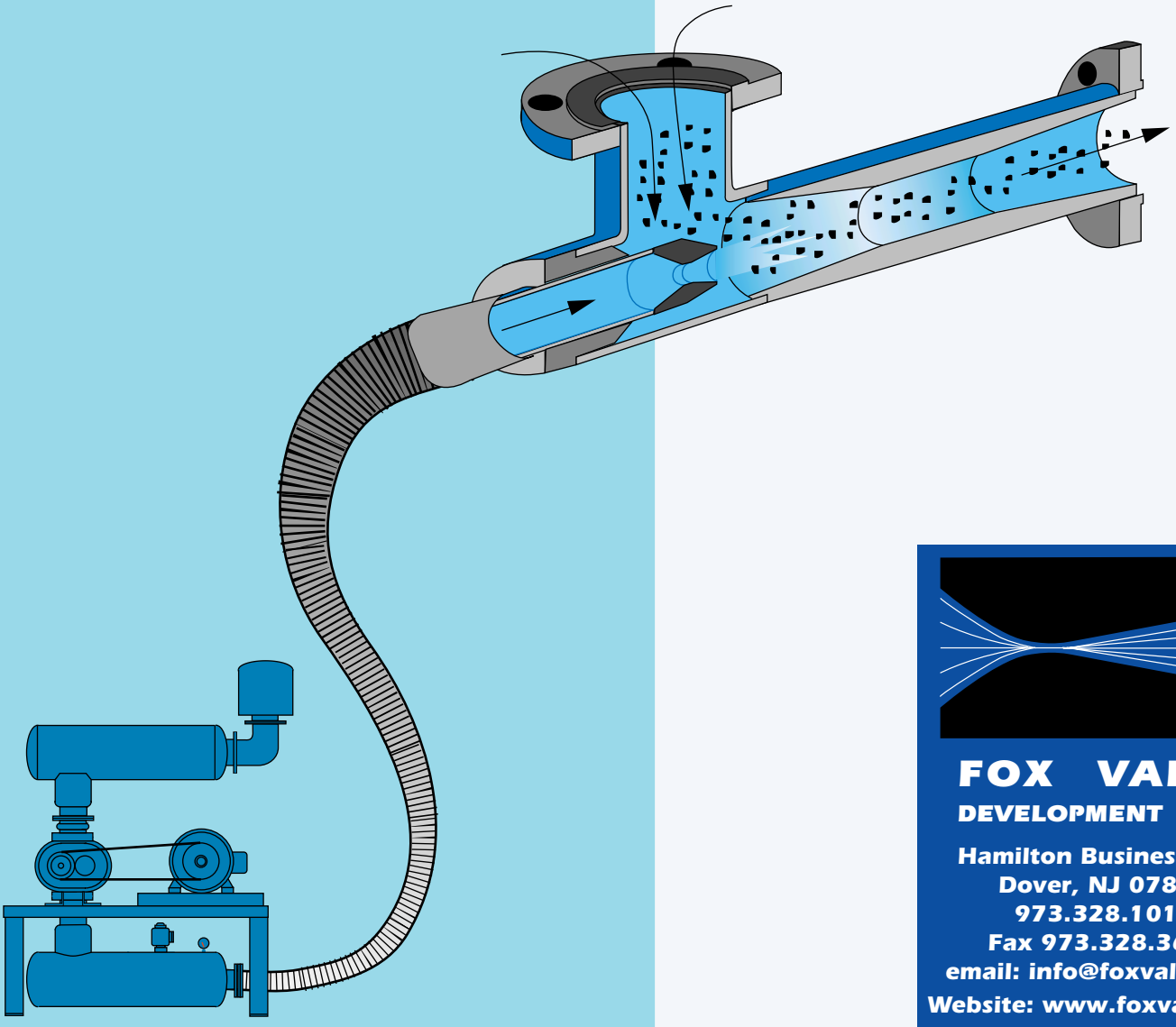
Installation Instructions

Fox Eductor/ PD Blower Subsystems



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Before You Start that P-D Blower...

Be sure to read and save the Operation & Maintenance Manual supplied with the positive displacement (PD) blower.

