



Blower Engineering

2022 IAOM Flour City District meeting

Brainerd, MN.

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Company Background

- Established in 1980.
- PD Blower Manufacturer.
- Specialize in Pneumatic Conveying.
- Started as a repair shop;
Applied knowledge obtained in repair facility to design our own Blowers.



Repair Facility

- Fully equipped Repair Facility
- Shop foreman has 40+ years experience with Blower repairs.
- Repairs completed at a fraction of the cost of a new Blower.



Raw Materials

Rotors



Cylinders



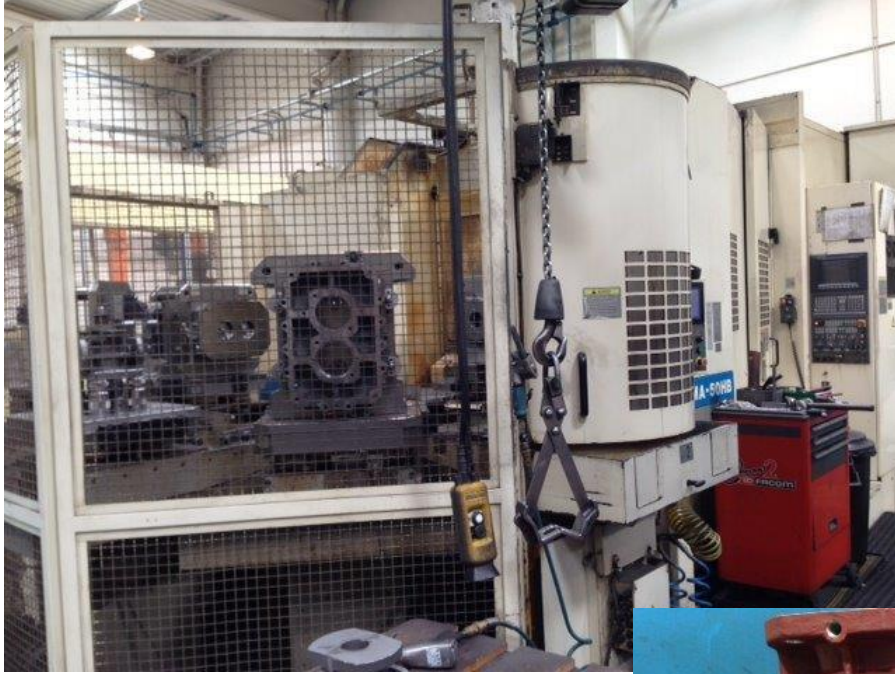
Endplates



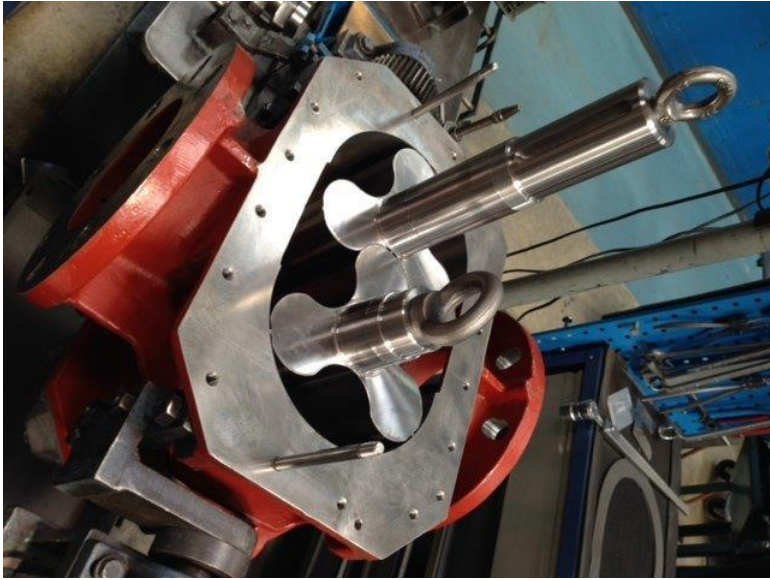
Rotor Machining



Endplate/Cylinder Machining



Blower Assembly and Testing



18 Blower Models

TRI-LOBE BLOWER PERFORMANCE

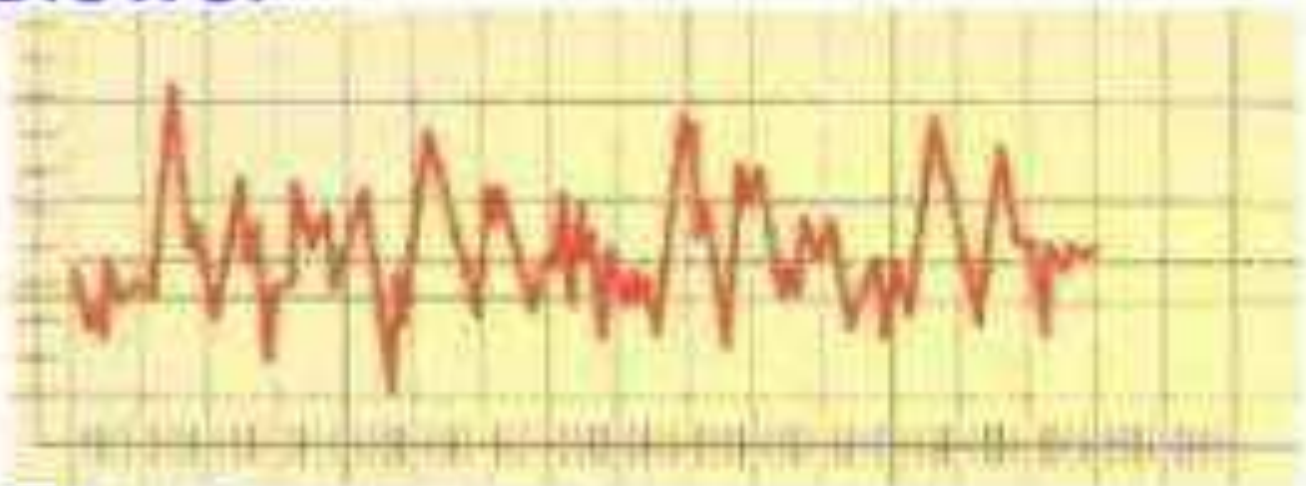
Tri-Lobe Model	ΔP Max PSIG	Vacuum Max "Hg	30	145	300	600	1200	2400	4800	5200
TL 10	13	13	████							
TL 20	13	13	██████							
TL 30	15	15	████████							
TL 40	15	15	██████████							
TL 41	11	12		██████████████						
TL 50	15	15		██████████████						
TL 60	15	15		██████████████						
TL 61	11	12			██████████████████					
TL 70	15	15		██████████████████						
TL 80	15	15		██████████████████						
TL 81	11	12			██████████████████████					
TL 90	15	15			██████████████████████					
TL 100	15	15				██████████████████████				
TL 101	10	12				██████████████████████				
TL 110	15	15				██████████████████████				
TL 120	12	13					██████████████████████			
TL 600	15	15					██████████████████████			
TL 900	12	13						██		

Pressure Performance data based on the following; Gas handled: Air, Inlet pressure: 14.7 PSIA, Inlet Temp.: 68°F

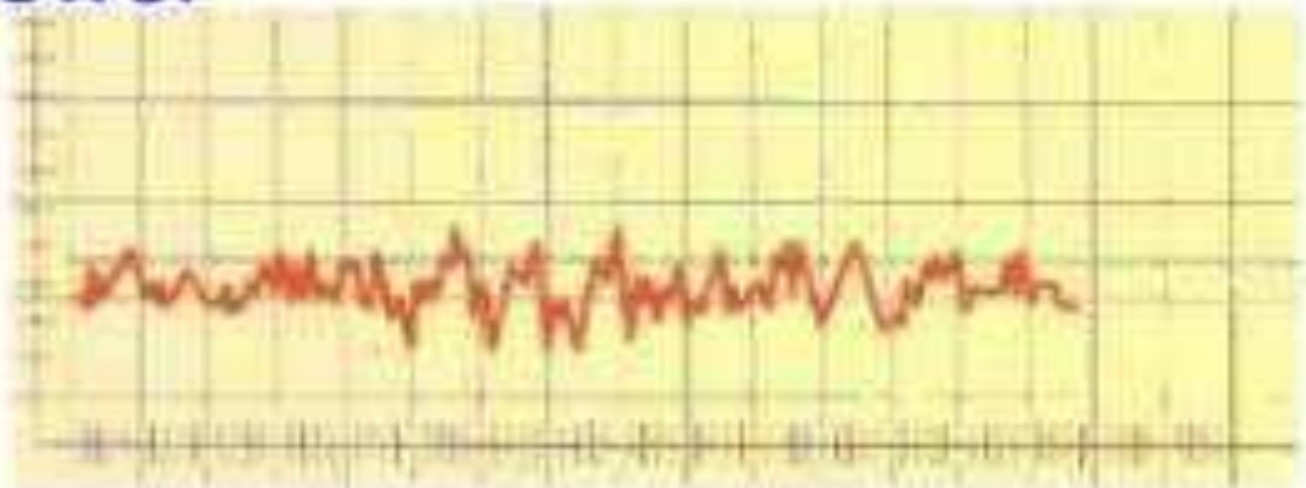
Vacuum Performance data based on the following; Gas handled: Air, Discharge pressure: 29.92 HG A, Inlet Temp.: 68°F

