ANSON ENVIRONMENTAL LTD.

771 New York Avenue
Huntington, New York 11743
631-351-3555
Fax: 631-351-3615
www.AnsonLtd.com

# Soil Vapor Extraction and Air Sparge Systems Design Report

## Voluntary Cleanup Program Site No. 01-30-034B

**Site Location:**

**Atlas Graphics, Inc.**
**567 Main Street**
**Westbury, NY 11590**

Date of Report:

**May 31, 2001**

Prepared by:

Anson Environmental Ltd.
771 New York Avenue
Huntington, NY 11743

*"Your Environmental Partner"*

# Table of Contents



# Figures

# Photos



# Appendices

## 1.0 Executive Summary

During October 2000, in accordance with the Remedial Design/Remedial Action Work Plan dated September 20, 2000, Anson Environmental Ltd. (AEL) began the installation of a Soil Vapor Extraction System (SVES) and an Air Sparge (AS) System at the Atlas Graphics site. The SVES is designed to remediate the contaminated soil in the area of the former cesspool chamber located at the west side of the site building (Figure 1). When the installation of the SVE and AS systems is complete their combined operation will remove the contamination in the on-site groundwater.

Prior to installing the electrical and mechanical equipment to support the SVE and AS systems, the following activities were performed:

- Install remediation extraction wells and air sparge points at a location west of the site building
- Install below grade trenches to contain the piping required to connect remediation wells and sparge points to the SVES and AS system components located inside the building basement
- Install SVES components in the basement of the site building
- Install SVES and AS electrical service panels in the basement
- Test run the SVES and collect air samples at strategic locations
- Operate the SVES full time
- Install AS system components in the in the basement of the site building
- Test run the AS system
- Operate the AS system full time

This report describes the installation of the soil vapor extraction and air sparge systems and summarizes the aforementioned activities. Also included in this report are the results of field and laboratory analysis of air samples collected at strategic SVES sampling locations.

## 2.0 Extraction Wells and Air Sparge Points

On October 21, 2000, Aquifer Drilling and Testing, Inc., a drilling company located in New Hyde Park, New York, installed two extraction wells and two air sparge points through the center of the former cesspool located at the southwest corner of the building (Figure 1). The two extraction wells, designated Extraction Well 1 (EW1) and Extraction Well 2 (EW2) were installed as part of one cluster well that also included the two air sparge points. The two air sparge points are designated Air Sparge Low (ASL) and Air Sparge High (ASH).

The extraction wells are designed and located to remediate the soil adjacent and below the former cesspool. The 2-inch diameter (DIA) extraction wells and 1-inch DIA sparge points were installed in one boring using 6.25-inch DIA hollow stem augers. No drilling fluids were introduced into the boring during construction. The extraction wells are constructed with two-inch DIA Schedule 40 flush joint PVC pipe. The air sparge points are constructed with one-inch DIA Schedule 40 flush joint PVC pipe.

The low sparge point, ASL, was installed first after the hollow stem augers were advanced to 97-feet below grade surface (bgs). Sparge point ASL is constructed with a 1-inch DIA PVC screen section of No. 20 slot from 96-feet to 94-feet bgs. The sparge point is constructed with 1-inch DIA PVC piping that extends from 94-feet bgs to grade surface. The volume of the boring in the annular space surrounding the slotted portion of ASL is backfilled with No. 2 Morie industrial quartz. The industrial quartz is backfilled around ASL to 92-feet bgs. Bentonite pellets are installed in the annular space surrounding ASL from 92-feet to 87-feet bgs. A bentonite/cement grout fills the annular space surrounding ASL from 87-feet to 72-feet bgs.

The grout mixture used during the construction of the air sparge points and extraction wells described herein was installed using the tremie method.

After installing ASL, the high air sparge point ASH was installed. The sparge point ASH is constructed with a 1-inch DIA PVC screen section of No. 20 slot from 72-feet to 70-feet bgs. The sparge point is constructed with 1-inch DIA PVC piping that extends from 70-feet bgs to grade surface. The volume of the boring in the annular space surrounding the slotted portion of ASH is backfilled with No. 2 Morie industrial quartz. The industrial quartz is backfilled around ASH to 68-feet bgs. Bentonite pellets are installed in the annular space surrounding ASH from 68-feet to 63-feet bgs. A bentonite/cement grout fills the annular space surrounding ASH from 63-feet to 49-feet bgs.

After installing air sparge point ASH, extraction well EW2 was installed from 49-feet bgs to grade level. Extraction well EW2 is constructed with a 2-inch DIA PVC screen section of No. 20 slot from 49-feet to 29-feet bgs. The extraction well is constructed with 2-inch DIA PVC piping that extends from 29-feet bgs to grade surface. The volume of the boring in the annular space surrounding the slotted portion of EW2 is backfilled with No. 2 Morie industrial quartz. The industrial quartz is backfilled around EW2 to 27-feet bgs. Bentonite pellets are installed in the annular space surrounding EW2 from 27-feet to 25-feet bgs. A bentonite/cement grout fills the annular space surrounding EW2 from 25-feet to 20-feet bgs.

After installing extraction well EW2, extraction well EW1 was installed from 20-feet bgs to grade level. Extraction well EW1 is constructed with a 2-inch DIA PVC screen section of No. 20 slot from 20-feet to 5-feet bgs. The extraction well is constructed with 2-inch DIA PVC piping that extends from 5-feet bgs to grade surface. The volume of the

boring in the annular space surrounding the slotted portion of EW1 is backfilled with No. 2 Morie industrial quartz. The industrial quartz is backfilled around EW1 to 4-feet bgs. Bentonite pellets are installed in the annular space surrounding EW1 from 4-feet to 3-feet bgs. A bentonite/cement grout fills the annular space surrounding EW1 from 3-feet to 1-feet bgs.

The drill cuttings generated during the installation of the extraction wells and air sparge points are stored on-site in one 55-gallon steel locked drum.

## 3.0 Installation of Trenches and Piping

On October 2, 2000, prior to installing the SVES extraction wells and air sparge points, AEL installed a trench from the southwest corner of the Atlas Graphics' building to the planned location of the extraction wells and sparge points. The trench was excavated using hand tools to a depth of 2-feet bgs. Since the area at the west side site building is used for parking vehicles, the trench was installed to contain and protect the piping connecting the extraction wells and air sparge points to the electrical and mechanical equipment located in the basement of the building. This horizontal piping is 2-inch Schedule 40 PVC. After installing the horizontal piping the trench was backfilled with native sand and gravel.

Access to the two extraction wells and the two air sparge points is provided by a 24-inch DIA metal covered man-way located in the parking area west of the site building (Photo 1). The man-way is located directly over the wells and sparge points and the metal cover is secured with $9/16^{th}$-inch DIA bolts.

## 4.0 SVES Equipment

The SVES mechanical and electrical equipment is installed in the basement of the Atlas Graphics building. The basement measures approximately 10-feet in the east/west direction and 14-feet in the north/south direction. The floor of the basement is poured concrete and contains a floor drain. The ceiling of the basement is covered with plasterboard material. The basement also contains an oil-fired hot water furnace and an oil-fired domestic hot water heater. An electrical heating oil pump and filter system is also located in the basement.

Access to the basement is provided by two heavy metal doors that are flush mounted to the sidewalk at the south side of the Atlas Graphics building (Photo 2). The basement has a single small window that opens to the west side of the building just below grade level.

The SVES is designed to extract vapors from two extraction wells, EW1 and EW2. A functional block diagram of the installed SVES electrical and mechanical equipment is in Figure 2.

The SVES installed at Atlas Graphics consists of two extraction wells, a moisture separator, a particulate filter, a regenerative blower, two air purification canisters, and an exhaust stack to the atmosphere.

Under the influence of a vacuum created by the SVES regenerative blower (Photo 3), soil gas vapors flow into the slotted sections of EW1 and EW2. The gas vapors then travel up to and through the entrenched horizontal piping that leads into the basement of the Atlas Graphics building. After entering the basement, the horizontal piping for EW1 and EW2 are fed to a polyvinyl chloride (PVC) manifold unit that directs the combined gas vapors to a moisture separator unit (Photo 4).

After leaving the moisture separator, the moisture free gas vapor then flows into a particulate filter where dust and other particulates that could potentially damage the SVES blower motor are removed (Photo 5).

The gas vapor output from the particulate filter is then drawn through the regenerative blower, the source of the system negative pressure (vacuum). From the regenerative blower the gas vapor moves under positive pressure through the first of two air purification canisters (Photo 6). The air purification canisters contain activated carbon granules that are designed to remove volatile organic compounds (VOCs) contamination from the gas vapor.

Next, the gas vapor moves through a second air purification canister were any residual VOCs contamination not removed in the first canister is removed from the gas vapor. The VOC free gas vapor from the second canister is then emitted to the atmosphere through an exhaust pipe that terminates above the building (Photo 8).

To monitor and adjust the performance of the SVES, the system is equipped with vapor flow meters, vacuum and pressure gauges, flow control valves, and sampling ports that are installed at strategic piping locations.

The flow meters for the gas vapors exiting EW1 and EW2 are located in a man-way that is located west of the site building. Access to the two flow meters is provided by a 24-inch metal covered man-way that is located in the parking area west of the site building (Photo 9). The man-way is located approximately 10-feet west of the building and its metal cover is secured with $9/16^{th}$-inch DIA bolts (Photo 10).

The following sections describe the installation/construction of the electrical and mechanical SVES equipment installed at the Atlas Graphics site.

## 4.1 Electrical Service Panel

To support the power requirements of the SVE and AS systems, a licensed electrician installed a dedicated electrical service panel for the two systems in the basement of the Atlas Graphics building (Photo 11). The service panel is connected to the main electrical distribution panel of the building and supplies three-phase 208-volts alternating current (VAC) electrical power to the SVES motor starter switch. Circuit breakers in the service panel provide current overload protection for the SVES.

## 4.2 Extraction Well Flow Meters

One flow meter is installed in series with each extraction well. The flow meter is used to measure the volume of soil gas being removed from its associated extraction well. As described in Section 4.0, the flow meters are installed in a manway west of the Atlas Graphics building. The 2-inch DIA flow meters are manufactured by Ametek Rotron TMD Industrial Products, Saugerties, NY. The flow meter model number is FM20C125Q and the flow range is 25 125 SCFM. The manufacturers information sheet for the moisture separator is in Appendix 1.

## 4.3 System Manifold

Under the influence of a vacuum created by the SVES regenerative blower, soil gas vapors drawn from the two extraction wells, EW1 and EW2 flow through the system manifold. The manifold is fabricated with a 2-inch DIA four-way PVC cross fitting and two 2-inch DIA 90-degree elbow fittings (Photo 12). The manifold is designed to operate with three input ports and one output port.

A dilution valve consisting of a PVC ball valve is installed on one of the manifold input ports to control the introduction of ambient air into the system when required. The dilution valve provides a method for introducing ambient air into the SVES to regulate the system vacuum and reduce the soil gas vapor concentrations flowing through the system.

The other two manifold input ports are each connected to the piping and flow meter associated with one of the extraction wells. Each of these input ports have a vacuum gauge and a 2-inch PVC ball valve for regulating vacuum and soil gas flow from the associated extraction well. The vacuum gauges are generic and have a range of 0-160 IWG (inches of water gauge).

The output port of the PVC cross fitting is connected to the moisture separator.

The PVC cross fitting is mounted vertically. The two elbow fittings are mated to the horizontal ports of the cross fitting with a small connecting piece of pipe. The top port of the cross fitting is mated to the ambient air control valve with a small connecting piece of pipe.

All of the piping and fittings used in the construction of the manifold are made of 2-inch DIA Schedule 40 PVC.

### 4.4 Moisture Separator

The design of the moisture separator uses high efficiency cyclonic action to separate and contain entrained liquids in the gas vapor stream (Photo 13). The separation of moisture from the gas vapor helps to protect the SVES regenerative blower from corrosion and mineralization damage. The moisture separator is constructed of heavy gauge metal and has a liquid capacity of approximately 19-gallons. It is equipped with a vacuum relief valve, which protects the moisture separator from implosion due to excessive vacuum negative pressure.

The moisture separator is protected against liquid overflow by a fail-safe mechanical method. When the liquid level in the moisture separator reaches a maximum level, a ball float clogs the exit port of the separator.

The collected liquid in the moisture separator is removed by gravity feed using an on/off drain valve located at the bottom of the unit. The removed liquid is stored on-site in 55-gallon steel locked drums for appropriate disposal (Photo 14).

Gast Manufacturing, Carlstadt, New Jersey, manufactures the moisture separator and its model number is RMS 200. The manufacturers information sheet for the moisture separator is in Appendix 1.

### 4.5 Particulate Filter

The output of the moisture separator is fed to an inline steel-housing filter (Photo 5). The inline filter protects the SVES regenerative blower from harmful dust and other particulates that may be drawn into the blower from the gas vapor extraction piping system. The filter media is polyester and is replaceable. The efficiency of the media is approximately 98 percent for particles size 8 to 10 microns.

Ametek Rotron TMD Industrial Products, Saugerties, New York, supplies the particulate filter and its model number is 515255. The filter replacement element is model number 516435. The manufacturers information sheet for the particulate filter and replacement element is in Appendix 1.

### 4.6 SVES Regenerative Blower

Gas vapors exiting the particulate filter under the influence of a vacuum created by the SVES regenerative blower, enter the intake port of that unit (Photo 3). Both the input and output ports of the SVES blower are 2-inch 11 ½ NPSC female thread. The blower is powered by 208-230 volt three-phase alternating current and its rated power is 3-horsepower. The blower has the following general electrical characteristics:

| | |
|---|---|
| Manufacturer | Ametek Rotron TMD, Saugerties, New York |
| Model No. | EN606M72ML |
| Rated Horsepower | 3 |
| Phase/Frequency | Three- 60Hz |
| Voltage | 208-230/460 |
| Maximum blower amps | 7.6-7.4/3.7 |
| Inrush amps (time zero) | 60-54/27 |
| Maximum flow | 200 SCFM |
| Maximum vacuum | 75 IWG |

The manufacturers information sheet for the blower is in Appendix 1.

The starter switch for the SVES blower is mounted on the west wall of the basement. It is labeled number "2" and is located adjacent to a second identical switch that is installed for expansion use. The starter switch is equipped with an ON control button and an OFF control button.

### 4.7 Air Purification Canisters

The output of the SVES regenerative blower is connected to two air purification canisters (Photo 6). The canisters are connected in series with four-inch Schedule 40 PVC piping and fittings.

The air purification canisters are supplied by Carbtrol Corporation of Westport, Connecticut, and are filled with activated carbon material. The canisters approximate the size of standard fifty-five gallon drums and each weighs 210 pounds. The canisters are Model G-2 canisters and contain170 pounds of carbon. The manufacturers information sheet for the G-2 air purification canister is in Appendix 1.

The maximum flow for the G-2 canister is 300 cubic feet per minute (CFM) and the maximum operating pressure is ten pounds per square inch (psi). AEL will increase the canister size if the SVES operating parameters indicate that a change is required.

To relieve system backpressure, the SVES blower output piping transitions from 2-inch DIA steel pipe to 4-inch DIA PVC pipe before being connected to the input port of the first air purification canister.

To collect an air sample from the SVES blower exhaust before the first air purification canister the input piping to the canister is equipped with a sampling port fitting. To collect a sample of the output from the first canister, a sampling port fitting is also installed between the first and second canister (Photo 7). This sample when analyzed in the field or laboratory will provide information for estimating when the first canister must be replaced.

## 4.8 Exhaust Stack

After moving under positive pressure through the two air purification canisters, the SVES emission is fed into the exhaust stack. The 4-inch DIA PVC exhaust stack is mounted vertically to the west wall of the Atlas Graphics building and extends approximately eight-feet above the building and terminates with a downward facing PVC pipe fitting to inhibit the entry of rainwater.

To collect a sample of the output from the exhaust stack, the exhaust piping is equipped with a sampling port. The sampling port is located inside the basement of the building just after the second canister and before the exhaust piping exits the basement (Photo 7).

To measure the rate of air flow being exhausted by the SVES, a flow meter is installed inline with the piping from the second canister to the exhaust stack (Photo 15). This flow meter is located in the basement of the building. Ametek Rotron TMD Industrial Products, Saugerties, New York, supplies the 4-inch DIA flow meter Model FM40C450Q and Part number 550608. The manufacturers information sheet for the flow meter is in Appendix 1.

## 4.9 Operational Parameters

The initial settings of the ball valves controlling SVES soil gas extraction resulted in the following system operational parameters:

| Monitored Item | Vacuum (IWG) | Flow (SCFM) |
|---|---|---|
| EW1 (5 to 20-ft bgs) | 7 | 50 |
| EW2 (29 to 49-ft bgs) | 10 | 80 |
| Exhaust Emission | -- | 190 |

IWG = inches of water gauge
SCFM = standard cubic feet per minute

On January 12, 2001, soon after the SVES became operational, Tedlar air bag samples were collected from the sampling points before the air purification canisters and at the exhaust stack of the system. The samples were delivered to Environmental Testing Laboratories, Inc., Farmingdale, New York, where they were analyzed for concentrations of volatile organic

compounds using EPA Method 8260. The laboratory analytical report for the collected samples is in Appendix 2.

## 5.0 Air Sparge Equipment

The Air Sparge (AS) system is designed to reduce concentrations of VOCs that are adsorbed to the soils and dissolved in the groundwater at the Atlas Graphics site. The AS technology, which is also known as "in situ air stripping" and "in situ volatilization," involves the injection of contaminant-free air into the subsurface saturated zone, enabling a phase transfer of hydrocarbons from a dissolved state to a vapor phase. The air is then vented through the unsaturated zone. Air sparging is most often used together with soil vapor extraction (SVE). When the air sparging is combined with SVE, the SVE system creates a negative pressure in the unsaturated zone through a series of injection wells to control the vapor plume migration.

The Air Sparge electrical and mechanical equipment is installed at the southern side of the basement of the Atlas Graphics building (Photo 16). The physical description of the basement is in Section 4.0. A functional block diagram of the AS system installed at the Atlas Graphics site is in Figure 3.

The Atlas Graphics AS system uses two air sparge points to inject contaminant-free air into the subsurface saturated zone at the west side of the Atlas Graphics property. The injection points are installed below the former cesspool location (Figure 1). Access to the injection points is provided by the same man-way used to access the extraction wells described in Section 3.0 (Photo 1). As previously described in Section 2.0, the sparge points are designated Air Sparge Low (ASL) and Air Sparge High (ASH). Pressurized air is injected into the saturated zone through a 2-foot section of one-inch DIA slotted PVC pipe in each of the sparge points. Sparge point ASL is used to inject air into the saturated zone at 94 to 96-feet bgs. Sparge point ASH is used to inject air into the saturated zone at 70 to 72-feet bgs. The depth to groundwater at the Atlas Graphics site is typically 54-feet bgs.

The air sparge system installed at Atlas Graphics consists of a motor driven compressor, a pressure relief valve, air flow control valves, flow meters and pressure gauges to monitor system parameters, and associated interconnect steel and PVC piping. During normal operation, the compressor provides pressurized contaminant-free air for the system. The pressurized air is delivered through 2-inch DIA steel piping to a manifold unit consisting of one input and two outputs.

The manifold unit input reduces the 2-inch DIA steel piping to 1-inch DIA steel piping and contains a system pressure gauge and a pressure relief valve.

Each of the two manifold outputs contain a 1-inch DIA brass ball valve for controlling air pressure supplied to the associated air sparge point and a 1-inch DIA brass ball valve for bleeding air pressure as required.

Each of the two manifold outputs is then connected through 1-inch DIA steel pipe to an air flow meter. The output of each flow meter is connected with 1-inch DIA steel pipe to an air pressure gauge. The connection between the air pressure gauge and the 1-inch PVC underground horizontal piping to the AS injection point also uses 1-inch DIA steel pipe. The transition from 1-inch DIA steel pipe to 1-inch DIA PVC pipe is made at the basement window.

The following sections describe the various components of the AS system installed at the Atlas Graphics site.

## 5.1 Air Sparge Compressor and Motor

Gast Manufacturing, Inc., Carlstadt, New Jersey supplies the AS compressor and motor (Figure 3). A 7.5 horsepower open drip proof motor drives the sparge compressor (Photo 16). Gast Manufacturing supplies the compressor and drive motor as a unit. However, Baldor Industrial Motor, Fort Smith, Arizona, manufactures the drive motor for the compressor. The following is a listing of the product specifications for the compressor and motor:

| Gast Compressor | |
|---|---|
| Model Number | 6066-P122A-T905 |
| Maximum Pressure | 20 PSI |
| Maximum Flow | 55 SCFM |

| Baldor Motor | |
|---|---|
| Model Number | M3311T |
| Voltage Required | 208-230 VAC, Three Phase, 60 Hz |
| Amperage | 23-22 |
| RPM | 1725 |

Net weight of motor and compressor unit is 205 pounds

The manufacturers information sheet for the compressor and motor is in Appendix 1.

## 5.2 Heat Reducer

Since the air temperature at the compressor output is approximately 250 degrees Fahrenheit, it is necessary to dissipate the heat prior to feeding the compressed air to input of manifold unit. To reduce the compressed air temperature, a unique assembly of 2-inch DIA black steel pipe is installed at the compressor output (Figure 3). The steel pipe assembly is formed in a rectangular shaped loop that reduces the compressed air

temperature to below 140 degrees Fahrenheit (Photo 17). The heat radiating from the pipe is drawn out of the basement by an exhaust fan.

