

## General Description

Geotech provides a single PD blower to provide 1170 ICFM @ 65" W.C. Vacuum, at the inlet of the blower. Blower package will be installed inside an 8.5' W X 16' long enclosed, insulated, trailer. System includes a NEMA 4 control panel on the outside of the trailer. Trailer interior is plumbed and wired to meet Class I, Div 2 Group C&D hazardous location requirements.

## DESIGN PARAMETERS

Elevation	=	2000 FTASL
Inlet Temperature	=	68° F (inlet air)
Application	=	SVE
Flow Rate	=	1170 ICFM
Inlet Vacuum	=	65 inches W.C. Vacuum (at blower inlet)
Electrical Req.	=	460 /3/60, Class I Div. 2
Controls	=	NEMA 4

*blower  
ship in a week*

## EQUIPMENT SPECIFICATIONS

- Blower Type = Positive Displacement Rotary Lobe (MD Pneumatic Model 6015 – 21L2)
- Special Features = Grease/Splash Lubricated
- Motor /Size/Class = 20 Hp, XP, 1770 RPM
- V-Belt Drive
- OSHA Belt Guard
- 200 gallon KO Tank with (1) High Liquid Level Shut Off Switch, Liquid Level Sight Gauge, Manual Drain, Clean Out Port ( 1500 CFM capability)
- Inlet Particulate Filter
- Inlet Vacuum Gauge
- Temperature Gauges (2)
- Inlet High Temperature Vacuum Shut off Switch
- Inlet Air Dilution Valve
- Base Mounted
- Discharge Silencer
- Vacuum Relief Valve
- Vacuum Gauge
- Sample Port
- Manifold- 6" header with (8) 4" legs piped inside the trailer

## **Control Panel**

- NEMA 4 Enclosure with dead face cover and Inner Door, lockable
- Disconnect Handle
- UL Listed Components
- Control Transformer
- 20 Hp Motor Starter, 460/3/60, fused
- HOA Switch
- Run Pilot Light (Green)
- High Temperature Alarm Light ( Red) (IS)
- High Level in KO Tank Alarm Light ( RED) (IS)
- XP Interior Light / On/Off Switch Interface (150 Watt, 115/1/60)
- XP Exhaust Fan / Thermostat interface ( ¼ Hp, 115/1/60)
- XP Heater / Thermostat interface (3600 watt- 460/3/60)
- Hour Meter

## **Trailer**

- 8.5' x 16' Enclosed Trailer, insulated
- XP heater and thermostat
- XP Exhaust fan and thermostat
- Exhaust Louver
- XP Light Switch
- Vapor Tight Light
- Double Rear doors
- (2) Stabilizer Jacks

## **WARNING NOTES:**

### **BLOWER OPERATING TEMPERATURES**

THIS PD BLOWER IS DESIGNED TO DELIVER 1170 ICFM @ APPROX 65-70 INCHES W.C. UNDER THESE OPERATING CONDITIONS, THE DISCHARGE AIR TEMPERATURE OF THE BLOWER (WHEN INLET SVE WELL AIR IS 68°F AND AMBIENT AIR IS 100°F) IS ANTICIAPTED TO BE 113.9° F.

DO NOT EXCEED 140° F BLOWER DISCHARGE AIR TEMPERATURES.

### **BLOWER DISCHARGE PIPING & MANUAL DILUTION AIR FILTER ASSEMBLY**

THE BLOWER DISCHARGE PIPING AND THE MANUAL AIR DILUTION FILTER ASSEMBLY HAVE BEEN PURPOSELY LEFT UN-ASSEMBLED FOR SHIPPING / TRANSPORTATION. CONCERN OVER HIGHWAY BRIDGE AND OVERPASS HEIGHT RESTRICTIONS WERE TAKEN INTO CONSIDERATION AND THEREFORE WERE LEFT UN-ASSEMBLED.

**Application Worksheet (Normal Condition)**

Reference/Quote: RC060106-01

**AMBIENT CONDITIONS:**

Atmospheric Pressure: 13.66 PSIA  
Elevation: 0 Feet  
Ambient Temperature: 100 Fahrenheit

**APPLICATION REQUIREMENTS:**

Gas:	AIR	Gas Properties:	
Molecular Weight:	28.966	Duty Cycle:	more than 4 hours
Cp:	0.241		
K Value (Cp/Cv):	1.398		
Inlet Temperature:	68 Fahrenheit		
Inlet Volume:	1170 ICFM		
Standard Volume:	869.3 SCFM		
Mass Flow:	3912 lbs./hr		
Inlet Pressure:	77.07 in. H2O vac (includes -7.070 in. H2O filter and/or silencer loss)		
Discharge Pressure:	13.88 PSIA (includes 0.223 PSI silencer loss)		