Two Lobe vs Tri-Lobe

Two-Lobe Blower



Tri-Lobe Blower



Tri-Lobe Blower Operation

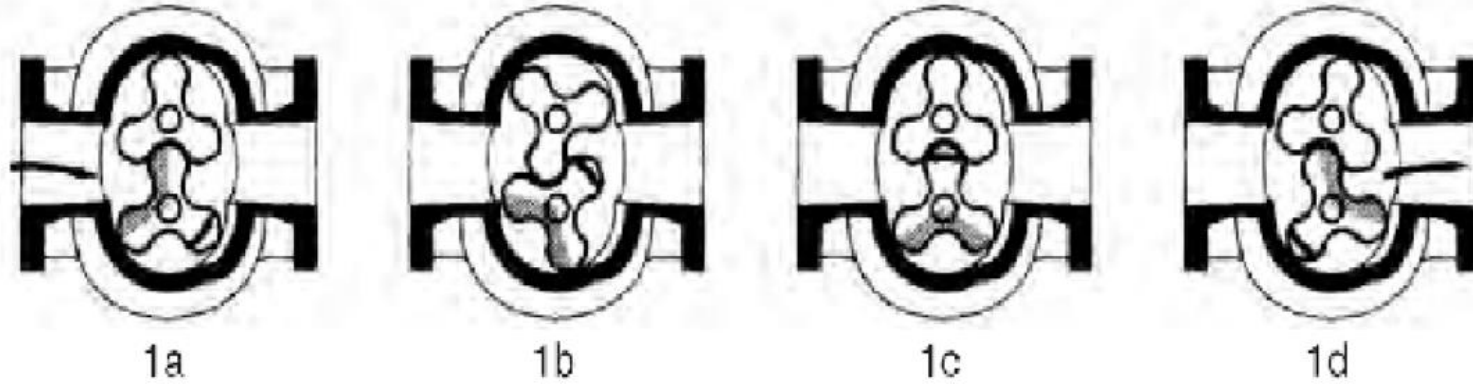


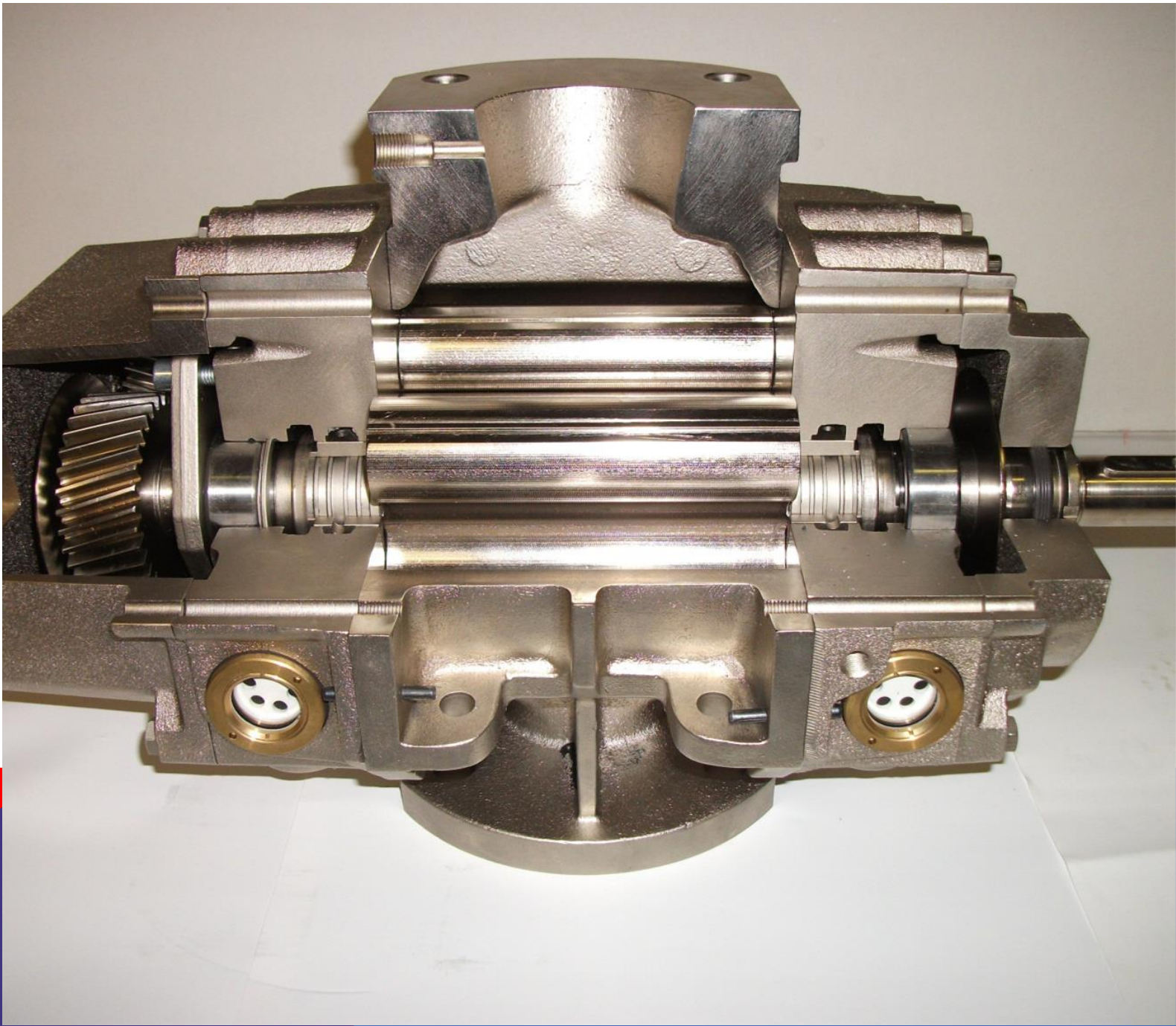
Fig. 1

1a - Gas enters inlet port

1b – Gas is trapped between rotor tips

1c – Gas pressure is equalized gradually

1d – Gas exits discharge port at system pressure



Pneumatic Conveying Data sheet



**Blower
Engineering**

Sales and Service

10228 Old Liberty Rd. Liberty, NC. 27298
800-388-1339, fax 800-523-8808

Date 7/13/2016

Pneumatic Conveying Data Sheet

Company Name Mill A

Contact _____

Phone (____) ____ - ____ Fax (____) ____ - ____

City Liberty State NC

Elevation 0 ft. ASL Average Ambient Temperature 70 °F

Type of System Pressure ☒ Vacuum _____

Product to be Conveyed Flour

Weight, lb/ft³ 32 lb/cu. ft Particle size _____

Flow Rate cwts/hr 300 cwts/hr or lbs/min _____

Conveying line size O/D 4" I/D 3.870"

Total Conveying line in feet Horizontal 50 feet Vertical 110 feet

Total number of long sweep elbows 90° 3 45° 0

Specify other i.e. Hammertek, short radius etc. Long Radius

Total number of diverters 1 Flap _____ Tunnel _____

Number of air locks 1

Size and manufacture of air locks Buhler 36/38

Terminal of conveying line ☐ Bin ☐ Cyclone ☐ Tanker ☐ Other _____

Please specify any other info i.e. flex hose, switching station, multi product line, etc. _____

Size of air line from blower to air lock _____

Total Length in feet Horizontal _____ Vertical _____

Number of elbows 90° _____ 45° _____

☐ Outside installation ☐ Inside installation ☐ Blower room ☐ Mill floor ☐ Other _____

☐ Plenum air intake (outside air) ☐ Blower room / mill intake (inside air) _____

☐ Motor frame TEFC ☐ Explosion proof _____

Please Attach Drawing of System Layout

- Thru put (cwts/hr.)
- Conveying length
- Line size
- # conveying 90's / 45's

Calculation and Blower Selection

THRU PUT:	13608	KG/HR	30000	LB/HR	500	LB/MIN
	300	cwts/hr.				
BULK DENSITY:		32.0	LB/CU.FT		512.6	KG/CU.M.
FEEED RATE:		937.5	CU.FT./H		26.5	CU.M./HR
		15.6	CU.FT./M		442.5	L/MIN
			IN			
AIRLOCK SELECTION:						
=	====					
MODEL DISPLACEMENT			RPM	RPM	RPM	Lock Loss
L	cu.ft.	50% Fill	60% Fill	100% Fill		60% Fill
36/38	27.80	0.98	31.83	26.53	15.92	SCFM
						55
BLOWLINE LENGTHS						

	QUANTITY			EQUIVALENT		
	=====			=	=	
HORIZONTAL:	50	FT		54	FT	
VERTICAL:	110	FT		110	FT	
ELLS 90:	3			18	FT	
ELLS 45:	0			0	FT	
DIVERT:	1			3	FT	
-	-	-	-	-	-	
TOTAL FEET (EQUIVALENT / EMPTY):				185	181	FT
LINE SIZE	3.870	INCH I.D.	11.76	SQ.IN.	0.082	SQ.FT.
PREF'D PICK-UP VEL.	3400	FPM				
PREF'D TERMINAL VEL.	4946	FPM				
PREF'D EMPTY PRESS.	0.69	PSI				
PREF'D TOTAL PRESS.	8.68	PSI				
PREF'D BLOWER VOLUME	404	SCFM				
MIN. CONVEYING VOLUME	456	SCFM		Saturation:0.808		