### 5.3 System Pressure Gauge

System air pressure is measured by a pressure gauge installed at the input of the AS manifold unit (Figure 3 and Photo 18). Gast Manufacturing, Inc., Carlstadt, New Jersey, supplies the system pressure gauge. The following is a description of the system pressure gauge:

| | |
|---|---|
| Model Number | AA644B |
| Mounting | ¼-inch NPT Bottom Mount |
| Face | 2-inch Face, 0 to 30 PSI |

The manufacturers information sheet for the flow meter is in Appendix 1.

### 5.4 Pressure Relief Valve

A system pressure relief valve is installed at the input port of the AS manifold (Figure 3 and Photo 18). Gast Manufacturing, Inc., Carlstadt, New Jersey, supplies the system pressure relief valve. This adjustable valve is installed as a safety device and opens when the system pressure exceeds ranges from 2 to 20 PSI. The following is a description of the system pressure relief valve:

| | |
|---|---|
| Model Number | AE 960 |
| Pipe Size | 1-inch NPT |
| Range | 2 to 20 PSI, Adjustable |
| Usage | For flows below 60 CFM |

The manufacturers information sheet for the flow meter is in Appendix 1.

### 5.5 Manifold Flow Control Valves

Each output port of the AS manifold unit is equipped with a flow control valve (Figure 3 and Photo 18). When the AS system is functioning, opening the flow control valve will cause increased air flow and increased pressure in the delivery piping of the associated sparge point. Conversely, closing the flow control valve will decrease air flow and pressure in the delivery piping of the sparge point. The 1-inch DIA brass manifold flow control valves installed in the AS system are manufactured by Mueller Industries, Inc. and have a working pressure use up to 150 PSI. These valves can be replaced with any generic type of the same size and working pressure.

### 5.6 Pressure Bleed Valves

Each output port of the AS manifold is equipped with a pressure bleed valve (Figure 3 and Photo 18). This valve is used to decrease the pressure in the air delivery piping for the associated sparge point. The pressure bleed valves are normally used during the

adjustment of air flow and pressure for each of the two sparge points. The pressure bleed valves are the same type of valves used for the manifold flow control valves described in Section 5.5.

### 5.7 Flow Meters

The air delivery piping of each of the two sparge points is equipped with a flow meter (Figure 3 and Photo 19). The flow meter is used to continually monitor the quantity of air being delivered to the sparge point. Dwyer Instruments, Inc., Michigan City, Indiana, manufactures the flow meter that has a range of 5 to 50 SCFM.

The manufacturers information sheet for the flow meter is in Appendix 1.

### 5.8 Sparge Point Pressure Gauge

A pressure gauge is installed in the piping following the flow meter for each sparge point (Figure 3 and Photo 20). These gauges are used to continuously monitor the pressure in the associated sparge point piping. The pressure gauges are manufactured by Weiss Instruments and have a range of 0 to 60 PSI. The model number of each gauge is 554-25.

### 5.9 Sparge Points

For a description of the air sparge points installed at the Atlas Graphics site see Section 2.0.

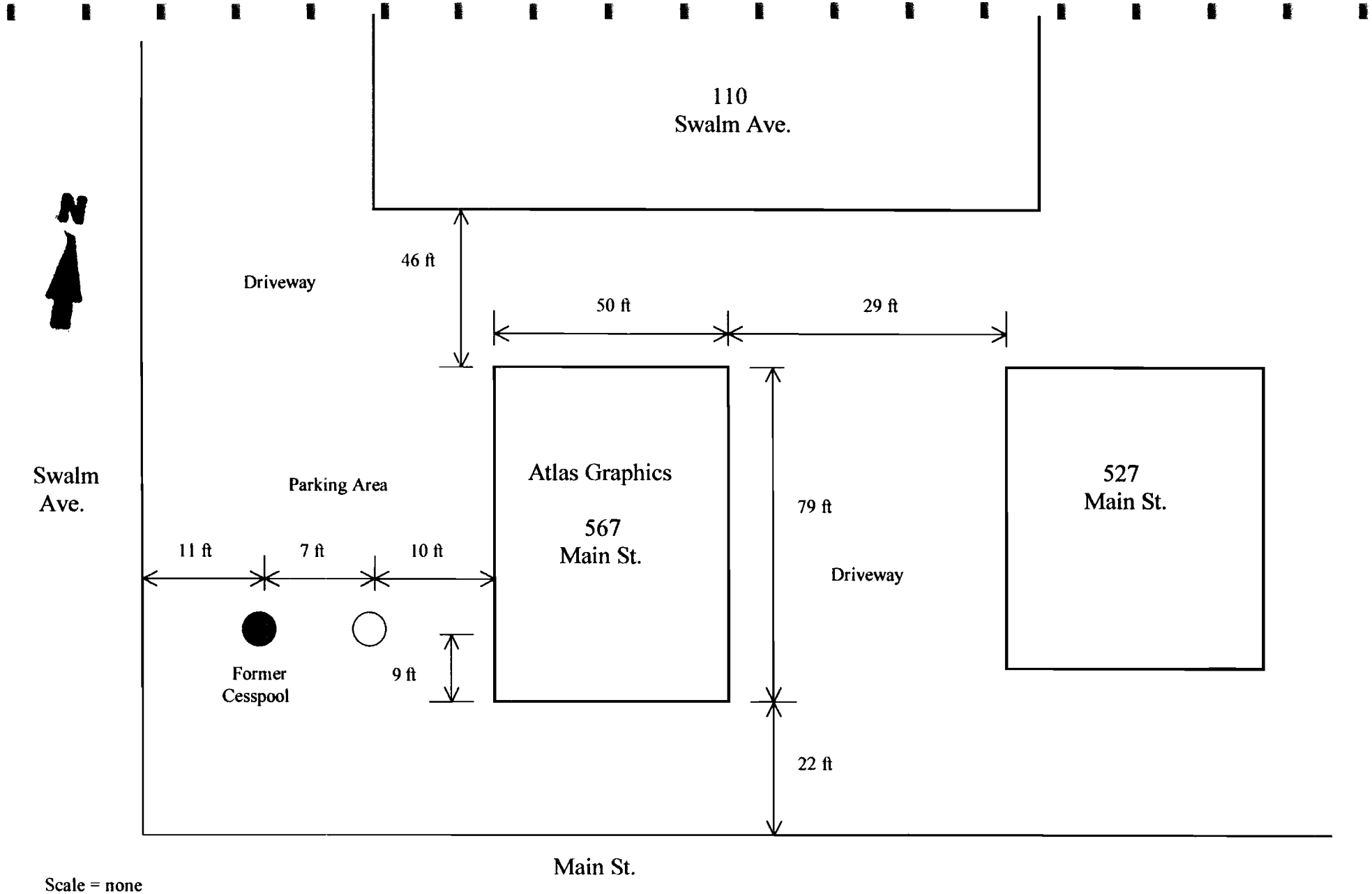
### 5.10 Starter for Air Sparge Compressor Motor

The magnetic starter switch for the air sparge motor is installed on the west wall of the basement (Photo 21). The switch is equipped with a power ON push button, a power OFF push button, and a RESET push button. Cutler-Hammer, Milwaukee, Wisconsin, manufactures the switch.

### 5.11 Operational Parameters

The initial settings of the ball valves controlling AS air flow to the sparge points resulted in the following system operational parameters:

| Monitored Item | Pressure (psi) | Flow (SCFM) |
|---|---|---|
| ASL (94-96 ft bgs) | 19 | 3 |
| ASH (70-72 ft bgs) | 12 | 28 |
| System Pressure | 20 | -- |




Scale = none
Dimensions = approximate

**Atlas Graphics Site**
**Westbury, New York**

**Figure 1**

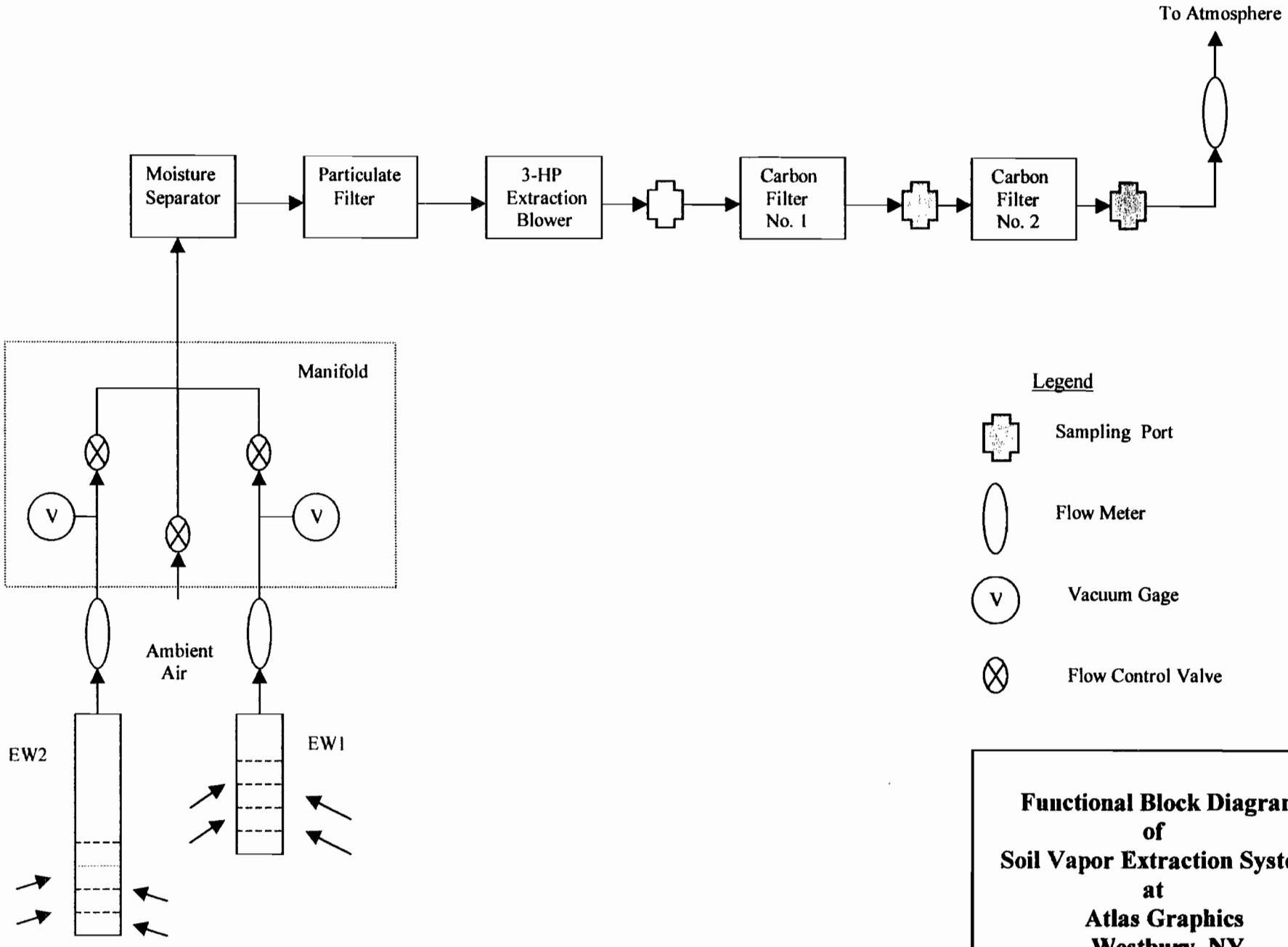



**Figure 2**

**Functional Block Diagram**
**of**
**Soil Vapor Extraction System**
**at**
**Atlas Graphics**
**Westbury, NY**

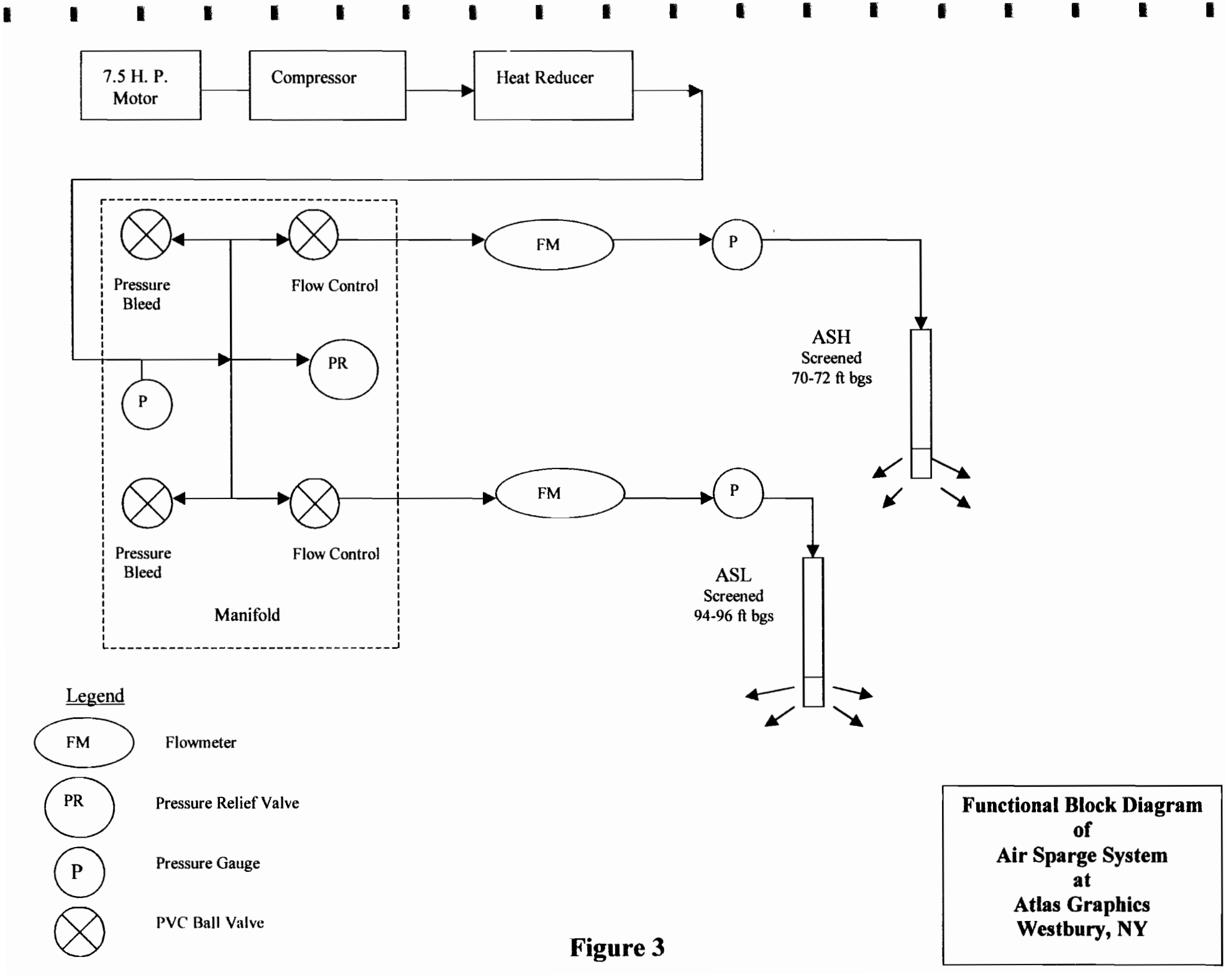
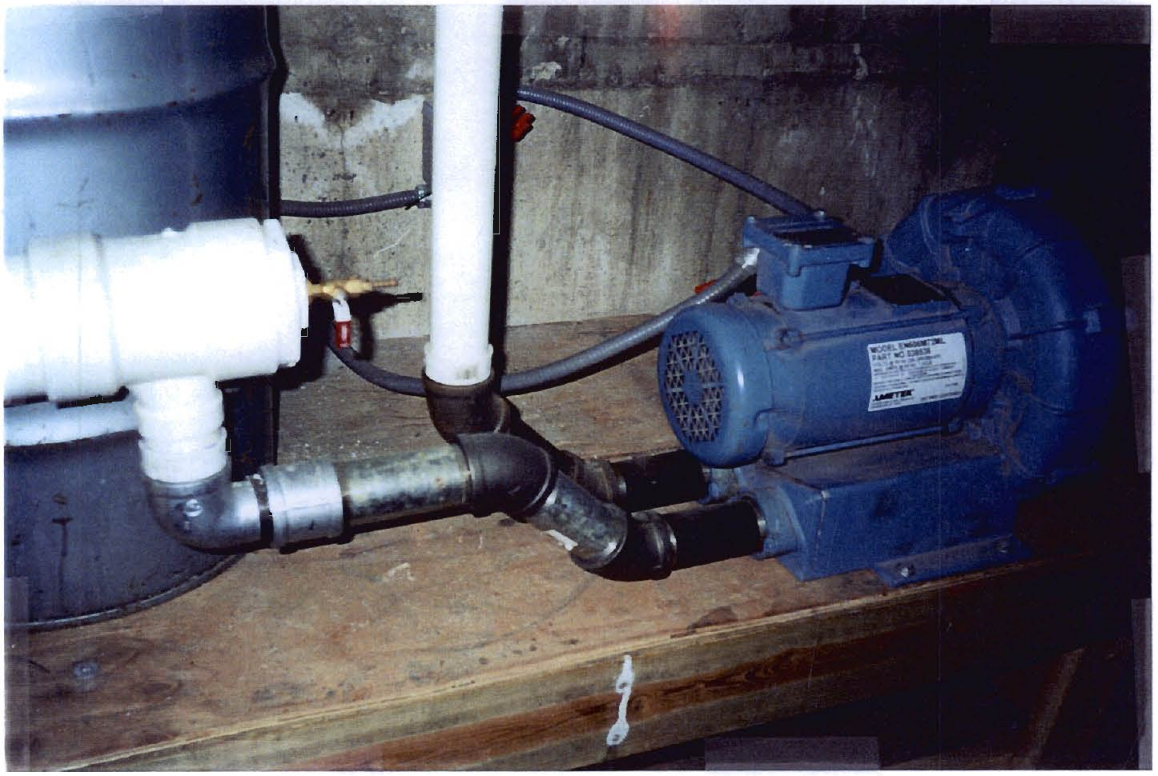



**Figure 3**

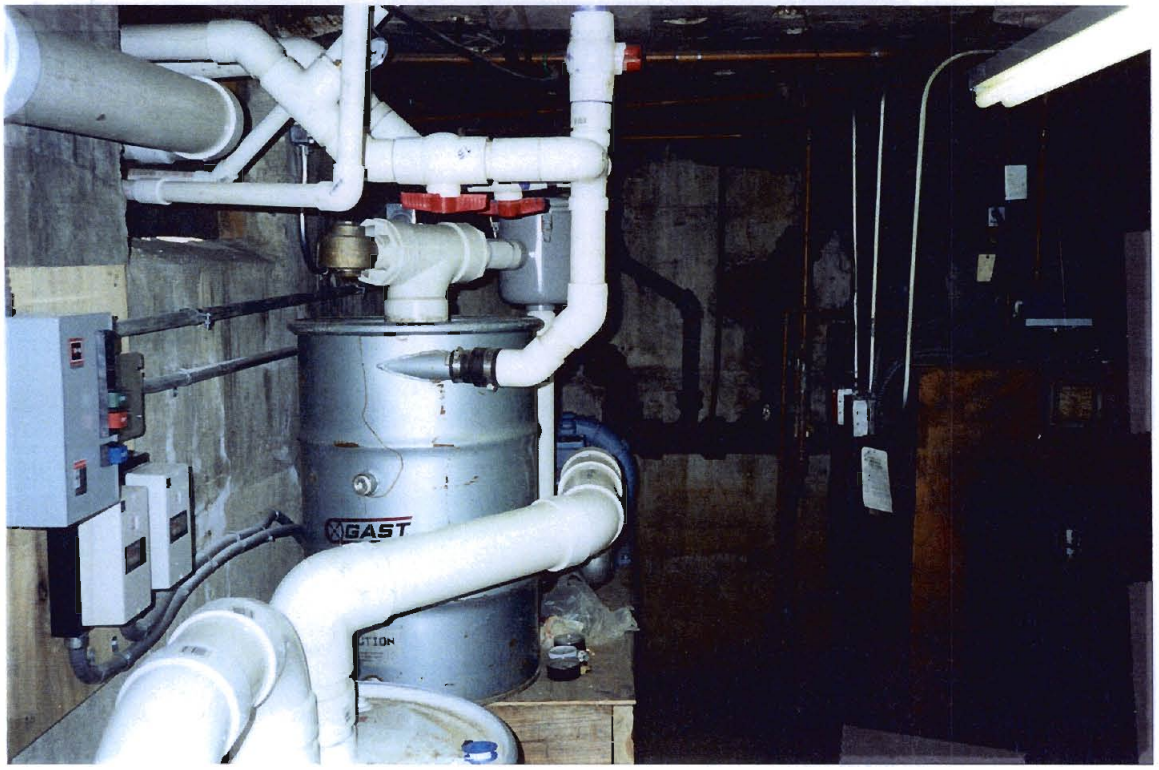
**Functional Block Diagram**
**of**
**Air Sparge System**
**at**
**Atlas Graphics**
**Westbury, NY**