Ensure that:

- **Oil is filled to correct level -** Essential!
- Correct grade of oil is used
- V-belts are correctly tensioned. Do not over-tension**.** Note: Blower is shipped with belts deliberately loose to avoid damage in transit.
- Blower assembly is levelled and bolted securely to foundation.
- Rotation of blower is correct.

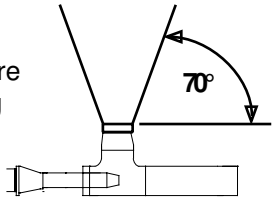
Amp Draw - Be sure electrician sets breakers per amp draw stated on the motor nameplate.

Start-Up - Follow the start-up checklist (in the O&M Manual) during the initial installation and after any shutdown.

Your Eductor System

Feed Hopper Design:

It is essential that the hopper or transition feeding the eductor is carefully selected based on the flow properties of your particular product. Inlet angles 70° from horizontal are considered prudent - any angle shallower than this may cause bridging or clogging above the eductor. Some products may require steeper sidewalls. Non-free flowing materials, which cannot flow out of a hopper unaided, will require flow aids or regulated feed.



Flood-Feeding Your Eductor

If your product is free-flowing, the Fox eductor can be flood fed, and will move product at the approximate maximum convey rate specified in your engineered quotation from Fox Valve. The eductor is self-regulating, cannot be 'overfed', and does not require metered feed when handling free-flowing materials.

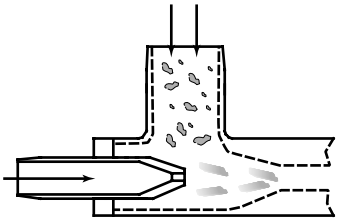
However, the Fox eductor/blower subsystem cannot succeed in transporting product to your destination if material cannot enter the eductor. The hopper or transition feeding the eductor must be carefully designed to prevent bridging or clogging. With irregularly shaped materials, such as flakes, plastic regrind, and odd-shaped food products, special care must be taken to ensure flow into the eductor. Irregular particle sizes can dictate a larger eductor or require metered feed. Contact Fox for advice if your product particle size changes and causes feeding problems.

If You are Installing a Fox/ PD Subsystem Beneath:

Dust Collectors /Baghouses:

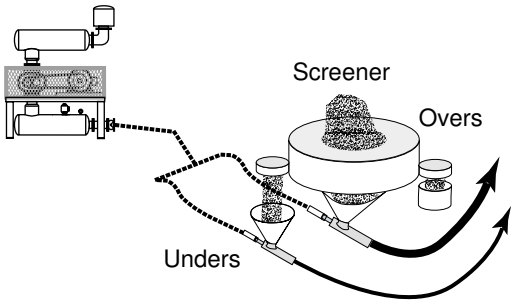
Fox eductor subsystems beneath dust collectors are almost always designed to be run **continuously**. Setting level detectors in the dust collector hopper, permitting material to accumulate, often allows material to "set up" and create bridging problems. Contact Fox to discuss design changes if you desire intermittent, rather than continuous, operation.

Large chunks of material can fall from dust collector bags. In applications where the particle size is irregular, fully withdrawing the motive nozzle will aid the passage of the larger chunks of product.



Screeners

The system should be sized to accommodate the maximum, instantaneous surge rate, not a time-averaged rate. In addition, be sure to design some surge capacity in the hoppers feeding the eductor so that a surge will have less chance of backing up into the screener.



Silos, Bins or Bulk Bags

As with any pneumatic conveying system, it is usually prudent to purge the convey line clear of product at the end of each conveying cycle. A shut-off valve may be installed above the eductor suction port. This valve should be closed and the blower run for an additional minute to ensure that the transport line has been emptied.

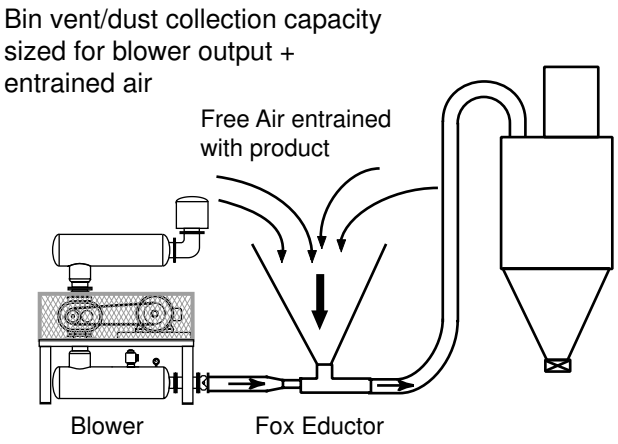
...Your Ejector System, continued.

