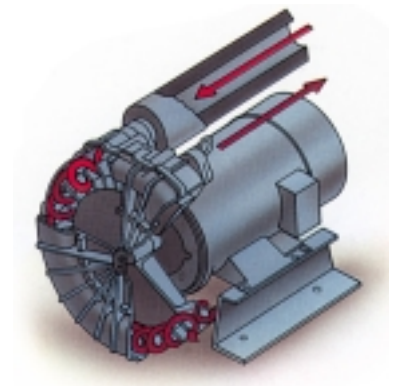
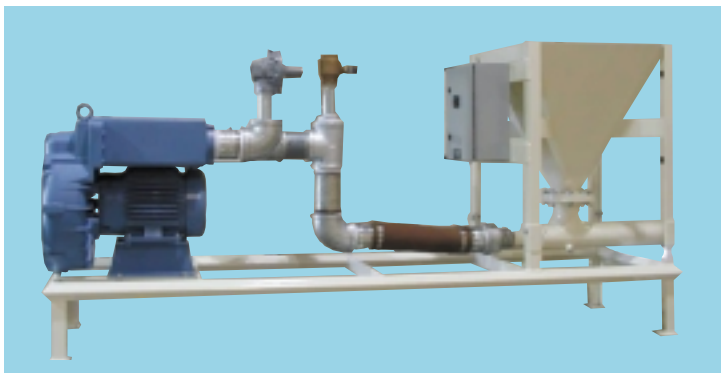
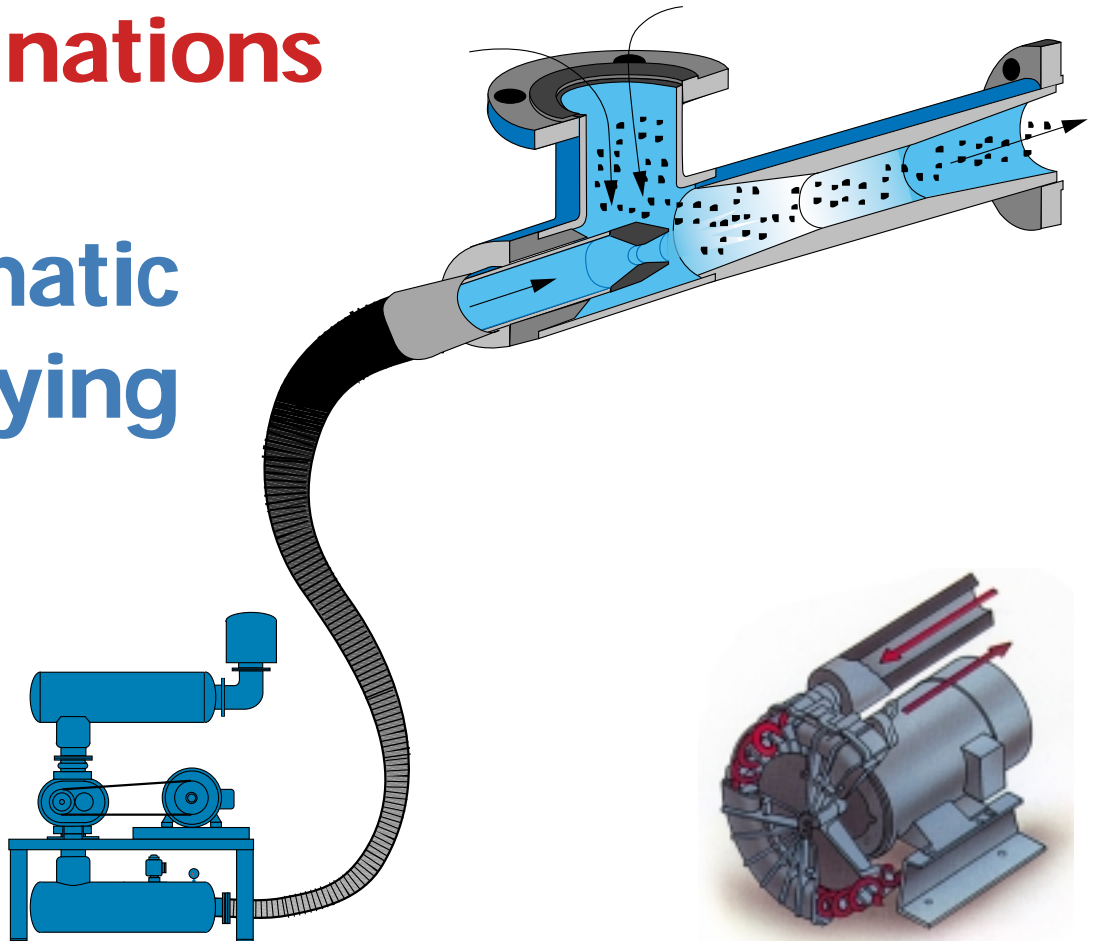