1. Manway providing access to tops of extraction wells and sparge points

2. Metal doors providing access to Atlas Graphics basement



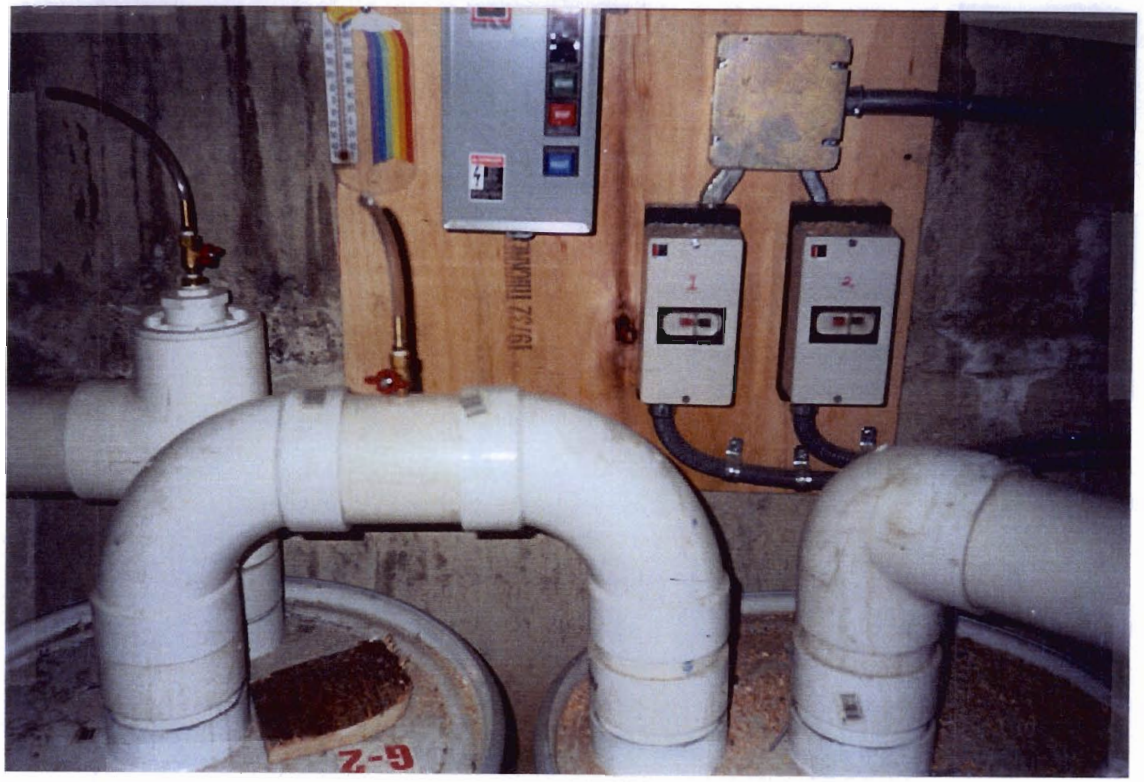
3. SVES blower input and output ports and output sampling point



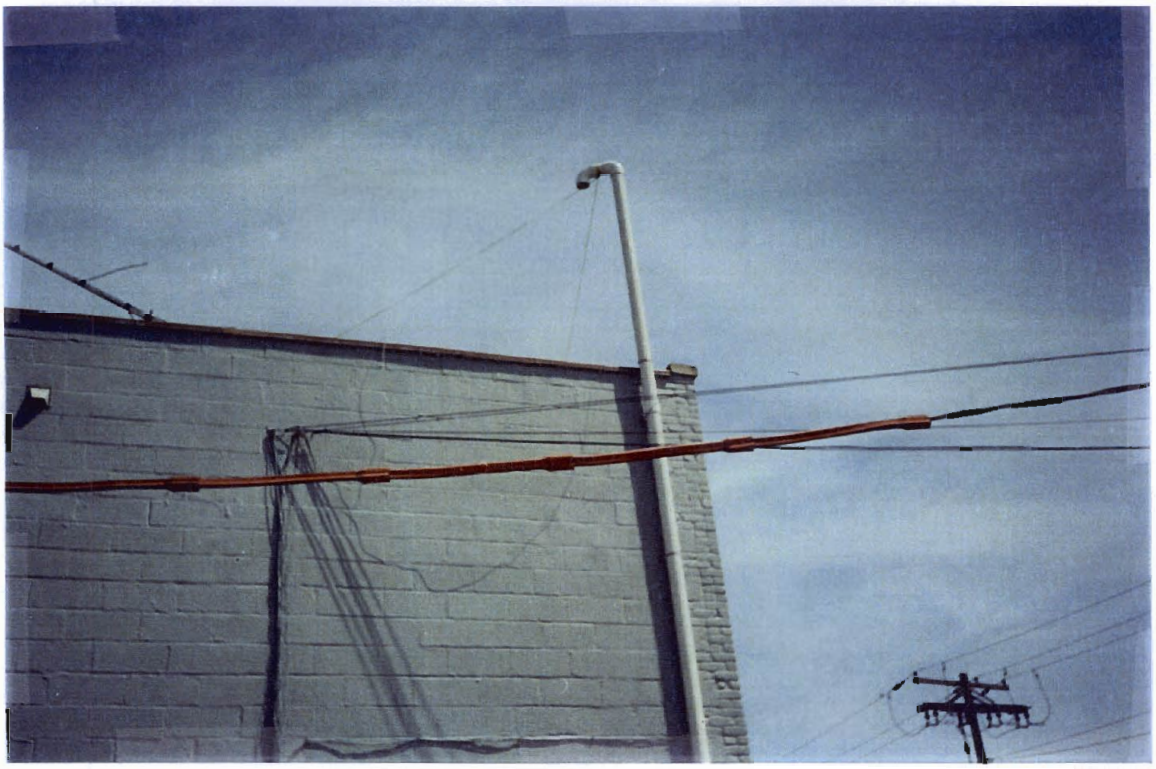

4. SVES moisture separator and system piping – view is looking north

5. Piping from SVES moisture separator feeding the particulate filter


6. SVES air purification canisters in the basement of Atlas Graphics site



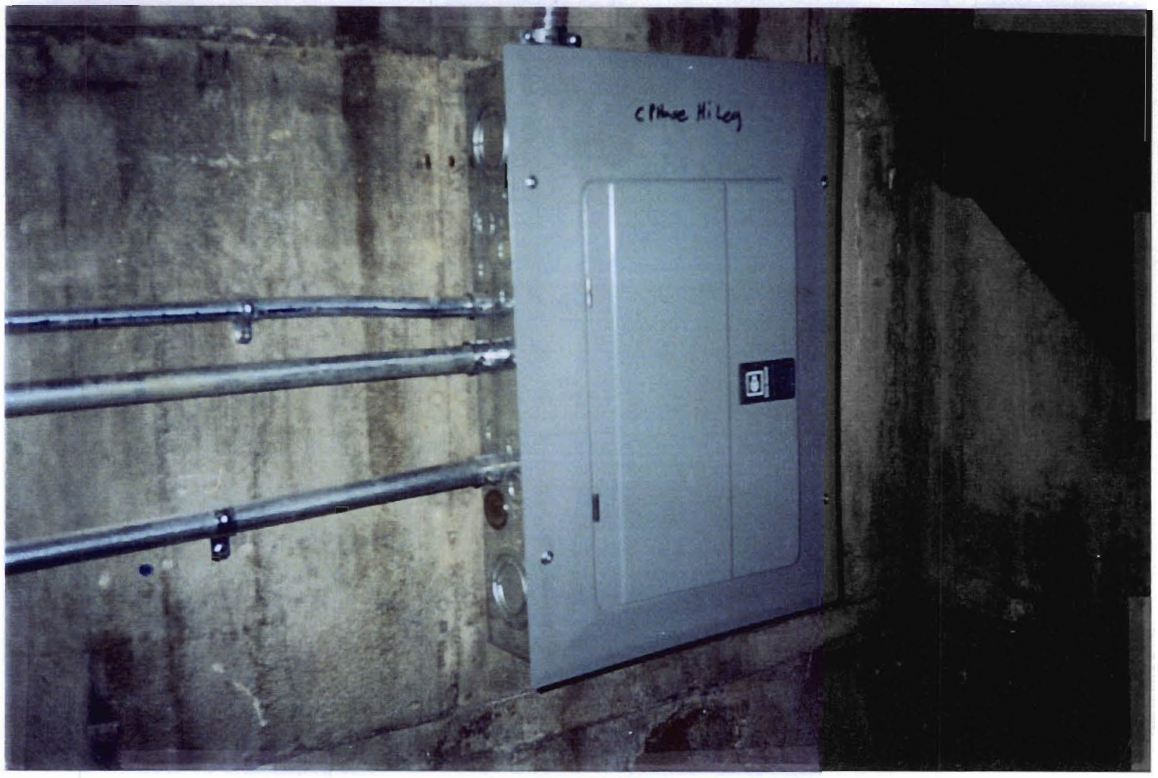

7. Connecting piping for SVES air purification canisters and sampling points



8. SVES exhaust stack at southwest corner of Atlas Graphics building

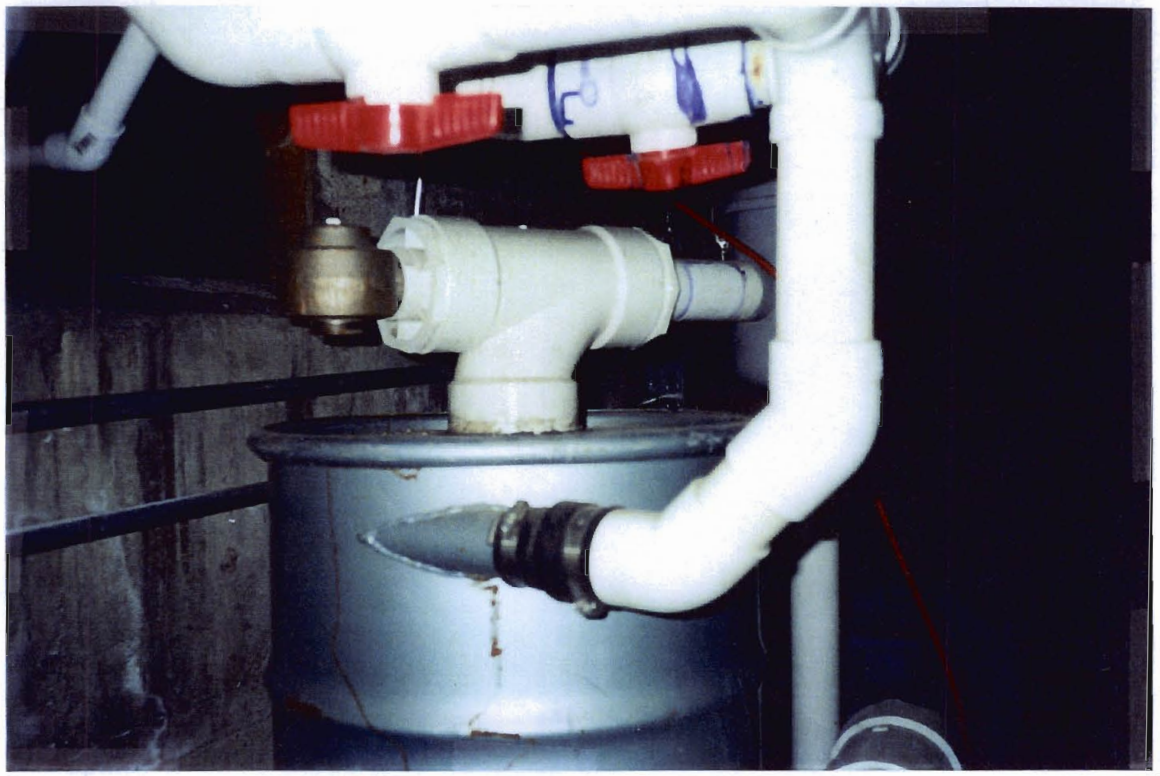
9. SVES extraction well flow meters inside manway at west parking area of site

10. Covered manway containing flow meters near southwest corner of site building



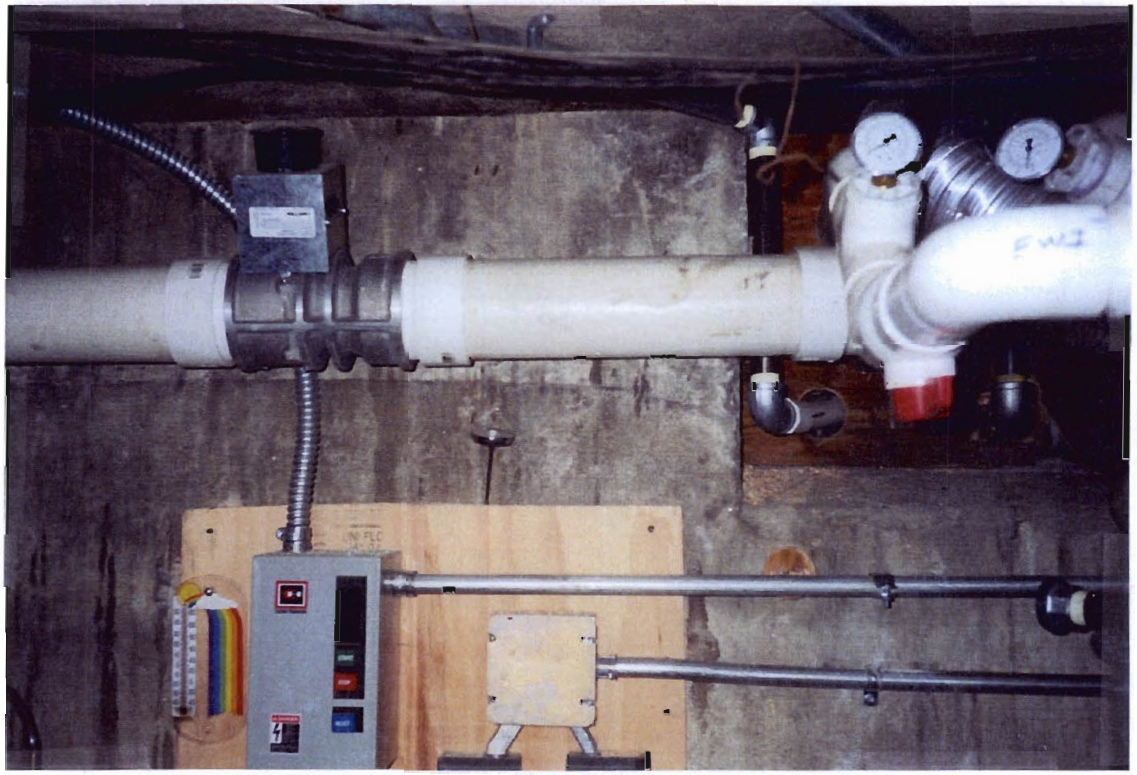
11. Electrical service panel for SVE and AS systems at the northwest corner of basement

12. SVES manifold with flow control valves and vacuum gauges

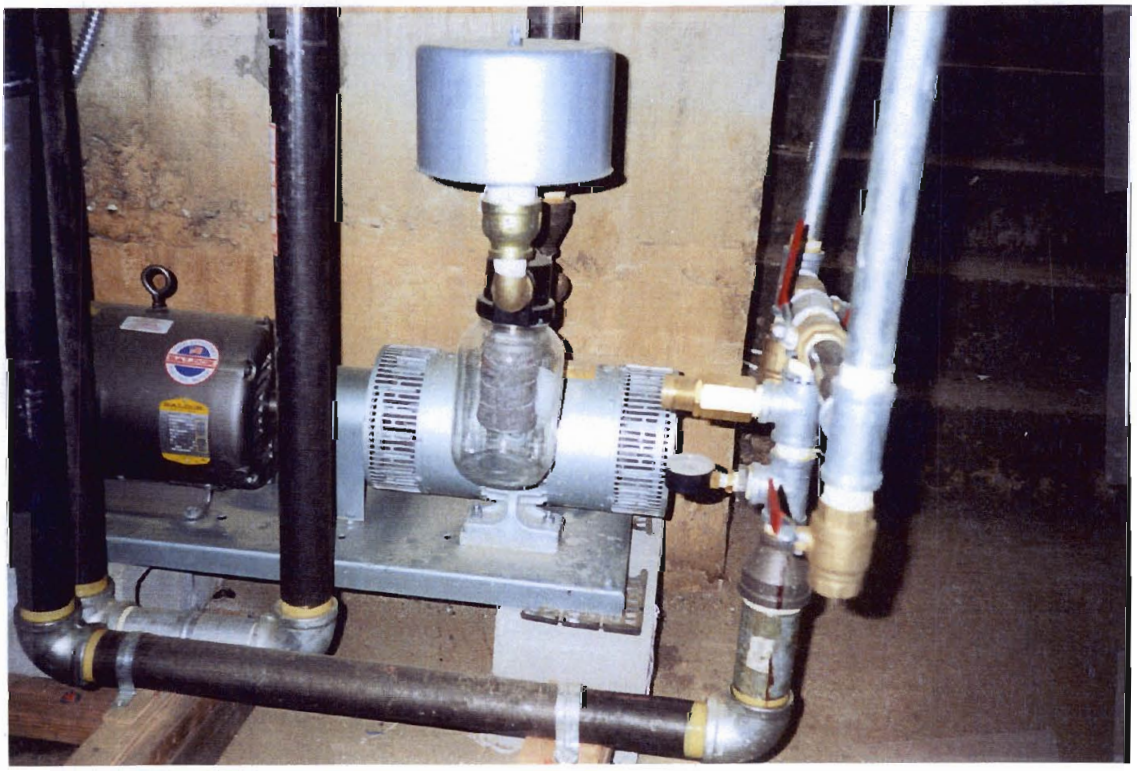


13. Input to SVES moisture separator from manifold and output to particulate filter

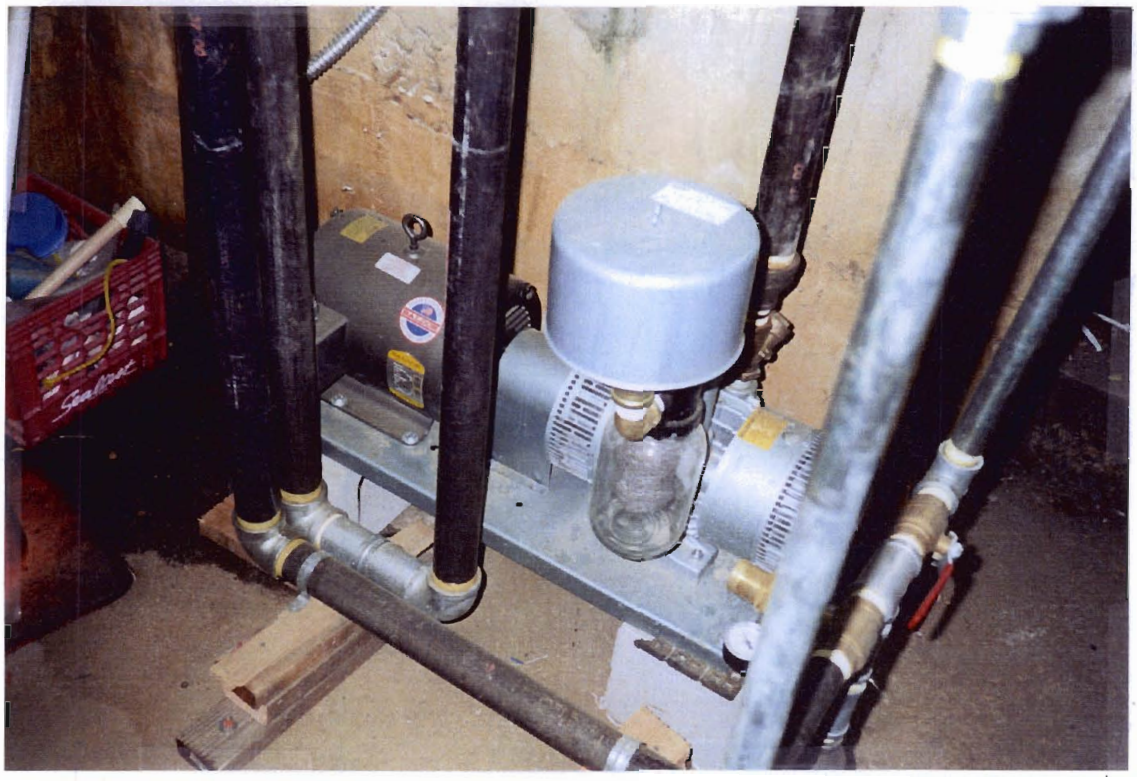
14. Storage drums in site basement for liquid collected from SVES moisture separator