SCFM	404	ICFM	469
Lock loss	65		
PSIG	8.68	PSIA	23.38
Elevation	0		
Inlet Temp. [Deg. F]	70		

MODEL	Temp rise	% Max. Temp.	BHP	RPM	% Max. RPM	% Max. Press
70	79.59	40	25.36	2200.3	58	58

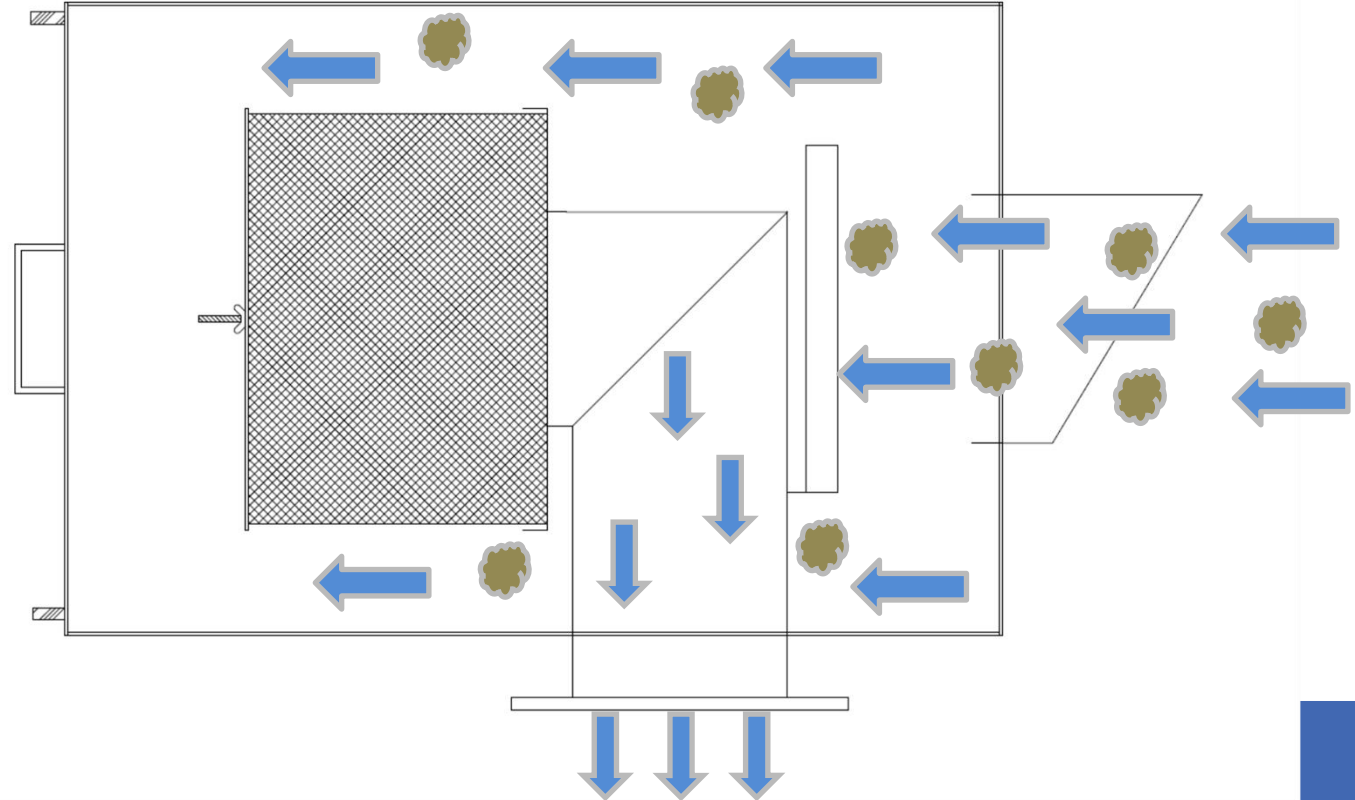
Compact Base Blower Package

- Smaller footprint than competitors.
- Quiet operation
- Sanitary Design