Temperature Rise (ΔT)

All blowers cause a temperature rise. A properly operating blower will be quite hot to the touch. If this warm air is a problem (because of a temperature-sensitive product), Fox can supply an air or water-cooled heat exchanger to cool the air as necessary.

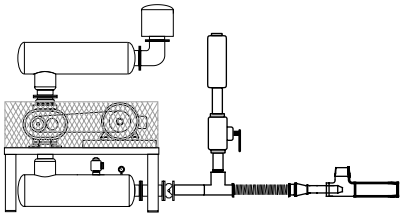
Entrained Air/Vent Sizing

Because the eductor creates "suction," there will usually be some additional air entrained into the eductor along with product. (Note - this is not necessary for conveying.) This additional entrained air, along with the motive air, should be accounted for when sizing receiver venting capacity. A safe rule of thumb is to install vent capacity that is double the blower output stated on your Fox quotation.



Fox Bleed Valve Assemblies for reducing product degradation or elbow wear.

The eductor nozzle orifice has been sized to match your PD blower, and locks the blower into one fixed air flow rate that sets a prudent conveying velocity in your convey line, usually between 3500 - 4000 ft/min.



However, there are some special situations where the user may wish to have the ability to assert some control over the transport velocity, usually to minimize it. This can be very advantageous for reducing degradation and product damage with fragile materials, or reducing wear when handling abrasive products. In these circumstances, a Fox Bleed Valve assembly should be installed, as shown above.

The air flow rate from PD blowers can also be adjusted by changing the blower speed using the sheaves, or with a variable frequency drive. Note if the blower speed is changed, the eductor nozzle orifice diameter will also, more than likely, need to be changed. Failure to ensure that the nozzle orifice is matched to the new blower operating point could result in over pressurization of the blower or motor overload. Contact Fox Valve for advice.

Avoiding Problems

• Oil Level

Correct oil level cannot be overemphasized. Change oil after every 1500 hours of operation — more often if blower running at close to max. pressure. (Heat drastically affects oil life!)

• Oil Grade

Consult O&M Manual to ensure that correct grade of lubricant is used. **(Note: Synthetic oil is best and can be changed less frequently.)**

• Check the inlet filter regularly

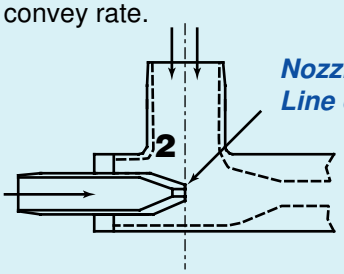
If your filters are clogging regularly, call Fox and have a larger filter installed on your blower. Alternatively, extend the intake piping (choose large diameter to avoid pressure losses!) and locate the inlet filter in a cleaner area.

• V-belt Tension

Check and retension belts after the first few hours of operation to minimize slippage and wear. Follow the instructions given in O&M Manual. Check at recommended intervals thereafter.

• Nozzle Position:

The motive nozzle tip should start at the centerline of the suction port. Nozzle position adjustment is primarily to allow passage of lumps, etc. It can also be adjusted to optimize convey rate.



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Venting/Dust Collection
Destination must be adequately vented with bin vent, cyclone, or connection to dust-collection to ensure no pressure build-up. Size venting capacity for about two times stated blower output.