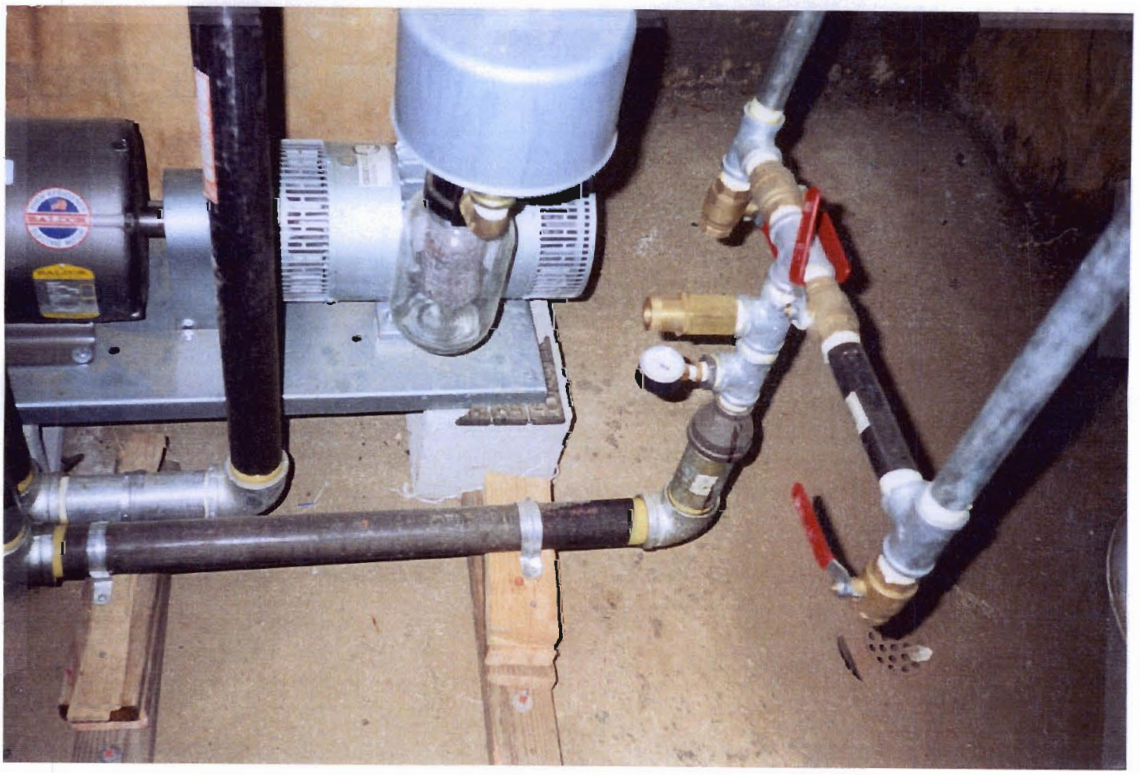
15. Flow meter in SVES stack exhaust line; AS motor starter is below exhaust line



16. AS motor and compressor with heat reducer piping and manifold in foreground

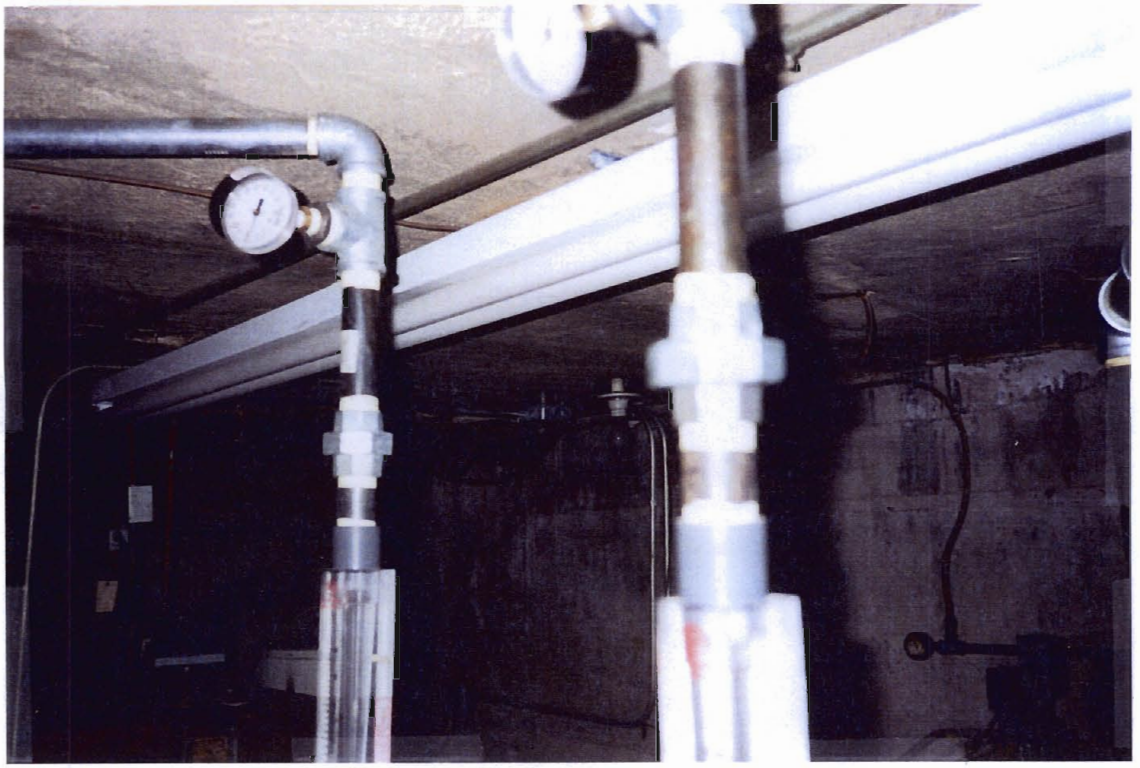


17. Heat reducer steel piping connected to AS compressor

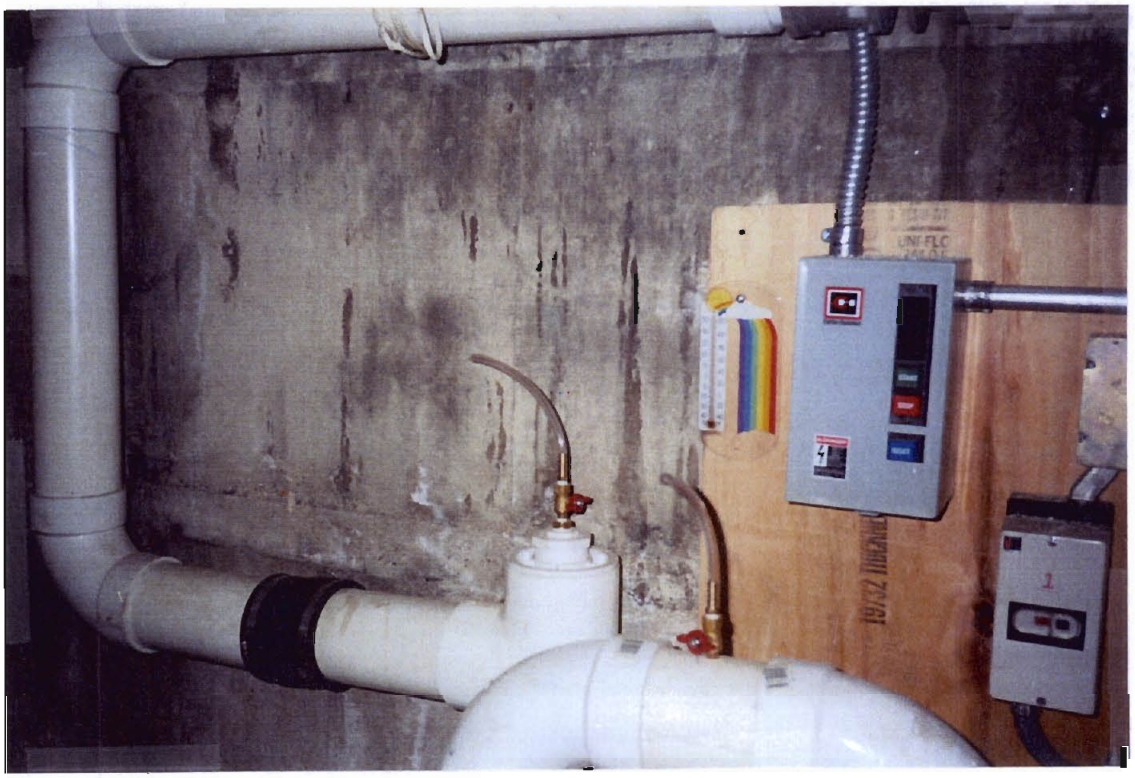


18. AS heat reducer steel piping connected to manifold

19. AS flow meters for high and low sparge points



20. AS flow meters connected to high and low sparge point pressure gauges



21. SVES sampling points and AS starter switch; smaller switch is for system expansion

# Measurement Accessories

| Blower Connection Key |
|---|
| NPT – American National Standard Taper Pipe Thread (Male) |
| NPSC – American National Standard Straight Pipe Thread for Coupling (Female) |
| SO – Slip On (Smooth – No Threads) |

## Air Flow Meter

### FEATURES

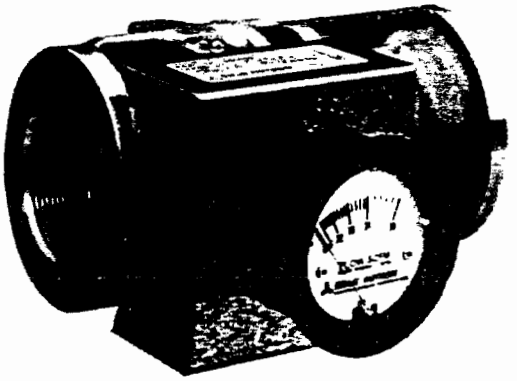
- Direct reading in SCFM
- Low pressure drop (2-4" typical) across the flow meter
- Non-clogging, low impedance air stream
- Light weight aluminum
- No moving parts
- Large easy-to-read dial
- Accurate within 2% at standard conditions
- Good repeatability
- Available in 2", 3" and 4" sizes
- Factory configured for quick installation
- .048" Allen key supplied for gauge adjustment

### OPTIONS

- For 4-20 mA outputs and digital readouts see page G-9
- High temperature version (above 140°F)
- Corrosion-resistant version with Chem-Tough™ or in stainless steel
- FDA-approved Food Tough™ surface conversion
- High pressure version (100 PSI)

### BENEFITS

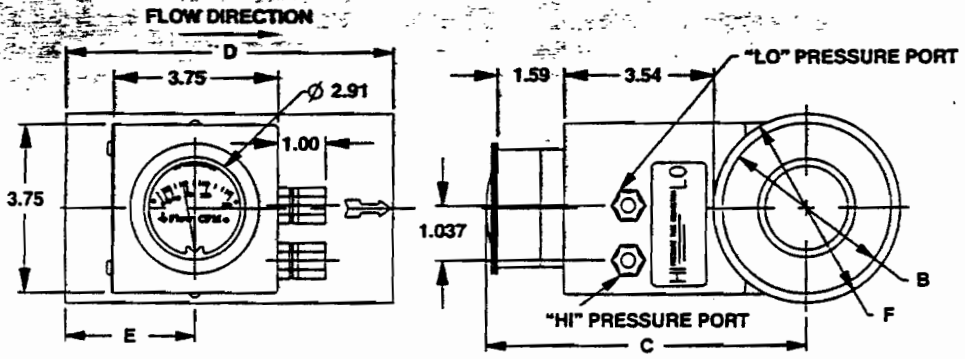
- OPTIMIZE SYSTEM EFFICIENCY
  Measuring the correct air flow can assist you in fine-tuning to your system's optimal efficiency.
- BALANCE MULTI-PIPING SYSTEMS
  When evacuating CFM from more than one pipe, different run lengths or end system impedance can cause one pipe to handle more CFM than the other. With an accurate CFM reading, piping can be balanced by bleeding air in/out or by creating an extra impedance.
- DETECT CHANNELING OR PLUGGING
  For systems in which channeling or plugging can occur, a change in the CFM measured can help indicate the unseen changes in your system.



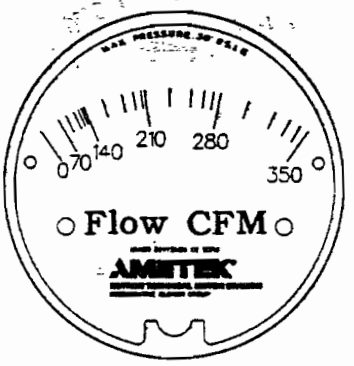
| Current Models | | Flow Range | B | C | D | E | F | Replaces | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Part # | (SCFM) | Threads | Length | Width | | | Model | Part # |
| FM20C030Q | 550599 | 6-30 | 2" - 11.5 NPSC | 7.18" | 7.0" | 2.0" | 3.75" | FM20A030Q | 550312 |
| FM20C045Q | 550600 | 9-45 | | | | | | FM20A045Q | 550313 |
| FM20C065Q | 550601 | 13-65 | | | | | | FM20A065Q | 550314 |
| FM20C125Q | 550602 | 25-125 | | | 5.6" | | | FM20A125Q | 550256 |
| FM20C175Q | 550603 | 35-175 | | | | | | FM20A175Q | 550255 |
| FM20C225Q | 550604 | 45-225 | | | | | | FM20A225Q | 550254 |
| FM30C250Q | 550605 | 50-250 | 3" - 8 NPSC | 7.52" | 7.4" | 2.5" | 4.43" | FM30A250Q | 550259 |
| FM30C350Q | 550606 | 70-350 | | | | | | FM30A350Q | 550258 |
| FM30C475Q | 550607 | 95-475 | | | | | | FM30A475Q | 550257 |
| FM40C450Q | 550608 | 90-450 | 4" - 8 NPSC | 8.00" | 7.7" | 2.7" | 5.43" | FM40A450Q | 550262 |
| FM40C600Q | 550609 | 120-600 | | | | | | FM40A600Q | 550261 |
| FM40C850Q | 550610 | 170-850 | | | | | | FM40A850Q | 550 |

| Blower Model Reference Key | |
|---|---|
| A = SPIRAL | E = DR/EN/CP 606, S543, 6, 623, S7, S75 |
| B = DR/EN/CP 068, 083, 101, 202 | F = DR/EN/CP 707, 808, S85, 858, S9, P9 (Inlet Only) |
| C = DR/EN/CP 303, 312, 313, 353 | G = DR/EN/CP 823, S13, P13 (Inlet Only) |
| D = DR/EN/CP 404, 454, 513, 505, 555, 523 | H = DR/EN/CP 909, 1223, 14, S15, P15 (Inlet Only) |

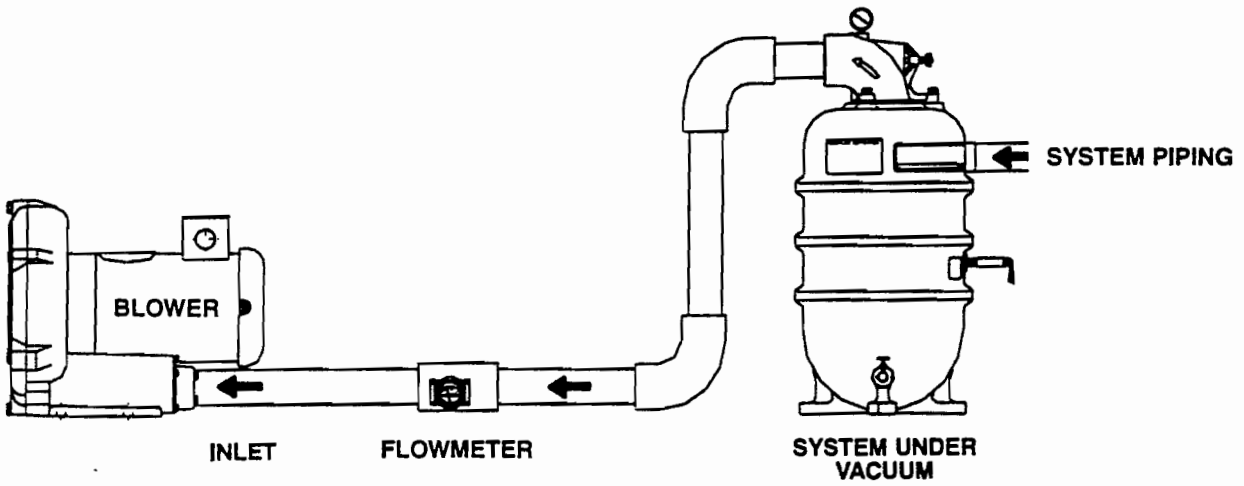
## TYPICAL FLOW METER ARRANGEMENT




ANALOG FLOW METER




TYPICAL GAUGE FACE




## HIGH TEMPERATURE/PRESSURE CORRECTION

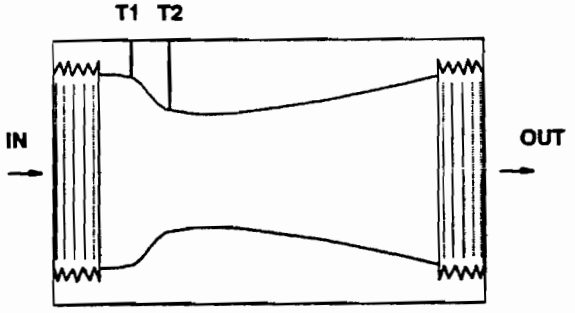
$$SCFM_2 = \frac{SCFM_1}{\sqrt{\left(\frac{14.7}{Pf_2}\right) \times \left(\frac{530}{Tf_2 + 460}\right)}}$$

$Pf_2$ = Absolute Pressure in PSIA

$Tf_2$ = Temperature in °F

- Use on inlet to limit need to correct for high pressure or elevated outlet temperature
- Standard model limits = 140°F and 30 PSIG

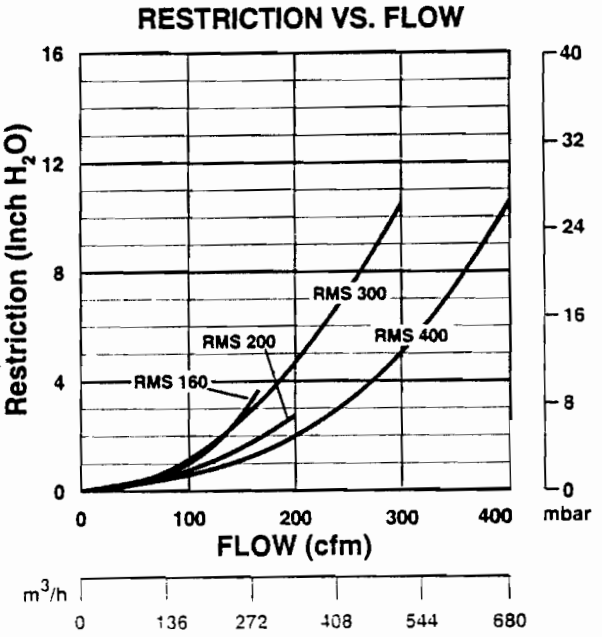
## HOW IT WORKS




Rotron's flow meter is a venturi style design. After air enters the inlet, the pressure is measured in the T1 tap. The second tap, T2, measures the pressure at the throat. The differential between T1 and T2 registers across a special calibrated CFM gauge to provide accurate readings. The throat is then expanded back to the original size to keep pressure loss to under 2-4 IWG.

The separator removes liquids from the gas stream in a soil vapor extraction process, to help protect both blower and vapor treatment system from corrosion and mineral deposit buildup. The separator is located between the extraction wells and the blower. An in-line filter is installed between separator and blower.

*Cut away to show ball float. Above model shows optional explosion proof float switch*

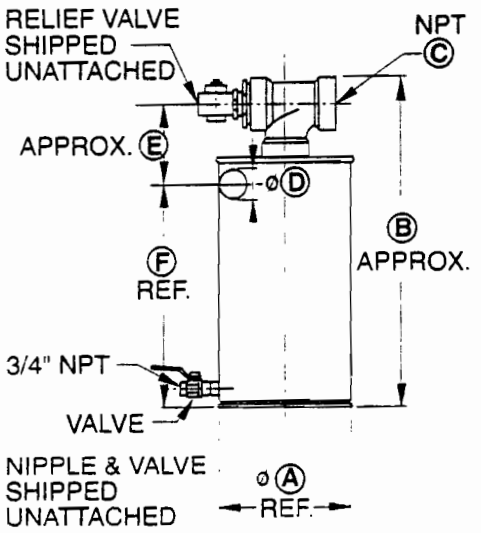



## Regenair® Liquid Separator Specifications

**Practical Design Engineered** to remove and contain moisture ranging from a fine mist to slugs of water from blower inlet air streams, Gast separators incorporate a cyclonic action which results in a very high degree of efficiency.
A floating ball valve which closes when the liquid level becomes too high prevents collected liquid from overflowing back into the air stream. When the float valve closes an integral vacuum relief valve opens, admitting air to cool the blower and prevent overheating.

**Rugged Construction** Gast separator drums are made from ribbed heavy gauge cold-rolled steel, with heavy steel inlet, drain and float switch ports welded to the drum wall. Drum interiors are epoxy coated to resist abrasion, corrosion and chemicals, while the drum exterior is coated with durable urethane. For ease of connection, the outlet port is female pipe threaded. The heavy-duty 304 stainless steel ball float resists chemicals.

Included is a pilot operated precision relief valve capable of functioning over a wide duty range. This vacuum relief valve is designed and built to proven reliability and durability standards. Moving parts are nickelplated for corrosion resistance and smooth operation.