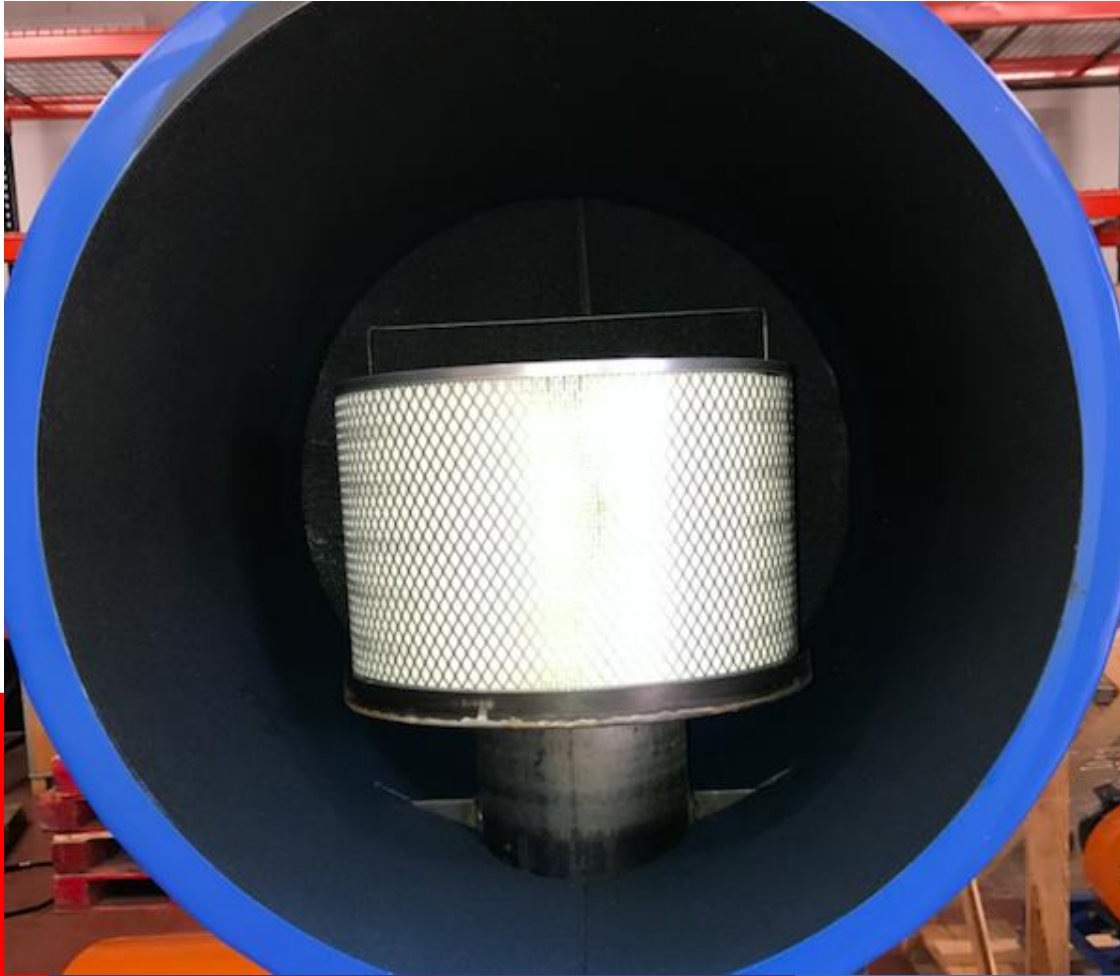


Intake Filter Silencer

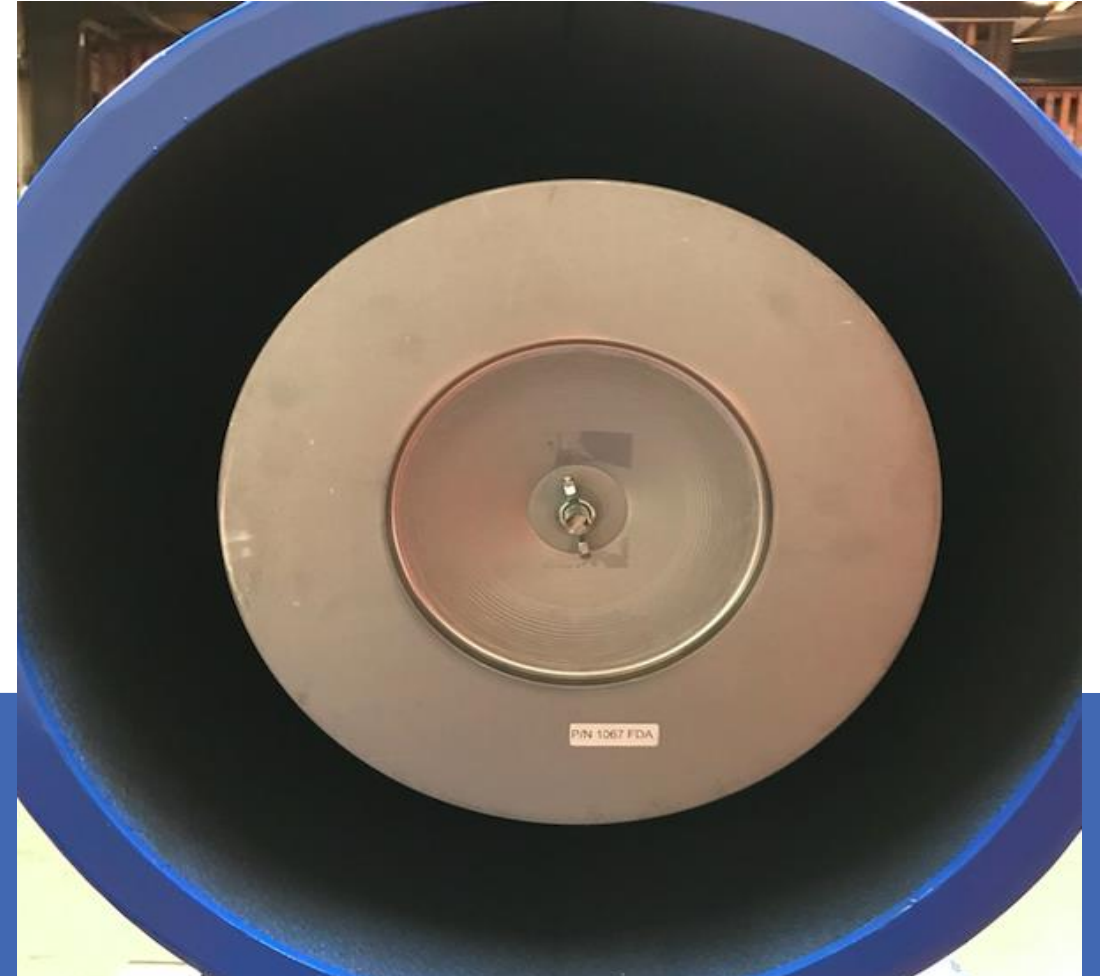


New Filter Silencer Design

Old Design



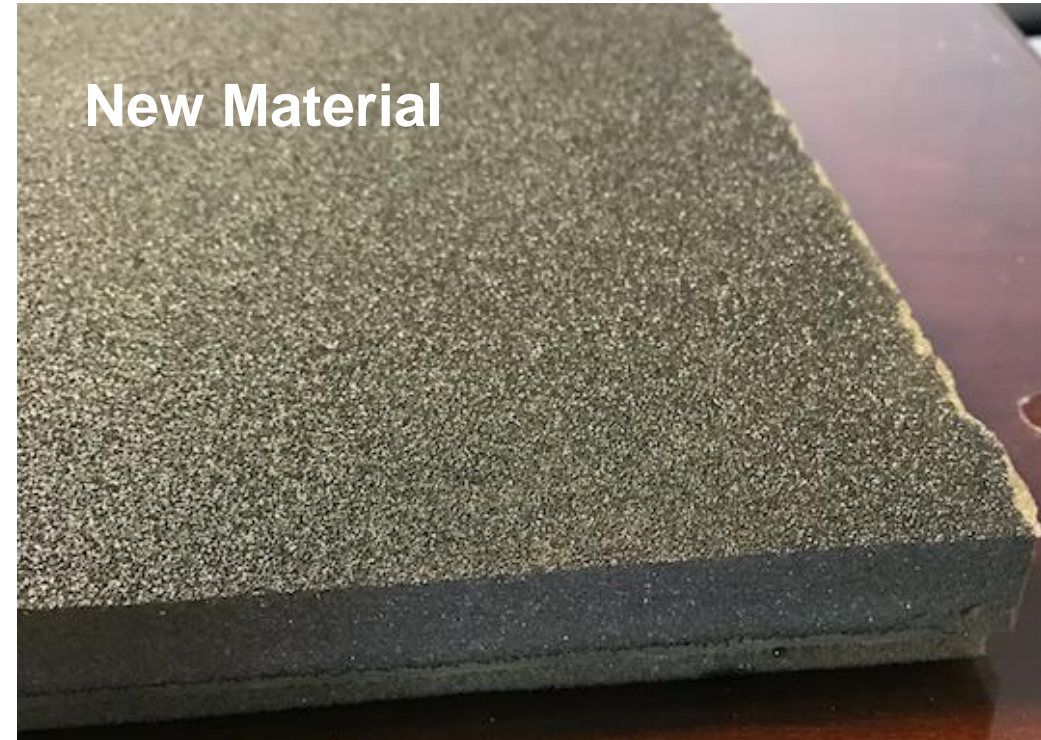
New Design



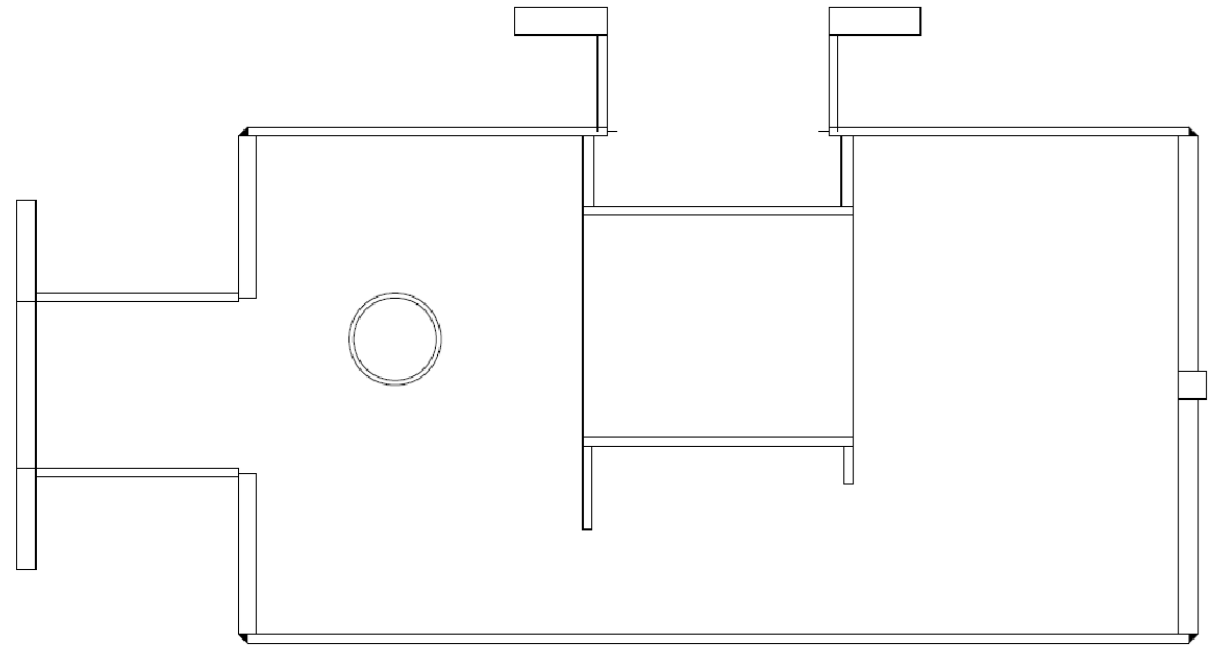
Sound Deadening Foam



Discontinued



- Urethane coated
- Does not peel or crack
- Non hazardous (OSHA)