*inlet*  
*standard*

**MODEL SELECTED FOR THE APPLICATION:**

Model Number:	COMPETITOR PLUS 6015-21L2
Materials of Construction:	Iron (standard)
Flow Direction:	Vertical Flow
Connection Size:	6 Flange Inlet 6 Flange Discharge
Seal Type:	Lip
Lubrication:	Splash/Grease
Rotative Speed:	1842 RPM (78.4 % of Max)
Gear Tip Velocity:	2894 ft/min
Discharge Temperature:	113.9 Fahrenheit
Discharge Volumetric Flow:	996.8 CFM
Required Input Power:	18.87 BHP
Estimated Blower Noise:	89 dB(A) at 1 meter, open field
Noise Level Based On:	<u>Inlet Silencer, and Discharge Silencer</u>

**SELECTED BLOWER OPTIONS:**

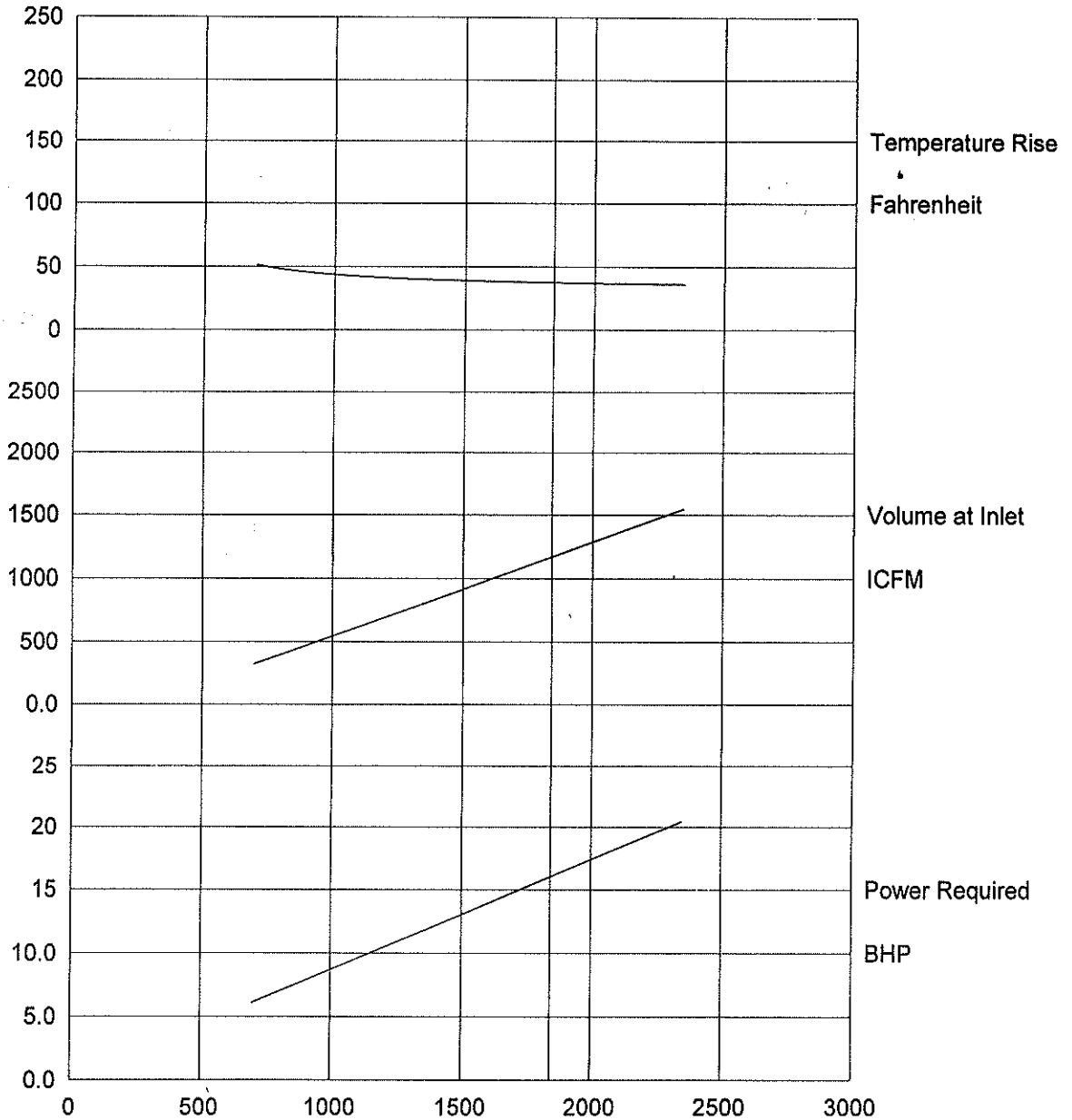
Vertical Flow  
Left Drive

**TESTING**

Standard Mechanical Integrity Test

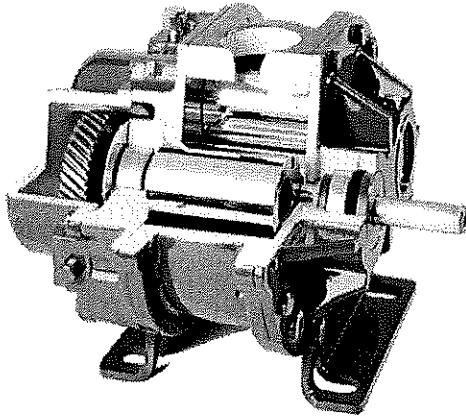
**Normal Condition Performance Curve for 6015-21L2**

Reference/Quote: RC060106-01



Performance Curve Based Upon The Conditions Of:

Displacement	0.740 CFR
Atmospheric Pressure:	13.66 PSIA
Elevation:	0 Feet
Gas:	AIR
Inlet Temperature	68 Fahrenheit
Molecular Weight	28.966
K Value	1.398
Inlet Pressure	77.07 in. H2O vac
Discharge Pressure	13.88 PSIA (includes 0.223 PSI silencer loss)



M-D Pneumatics™

# COMPETITOR PLUS™

## Rotary Positive Blowers

COMPETITOR PLUS rotary blowers are designed to be interchangeable with equivalent sizes of Roots Universal RAI®, and many Sutorbilt® California Series B and F, and Legend™ Series L and P blowers. COMPETITOR PLUS models are rated up to 15 PSIG discharge pressure or 16" Hg dry vacuum.

In addition to interchangeability, Tuthill Vacuum & Blower Systems has improved on existing designs with the following superior features ordinarily found only on premium blowers:

### Helical Gearing

COMPETITOR PLUS blowers are timed with hardened, precision helical gears, keyed to the rotor shafts, not taper fit spur gears as offered by other manufacturers, which have greater backlash, and can slip and lose timing. Helical gears are also quieter, reducing mechanical noise.