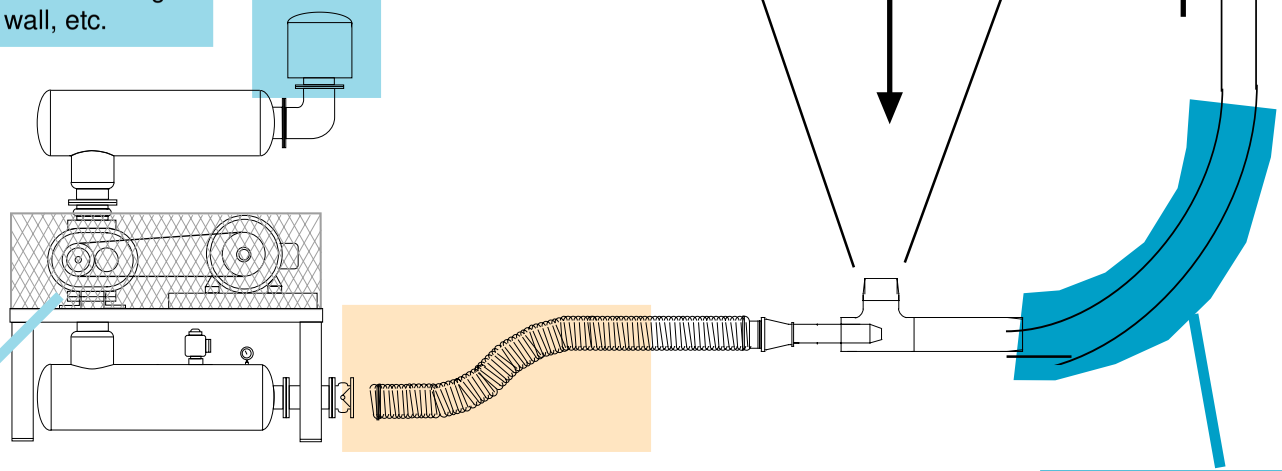
Destination:

Silo, Bin, Hopper, Mixer, Etc.

Filter
Filtration of inlet air is essential. Blower warranty becomes invalid if any material or powder is ingested into blower. Use extensions if necessary to locate inlet filter in a clean environment - i.e. through window or wall, etc.

Hopper/ Transition Design

See notes on Page 2



PD Blower
It is essential that the instructions given in blower O & M Manual are closely followed. Warranty is voided by unauthorized disassembly.

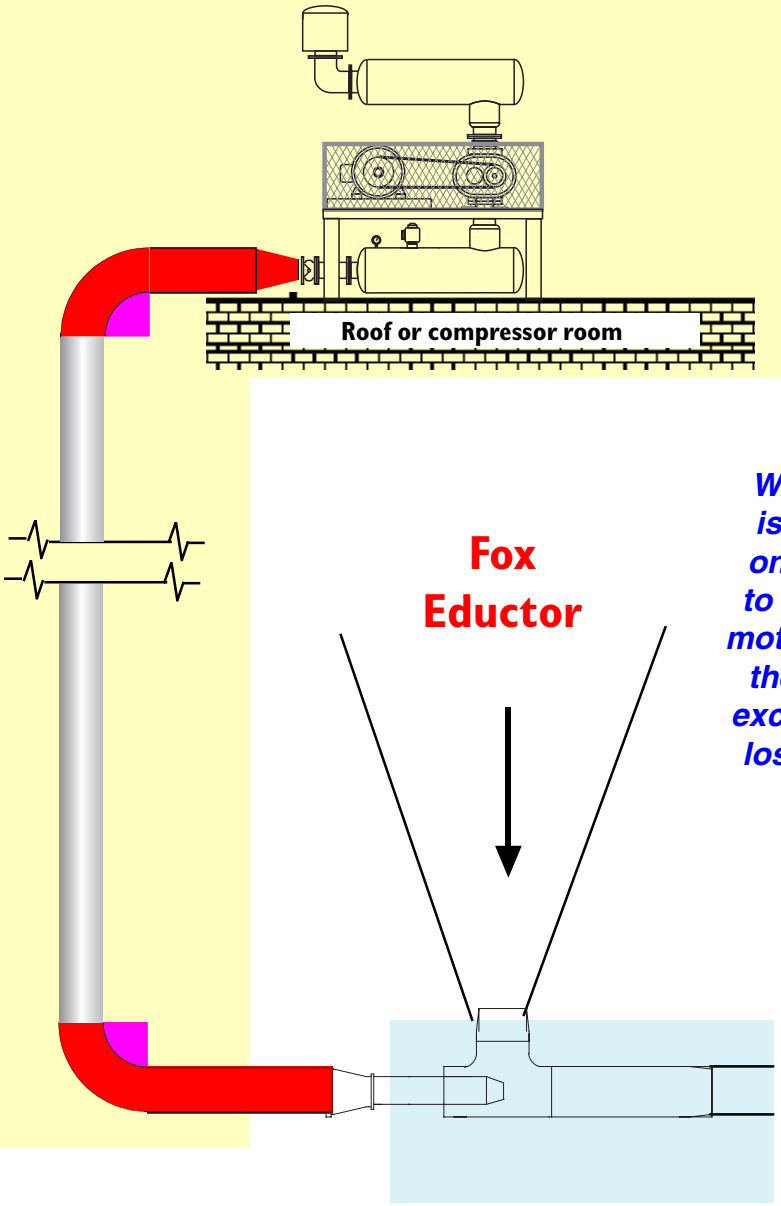
Flex Hose
Use a short piece of flex hose to connect rigid air piping to eductor. This is necessary to permit nozzle removal and/or position adjustment. Be sure that hose can withstand temperatures of 250-300°F (120-150°C).