Discharge Silencer



Filter Restriction Indicator



Food Grade Gaskets



Check Valve



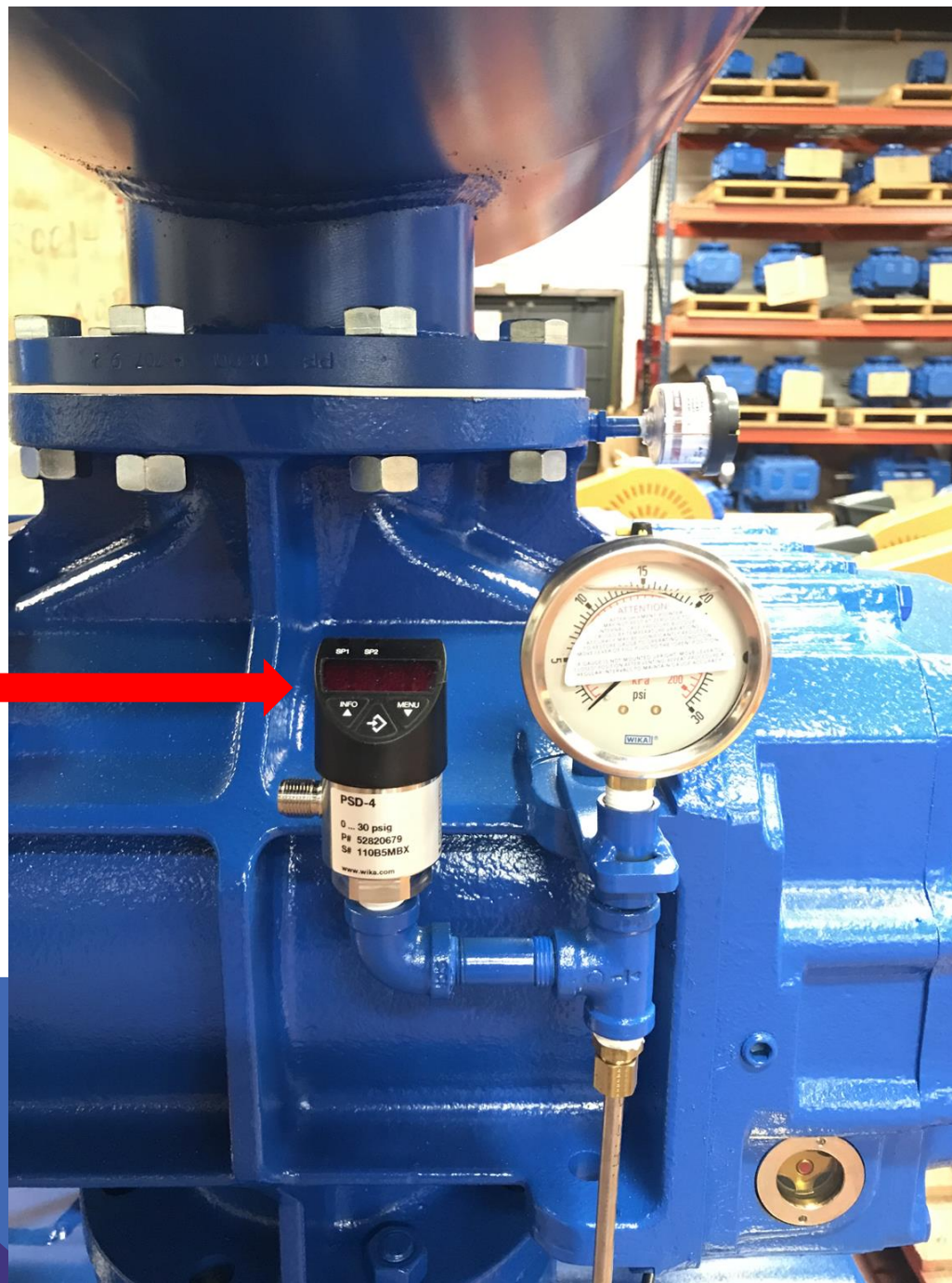
Pressure Relief Valve



Model 337, Non-code¹ and ASME Section VIII
Air (SCFM)

Set Pressure (psig)	Valve Inlet and Outlet Size		
	2"	2 1/2"	3"
	Orifice Area, in ²	Orifice Area, in ²	Orifice Area, in ²
	1.915	2.79	4.04
1	240	364	527
5	531	805	1166
10	741	1124	1628
15	948	1436	2081
20	1092	1656	2399

4-20mA Pressure
Transducer
with Digital read-out



Weather Proof Acoustic Enclosure





- Removable panels for oil changes, replacing parts.



- Double doors for easy access; tightening belts, or replacing a filter

Exhaust Fan



- Thermostat set @ 70°F



Gauges



Blower pressure (PSIG)

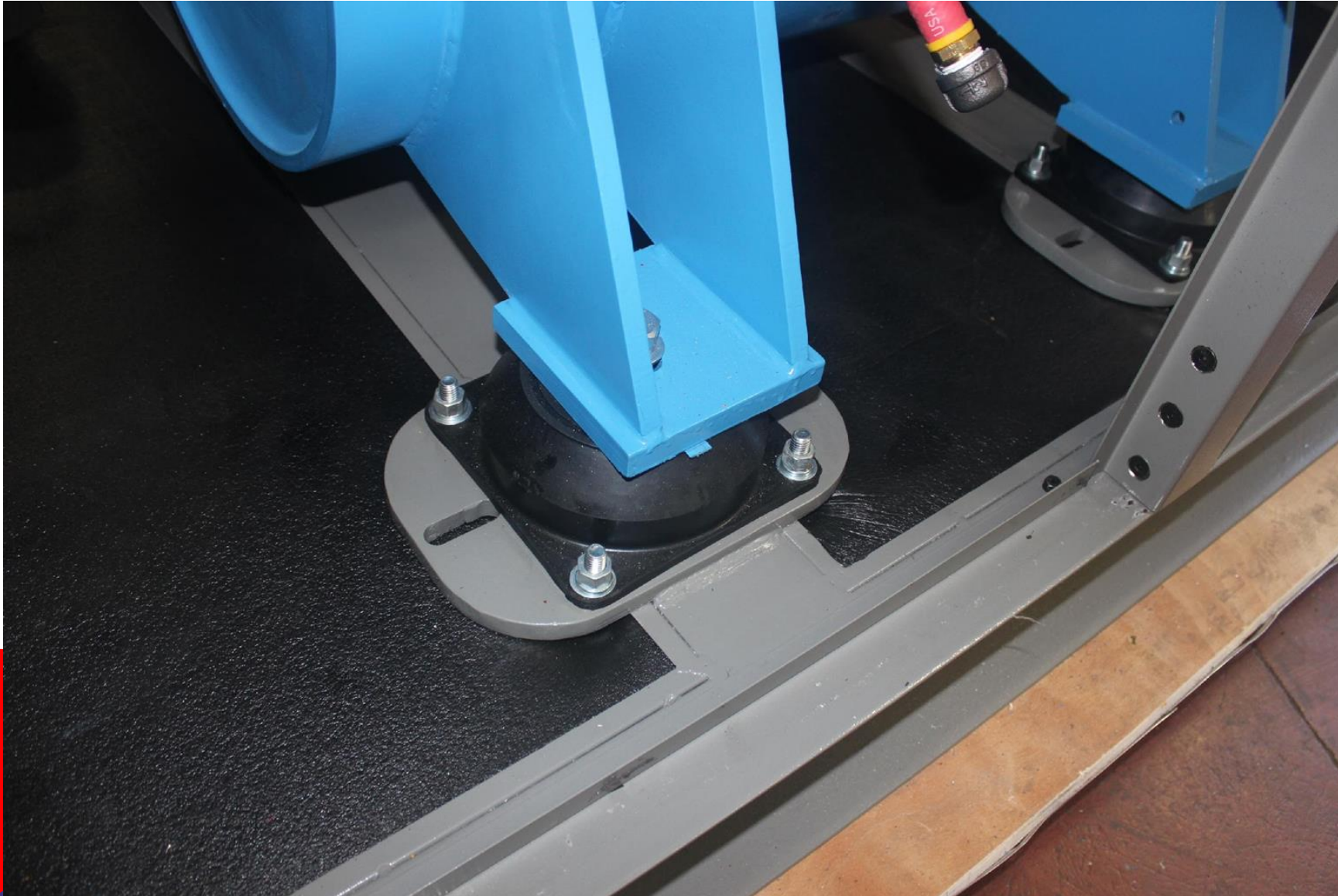


Discharge temperature (°F)



Filter minder ("WC)

Vibration Pads



- Reduce vibration
- Improve quieter operation

Key Benefits



- < 75 dba. @ 15 psig (3ft. field conditions)
- Weather proof
- Residential areas
- Outdoor applications