### Stronger Bearings

All COMPETITOR PLUS blowers include double row ball bearings at the gear end, stronger than single row ball bearings offered by other manufacturers. Drive shaft bearing is cylindrical roller type for additional strength against side loading from V-belt drives. As a result of this superior design, COMPETITOR PLUS blowers offer design bearing life as much as 50% greater than models offered by other manufacturers.

### Rotors with Integral Shafts

COMPETITOR PLUS blowers include precision machined ductile iron rotors with large, integrally cast shafts, not press fit and/or pinned shafts offered by other manufacturers, which can loosen over time and cause rotor clash. All rotors are dynamically balanced for vibration-free rotation.

### Positive End Clearances

End clearances are positively established at the blower gear end, eliminating the risk of shifting end clearances when installing or removing drive components. This also eliminates the need for those special fork and saddle tools required by other brands to reset end clearances.

### Polished Sealing Surfaces

All shaft surfaces in contact with sealing members are polished to reduce seal wear and risk of leakage.

### Individually Tested

Every COMPETITOR PLUS blower is factory tested to assure you of the highest quality. While some manufacturers perform only sample testing, We go the distance to insure that your blower meets our rigid ISO 9001 registered quality standards.

### ISO 9001 Registration

COMPETITOR PLUS blowers are manufactured under the Tuthill Vacuum & Blower Systems ISO 9001 registered quality assurance program, the first American manufacturer of rotary blowers to gain such international recognition.

### Warranty

Every COMPETITOR PLUS blower is backed by the Tuthill Vacuum & Blower Systems limited warranty for a period of 18 months after installation or 2 years after original blower shipment, whichever occurs first.

### Metric Availability

All COMPETITOR PLUS blowers are available with metric drive shaft and process connections.

### Worldwide Sales and Service

With sales offices and service facilities located on six continents, you can be assured of availability and service for your COMPETITOR PLUS blowers.