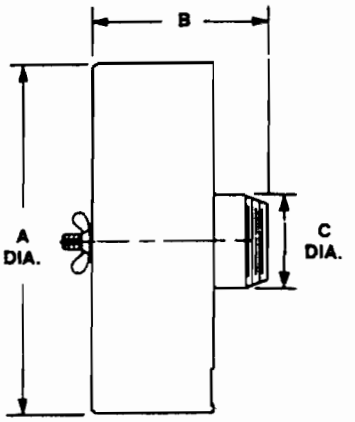

| Part No. | Liq. Cap. (gal.) | A(dia.) | Dim. B | C(NPT) | D(dia.) | Dim. E | Dim. F |
|---|---|---|---|---|---|---|---|
| RMS160 | 10 | 14.8" | 37.5" | 2" | 2" | 7.5" | 26.6" |
| RMS200 | 19 | 19.7" | 35" | 2" | 2" | 7.5" | 26.6" |
| RMS300 | 19 | 19.7" | 35" | 2.5" | 2.5" | 7.5" | 26.6" |
| RMS400 | 40 | 24" | 44" | 3" | 3" | 9.7" | 29" |

# Filtration Accessories

| Blower Connection Key |
|---|
| NPT – American National Standard Taper Pipe Thread (Male) |
| NPSC – American National Standard Straight Pipe Thread for Coupling (Female) |
| SO – Slip On (Smooth – No Threads) |

## Inlet Filter (Single Connection)

Inlet Filters protect the blower and the air distribution system from dust, and other airborne particles and contaminants. Normally used in pressure systems.



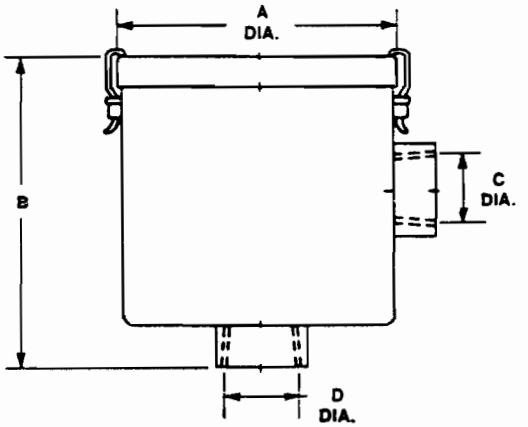

### SPECIFICATIONS:

HOUSING – Steel
MEDIA – Polyester
EFFICIENCY – 97-98% (8 to 10 micron particle size)
FILTER ELEMENT – Replaceable (see filter elements)
NOTE: "Z" MEDIA (1 to 3 micron particle size) available

| Standard Media Part Number | Z Media Filter Part Number | Reference Blower Model | Connection Inlet | Dimensions (Inches) A | B | C | Filter Element |
|---|---|---|---|---|---|---|---|
| 477411 | | A | 2.00 SO | 4.56 | 7.00 | 2.00 | 271078 |
| 516466 | 517865 | B | 1.00 NPT | 6.00 | 6.50 | 1.00 | 515132 |
| 515122 | 517866 | C,D | 1.50 NPT | 6.00 | 6.50 | 1.50 | 515132 |
| 515123 | 517867 | E | 2.00 NPT | 7.75 | 7.25 | 2.00 | 515133 |
| 515124 | 517868 | E | 2.00 NPT | 10.00 | 12.25 | 2.00 | 515134 |
| 515125 | 517869 | F | 2.50 NPT | 10.00 | 12.50 | 2.50 | 515134 |
| 515145 | 517870 | G | 3.00 NPT | 10.00 | 13.00 | 3.00 | 515134 |
| 515151 | 517871 | H | 4.00 NPT | 10.00 | 14.00 | 4.00 | 515135 |
| 516511 | 517872 | H | 6.00 NPT | 16.00 | 15.00 | 6.00 | 516515 |

## Inline Filter (Dual Connection)

Inline Filters protect the blower from harmful dust and other particles that may be drawn into the blower through the air distribution system. Normally used in vacuum systems.




### SPECIFICATIONS:

HOUSING – Steel
MEDIA – Polyester
EFFICIENCY – 97-98% (8 to 10 micron particle size)
FILTER ELEMENT – Replaceable (see filter elements)
NOTE: "Z" MEDIA (1 to 3 micron particle size) available

| Standard Media Part Number | Z Media Filter Part Number | Reference Blower Model | Connection Inlet | Connection Outlet | Dimensions (Inches) A | B | C | D | Filter Element |
|---|---|---|---|---|---|---|---|---|---|
| 271200 | | A | 1.75 SO | 2.00 SO | 5.25 | 8.31 | 2.00 | 1.75 | 271078 |
| 516461 | 517886 | B | 1.00 NPSC-F | 1.00 NPSC-F | 7.25 | 6.50 | 1.00 | 1.00 | 516434 |
| 515254 | 517887 | C,D | 1.50 NPSC-F | 1.50 NPSC-F | 7.00 | 6.50 | 1.50 | 1.50 | 516434 |
| 515255 | 517888 | E | 2.00 NPSC-F | 2.00 NPSC-F | 8.00 | 10.25 | 2.00 | 2.00 | 516435 |
| 515256 | 517889 | F | 2.50 NPSC-F | 2.50 NPSC | 8.00 | 10.25 | 2.50 | 2.50 | 516435 |
| 516463* | 517890 | G | 3.00 NPT-M | 3.00 NTP-M | 14.00 | 26.50 | 3.00 | 3.00 | 515135 |
| 516465* | 517891 | H | 4.00 NPT-M | 4.00 NPT-M | 14.00 | 27.00 | 4.00 | 4.00 | 515135 |
| 517611* | 517892 | H | 6.00 NPT-M | 6.00 NPT-M | 18.00 | 28.00 | 6.00 | 6.00 | 516515 |

* Feature 1/4" threaded tap for gauge connection on inlet and outlet

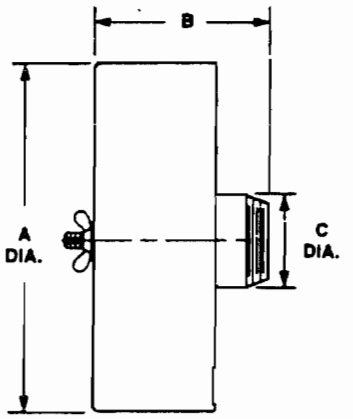
| Blower Model Reference Key | |
|---|---|
| A = SPIRAL | E = DR/EN/CP 606, S543, 6, 623, S7, S75 |
| B = DR/EN/CP 068, 083, 101, 202 | F = DR/EN/CP 707, 808, S85, 858, S9, P9 (Inlet Only) |
| C = DR/EN/CP 303, 312, 313, 353 | G = DR/EN/CP 823, S13, P13 (Inlet Only) |
| D = DR/EN/CP 404, 454, 513, 505, 555, 523 | H = DR/EN/CP 909, 1223, 14, S15, P15 (Inlet Only) |

# Filtration Accessories

## Filter Silencers (Single Connection)

* For Supplemental silencing only. (Used to augment existing muffling systems.)

Filter/Silencers reduce noise levels while ensuring clean air is provided to the blower and the air distribution system. Normally used in pressure applications.



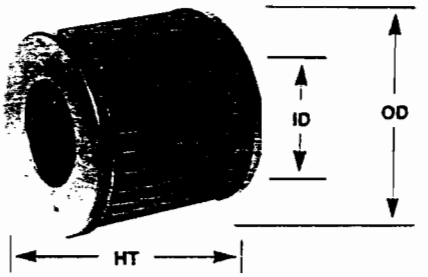

### SPECIFICATIONS:

HOUSING – Steel
MEDIA – Polyester
EFFICIENCY – 97-98% (8 to 10 micron particle size)
FILTER ELEMENT – Replaceable (see filter elements)

| Standard Media Part Number | Z Media Filter Part Number | Reference Blower Model | Connection Inlet | Dimensions (Inches) A | B | C | Filter Element |
|---|---|---|---|---|---|---|---|
| 516487 | 517878 | B | 1.00 NPT | 6.00 | 6.50 | 1.00 | 515132 |
| 516489 | 517879 | C,D | 1.50 NPT | 6.00 | 6.50 | 1.50 | 515132 |
| 516491 | 517880 | E | 2.00 NPT | 10.00 | 7.25 | 2.00 | 515133 |
| 516493 | 517881 | E | 2.00 NPT | 10.00 | 12.25 | 2.00 | 515134 |
| 516495 | 517882 | F | 2.50 NPT | 10.00 | 12.50 | 2.50 | 515134 |
| 516497 | 517883 | G | 3.00 NPT | 10.00 | 12.50 | 3.00 | 515134 |
| 516499 | 517884 | H | 4.00 NPT | 16.00 | 14.00 | 4.00 | 515135 |
| 516513 | 517885 | H | 6.00 NPT | 16.00 | 15.00 | 6.00 | 516515 |

## Filter Element

All Rotron Air Filters and Filter/Silencers have replaceable filter elements. The filter media is polyester designed for high efficiency over a wide spectrum of industrial applications. See filter element cross reference table.



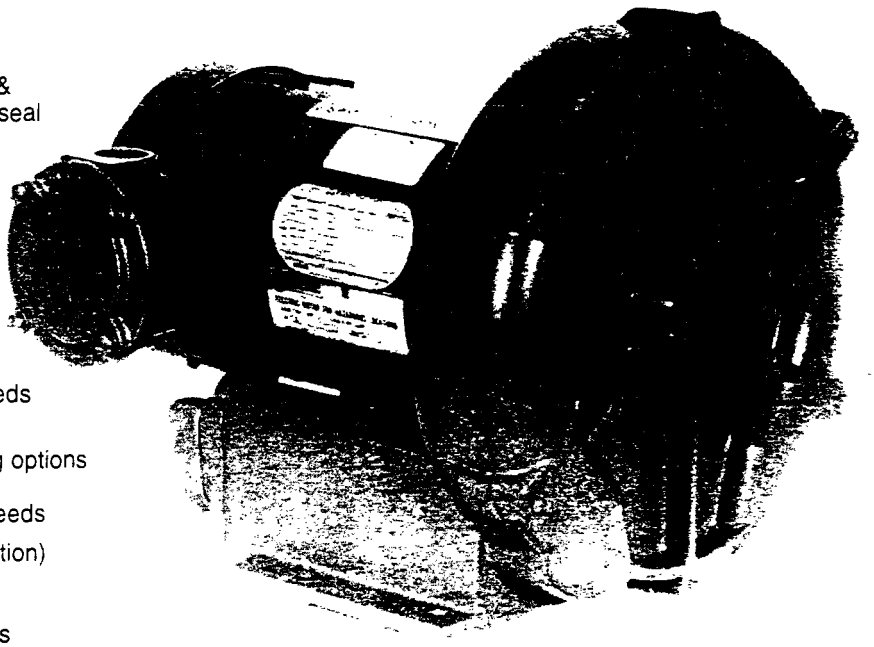

FOR DR BLOWER MODELS

| Standard Replacement Filter Element Cross Reference Table | | | | | |
|---|---|---|---|---|---|
| 271200 | 271078 | 515158 | 515134 | 516489 | 515132 |
| 477411 | 271078 | 515254 | 516434 | 516491 | 515133 |
| 515122 | 515132 | 515255 | 516435 | 516493 | 515134 |
| 515123 | 515133 | 515256 | 516435 | 516495 | 515134 |
| 515124 | 515134 | 516461 | 516434 | 516497 | 515134 |
| 515125 | 515134 | 516463 | 515135 | 516499 | 515135 |
| 515145 | 515134 | 516465 | 515135 | 516511 | 516515 |
| 515151 | 515135 | 516466 | 515132 | 516513 | 516515 |
| 515157 | 515133 | 516487 | 515133 | 517611 | 516515 |

| Standard Media Part Number | Z Media Filter Part Number | ID (Inches) | OD (Inches) | HT (Inches) | Area (Sq/Ft) |
|---|---|---|---|---|---|
| 515132 | 517873 | 3.00 | 4.38 | 4.75 | 1.5 |
| 515133 | 517874 | 3.63 | 5.88 | 4.75 | 2.3 |
| 515134 | 517875 | 4.63 | 5.88 | 9.50 | 4.5 |
| 515135 | 517876 | 4.75 | 7.88 | 9.63 | 8.3 |
| 516434 | 517893 | 2.56 | 5.00 | 4.75 | 2.0 |
| 516435 | 517894 | 3.50 | 5.88 | 8.75 | 4.5 |
| 516515 | 517877 | 8.00 | 11.75 | 9.63 | 19.0 |

# EN 606 & CP 606
# Explosion-Proof Regenerative Blower

## FEATURES
- Manufactured in the USA – ISO 9001 compliant
- Maximum flow: 200 SCFM
- Maximum pressure: 75 IWG
- Maximum vacuum: 75 IWG
- Standard motor: 3.0 HP, explosion-proof
- Cast aluminum blower housing, cover, impeller & manifold; cast iron flanges (threaded); teflon lip seal
- UL & CSA approved motor with permanently sealed ball bearings for explosive gas atmospheres Class I Group D minimum
- Sealed blower assembly
- Quiet operation within OSHA standards

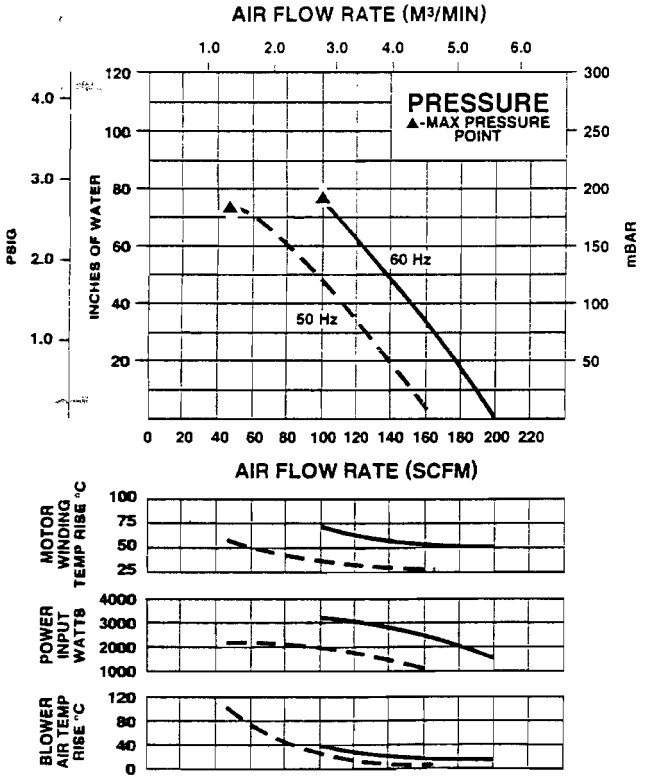


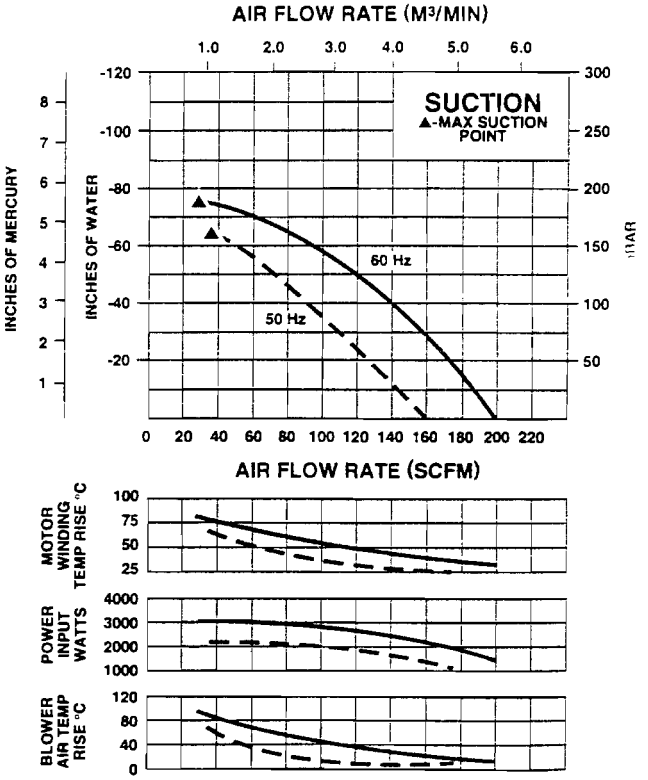
## MOTOR OPTIONS
- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

## BLOWER OPTIONS
- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

## ACCESSORIES (See Catalog Accessory Section)
- Flowmeters reading in SCFM
- Filters & moisture separators
  Pressure gauges, vacuum gauges & relief valves
  Switches – air flow, pressure, vacuum or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package

## BLOWER PERFORMANCE AT STANDARD CONDITIONS



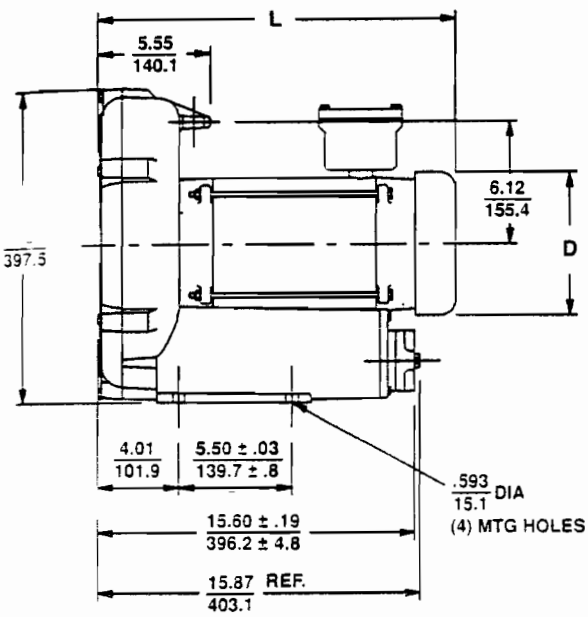



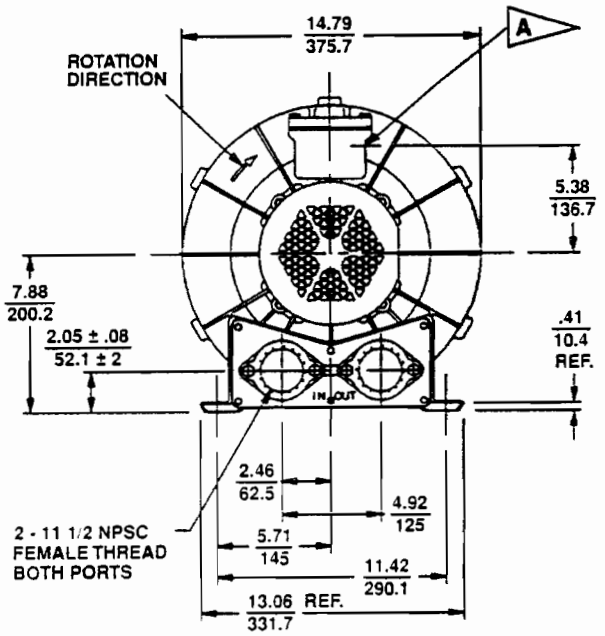


AMETEK ROTRON TMD, SAUGERTIES, NY 12477 • e mail: info@ametek.com • internet: www.rotrontmd.com

# EN 606 & CP 606
# Explosion-Proof Regenerative Blower

Scale CAD drawing available upon request.




| DIMENSIONS: IN / MM |
|---|
| TOLERANCES: .XX ± .1 / 2.5 |
| (UNLESS OTHERWISE NOTED) |

| MODEL | L (IN) ± .3 | L (MM) ± 8 | D (IN) ± .1 | D(MM) ±3 |
|---|---|---|---|---|
| EN/CP606M72ML | 17.89 | 454 | 7.2 | 182 |
| EN/CP606M5ML | 19.9 | 505 | 8.5 | 216 |

A — 0.75" NPT CONDUIT CONNECTION

## SPECIFICATIONS

| MODEL | EN606M5ML | EN606M72ML | | EN606M86ML | CP606FU5MLR | CP606FU72MLR |
|---|---|---|---|---|---|---|
| Part No. | 038538 | 038536 | | 038437 | – | 038972 |
| Motor Enclosure – Shaft Material | Explosion-proof – **CS** | Explosion-proof – **CS** | | Explosion-proof – **CS** | Chem XP – **SS** | Chem XP – **SS** |
| Horsepower | 3.0 | 3.0 | | 3.0 | Same as EN606M5ML – 038538 except add Chemical Processing (CP) features from catalog inside front cover | Same as EN606M72ML – 038536 except add Chemical Processing (CP) features from catalog inside front cover |
| Phase – Frequency [1] | Single - 60 Hz | Three - 60 Hz | | Three - 60 Hz | | |
| Voltage [1] | 208-230 | 208-230 | 460 | 575 | | |
| Motor Nameplate Amps | 15.5-14.5 | 7.8-7.4 | 3.7 | 3.0 | | |
| Blower Amps [3] | 19 | 7.6 | 3.8 | 3.1 | | |
| Inrush Amps | 94-88 | 60-54 | 27 | 26 | | |
| Starter Size | 1 | 0 | 0 | 0 | | |
| Service Factor | 1.0 | 1.0 | | 1.0 | | |
| Thermal Protection [2] | Class B - Pilot Duty | Class B - Pilot Duty | | Class B - Pilot Duty | | |
| XP Motor Class – Group | I-D, II-F&G | I-D, II-F&G | | I-D, II-F&G | | |
| Shipping Weight | 130 lb (59 kg) | 106 lb (48 kg) | | 106 lb (48 kg) | | |

[1] Rotron motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

[2] Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated motors or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature). Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet or ambient temperatures above 40°C.

[3] Maximum blower amps corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and/or ambient temperature reaches the maximum operating temperature.

