal |
| 203187002 | NCC DT-20 Replacement Board - 20 Terminal |
| 122363001 | Goyen T4 & P4 Replacement Board - 10 Terminal |
| 122363002 | Goyen T4 & P4 Replacement Board - 16 Terminal |
| 122363003 | Goyen T4 & P4 Replacement Board - 32 Terminal |
| STATIC PRESSURE DEVICES | |
| 122999001 | P4 Photohelic Gage, Replacement |
| 124157000 | Photohelic Gage Kit 0"-8" w/ Mtg Brkt |
| 074680000 | M3 Magnehelic Gage Kit w/ Mtg Brkt |
| 033988003 | Magnehelic Gage 0"-4" Replacement |
| 033988006 | Magnehelic Gage 0"-8" Replacement |
| OPTIONAL EQUIPMENT | |
| 203787001 | Determinator Input/Output (I/O) Box |
| 205098001 | Determinator Remote Display Panel - NEMA 4 |
| 203789001 | Thermocouple |
| 203790001 | Flow Meter |
| 203791001 | Compressed Air Pressure Transducer |
| 203792001 | Emissions Monitor, Low Temp. (Triboelectric) |
| 203793001 | Emissions Monitor, High Temp. (Triboelectric) |
| 203794001 | Emissions Monitor, Real Time |
| | Motor Starter (See Table 330.1.1) |
| DUST DISCHARGE DEVICES | |
| 209572010 | Positive Pressure Drum Kit (Includes items 17 thru 22) |
| 209572210 | Positive Pressure Drum Cover Kit (Includes items 17 thru 21) |
| 211590001 | 10x10 Rotary Airlock - Cast Iron |
| 211880001 | 10x10 Rotary Airlock - Fabricated |
| 073866RH4 | Dust Level Indicator |
| DIAPHRAGM VALVE REPAIR KITS | |
| 084416012 | Repair Kit, 1" Diaphragm Valve (GS2 – GS6) |
| 084416016 | Repair Kit, 1-1/2" Diaphragm Valve (GS8 – GS120) |
| 084415002 | Solenoid Valve (Single) |
| 084415011 | Repair Kit, Solenoid Valve |
| SAFETY DECALS | |
| 205821001 | ENTRAPMENT 6"X3" |

| | |
|-----------|---|
| 205822001 | EXPLOSION 6"X3" |
| 205819001 | SAFETY INSTRUCTIONS 3"X6" |
| 205817001 | WARNING 3"X6" |
| 205965001 | WARNING AUTO START |
| 205818001 | WARNING COMPRESSED AIR 2X4 |
| 205820001 | WARNING LOCKOUT 3"X6" |
| 205816001 | DANGER BLADES 2"X4" |
| 207172001 | CONTAINS GOLD SERIES HARDWARE |
| 205516001 | FARR GOLD SERIES 1"X4.5" |
| 205668001 | FARR APC 32X10 |
| 205515001 | FILTERMAN |
| | MISCELLANEOUS |
| 074492000 | Rope Caulk – (40 ft. per roll) |
| 205795001 | <i>Gold Series</i> “Evergreen” Touch-Up Paint |

Following is a part list and diagram of common hardware parts on your collector. To identify your replacement part, match the item number in the list with the balloon number on the diagram. Check the description to be sure you have the specific part for your collector.

| Item No. | Farr Part No. | Description |
|----------|---------------|---|
| 1 | 212659001 | Diaphragm Valve – 1" (GS2 – GS6) |
| | 212506001 | Diaphragm Valve – 1-1/2" (GS8 – GS120) |
| 2 | 078234001 | Brass elbow fitting w/ push-in connector for 1/4" diameter plastic tubing |
| 3 | 078235001 | Brass straight fitting w/ push-in connector for 1/4" diameter plastic tubing |
| 4 | 208192002 | Bulkhead Connector - includes fitting, dresser nut and lock ring (GS2 – GS6) |
| | 208192001 | Bulkhead Connector - includes fitting, dresser nut and lock ring (GS8 – GS120) |
| 5 | 098683002 | Brass Drain Cock |
| 6 | 048624005 | 1/4" Diameter Black Plastic Tubing |
| 7 | 067497002 | Solenoid Box – 2 solenoids |
| | 067497004 | Solenoid Box – 4 solenoids |
| | 067497005 | Solenoid Box – 5 solenoids |
| | 067497006 | Solenoid Box – 6 solenoids |
| | 067497008 | Solenoid Box – 8 solenoids |
| | 067497010 | Solenoid Box – 10 solenoids |
| | 067497012 | Solenoid Box – 12 solenoids |
| 8 | 084415002 | Solenoid Valve – Single (Included in item 7) |
| 9 | 205745001 | Clamp Bar – Right hand – (2) filters deep |
| | 205745002 | Clamp Bar – Right hand – (4) filters deep |
| | 205745003 | Clamp Bar – Right hand – (6) filters deep |
| | 205745004 | Clamp Bar – Right hand – (5) filters deep |
| | 205745005 | Clamp Bar – Right hand – (3) filters deep |
| | 205745006 | Clamp Bar – Right hand – (1) filter deep |
| 10 | 205744001 | Clamp Bar – Left hand – (2) filters deep |
| | 205744002 | Clamp Bar – Left hand – (4) filters deep |
| | 205744003 | Clamp Bar – Left hand – (6) filters deep |
| | 205744004 | Clamp Bar – Left hand – (5) filters deep |
| | 205744005 | Clamp Bar – Left hand – (3) filters deep |
| | 205744006 | Clamp Bar – Left hand – (1) filter deep |
| 11 | 204574001 | Door Gasket |
| 12 | 205757001 | Door Hardware Kit |
| 13 | 205764001 | Door Hinge |
| 14 | 205756003 | Door Frame Assembly |
| 15 | 205756002 | Door Assembly |
| 16 | 205229001 | Gold Bolt (100 minimum quantity per order) |
| 17 | 206019001 | Manual Slide Gate |
| 18 | 069441015 | Flex Hose – 10" Diameter |
| 19 | 004690019 | Hose Clamp – 10" Diameter |
| 20 | 209573001 | Drum Cover with Gasket |
| 21 | 210511001 | Drum Latch Ring |
| 22 | 094562001 | 55 Gallon Drum |
| 23 | N/A | Fan (Refer to your fan name plate, bill of lading, or original packing slip for part no.) |