### Material Specifications:

Housing: Cast iron

End Plates: Cast iron

End Cover: Cast iron

Rotors: Ductile iron

Shafts: Ductile iron, cast integrally with rotors

Bearings: Gear end - Double row ball, both rotors

Drive end - Cylindrical roller on drive rotor

Single row ball on driven rotor

Drive Shaft: Ductile iron, cast integrally with drive rotor

Gears: Heat treated alloy steel, helical cut

Seals: Lip seals on rotor shafts and drive shaft

Lubrication: Oil splash on gear end, grease on drive end

Model Size	Max. Press. PSI	Max. Vac. (in. Hg)	Maximum RPM	Displacement CFR
2002	12	16	5275	.016
2004	7	16	5275	.032
3002	15	16	3600	.0467
3003	12	15	3600	.0616
3006	7	15	3600	.102
4002	15	16	3600	.061
4005	12	16	3600	.121
4007	7	15	3600	.160
5003	15	16	2850	.132
5006	13	16	2850	.221
5009	7	15	2850	.323
6005	15	16	2350	.246
6008	14	16	2350	.395
6015	7	14	2350	.740
7006	15	16	2050	.402
7011	10	16	2050	.738
7018	6	12	2050	1.200

LEADING THE SEARCH FOR INNOVATIVE SOLUTIONS



**TUTHILL**  
Vacuum & Blower Systems

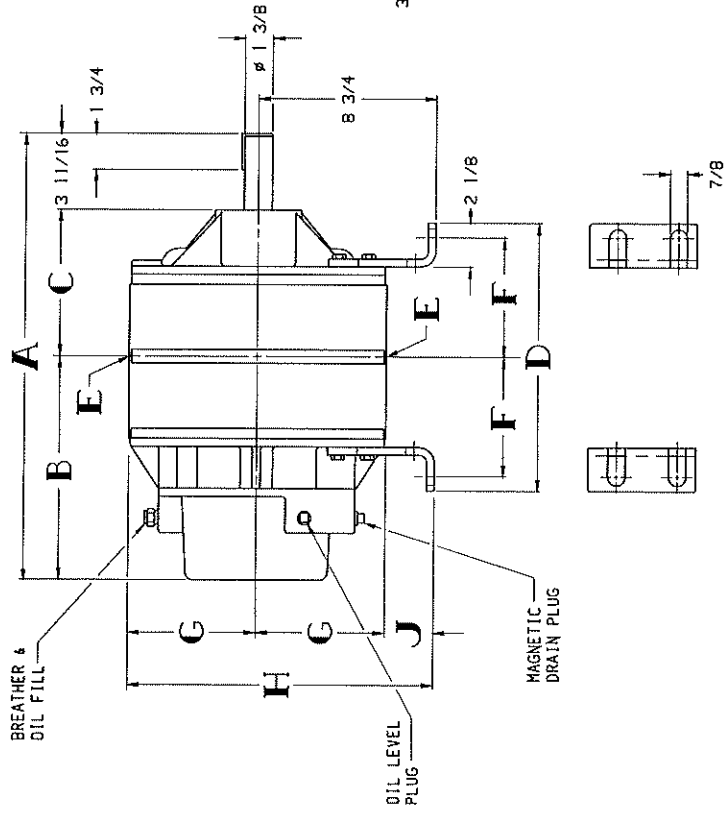
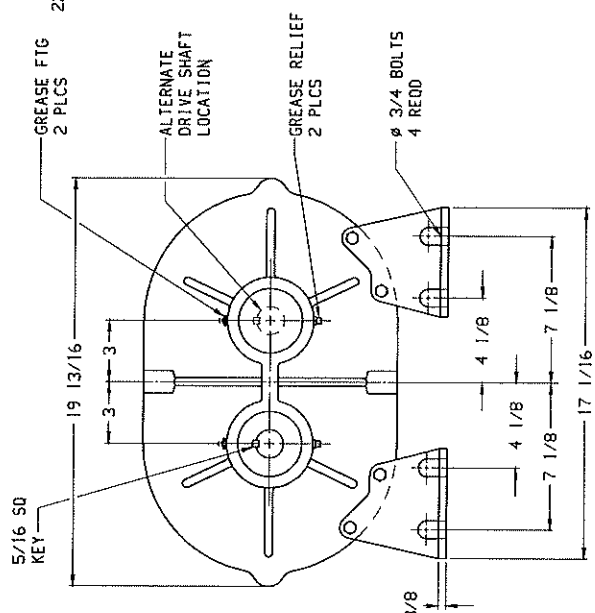
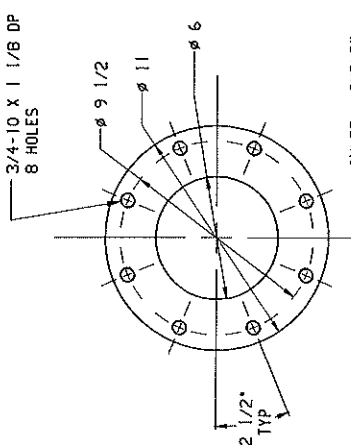