**Specifications subject to change without notice. Please consult your Local Field Sales Engineer for specification updates.**

# CARBTROL®

# AIR PURIFICATION CANISTERS 140-200 LB. ACTIVATED CARBON

**G-1**
**G-2**
**G-3**

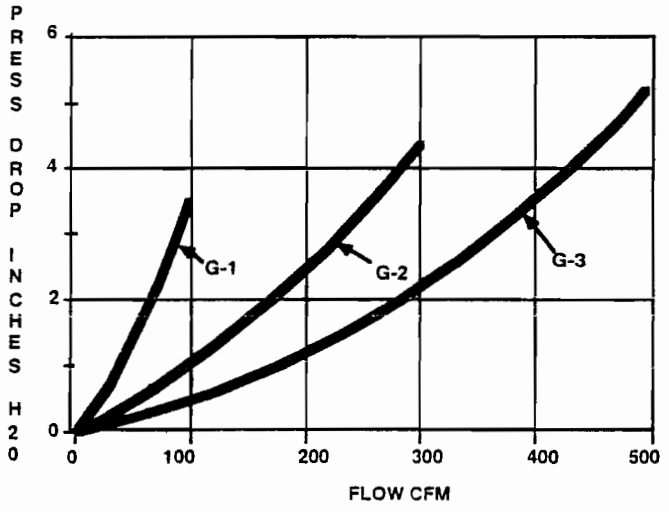

The CARBTROL "G" Canisters handles flows up to 500 CFM.

## FEATURES

- High activity carbon.
- Epoxy lined steel or polyethylene construction.
- Acceptable for transport of hazardous spent carbon.
- Side drain for removal of accumulated condensate.
- Low pressure drop.
- PVC internal piping.
- High temperature (180°F) steel units available.

## APPLICATIONS

- Soil vapor remediation
- Air stripper exhausts
- Tank vents
- Exhaust hoods
- Work area purification
- Sewage plant odor control






AT-116/#1

CARBTROL® CORPORATION

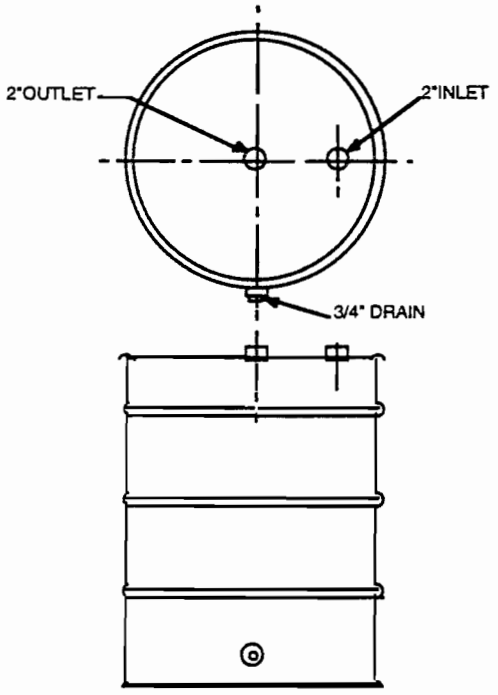
51 Riverside Avenue
Westport, CT 06880

1-800-242-1150 • Fax # (203) 226-5322
Web Address: http://www.carbtrol.com

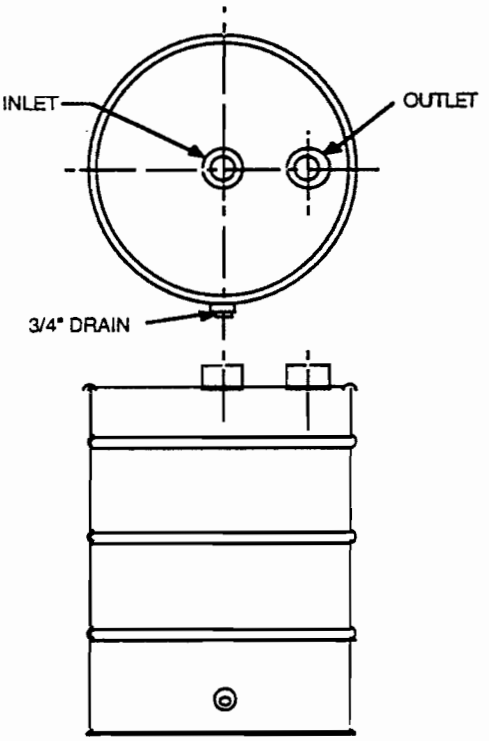
# CARBTROL®

# AIR PURIFICATION CANISTERS 140-200 LB. ACTIVATED CARBON

**G-1**
**G-2**
**G-3**




MODEL G-1




MODEL G-2,G-3

## SPECIFICATIONS

| MODEL | DIAMETER/HEIGHT | CARBON WEIGHT | INLET/OUTLET | MAXIMUM RATED FLOW | APPROXIMATE SHIP WEIGHT |
|---|---|---|---|---|---|
| G-1* | 24"/36" | 200 lbs. | 2"/2" | 100 CFM | 240 lbs. |
| G-2* | 24"/36" | 170 lbs. | 4"/4" | 300 CFM | 210 lbs. |
| G-3P | 24"/36" | 140 ibs. | 6"/6" | 500 CFM | 180 lbs. |
| G-3S | 24"/34" | 140 lbs. | 4"/4" | 500 CFM | 180 lbs. |

* Specify: Polyethylene (P) or Epoxy Lined Steel (S)

**SAFETY**

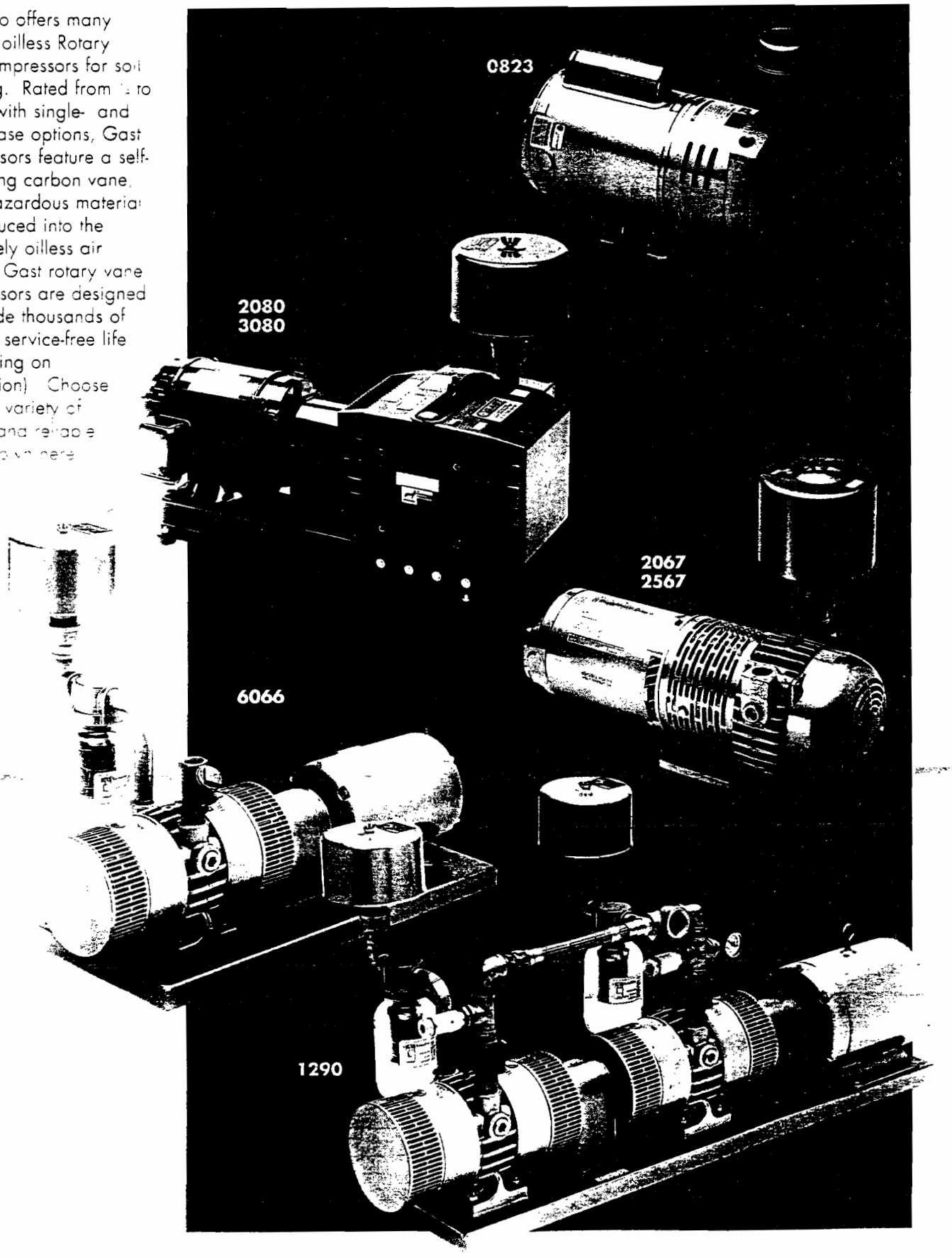
Certain chemical compounds in the presence of activated carbon may oxidize, decompose or polymerize. This could result in temperature increases sufficient to cause ignition of the activated carbon or adsorbed material. If a compounds reaction with activated carbon is unknown, appropriate tests should be considered.

CARBTROL® CORPORATION

51 Riverside Avenue
Westport, CT 06880

1-800-242-1150 • Fax # (203) 226-5322
Web Address: http://www.carbtrol.com

Gast also offers many types of oilless Rotary Vane compressors for soil sparging. Rated from ½ to 15 HP, with single- and three-phase options, Gast compressors feature a self-lubricating carbon vane, so no hazardous material is introduced into the completely oilless air stream. Gast rotary vane compressors are designed to provide thousands of hours of service-free life (depending on application). Choose from the variety of rugged and reliable styles shown here.



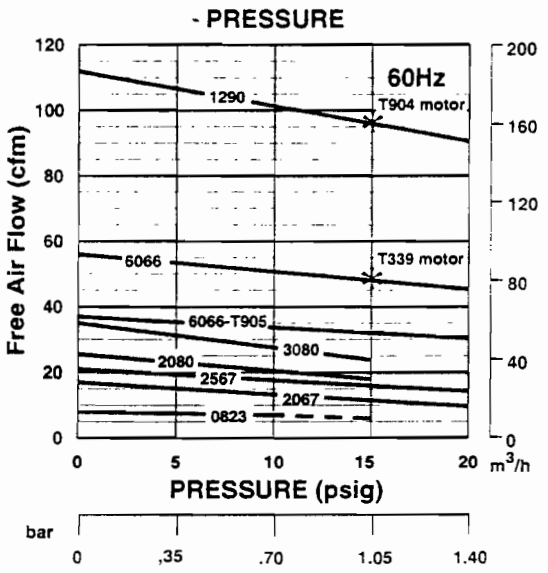
| Product Specifications Model Number | Motor Specifications Phase | Hz | Voltage | HP | Max. Pressure @ 60Hz psig | 1 bar | Max. Flow @ 60Hz cfm | m³h | Net Wt. lbs | kg |
|---|---|---|---|---|---|---|---|---|---|---|
| 0823-P155-G608X* | Single | 50 | 100-110/220-240 | 0.75 | 10 (15 inter) | 0,7 (1,0) | 8 | 14 | 50 | 23 |
| | | 60 | 100-115/208-230 | | | | | | | |
| 2080-P124-T337 | Three | 60 | 230/460 | 2.0 | 15 | 1,0 | 25 | 42 | 135 | 61 |
| 2080-P124-T906X | Single | 60 | 115/230 | 3.0 | 15 | 1,0 | 25 | 42 | 135 | 61 |
| 3080-P124-T338 | Three | 60 | 208-230/460 | 3.0 | 15 | 1,0 | 35 | 59 | 160 | 72 |
| 3080-P124-T907X | Single | 60 | 208-230 | 5.0 | 15 | 1,0 | 35 | 59 | 160 | 72 |
| 2067-P118-G470X† | Single | 60 | 115/230 | 1.5 | 20 | 1,4 | 17 | 29 | 84 | 38 |
| 2067-P118-G471*† | Three | 50 | 220/380-415 | 1.0 | 20 | 1,4 | 17 | 29 | 84 | 38 |
| | | 60 | 208-230/460 | 1.5 | | | | | | |
| 2567-P132-G475† | Three | 60 | 230/460 | 2.0 | 20 | 1,4 | 21 | 36 | 85 | 38 |
| 2567-P132-T908X† | Single | 60 | 115/230 | 2.0 | 20 | 1,4 | 21 | 36 | 85 | 38 |
| 6066-P122-T339***† | Three | 60 | 208-230/460 | 5.0 | 15 | 1,0 | 55 | 93 | 205 | 92 |
| 6066-P122A-T905**† | Three | 60 | 208-230/460 | 5.0 | 20 | 1,4 | 37 | 63 | 205 | 92 |
| 6066-P122A-T909† | Three | 60 | 208-230/460 | 7.5 | 20 | 1,4 | 55 | 93 | 205 | 92 |
| 1290-P110-T904***† | Three | 60 | 208-230/460 | 10 | 15 | 1,0 | 112 | 190 | 430 | 194 |
| 1290-P110A-T910† | Three | 60 | 208-230/460 | 15 | 20 | 1,4 | 112 | 190 | 440 | 198 |

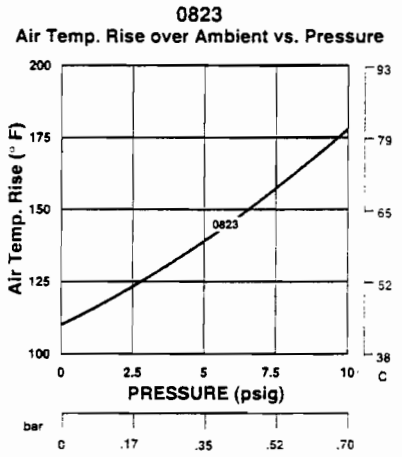
*For 50Hz performance reduce air flow on grid by approximately 17%

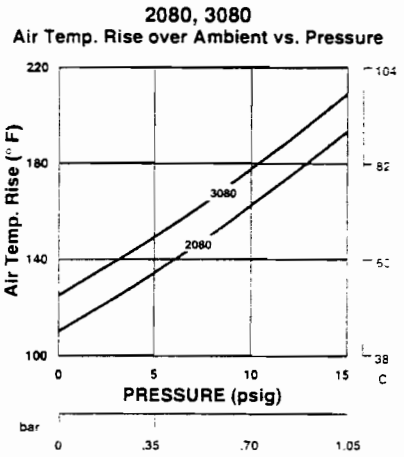
**6 pole motor; 1140 RPM

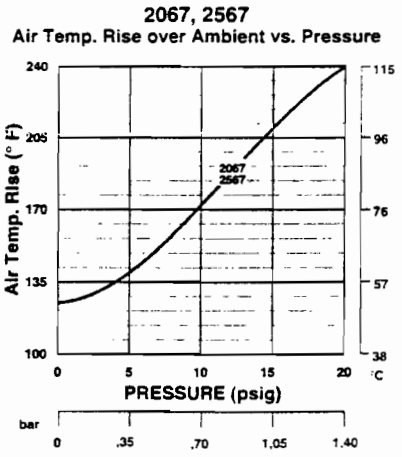
***These models are capable of 15 psi max. performance. reference performance gnd below

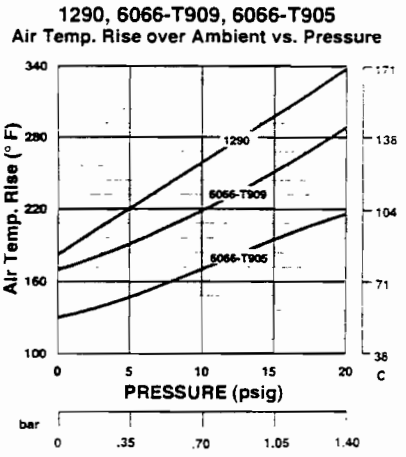
†Also available as separate drive. less the motor. To order as a separate drive version. specify the first two sets of digits only of this model number. Consult factory or distributor for the correct Nema frame size motor to use. Customer supplied motor must have minimum service factor of 1.15



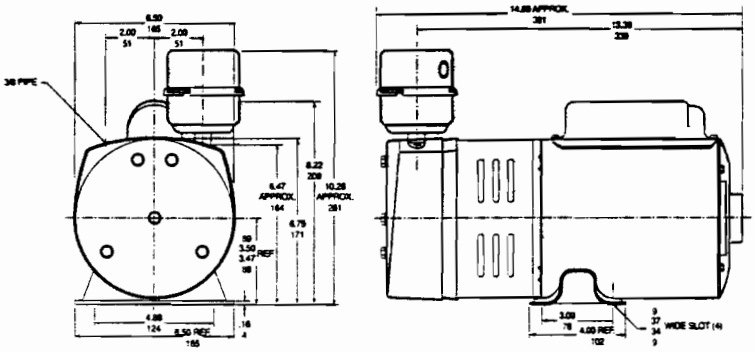



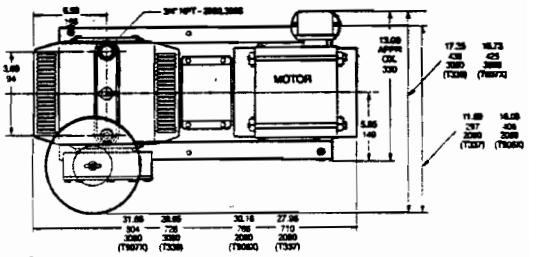
(mm) (inches)

## Model 0823

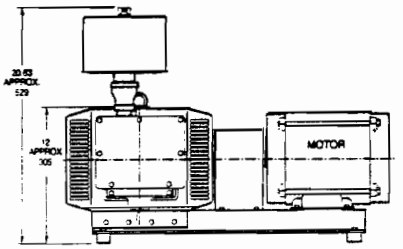


## Models 2080, 3080

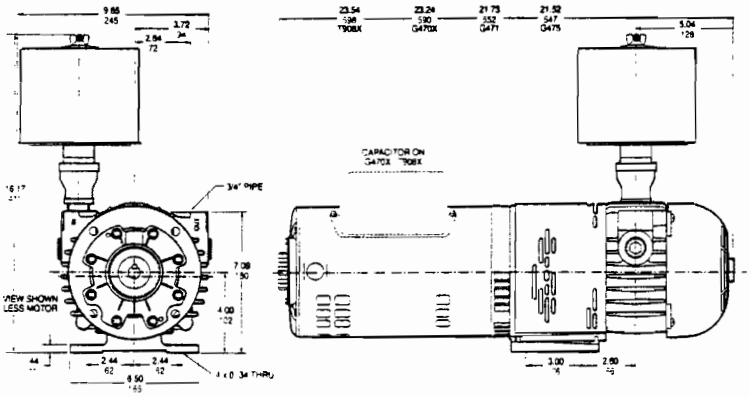
### Top view



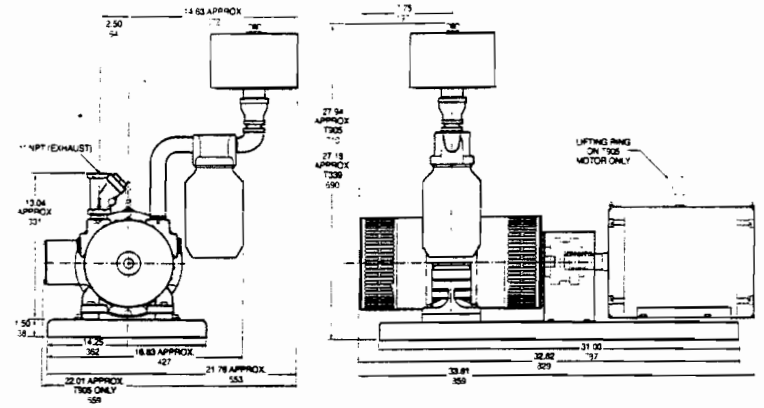

### Side view



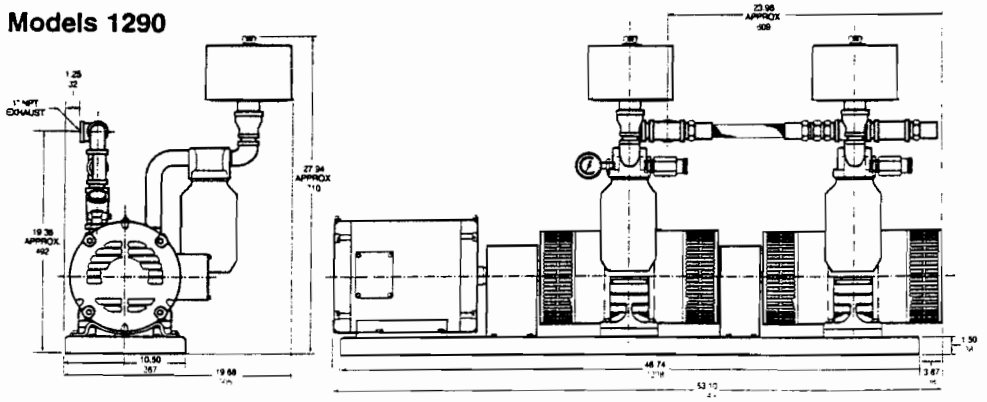

## Models 2067, 2567



## Models 6066



## Models 1290



NOTICE: Overall length dimensions are reference only, due to optional motor sizes available

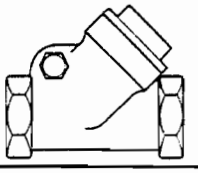
## Pressure-Vacuum Gauge

To monitor the system performance so maximum duties are not exceeded. Using two gauges (one on each side of the filter) is a great way to know when the filter needs servicing.

| | | | |
|---|---|---|---|
| **AJ497** | Vacuum gauge | 0-60" $H_2O$, 1/4" NPT connection | Blowers |
| **AE134** | Vacuum gauge | 0-160" $H_2O$, 1/4" NPT connection | Blowers |
| **AE134F** | Vacuum gauge | 0-15" HG, 1/4" NPT connection | R4H Blower |
| **AA644B** | Pressure gauge | 0-30 psi, 1/4" NPT | 80 Series, 2567, 2067, 6066, 0823 |
| **AE133** | Pressure gauge | 0-160" $H_2O$, 1/4" NPT connection | Blowers |
| **AE133A** | Pressure gauge | 0-200" $H_2O$, 1/4" NPT connection | Blowers |
| **AE133F** | Pressure gauge | 0-15 psi, 1/4" NPT connection | R4H Blower |
| **AJ496** | Pressure gauge | 0-60" $H_2O$, 1/4" NPT connection | SVE Blowers |

## Check Valve

Designed to prevent back-wash of fluids that would enter the blower. Also prevents air back-streaming if needed. Can be mounted with discharge either vertical or horizontal. Valve will open with 3" of water pressure.