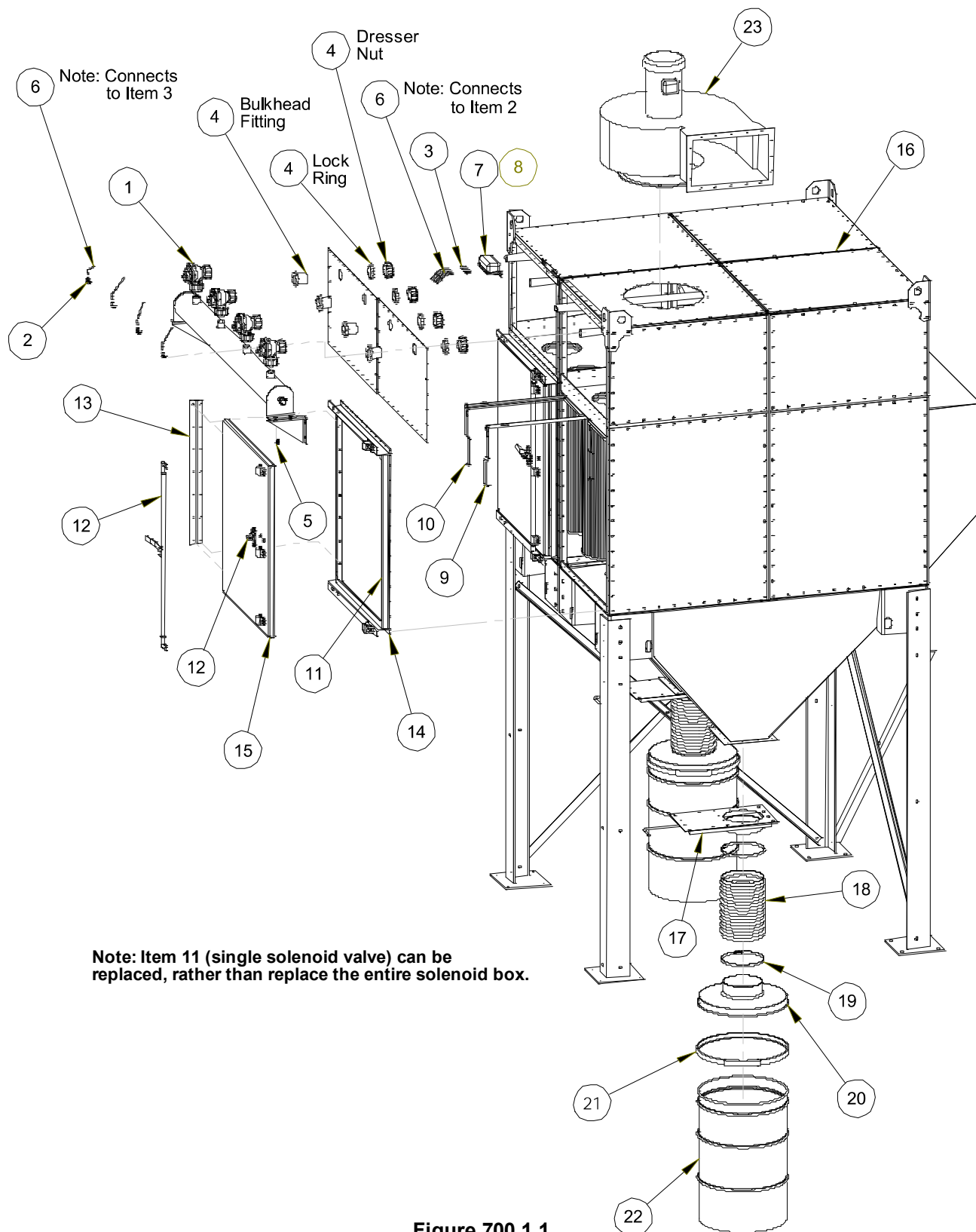


Figure 700.1.1