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<http://pneumatics.tuthill.com>



BLOWER MODEL	A	B	C	D	E	F	G	H	J	WEIGHT LBS
6005	18 11/16	9 3/8	5 5/8	10	3 NPT	4 1/4	6 1/4	15	2 1/2	250
6008	21 11/16	10 7/8	7 1/8	13	5 NPT	5 3/4	6 1/4	15	2 1/2	310
6015	28 11/16	14 3/8	10 5/8	20	6 FLG	9 1/4	7 1/2	16 1/4	1 1/4	456



**TUTHILL**  
 Vacuum & Blower Systems  
 Scarborough, Massachusetts, USA

ROTARY BLOWER OUTLINE

6000-21L/21R

DR. BD. 2-25-05. CH. 80.3-1-05.

Scale: C4

SCALE: 7/32

WT

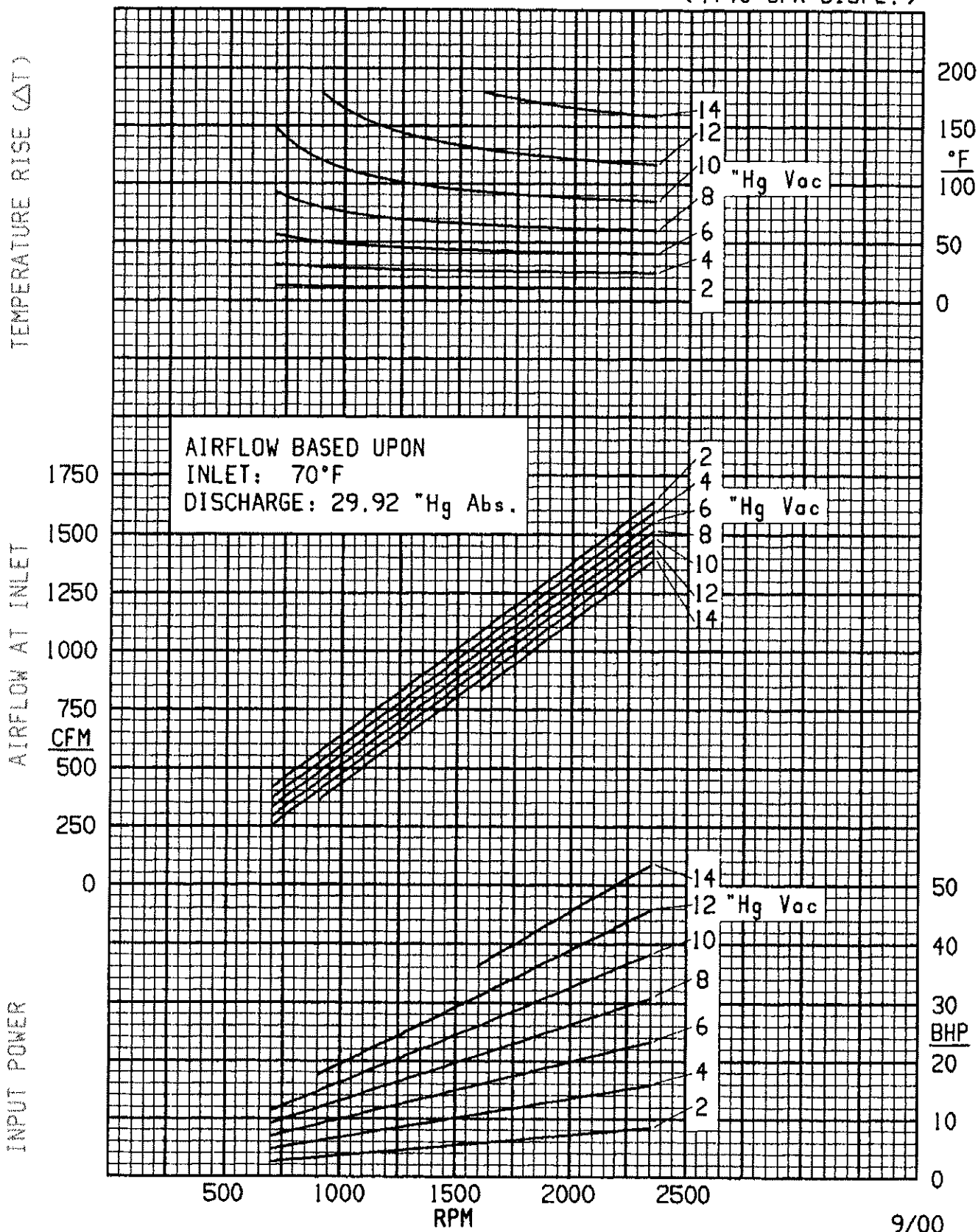
LBS

BOTTOM VIEW OF FEET

NOTE: REFER TO CURRENT MAINTENANCE MANUAL FOR SERVICE INSTRUCTIONS