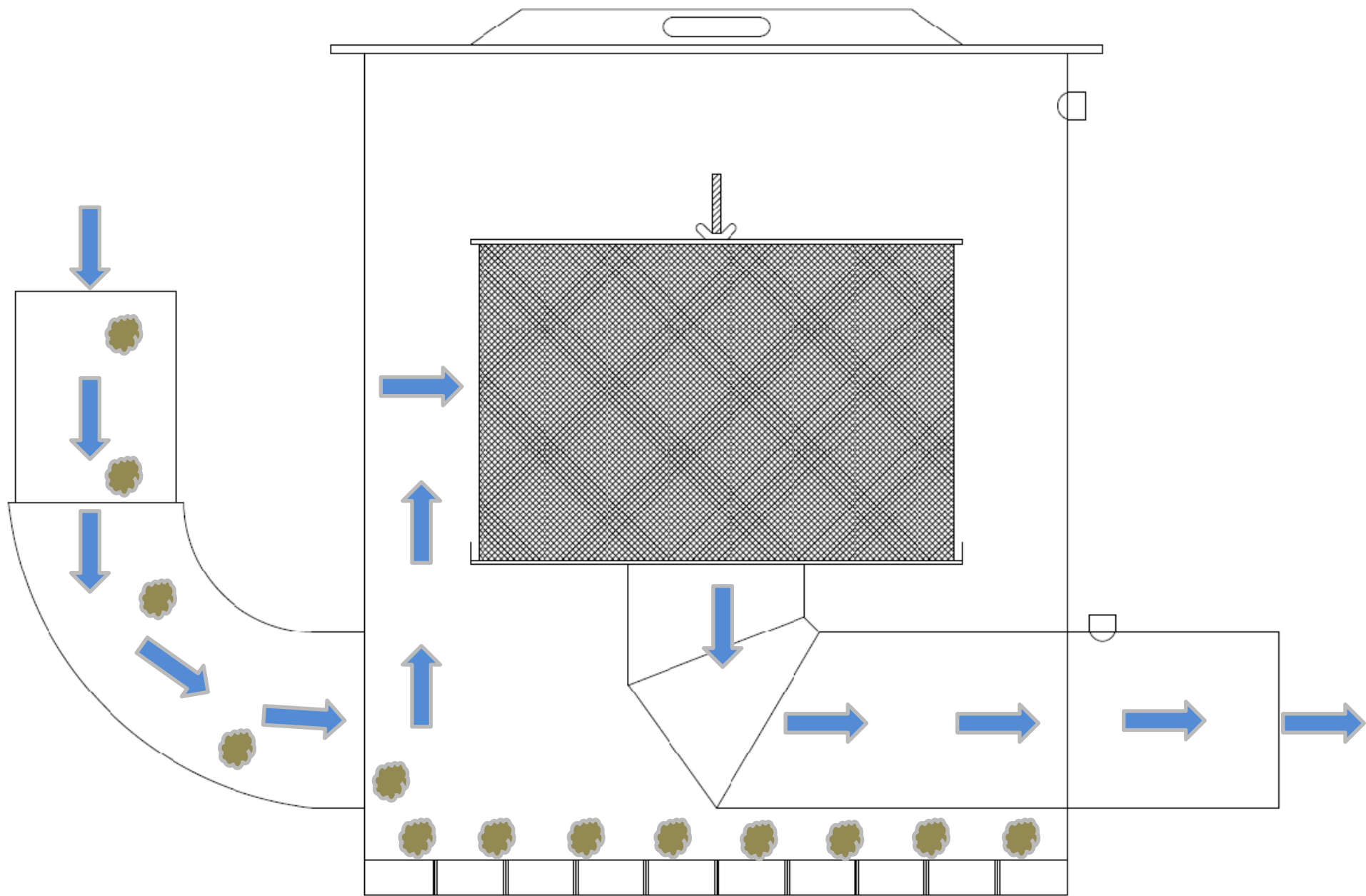
Knock Down Acoustic Enclosure

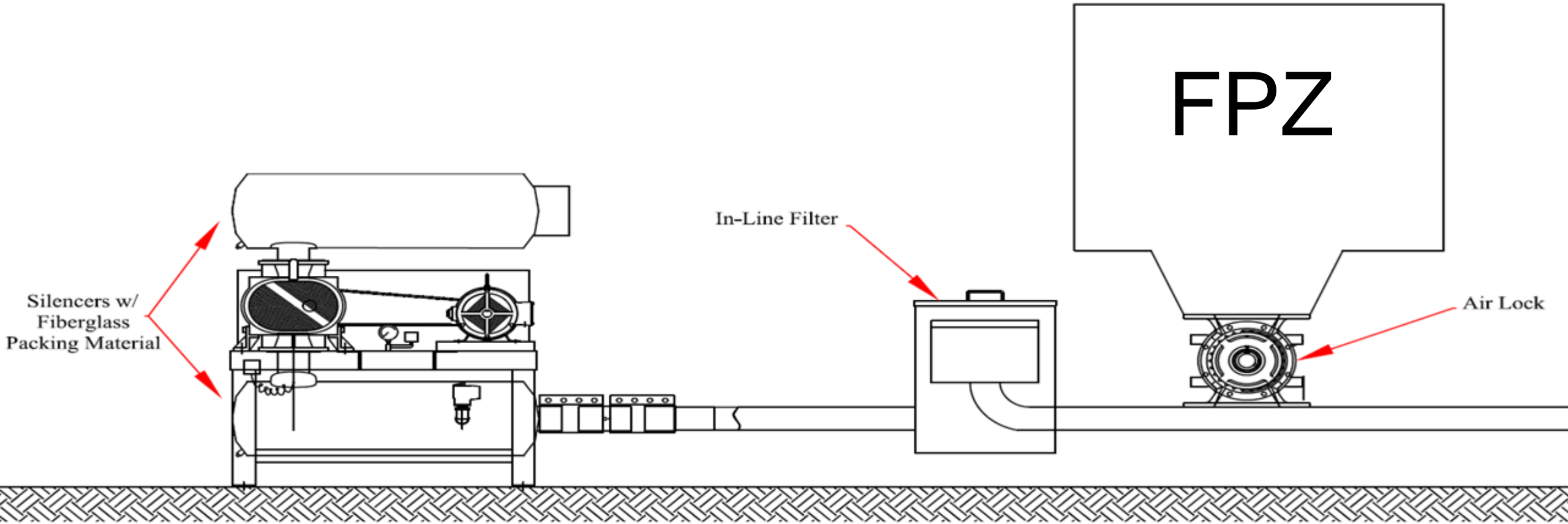


- Alternative to acoustic enclosure

In-line Filter









Sight Glass Tools

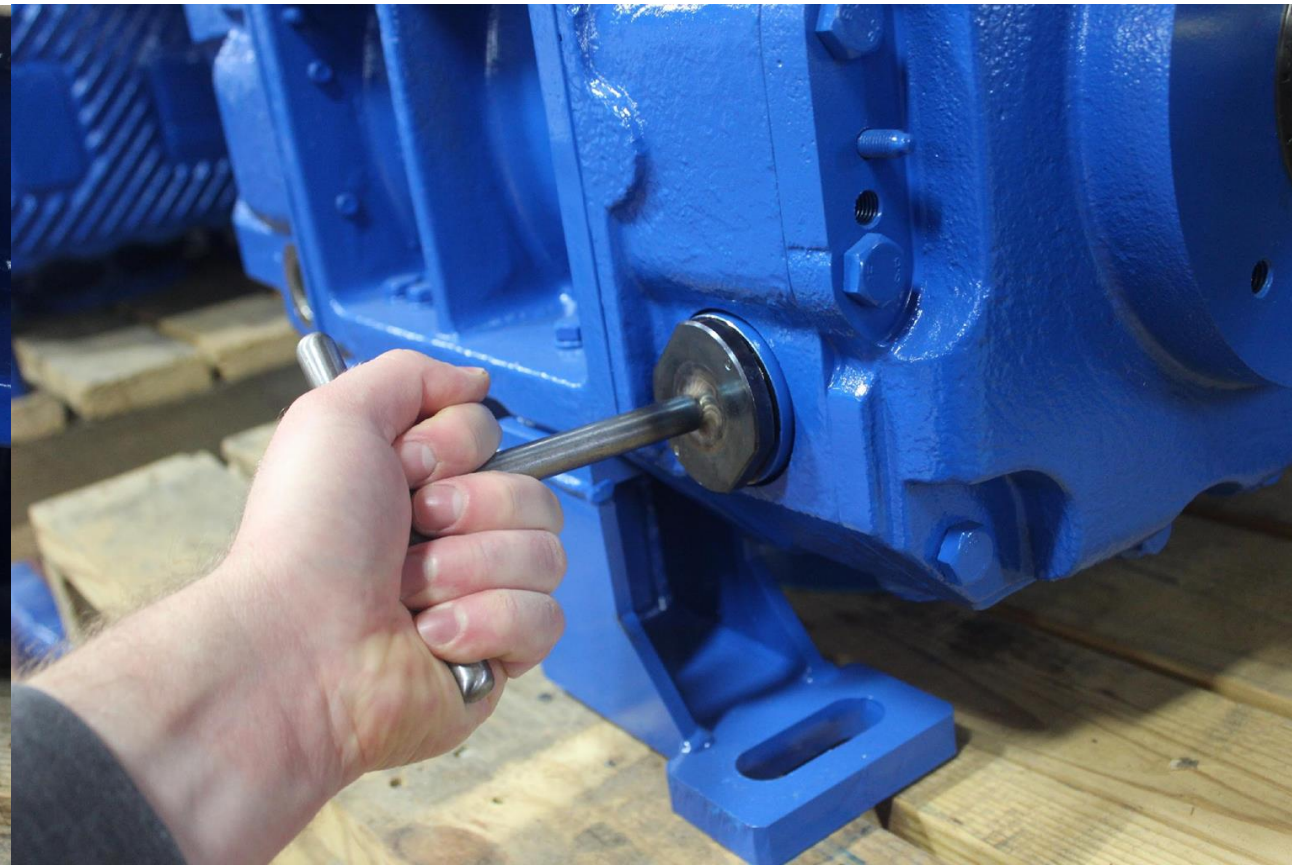
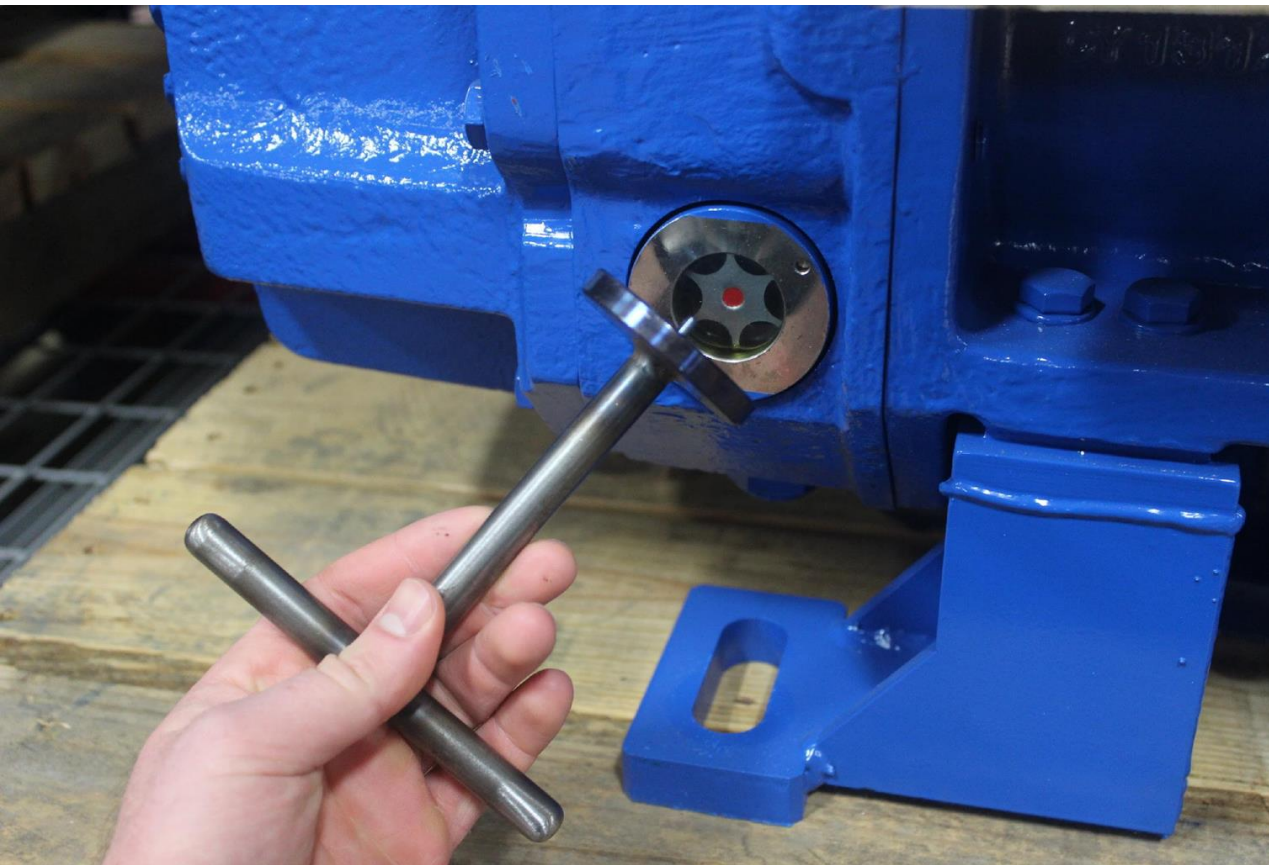
TL10-TL90