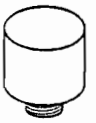
| | | | |
|---|---|---|---|
| **AH326D** | Check valve | 1-1/2" NPT (3" $H_2O$ cracking pressure) | Blowers |
| **AH326F** | Check valve | 2" NPT (3" $H_2O$ cracking pressure) | Blowers |
| **AH326G** | Check valve | 2-1/2" NPT (3" $H_2O$ cracking pressure) | R7 Blower |

## Relief Valve

By setting a relief valve at a given pressure/vacuum you can ensure excessive duties will not harm the blower or products in your application.

**AG258**

**AN225**

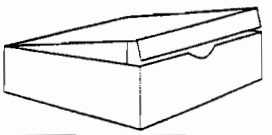


**PV Series**

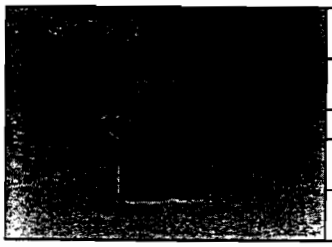
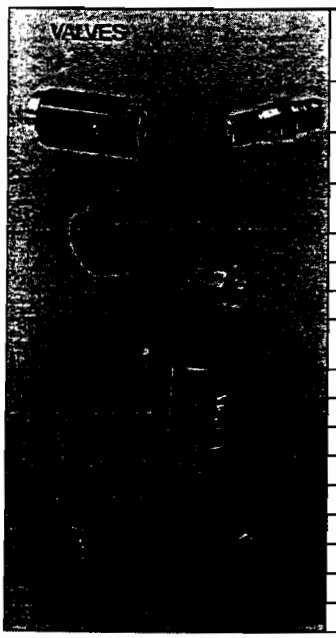
| | | | |
|---|---|---|---|
| **AA307** | Relief valve | For pressure, 3/4" NPT, adjustable 2-25 psi | 6066, 2567 Series |
| **AA600** | Relief valve | For pressure, 3/8" NPT, adjustable 2-30 psi | 0823 |
| **AG258** | Relief valve | 1-1/2" NPT adjustable 30-170" $H_2O$, vac. or press., 200 CFM max. | Blowers |
| **AG258F** | Relief valve | 2-1/2" NPT adjustable for higher flows, vacuum or pressure | Blowers |
| **PV065** | Relief valve | For pressure, pre-set for 6.5 psi, 1-1/4" NPT connection (60Hz) | R3H Blower |
| **PV072** | Relief valve | For pressure, pre-set for 7.2 psi, 1-1/4" NPT connection (60Hz) | R3H Blower |
| **PV098** | Relief valve | For pressure, pre-set for 9.8 psi, 1-1/4" NPT connection (50Hz) | R4H Blower |
| **PV102** | Relief valve | For pressure, pre-set for 10.2 psi, 1-1/4" NPT connection (60Hz) | R4H Blower |
| **AN225** | Relief valve | 15-45 cfm, 3/4" NPT connection, adjustable 0-20 psi | 2080, 3080, 4060 Series |

## Service Kit

If pump performance on rotary vane models diminishes, installation of the Service Kit replacement parts will have it performing like new again.



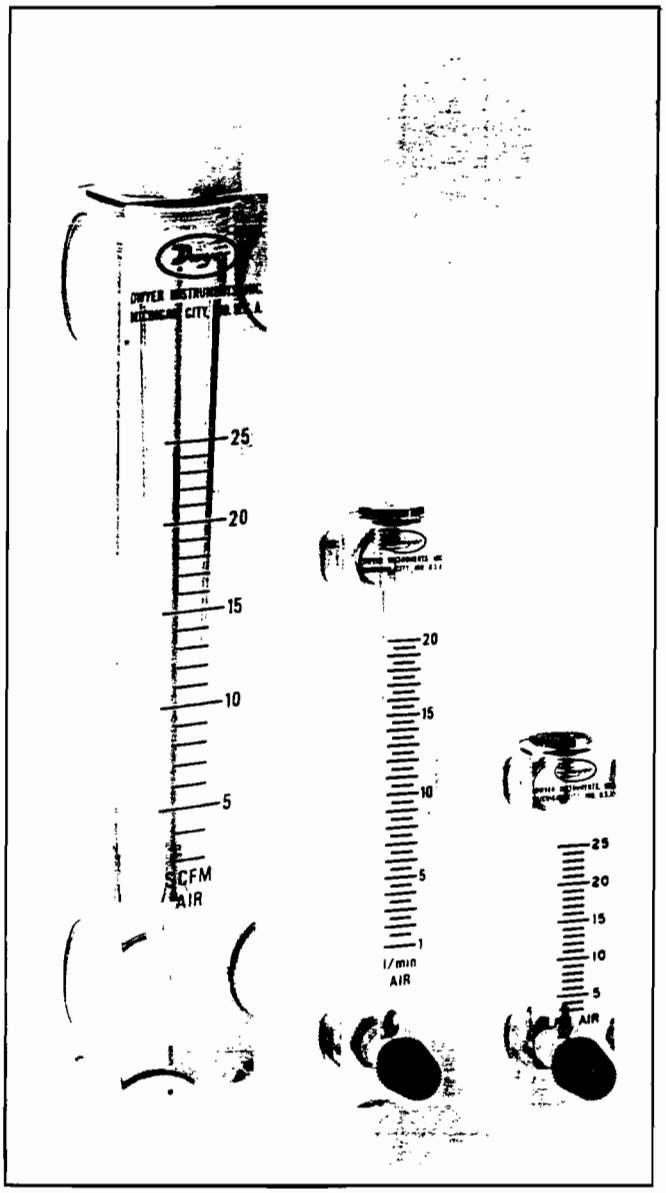
| | | | |
|---|---|---|---|
| **K479A** | Service Kit | Includes items for unit repair | 0823 Model |
| **K504** | Service Kit | Includes items for unit repair | 6066, 1290 (uses 2) |
| **K583** | Service Kit | Includes items for unit repair | 2567 Models |
| **K584** | Service Kit | Includes items for unit repair | 2080, 3080, 4080 Models |
| **K585** | Service Kit | Filter/Muffler Kit only | 2080, 3080, 4080 Models |

| ACCESSORY | PART NO. | DESCRIPTION | USED ON |
|---|---|---|---|
|  | AB140 | ¾" BORE, 5" P.D., SINGLE GROOVE | 1550, 2065, 2565 |
| | AB140A | 9/16" BORE, 5" P.D., SINGLE GROOVE | 1065 |
| | AB140C | ½" BORE, 5" P.D., SINGLE GROOVE | VAB, VBB |
| | AC374 | ⅞" BORE 6.5" P.D., SINGLE GROOVE | 10 × 1040 |
| | AC374B | ⅞" BORE 6.5" P.D., SINGLE GROOVE WITH HUB | 11 × 1740, 3040 |
| | AC376 | ⅞" BORE 6.5" P.D., DOUBLE GROOVE | 3040 |
| | AC374C | ¾" BORE 6.5" P.D., SINGLE GROOVE | 2065, 2565, 4565 |
| | AC376B | 1" BORE 6.5" P.D., DOUBLE GROOVE | 4565 |
| | AC376D | 1⅛" BORE 6.5" P.D., DOUBLE GROOVE | 2565, 4565 |
| | AK670A | ⅝" BORE 6" P.D., SINGLE GROOVE | PCD, PCA |
| | AD139A | ½" BORE 3.7" P.D., SINGLE GROOVE | 0440 |
|  | AH255 | 32 OUNCES OF NON-FLAMMABLE FLUSHING SOLVENT | * |
| | AH255A | 16 OUNCES SPRAY CAN OF NON-FLAMMABLE SOLVENT | * |
|  | AF265 | DIAPHRAGM-TYPE UNLOADING PRESSURE SWITCH 10-100 PSI RANGE, 20-30 LB. DIFFERENTIAL | ROA-DOA |
| | AF564 | DIAPHRAGM-TYPE PRESSURE SWITCH 10-100 PSI RANGE, 20-30 LB. DIFFERENTIAL | ALL SIMPLEX SYSTEMS |
| | AG527S | LIKE AF564 WITH 6-FOOT ELECTRICAL POWER CORD ATTACHED | 1HAB, 1LAA, 2HAH |
| | AE163A | DIAPHRAGM-TYPE PRESSURE SWITCH 10-100 PSI RANGE, 10-13 LB. DIFFERENTIAL | PISTON UNITS FOR DRY SPRINKLER INDUSTRY |
| | AK620 | DIAPHRAGM-TYPE PRESSURE SWITCH 10-100 PSI RANGE, 6 LB. MINIMUM DIFFERENTIAL | PISTON UNITS FOR DRY SPRINKLER INDUSTRY |
|  | AF599D | 2 GALLON TANK ASSM FOR ROA & DOA SERIES (PRESSURE) | DOA/ROA-P106T-AA |
| | AF599 | 2 GALLON TANK ASSEMBLY FOR 48 FRAME PISTON (PRESSURE) | 1HAB, 2HAH |
| | AF599A | 2 GALLON TANK ASSM FOR 56 FRAME PISTON (PRESSURE) | 4HCC, 5HCD |
| | AK329 | 2 GALLON TANK ASSEMBLY FOR 48 FRAME PISTON (LOW PRESSURE) | 1LAA-11T-M100X |
| | AF600 | 12 GALLON TANK ASSEMBLY FOR 48 FRAME PISTON (PRESSURE) | 1HAB, 2HAH, 3HBB |
| | AF600B | 12 GALLON TANK ASSEMBLY FOR 56 FRAME PISTON (PRESSURE) | 4HCC, 5HCD, 6HCA |
| | AF601 | 20 GALLON TANK ASSEMBLY FOR 2 CYLINDER 56 FRAME PISTON (PRESSURE) | 4HCC, 5HCD, 6HCA |
| | AF252 | 20 GALLON TANK ASSEMBLY FOR 4 CYLINDER 56 FRAME PISTON (PRESSURE) | 6HDK, 7HDD, 8HDM |
| | AF606 | 30 GALLON TANK ASSEMBLY FOR 56 FRAME PISTON (PRESSURE) | 5HCD, 6HCA, 7HDD, 8HDM |
|  | AG258 | RELIEF VALVE, 1½" NPT, ADJUSTABLE 30-170" $H_2O$ | FLOWS BELOW 200 CFM (MAY NEED 2 ON SOME BLOWER APPLICATIONS) |
| | AE238 | CHECK VALVE, ¼" NPT | ALL RECIPS UP TO ½ HP, 0211, 0240-440, 0323, 0523 |
| | AJ824 | CHECK VALVE, ⅜" NPT | 0465, 0765, 0740, 0870, 0823, 1023 |
| | AH326A | CHECK VALVE, ¾" NPT | 2067, 2567, 2065, 2565, 3040, 11 × 1740 |
| | AH326B | CHECK VALVE, 1" NPT | 4565, 5565, 6066, R1, R2 |
| | AH326C | CHECK VALVE, 1¼" NPT | R3 |
| | AH326D | CHECK VALVE, 1½" NPT | R4, R5, SDR4, SDR5 |
| | AH326F | CHECK VALVE, 2" NPT | R6, R6P, R6PP, R6PS, SDR6, SDR6P |
| | AH326G | CHECK VALVE, 2½" NPT | R7 |
| | AA203 | RELIEF VALVE, ⅛" NPT ADJUSTABLE 2-25 PSI | FLOWS BELOW 2 CFM |
| | AA205 | RELIEF VALVE, ¼" NPT ADJUSTABLE 2-25 PSI | FLOWS BELOW 2 CFM |
| | AA600 | RELIEF VALVE, ⅜" NPT ADJUSTABLE 2-30 PSI | FLOWS BELOW 15 CFM |
| | AA307 | RELIEF VALVE, ¾" NPT ADJUSTABLE 2-25 PSI | FLOWS BELOW 50 CFM |
| | AE960 | RELIEF VALVE, 1" NPT ADJUSTABLE 2-20 PSI | FLOWS BELOW 60 CFM |
| | AE248 | MANUAL DRAIN VALVE, ¼" NPT | ALL SYSTEMS |
| | AG528H | AUTOMATIC DRAIN VALVE, ¼" NPT | OPTION FOR SYSTEMS |
| | AF682A | TANK SAFETY VALVE, ¼" NPT (ASME CODED) | ALL SYSTEMS |

***FOR ANSWERS ON FLUSHING PROCEDURES, CONSULT YOUR GAST REP/DISTRIBUTOR OR GAST FACTORY SERVICE DEPARTMENT OR REFER TO YOUR PARTS LIST AND OPERATING PROCEDURES.**

# Series VF Visi-Float® Flowmeters

## Precision machined from solid acrylic — Used to indicate or manually control air or gas flow from .1 SCFH to 100 SCFM . . . water from .6 GPH to 20 GPM




(VFCII shown above)

Dwyer Visi-Float® flowmeter bodies are cut and precision machined from solid, clear acrylic plastic blocks. This construction not only produces a handsome finished product, but permits complete visual inspection. As a result, the Dwyer Visi-Float® flowmeters are especially popular for medical and laboratory equipment applications.

**Scales are easy to read** – The front scale location and white background provides excellent visibility. The direct reading scales are hot stamped into the plastic and will not wear off. Mid-range calibration is established with a master flowmeter. Accuracy is ±5% of full scale for VFA models, ±3% for VFB, and ±2% for VFC. Scales average 2" long on the VFA models. 4" long on VFB, and 5" long on VFC.

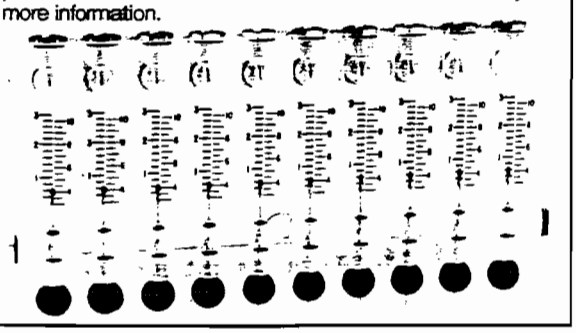
**Durable and attractive construction** – The machined acrylic bodies of the Dwyer Visi-Float flowmeters are practically unbreakable. Fabrication is backed by over 60 years of experience in acrylic instrument machining. The tapered bore is precision machined to a smooth surface that provides perfect visibility of the indicating float. The VFA and VFB models are available with either brass or stainless steel inlet and outlet connections and are tapped for ⅛" NPT Thread. VFB models 85 and 86 have either ¼" back or ⅜" end connections. The VFC models have PVC 1" NPT female connections and VFCII units are equipped with acetal thermoplastic 1" NPT male fittings. VFCII fittings also include hex wrench flats to prevent stripped threads. All standard models employ Buna-N "O" rings for leak proof operation and are available with either back or end connections for horizontal or vertical piping. Precision metering valves in brass or stainless steel are available for most VFA and VFB models. VFC models, intended for use with external metering valves, include a stainless steel guide rod and large diameter float for excellent stability and visibility at higher flow rates. Two options are offered for VFCII units, specifically designed for applications requiring FDA approved materials. Choose 316 stainless steel float and guide rod and Viton® "O" rings. See OPTIONS for ordering codes.

**Easy installation** – All Visi-Float® flowmeters have metal mounting inserts on rear for panel mounting. They can also be supported directly by system piping.

**OEM specials** – See page 5 of this bulletin for a small sampling of custom designed flowmeters we have built.

### Special Multi-Column Visi-Float Flowmeters

Perfect for OEM applications, Visi-Float flowmeters can be custom made with up to 10 columns in a single block of acrylic plastic. Available with or without valves. Consult factory for more information.



### How To Order

1. Select series by letter designation, VFA, VFA–EC, VFA–SS, VFA–EC–SS, VFB, VFB–EC, VFB–SS, VFB–EC–SS, VFC, VFC–EC, VFCII or VFCII–EC.
2. Add ordering number to specify range. Example: VFB–50.
3. Add suffix BV for brass valve, SSV for stainless steel valve. Example: VFB–50–SSV.
4. For adjustable pointer flag add –PF. Available only on VFA and VFB. Example: VFB–50–SSV–PF.
5. Add additional options or accessories as required.

| | SPECIFICATIONS | |
|---|---|---|
| Meter Body | Acrylic plastic. Metering tube machined into body | |
| Wetted Metal Parts | VFA & VFB-Brass std., SS opt.<br>VFC-SS std. | |
| Floats | St. Steel, Blk. Glass, Alum., K Monel | |
| Float Stops | Stainless Steel Springs | |
| Pipe Connections | VFA & VFB-¼" NPT (See note at right under dimensions)*<br>VFC-1" NPT | |
| "O" Rings | Buna-N | |
| Mounting Inserts | 10-32x6" deep | |
| Scale | Hot pressed into acrylic body | |
| Knobs | ABS Plastic | |
| Maximum Pressures and Temperatures | VFA & VFB without valve:<br>100 PSIG (690 kPa)@ 150°F (85°C)<br>150 PSIG (1034 kPa)@ 100°F (38°C)<br>VFA & VFB with valve:<br>100 PSIG (690 kPa)@ 150°F(85°C)<br>VFC: 100 PSIG (690 kPa) @ 120°F(48°C) | |
| Accuracy | Model VFA, 5%; Model VFB, 3%<br>Model VFC, 2% of full scale | |
| | **OPTIONS** | **CODE** |
| Metering Valve & Connection | Brass (VFA, VFB) | BV |
| | Stainless Steel (VFA, VFB) | SSV |
| Connections only | Stainless Steel (VFA, VFB) | SS |
| End Connections | Fittings on bottom and top (All Models) | EC |
| Pointer Flag | Red ABS Plastic (VFA, VFB) | PF |
| FDA Acceptable | 316 SS float and guide rod (required, VFCII) | FDA |
| FDA Acceptable | Viton O-rings (required, VFCII) | VIT |

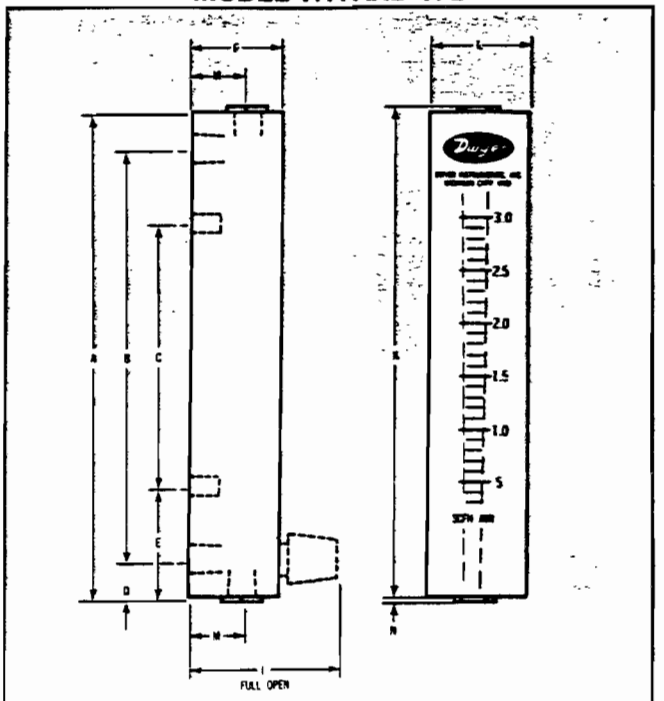
## Series VF VISI-FLOAT® Models and Range
**STOCKED MODELS** in bold

| Model VFA — 2" Scale | | | | Model VFB — 4" Scale | |
|---|---|---|---|---|---|
| Range SCFH Air | Ordering No. | Range LPM Air | Ordering No. | Range SCFH Air | Ordering No. |
| .1-1 | 1 | .06-0.5 | 21 | .3-3 | 50 |
| .2-2 | 2 | .15-1 | 22 | 1-10 | 91 |
| .6-5 | 3 | .6-5 | 23 | 2-20 | 51 |
| 1-10 | 4 | 1-10 | 24 | 4-40 | 52 |
| 2-20 | 5 | 3-25 | 25 | 10-100 | 53 |
| 4-30 | 6 | 6-50 | 26 | 15-150 | 54 |
| 5-50 | 7 | 10-100 | 27 | 20-200 | 55 |
| 10-100 | 8 | | | **SCFM Air** | |
| 20-200 | 9 | | | .3-3 | 90 |
| **CC Water per min.** | | **Gal. Water per hour** | | **CC/Min. Air** | |
| | | | | 100-1000 | 60 |
| 6-50 | 32 | .6-5 | 41 | **LPM Air** | |
| 10-100 | 33 | 2-10 | 42 | .2-4 | 65 |
| 20-200 | 34 | 3-20 | 43 | 1-10 | 66 |
| | | 8-40 | 44 | 1-20 | 67 |
| | | | | 3-30 | 68 |
| **Model VFC — 5" Scale** | | | | 4-40 | 69 |
| **Range SCFM Air** | **Ordering No.** | **Range GPM Water** | **Ordering No.** | **CC/Min. Water** | |
| 2.5-25 | 121 | .5-5 | 141 | 2-30 | 82 |
| 5-50 | 122 | 1-10 | 142 | **GPHWater** | |
| 10-100 | 123 | 2-20 | 143 | .5-12 | 80 |
| | | | | 1-20 | 83 |
| | | | | 6-60 | 81 |
| **LPM Air** | | **LPM Water** | | **GPM Water** | |
| 60-700 | 131 | 2-20 | 151 | .2-2 | 85 |
| 200-1400 | 132 | 4-40 | 152 | .5-5 | 86 |
| 300-2800 | 133 | 10-75 | 153 | | |