# 6015 COMPETITOR PLUS™ VACUUM CURVE (.740 CFR DISPL.)



## **Control Panel Description and Logic**

### **Control Panel**

**The Control Panel consists of the following :**

- NEMA 4 Enclosure with dead face cover and Inner Door, lockable
- Disconnect Handle
- UL Listed Components
- Control Transformer
- 20 Hp Motor Starter, 460/3/60, fused
- HOA Switch
- Run Pilot Light (Green)
- High Temperature Alarm Light ( Red) (IS)
- High Level in KO Tank Alarm Light ( RED) (IS)
- XP Interior Light / On/Off Switch Interface (150 Watt, 115/1/60)
- XP Exhaust Fan / Thermostat interface ( ¼ Hp, 115/1/60)
- XP Heater / Thermostat interface (3600 watt- 460/3/60)
- Hour Meter

### **Logic for SVE Blower Control is:**

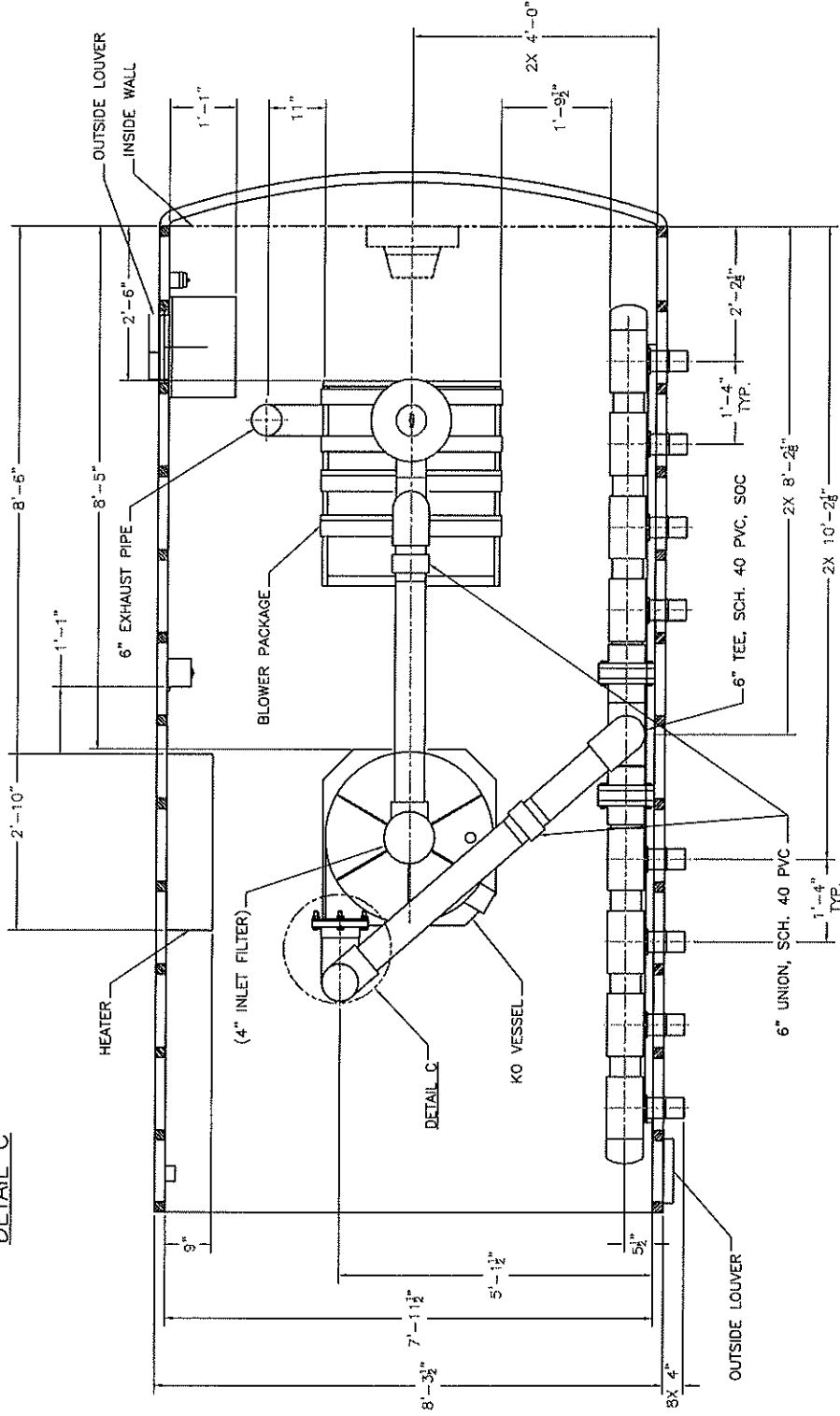
Main power will be supplied to the SVE blower motor.

