Blower Engineering

Pneumatic Conveying Above 15 PSIG

Brainerd MN.
August, 8th, 2019
Presented by: Tom Byrnes Jr.
Company Background
Raw Materials
Endplate/Cylinder Machining
Blower Assembly and Testing
Design Features

- Bearings: Spherical/cylindrical roller and ball bearing combinations; minimum 100,000 hour design life.
- Tri-Lobe Rotors: Involute contoured impeller profiles for maximum efficiency.
- Impeller/Shaft Rigidity: Reduces mechanical deflection and vibration.
- Oil Seals: Simple non-wearing slinger type oil seals, provide positive sealing in both oil sumps. Unaffected by high temperatures. No shaft wear.
- Air Seals: Piston ring air seals provide dependable non-wearing operation to minimize air leakage past the shafts.
- Heavy-Duty and ribbed cast iron housing and end covers: Reduce noise levels and increase heat dissipation.
- Versatile Mounting: Horizontal or vertical airflow is easily achieved by relocating the removable mounting feet incorporated in all models.
- Splash Oil Lubrication: Assures improved bearing life and operational simplicity.
- Gas or air is delivered in an uncontaminated, oil free state.
- The unit may be coupled directly or driven by V-belts.
- Rotation of the impellers is synchronized by a pair of timing gears having helical, hardened and ground teeth.
## TRI-LOBE BLOWER PERFORMANCE

<table>
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<tr>
<th>Tri-Lobe Model</th>
<th>$\Delta P$ Max PSIG</th>
<th>Vacuum Max &quot;Hg</th>
<th>Inlet Volume CFM</th>
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Weather Proof Acoustic Enclosure
• Removable panels for oil changes, replacing parts.
• Double doors for easy access
Key Benefits

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

- Alternative to acoustic enclosure
- Easily erected around existing equipment
New Filter Silencer Design

Old Design

New Design
Filter Restriction Indicator
Check Valve
Non contacting, Air / Oil Seal
Standard or “Exotic” micron or HEPA elements available
Two Lobe vs Tri-Lobe

Two-Lobe Blower

Tri-Lobe Blower
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

Tri-Lobe Blower Limited to 15 psig
Pneumatic Conveying System

- Diverter Valve
- Couplings
- Check Valve
- Airlock
- Discharge Silencer
- Blower
Dry Screw Compressor, above 15 psig
American Society of Mechanical Engineers
Boiler & Pressure Vessel Code

• First edition written in 1914 after several boiler explosions in early 1900’s.

• **Pressure Vessels:** containers which are designed to hold liquids, vapors, or gases above **15 psig**

• Must be built to BPVC Code, signed off by Authorized Inspector, Insured, yearly inspections etc.

• All Components must be certified pressure vessel rated.

• Certified pressure vessel welder required to fabricate components.
Pneumatic Conveying System

- Screw Compressor
- Diverter Valve
- Couplings
- Check Valve
- Airlock
- Discharge Silencer
Pressure Relief Valve
Check Valve
Morris Coupling Pressure Rating

• Designed for Vacuum and Pressure applications up to **15 PSIG/15” HG** in pneumatic conveying or IVAC systems.

• Exceeding max pressure rating can result in coupling blowing off; unexpected downtime, injury, etc.
Flanged Connection, Root and Filler Weld

Details of Slip On flange

1. Slip On flange
2. Filled weld outside
3. Filled weld inside
4. Pipe
Weld Neck Flanged Connection

Details of Welding Neck flange

1. Weld Neck flange  
2. Butt Weld  
3. Pipe or Fitting
Magnet
In-Line Sifter
Diverters
Diverters
Recap

• **Pressure Vessels**: containers which are designed to hold liquids, vapors, or gases above **15 psig**

• Must be built to BPVC Code, certified for pressure vessel application, signed off by Authorized Inspector, Insured, yearly inspections etc.

• All Components must be certified pressure vessel rated, including, all piping, silencers, check valve, air lock, diverter, magnet etc.

• Certified pressure vessel welder required to fabricate components; all joints needed to be welded

• Increased cost for installation and operation
THANK YOU!

1-800-388-1339
tomjr@blowerengineering.com