Elbows
Use wide radius bends only. Do not use Blind Tees. Contact Fox if "Vortice" bends are to be used.

If the Blower is located more than 10 ft (3m) from the Fox Eductor, Avoid Problems and Read This:

Remote Location of Blower

For remote blower locations, selecting the proper air-only line is a critical engineering decision (Do not let a pipefitter make this selection) The eductor nozzle connection should never be used as a guide to the size of this line, which must be selected to maintain a pressure loss of less than 1/4 psig. If you or your mechanical contractor is unable to make this selection, contact Fox Valve.



Air Line Size!

Pipe diameter for air line from remotely located blower must be carefully selected by an engineer.

When the air line is selected based on what happens to be the nozzle's motive connection, the usual result is excessive pressure loss in the air line, resulting in low pressure at the eductor and reduced conveying.

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Troubleshooting Guide

Fox Eductor/PD Blower Sub-Systems

Problem	*Possible cause*	*Corrective Steps to Take*
System conveys at a rate below specified capacity.	Low air flow from blower	Check blower is operating at correct speed (RPM) - check sheave sizes. O&M Manual includes sheave set data
	Insufficient air outlet pressure or air flow rate from blower.	Check pressure gage to see that motive air pressure is per Fox specification. Check that: • Inlet Filter is not clogged • Air line between blower and eductor has no leaks, and is sized to minimize ΔP (if not supplied by Fox) • Altitude at site is as described to Fox.
	Too much back-pressure at end of convey line.	Check that venting of receiving bin/silo/etc. is sized and operating correctly. Check that filter media is clean.
	Bridging in hopper is restricting flow of product.	Call Fox Valve for advice.
	Build-up in eductor or downstream piping.	Check line for blockages and buildup—clean as necessary.
	Convey line distance and/or number of elbows greater than originally specified.	If the line length cannot be reduced, a lower eductor convey rate may have to be accepted.
	Product characteristics are different from design. (Particle size, temperature, fat content, moisture, etc.)	Call Fox.
	Nozzle Position not ideal.	Nozzle position can play a minor role in optimizing eductor performance in certain situations. Start with nozzle at suction port centerline.
	Excessive vacuum in product feed hopper.	Call Fox.
Relief valve "popping off" or opening.	Too much air flow.	Blower speed (RPM) is too high. Check that blower is correctly sheaved - drawing in O&M Manual includes sheave set data. Call Fox Valve for advice.
	Excessive pressure drop between blower and eductor.	Piping installed between blower and eductor should be large enough to give negligible pressure drop.
Air puffing back through material inlet port.	Too much back-pressure at end of convey line.	Check convey line exit pressure. If excessive, take corrective action, e.g. clean filter bags.
	Insufficient motive pressure.	Check blower: Inspect inlet filter, etc.
	Nozzle position not ideal.	Adjust nozzle position.
	Convey line partially blocked	Check line for blockages and buildup—clean as necessary.
	Excessive vacuum in product feed hopper.	Call Fox.

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