If a high water condition is encountered in the knock out vessel, A signal will be sent to the panel, shutting down the blower and turning on the High Level Alarm Light. ( Red) A latched condition exists; the alarm condition needs to be cleared, and the blower needs to be manually re-started.

If the blower encounters a high discharge air temperature condition, a signal will be sent to the panel, shutting down the blower and turning on the High Temperature Alarm Light. ( Red) A latched condition exists; the alarm condition needs to be cleared, and the blower needs to be manually re-started.

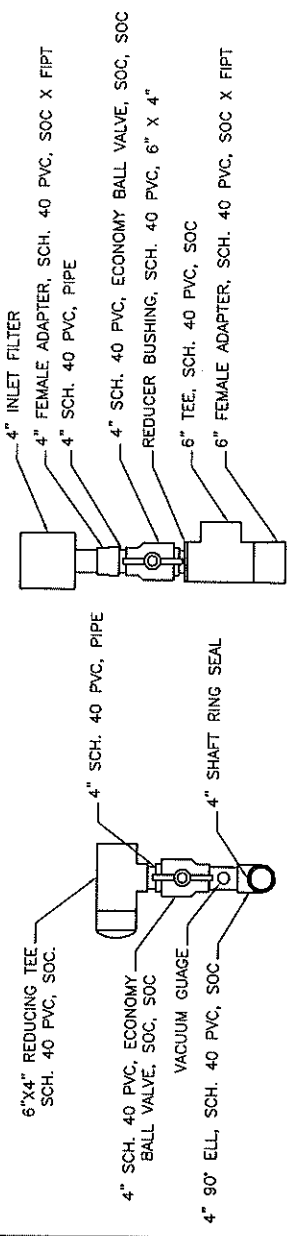
- 2PC. FLANGE, 6"
- 3/4" BOLT X 3" LG. (8 PLACES)
- 3/4" HEX NUT (8 PLACES)
- 3/4" FLAT WASHER (8 PLACES)
- FLANGE GASKET, 11" O.D.
- 2X 6" 90° ELL. SCH. 40 PVC, SOC X SPIG