**Prices** (Add $10.40 to VFB prices for ranges 85 and 86.)

| | | | |
|---|---|---|---|
| VFA | $21.40 | VFA-EC | $20.80 |
| VFA-SS | 24.50 | VFA-EC-SS | 24.00 |
| VFA-BV | 26.60 | -PF pointer flag | 1.00 |
| VFA-SSV | 35.50 | -RKA regulator kit | 64.90 |
| VFB | $30.10 | VFB-EC | $30.30 |
| VFB-SS | 32.80 | VFB-EC-SS | 32.40 |
| VFB-BV | 36.10 | -PF pointer flag | 1.00 |
| VFB-SSV | 43.90 | -RK-VFB regulator kit | 64.90 |
| VFC | $74.40 | VFCII-EC | $74.40 |
| VFC-EC | 74.40 | -FDA (VFCII only) | 7.50 |
| VFCII | 74.40 | -VIT (VFCII only) | 3.75 |

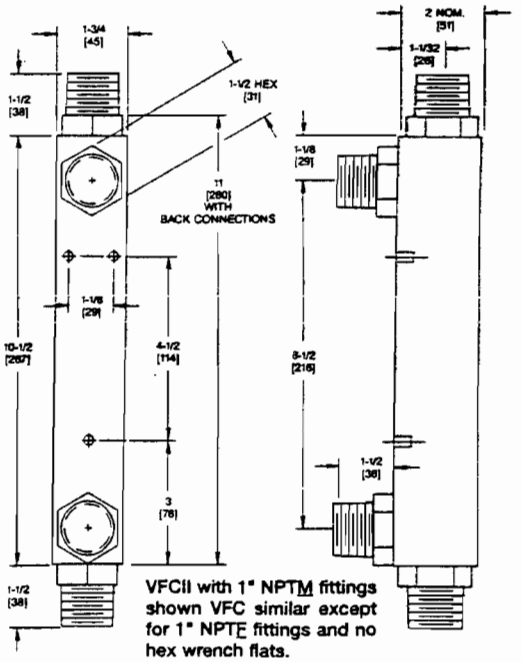
## MODEL VFA AND VFB




| DIMENSION-IN INCHES | | |
|---|---|---|
| | Model VFA | Model VFB |
| A | 4 | 6½ |
| B | 3 (⅛ NPT female) | 5½ (¼ NPT female)* |
| C | 1⅜ (10-32 Thread) | 3½ (10-32 thread) |
| D | ½ | ½ |
| E | 1¾₆ | 1½ |
| F | 1¼ | 1¼ |
| I | 2¼₆ (BV or SSV) | 2¼₆ (BV or SSV) |
| K | 4½ | 6½ |
| L | 1 | 1¼ |
| M | ¾ (EC) | ¾ (EC) |
| N | ⅜ (EC) | ⅜ (EC) |

*VFB ranges 85 and 86 have ¼" NPT back connections or ⅜" NPT end connections. These ranges not available with brass valves.

## MODEL VFCII




VFCII with 1" NPTM fittings shown VFC similar except for 1" NPTF fittings and no hex wrench flats.

# Appendix 2

Laboratory Analytical Report

for

Air Samples Collected

at

Atlas Graphics

Sample Date: January 12, 2001

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/25/2001

***Custody Document: L3714***

*Received: 01/12/2001 11:41*
*Sampled by: Jim Van Horn*

***Client: Anson Environmental Inc***

*771 New York Avenue*
*Huntington,*
*NY 11743*

***Project:***

*Area: Atlas Graphics*

***Manager: Dean Anson***

*Respectfully submitted,*

*Laboratory Director*

*NYS Lab ID # 10969*
*NJ Cert. # 73812*
*CT Cert. # PH0645*
*MA Cert. # NY061*
*PA Cert. # 68-535*
*VA Cert. # 108*
*NH Cert. # 252592-BA*
*RI Cert. # 161*

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/25/2001

# EPA 8260 in AIR

**Sample: L3714-1**
Client Sample ID: Pre-Carbon
Matrix: Air
Type: Grab
Collected: 01/12/2001 12:00
Remarks: See Case Narrative
Analyzed Date: 01/19/2001

| Cas No | Analyte | MDL | Concentration | Units | Q |
|---|---|---|---|---|---|
| 75-71-8 | Dichlorodifluoromethane | 0.011 | 0.011 | mg/M3 | U |
| 74-87-3 | Chloromethane | 0.019 | 0.019 | mg/M3 | U |
| 75-01-4 | Vinyl Chloride | 0.021 | 0.021 | mg/M3 | U |
| 74-83-9 | Bromomethane | 0.019 | 0.019 | mg/M3 | U |
| 75-00-3 | Chloroethane | 0.020 | 0.020 | mg/M3 | U |
| 75-69-4 | Trichlorofluoromethane | 0.030 | 0.030 | mg/M3 | U |
| 75-35-4 | 1,1-Dichloroethene | 0.024 | 0.024 | mg/M3 | U |
| 75-09-2 | Methylene Chloride | 0.021 | 0.021 | mg/M3 | U |
| 156-60-5 | t-1,2-Dichloroethene | 0.017 | 0.017 | mg/M3 | U |
| 75-34-3 | 1,1-Dichloroethane | 0.021 | 0.021 | mg/M3 | U |
| 590-20-7 | 2,2-Dichloropropane | 0.016 | 0.016 | mg/M3 | U |
| 156-59-2 | c-1,2-Dichloroethene | 0.019 | **0.43** | mg/M3 | |
| 67-66-3 | Chloroform | 0.019 | 0.019 | mg/M3 | U |
| 74-97-5 | Bromochloromethane | 0.024 | 0.024 | mg/M3 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 0.021 | 0.021 | mg/M3 | U |
| 563-58-6 | 1,1-Dichloropropene | 0.027 | 0.027 | mg/M3 | U |
| 56-23-5 | Carbon Tetrachloride | 0.019 | 0.019 | mg/M3 | U |
| 107-06-2 | 1,2 Dichloroethane | 0.019 | 0.019 | mg/M3 | U |
| 71-43-2 | Benzene | 0.019 | 0.019 | mg/M3 | U |
| 79-01-6 | Trichloroethene | 0.023 | **0.82** | mg/M3 | |
| 78-87-5 | 1,2-Dichloropropane | 0.018 | 0.018 | mg/M3 | U |
| 75-27-4 | Bromodichloromethane | 0.018 | 0.018 | mg/M3 | U |
| 74-95-3 | Dibromomethane | 0.024 | 0.024 | mg/M3 | U |
| 10061-01-5 | c-1,3-Dichloropropene | 0.018 | 0.018 | mg/M3 | U |
| 108-88-3 | Toluene | 0.018 | 0.018 | mg/M3 | U |
| 10061-02-6 | t-1,3-Dichloropropene | 0.013 | 0.013 | mg/M3 | U |
| 79-00-5 | 1,1,2-Trichloroethane | 0.022 | 0.022 | mg/M3 | U |
| 142-28-9 | 1,3-Dichloropropane | 0.024 | 0.024 | mg/M3 | U |
| 127-18-4 | Tetrachloroethene | 0.014 | **0.38** | mg/M3 | |
| 124-48-1 | Dibromochloromethane | 0.020 | 0.020 | mg/M3 | U |
| 106-93-4 | 1,2-Dibromoethane | 0.019 | 0.019 | mg/M3 | U |
| 108-90-7 | Chlorobenzene | 0.020 | 0.020 | mg/M3 | U |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.018 | 0.018 | mg/M3 | U |
| 100-41-4 | Ethylbenzene | 0.020 | 0.020 | mg/M3 | U |
| 108-38-3 | m,p-xylene | 0.044 | 0.044 | mg/M3 | U |

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/25/2001

# EPA 8260 in AIR

**Sample: L3714-1...continue**
Client Sample ID: Pre-Carbon
Matrix: Air
Remarks: See Case Narrative
Analyzed Date: 01/19/2001

Type: Grab

Collected: 01/12/2001 12:00

| Cas No | Analyte | MDL | Concentration | Units | Q |
|---|---|---|---|---|---|
| 95-47-6 | o-xylene | 0.018 | 0.018 | mg/M3 | U |
| 100-42-5 | Styrene | 0.020 | 0.020 | mg/M3 | U |
| 98-82-8 | Isopropylbenzene | 0.016 | 0.016 | mg/M3 | U |
| 75-25-2 | Bromoform | 0.014 | 0.014 | mg/M3 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.018 | 0.018 | mg/M3 | U |
| 96-18-4 | 1,2,3-Trichloropropane | 0.030 | 0.030 | mg/M3 | U |
| 103-65-1 | n-Propylbenzene | 0.017 | 0.017 | mg/M3 | U |
| 108-86-1 | Bromobenzene | 0.018 | 0.018 | mg/M3 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.014 | 0.014 | mg/M3 | U |
| 95-49-8 | 2-Chlorotoluene | 0.020 | 0.020 | mg/M3 | U |
| 106-43-4 | 4-Chlorotoluene | 0.024 | 0.024 | mg/M3 | U |
| 99-87-6 | 4-Isopropyltoluene | 0.021 | 0.021 | mg/M3 | U |
| 95-63-6 | 1,2,4-trimethylbenzene | 0.020 | 0.020 | mg/M3 | U |
| 135-98-8 | sec-Butylbenzene | 0.019 | 0.019 | mg/M3 | U |
| 98-06-6 | tert-Butylbenzene | 0.028 | 0.028 | mg/M3 | U |
| 541-73-1 | 1,3 Dichlorobenzene | 0.023 | 0.023 | mg/M3 | U |
| 106-46-7 | 1,4-Dichlorobenzene | 0.019 | 0.019 | mg/M3 | U |
| 104-51-8 | n-Butylbenzene | 0.023 | 0.023 | mg/M3 | U |
| 95-50-1 | 1,2-Dichlorobenzene | 0.021 | 0.021 | mg/M3 | U |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.036 | 0.036 | mg/M3 | U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.023 | 0.023 | mg/M3 | U |
| 87-68-3 | Hexachlorobutadiene | 0.047 | 0.047 | mg/M3 | U |
| 91-20-3 | Naphthalene | 0.038 | 0.038 | mg/M3 | U |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.049 | 0.049 | mg/M3 | U |
| 1634-04-4 | MTBE | 0.038 | 11.2 | mg/M3 | |

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/25/2001

# EPA 8260 in AIR

**Sample: L3714-2**
Client Sample ID: Exhaust
Matrix: Air
Remarks: See Case Narrative
Analyzed Date: 01/19/2001

Type: Grab

Collected: 01/12/2001 12:15

| Cas No | Analyte | MDL | Concentration | Units | Q |
|---|---|---|---|---|---|
| 75-71-8 | Dichlorodifluoromethane | 0.011 | 0.011 | mg/M3 | U |
| 74-87-3 | Chloromethane | 0.019 | 0.019 | mg/M3 | U |
| 75-01-4 | Vinyl Chloride | 0.021 | 0.021 | mg/M3 | U |
| 74-83-9 | Bromomethane | 0.019 | 0.019 | mg/M3 | U |
| 75-00-3 | Chloroethane | 0.020 | 0.020 | mg/M3 | U |
| 75-69-4 | Trichlorofluoromethane | 0.030 | 0.030 | mg/M3 | U |
| 75-35-4 | 1,1-Dichloroethene | 0.024 | 0.024 | mg/M3 | U |
| 75-09-2 | Methylene Chloride | 0.021 | 0.021 | mg/M3 | U |
| 156-60-5 | t-1,2-Dichloroethene | 0.017 | 0.017 | mg/M3 | U |
| 75-34-3 | 1,1-Dichloroethane | 0.021 | 0.021 | mg/M3 | U |
| 590-20-7 | 2,2-Dichloropropane | 0.016 | 0.016 | mg/M3 | U |
| 156-59-2 | c-1,2-Dichloroethene | 0.019 | **0.94** | mg/M3 | |
| 67-66-3 | Chloroform | 0.019 | 0.019 | mg/M3 | U |
| 74-97-5 | Bromochloromethane | 0.024 | 0.024 | mg/M3 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 0.021 | 0.021 | mg/M3 | U |
| 563-58-6 | 1,1-Dichloropropene | 0.027 | 0.027 | mg/M3 | U |
| 56-23-5 | Carbon Tetrachloride | 0.019 | 0.019 | mg/M3 | U |
| 107-06-2 | 1,2 Dichloroethane | 0.019 | 0.019 | mg/M3 | U |
| 71-43-2 | Benzene | 0.019 | 0.019 | mg/M3 | U |
| 79-01-6 | Trichloroethene | 0.023 | 0.023 | mg/M3 | U |
| 78-87-5 | 1,2-Dichloropropane | 0.018 | 0.018 | mg/M3 | U |
| 75-27-4 | Bromodichloromethane | 0.018 | 0.018 | mg/M3 | U |
| 74-95-3 | Dibromomethane | 0.024 | 0.024 | mg/M3 | U |
| 10061-01-5 | c-1,3-Dichloropropene | 0.018 | 0.018 | mg/M3 | U |
| 108-88-3 | Toluene | 0.018 | 0.018 | mg/M3 | U |
| 10061-02-6 | t-1,3-Dichloropropene | 0.013 | 0.013 | mg/M3 | U |
| 79-00-5 | 1,1,2-Trichloroethane | 0.022 | 0.022 | mg/M3 | U |
| 142-28-9 | 1,3-Dichloropropane | 0.024 | 0.024 | mg/M3 | U |
| 127-18-4 | Tetrachloroethene | 0.014 | 0.014 | mg/M3 | U |
| 124-48-1 | Dibromochloromethane | 0.020 | 0.020 | mg/M3 | U |
| 106-93-4 | 1,2-Dibromoethane | 0.019 | 0.019 | mg/M3 | U |
| 108-90-7 | Chlorobenzene | 0.020 | 0.020 | mg/M3 | U |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 0.018 | 0.018 | mg/M3 | U |
| 100-41-4 | Ethylbenzene | 0.020 | 0.020 | mg/M3 | U |
| 108-38-3 | m,p-xylene | 0.044 | 0.044 | mg/M3 | U |

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/25/2001

# EPA 8260 in AIR

**Sample: L3714-2...continue**
Client Sample ID: Exhaust
Matrix: Air
Remarks: See Case Narrative
Analyzed Date: 01/19/2001

Type: Grab

Collected: 01/12/2001 12:15

| Cas No | Analyte | MDL | Concentration | Units | Q |
|---|---|---|---|---|---|
| 95-47-6 | o-xylene | 0.018 | 0.018 | mg/M3 | U |
| 100-42-5 | Styrene | 0.020 | 0.020 | mg/M3 | U |
| 98-82-8 | Isopropylbenzene | 0.016 | 0.016 | mg/M3 | U |
| 75-25-2 | Bromoform | 0.014 | 0.014 | mg/M3 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 0.018 | 0.018 | mg/M3 | U |
| 96-18-4 | 1,2,3-Trichloropropane | 0.030 | 0.030 | mg/M3 | U |
| 103-65-1 | n-Propylbenzene | 0.017 | 0.017 | mg/M3 | U |
| 108-86-1 | Bromobenzene | 0.018 | 0.018 | mg/M3 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.014 | 0.014 | mg/M3 | U |
| 95-49-8 | 2-Chlorotoluene | 0.020 | 0.020 | mg/M3 | U |
| 106-43-4 | 4-Chlorotoluene | 0.024 | 0.024 | mg/M3 | U |
| 99-87-6 | 4-Isopropyltoluene | 0.021 | 0.021 | mg/M3 | U |
| 95-63-6 | 1,2,4-trimethylbenzene | 0.020 | 0.020 | mg/M3 | U |
| 135-98-8 | sec-Butylbenzene | 0.019 | 0.019 | mg/M3 | U |
| 98-06-6 | tert-Butylbenzene | 0.028 | 0.028 | mg/M3 | U |
| 541-73-1 | 1,3 Dichlorobenzene | 0.023 | 0.023 | mg/M3 | U |
| 106-46-7 | 1,4-Dichlorobenzene | 0.019 | 0.019 | mg/M3 | U |
| 104-51-8 | n-Butylbenzene | 0.023 | 0.023 | mg/M3 | U |
| 95-50-1 | 1,2-Dichlorobenzene | 0.021 | 0.021 | mg/M3 | U |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.036 | 0.036 | mg/M3 | U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 0.023 | 0.023 | mg/M3 | U |
| 87-68-3 | Hexachlorobutadiene | 0.047 | 0.047 | mg/M3 | U |
| 91-20-3 | Naphthalene | 0.038 | 0.038 | mg/M3 | U |
| 87-61-6 | 1,2,3-Trichlorobenzene | 0.049 | 0.049 | mg/M3 | U |
| 1634-04-4 | MTBE | 0.038 | **0.72** | mg/M3 | |

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/25/2001

## Case Narrative

The following compounds were calibrated at 25, 50, 100, 150 and 200 ppb levels in the initial calibration curve:

Acetone
2-Butanone
4-Methyl-2-pentanone
2-Hexanone

M&P-Xylenes were calibrated at 10, 40, 100, 200 and 300 ppb levels.

All other compounds were calibrated at 5, 20, 50, 100 and 150 ppb levels.

Samples were quantitated using the continuing calibration standard response factor as opposed to the initial calibration average response factor.

Reviewed by: _____

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/25/2001

## ORGANIC METHOD QUALIFIERS

Q - Qualifier - specified entries and their meanings are as follows:

U - The analytical result is a non-detect.

J - Indicates an estimated value. The concentration reported was detected below the Method Detection Limit.

B - The analyte was found in the associated method blank as well as the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - The concentration of the analyte exceeded the calibration range of the instrument.

D - This flag identifies all compounds identified in an analysis at a secondary dilution.

## INORGANIC METHOD QUALIFIERS

C - (Concentration) qualifiers are as follows:

B - Entered if the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Entered when the analyte was analyzed for, but not detected.

J - Indicates an estimated value. The concentration reported was detected below the Method Detection Limit.

Q - Qualifier specific entries and their meanings are as follows:

E - Reported value is estimated because of the presence of interferences.

M - (Method) qualifiers are as follows:

A - Flame AA

AS - Semi-automated Spectrophotometric

AV - Automated Cold Vapor AA

C - Manual Spectrophotometric

F - Furnace AA

NR - when the analyte is not required to be analyzed.

P - ICP

T - Titrimetric

# ETL

*Environmental Testing Laboratories, Inc.*
*208 Route 109 • Farmingdale • New York 11735*
***631-249-1456 • Fax: 631-249-8344***

## CHAIN OF CUSTODY DOCUMENT

L 3714

Project Name: Atlas Graphics | Project Manager: Dean Alison | Sampler (Signature): | (Print): Jim Van Horn

Project Address:

Client Alson Env | J/N: | ☐ Rush by / /

**SAMPLE INFO** Type: SS = Split Spoon; G = Grab; C = Composite; B = Blank; Matrix: L = Liquid; S = Soil; SL = Sludge; A* = Air; W = Wipe | *Air - Vol. (Liters) include. Flow (CFM)

| ID | Date | Time | Type | Matrix | Sample Location | Total. # Cont. | 601/602 | BTX/BTEX | MTBE | 624/8260/8021 | 625/8270/BN | PCB/Pesticides | Pet.Prods./8100M | RCRA Metals | pH/Flash/React | 418.1 - TRPH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1/12 | 12:00 | | Air | Pre Carbon | | | | | + | | | | | | |
| 2 | 1/12 | 12:15 | | Air | Exhaust | | | | | X | | | | | | |
| 3 | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by (Signature): | Date 1/12 Time | Printed Name & Agent: Jim Van Horn | Received by (Signature): | Date Time | Printed Name & Agent |
| Relinquished by (Signature): | Date Time | Printed Name & Agent: | Received for Lab by (Signature): | Date 1/12 Time 8/10 | Printed Name |
| Comments & Special Instructions | | QA/QC Type: | Number & Type of Containers: 2 Tedlar | Preservatives: | Temp: |

CLIENT COPY