TL100-TL120



Sight Glass Tools



Maintenance Tips

- Daily operating checks:
 - Outlet temperature
 - Discharge pressure
 - Power absorbed
- Every 500 hours check:
 - Oil condition
 - Belt wear
 - Coupling inserts
- Filter minder on all blowers

Oil Tips

- Use synthetic or food grade synthetic oil in all blowers
- New blowers – change oil after first 100 working hours (breaking oil).
- Regular oil changes every 2000 working hours
- Check oil level/quality every 500 hours.



Mobil SHC 630 - Synthetic



- High temperature resistance
- High Viscosity Index
- Reduce friction
- Rust and corrosion prevention



Mobil Cibus 220- Food Grade Synthetic

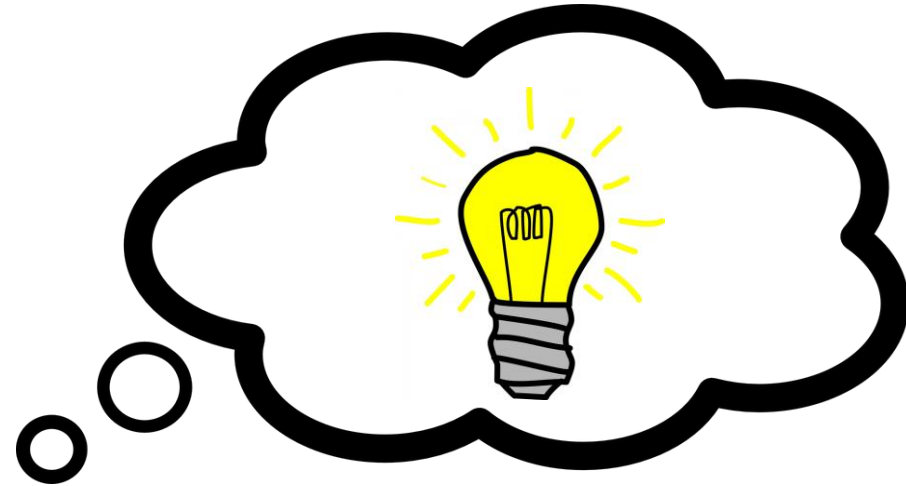


- FDA / NSF registered lubricants
- Low Potential of leakage
- Rust and corrosion prevention



What's new ?

- CAT Diesel Generator Powered Mobile Blower Package
 - Mechanical Pre-Cleaners for Blower intake.
 - Aerzen to TL Conversion



Diesel Generator Powered Mobile Blower Package



Powered by CAT Diesel Generator

60 KVA Diesel Generator

- **Integral fuel tank with 18 hour capacity @ 100% full load**
- **Fully automated, remote controlled.**
- **Quick couplers to connect large portable auxiliary fuel tank if longer uninterrupted operation is required**



Standard TL50 Blower Package c/w 25 hp



Thermostatically controlled Solar-Powered Ventilation Fan



Mechanical Pre-Cleaners

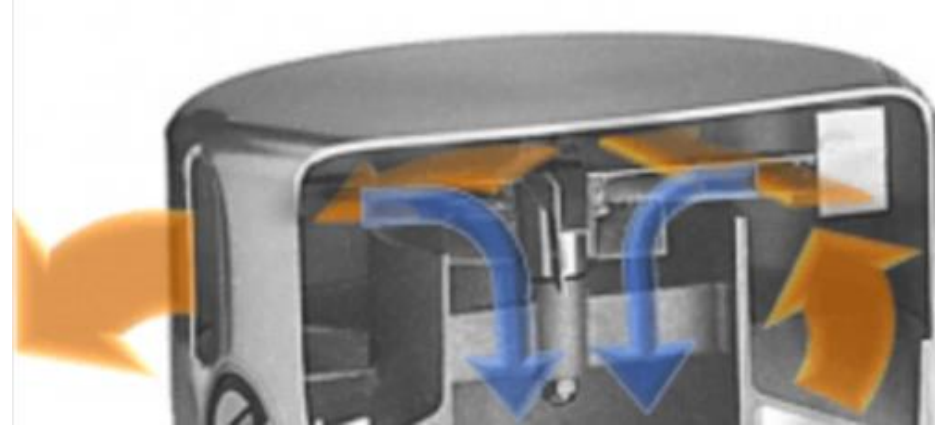


How it works:

- Dirty air enters the Mechanical Pre-Cleaner.
- Spinning rotors separate dirt from the air.
- Dirt is carried along the inside of the cover to the discharge port.
- Dirt is ejected back into the atmosphere.
- Clean air is drawn in through the chamber; only dry, clean air enters the Filter/Silencer.



- 20 to 2000 CFM Airflow range.
- Eliminates 95% of dirt from intake air.
- **Extends filter element life up to 75%.**
- Reduce maintenance and down time
- ~~Increase~~ Blower operation.

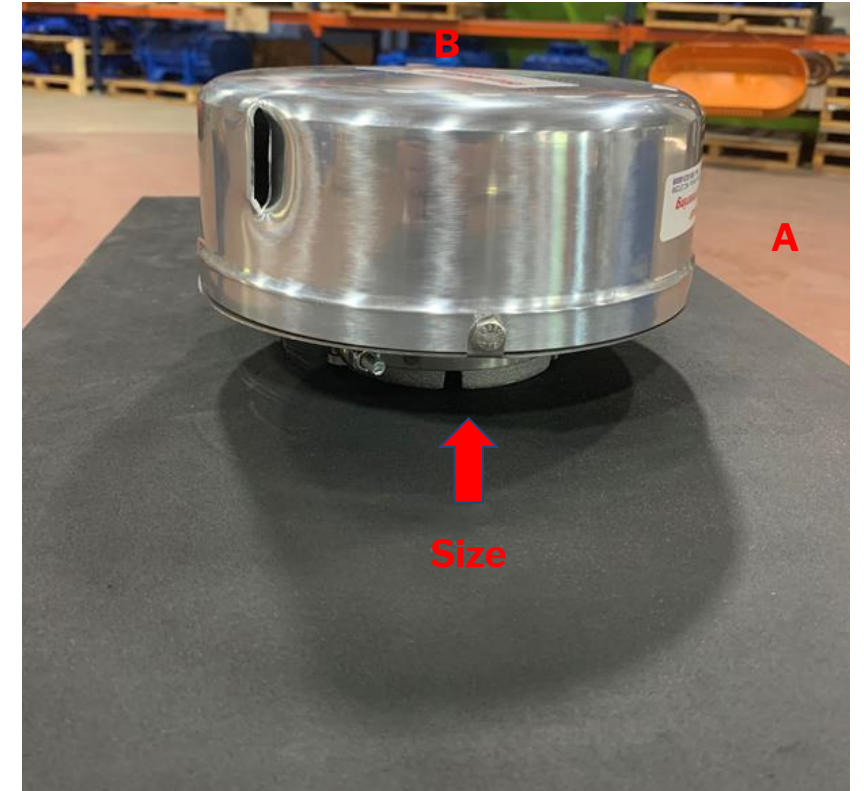


High Debris Environments



Size & Dimensions:

Size	CFM		A	B
2	20	100	3.125	4.75
2.5	100	200	4.25	6.00
3	140	350	4.75	8.25
4	140	350	4.75	8.25
5	300	600	7.15	10.63
6/6S	300	850	7.125	10.63/12.25
8	500	1400	7.25	14.13
10	900	2000	8.125	17.13