DETAIL C



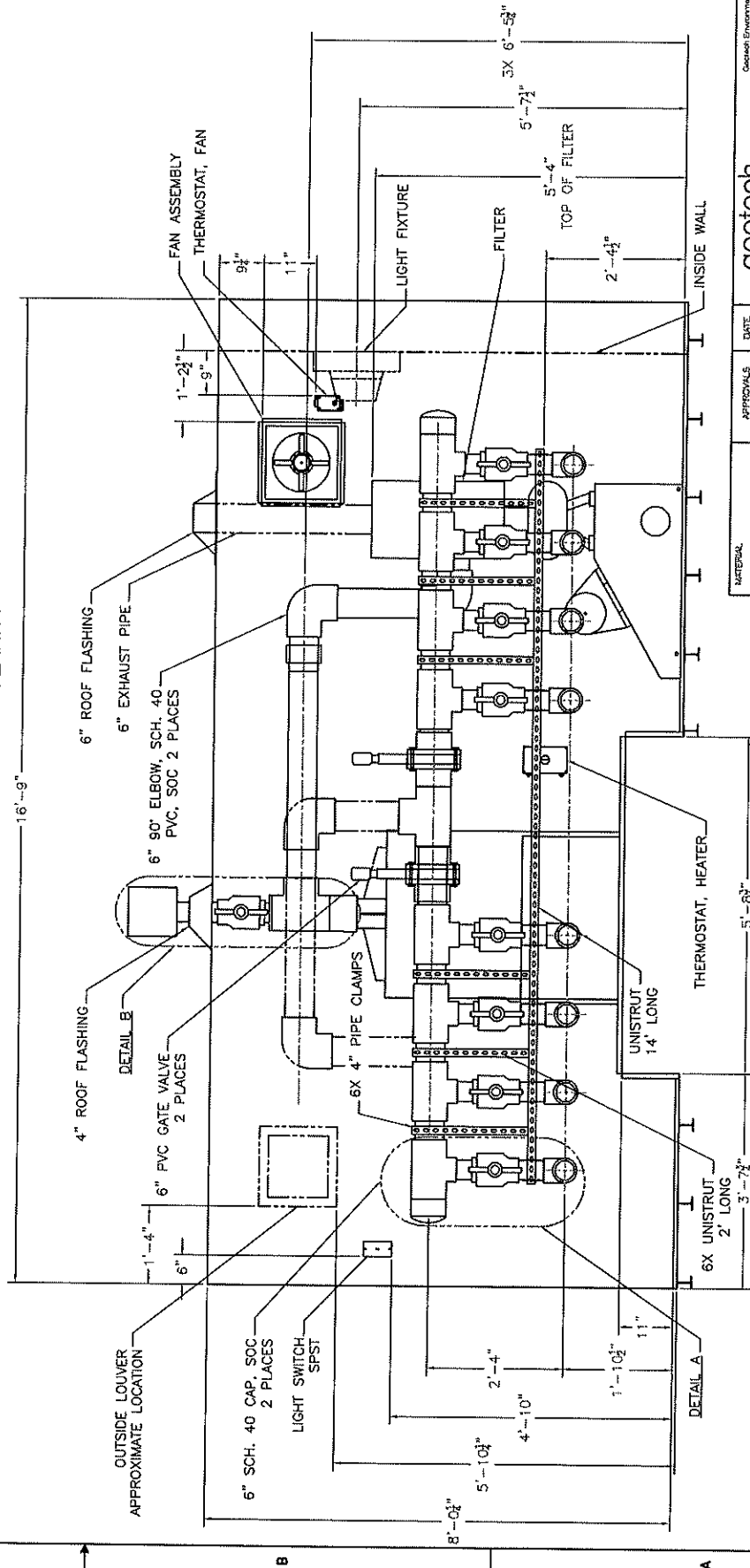
<b>geotech</b> geotech Environmental Equipment, Inc. 8003 East 10th Avenue Denver, Colorado 80237 1-800-533-7858		DATE: 6/20/06 APPROVALS: [Signature] DESIGN: [Signature] CHECKED: [Signature] QUANTITY: 2265309
ASSY. TRAILER, GSI SVE		SIZE: C DWG NO.: 4309-000 SCALE: NTS DO NOT SCALE DRAWING
MATERIALS:		TOLERANCES: ± .005 UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
THIS DRAWING CONTAINS INFORMATION WHICH IS PROPRIETARY TO GEOTECH ENVIRONMENTAL EQUIPMENT, INC. OR CONSIDERED BY GEOTECH ENVIRONMENTAL EQUIPMENT, INC. TO BE CONFIDENTIAL. IT IS HEREBY AGREED THAT THE RECIPIENT OF THIS DRAWING WILL NOT DISCLOSE OR REPRODUCE THE INFORMATION CONTAINED HEREIN WITHOUT THE WRITTEN PERMISSION OF GEOTECH ENVIRONMENTAL EQUIPMENT, INC. GEOTECH ENVIRONMENTAL EQUIPMENT RESERVES ALL RIGHTS TO SUCH PROPRIETARY INFORMATION.		DECIMALS: ± .005 ANGLES: ± 0.30° INVENTORY P/N: 2265309
SHEET 2 OF 2		3

REV	DATE	DESCRIPTION	DATE	APPROVED



**DETAIL A**  
8 PLACES

**DETAIL B**  
FLASHING REMOVED FOR CLARITY



<b>geotech</b> geotech Environmental Equipment, Inc. Denver, Colorado 80207 1-800-635-7658		DATE: 4/20/08 DRAWN: [blank] CHECKED: [blank] APPROVED: [blank]
MATERIAL: [blank]		TOLERANCES - UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES DECIMALS: .0005 FRACTIONS: 1/32 ANGLES: 1/2°
ASSY. TRAILER, GSI SVE		SIZE: C DWG NO.: 4309-000 SCALE: AS SHOWN SHEET: 1 OF 2

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