Aerzen to TL Conversion Chart

Aerzen	Max PSIG	DN Flange Size	TL Series Flange Size	TL Series Direct Replacement	TL Series Up-Grade Replacement	TL PSIG
GM 3 S	13 PSIG	DN 50	ANSI 2" / DN 50	N/A	TL10	13 PSIG
GM 4 S	15 PSIG	DN 80, 8 bolt holes	ANSI 3" / DN 80, 4 bolt holes	N/A	TL20 (Needs Adapter)	13 PSIG
GM7 L	10 PSIG	DN80, 8 bolt holes	ANSI 3" / DN 80, 4 bolt holes	N/A	TL30/40 (Needs Adapter)	15 PSIG
GM 10 S	15 PSIG	DN 100	ANSI 4" / DN 100	N/A	TL50	15 PSIG
GM15L	10 PSIG	DN 100	ANSI 4" / DN 100	TL41	TL50/60	15 PSIG
GM 25 S	15 PSIG	DN 150	ANSI 6" / DN 150	N/A	TL70	15 PSIG
GM 30 L	10 PSIG	DN 150	ANSI 6" / DN 150	TL61	TL70/80 or 90	15 PSIG
GM 35 S	15 PSIG	DN 150	ANSI 6" / DN 150	TL80	TL90	15 PSIG
GM 50 L	10 PSIG	DN 200	ANSI 8" / DN 200	N/A	TL100/TL110	15 PSIG
GM 60 S	15 PSIG	DN200	ANSI 8" / DN 200	TL100	TL110	15 PSIG
GM 80 L	10 PSIG	DN 250	ANSI 10" / DN 250	N/A	TL120/TL600	12/15 PSIG
GM 90 S	15 PSIG	DN 250	ANSI 10" / DN 250	TL120	TL600	12/15 PSIG
GM 130 L	9.0 PSIG	DN 300	ANSI 12" / DN 300	N/A	TL900	12 PSIG
GM 150 S	15 PSIG	DN 300	ANSI 12" / DN 300	TL900	TL900	12 PSIG

Aerzen to TL Conversion Explained

- TL Blower flange fits both Metric and ANSI Flange sizes
 - Achievable by using slotted bolt holes.
- Cross Referencing Performance Curves, CFR, and Dimensional data.
- Standardizing TL Blower Sizes by Conveying line size.
 - Easier to stock spares.



AERZEN GM 35S DELTA PACKAGE, PRESSURE
INLET FLOW

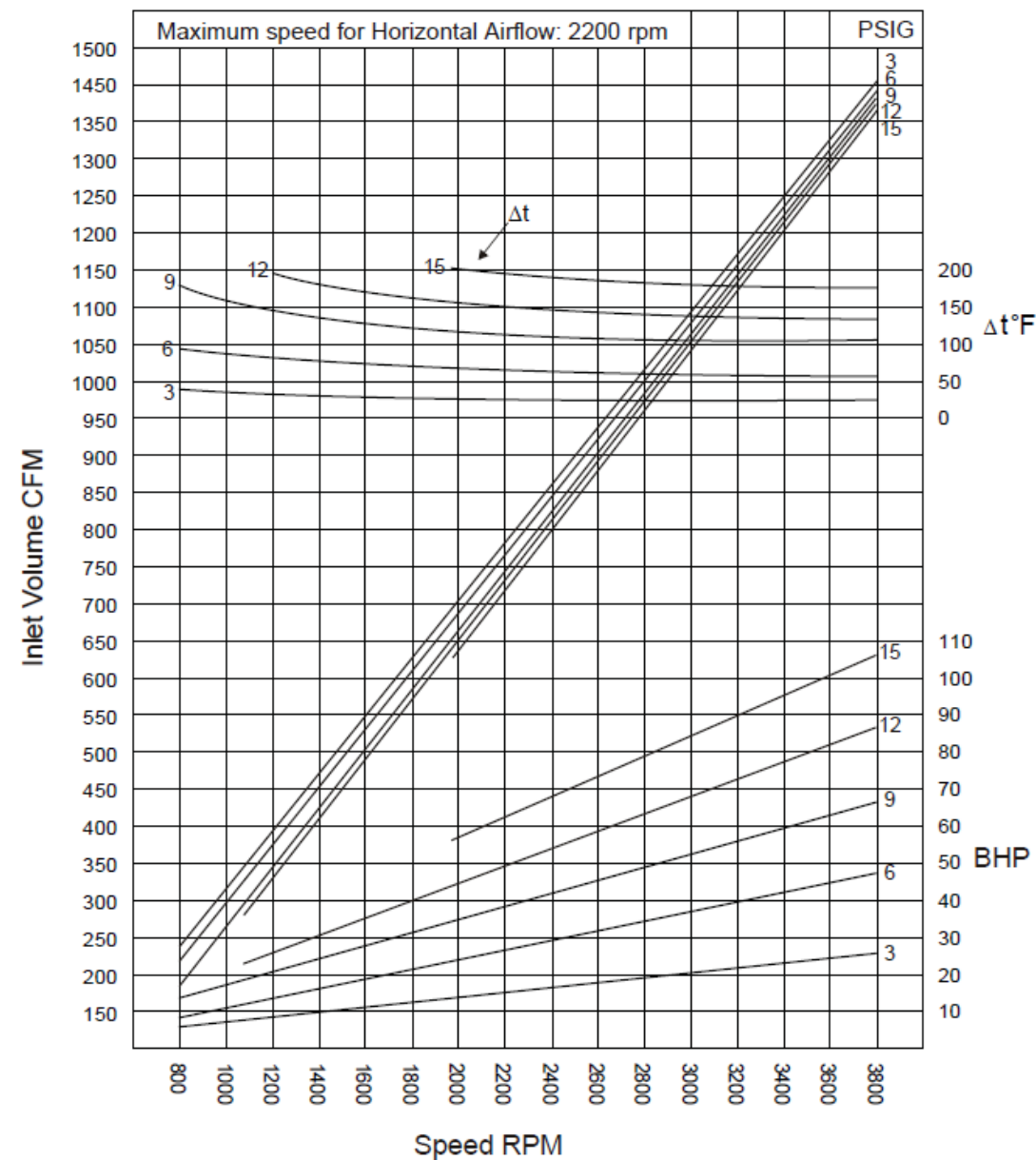
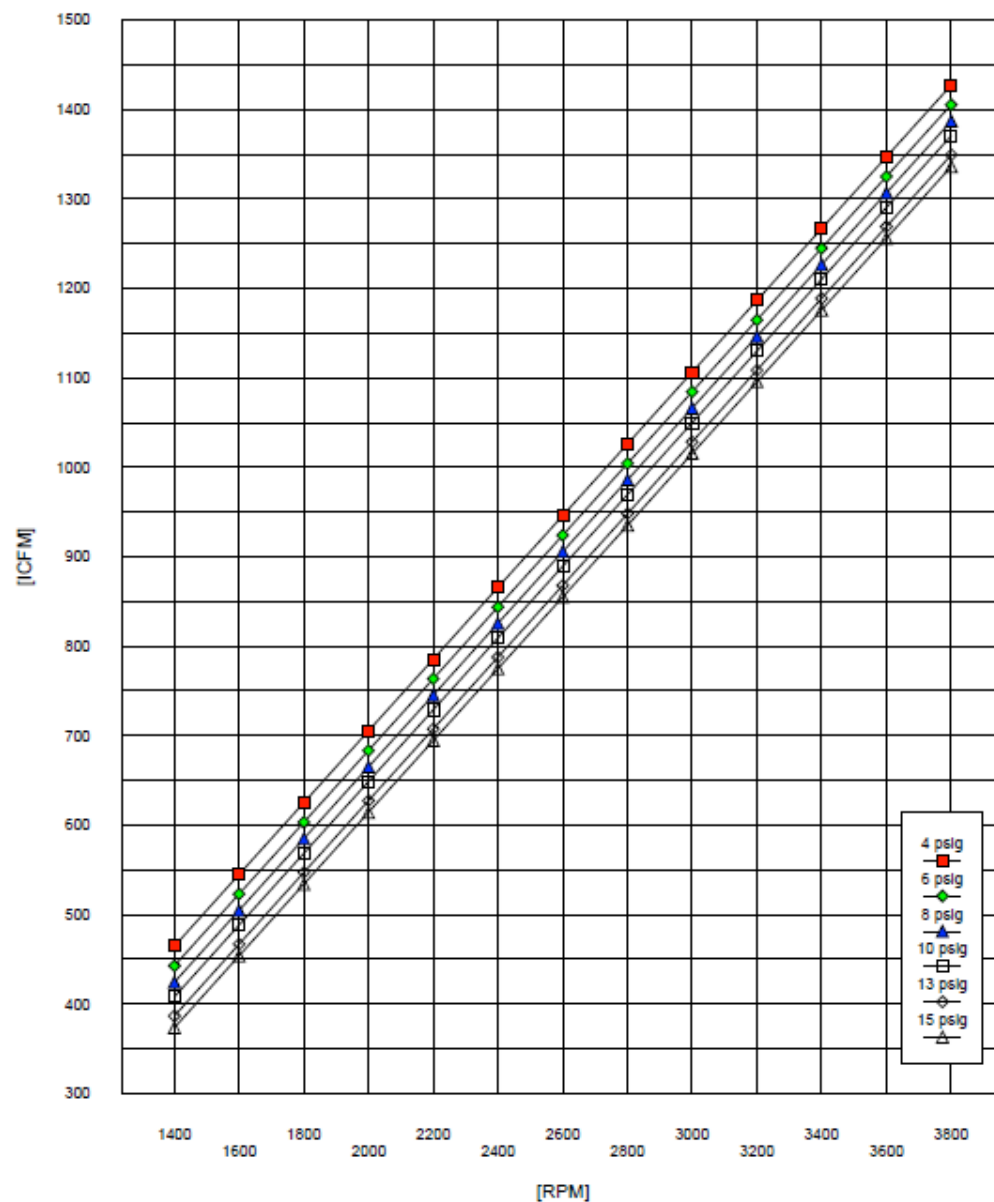


**Blower
Engineering**

Model TL 80

Pressure

Allowance 5%





Blower Engineering



THANK YOU!

1-800-388-1339

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