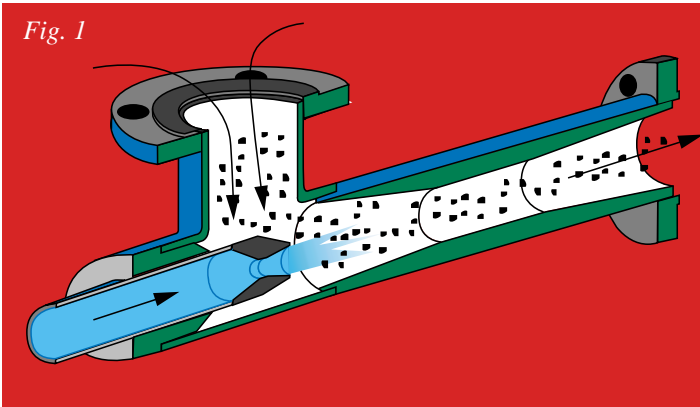
# Fox Venturi Eductor/Blower

Combinations  
for  
Pneumatic  
Conveying



**FOX VALVE**  
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Website: [www.foxvalve.com](http://www.foxvalve.com)

# Pneumatic Conveying with No Moving Parts : Fox Venturi Eductors with Engineered Blower Packages



- PROPER SELECTION AND SIZING
- QUIET
- FAST DELIVERIES
- ANCILLIARY EQUIPMENT

## BLOWERS FROM FOX VALVE

Fox provides over 400 blowers per year as part of Fox eductor systems, ranging from small 1 HP blowers driving one-inch additive injection systems to 100 HP blower packages driving six 4" eductors simultaneously.

*Since 1963, Fox Venturi Eductors have been used to pneumatically transport hundreds of different products, in dozens of industries using air at 2-14 psig*

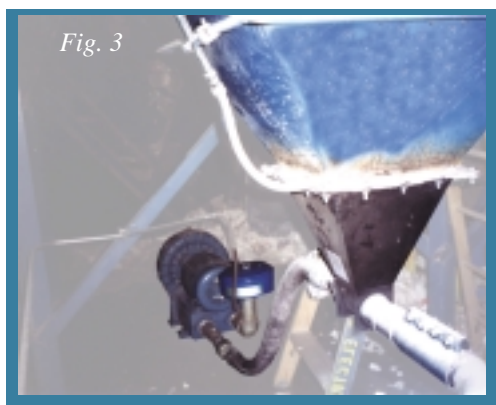
- **Getting it Right**—Only Fox Valve has over 35 years of experience in integrating blowers with venturi eductors in thousands of successful industrial processes. No other company comes close to our experience and expertise in integrating blowers and eductors for specific conveying applications.



*A quiet Rotron blower drives a Fox Eductor, conveying pellets from an extruder and screener with no moving parts. Rotrons don't need to be located in remote locations and normally don't require acoustic enclosures. What could be simpler?*

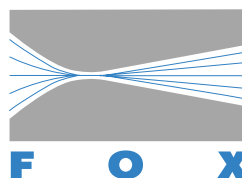
- **Getting it Fast**—Standard Rotron blowers can usually ship in 2 - 4 days. Since standard Fox eductors in 1" - 6" sizes are stocked in carbon steel, stainless, and ceramic-lined versions, we can ship a conveying system in less than one week. Standard pd blower packages ship in 2 - 6 weeks.

- **Controlling Conveying Velocity**...Selecting the right conveying velocity is a major technical consideration in making a conveying system work reliably. This is particularly critical when conveying fragile products, like breakfast cereal or pet food, and abrasives, like silica, cement, or glass-filled pellets. An engineered eductor/blower combination from Fox assures proper selection and operation.



*An enlarged suction port eductor is mounted beneath a large dust collector is driven with a small, quiet regn blower - handling paper waste at a large printer.*

- **Technical Support**—When you procure the blower to drive your pneumatic transport system from Fox, you are assured of complete, prompt technical support from our staff of pneumatic conveying experts.



**Fox Venturi Eductors**

Dover NJ USA

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info@foxvalve.com

# The Ten Most Commonly Asked Questions About Blowers Used in Combination with Fox Eductors

## 1) What type of blowers does Fox supply as an integral part of Fox pneumatic conveying solutions?

The most common blowers supplied by Fox are typical positive displacement blower packages and side-channel blowers, but we have supplied many other types.

## 2) Why should I buy the blower from Fox? I can always buy one cheaper somewhere else.

It is certainly always true that somewhere, you can locate a website, catalog, or a compressor/fan rep who can offer a cheaper blower. However, if this blower is to be part of a guaranteed venturi conveying solution, it needs to be supplied by Fox. Websites, catalogs, and fan reps cannot provide proper sizing of blowers to match a Fox eductor to convey your product, in your specific application, in a pneumatic conveying system. We do not specify equipment that is bought from others, yet whose performance Fox is expected to select, guarantee, and troubleshoot. Moreover, are you comfortable with no one taking any system responsibility for your pneumatic conveying system?

## 3) Why does Fox offer regen, or side-channel blowers when most pneumatic conveying system designers rarely do?

Before Fox started supplying 300+ Rotron blowers per year as part of our eductor systems back in the mid-1980's, small regen blowers were almost never used for pneumatic conveying. Now, small blowers not much bigger than basketballs can be used to drive conveying systems up to 100 - 150 ft long. **And they ship in 2 days.** Packaging pd blowers is an important profit center for pneumatic conveying system designers, so supplying small, no-maintenance side-channel blowers is not ideal.

## 4) What accessories does Fox supply? Fox knows exactly what accessories are critical when blowers are used in a pneumatic conveying system. The right accessories can make all the difference. Each quote from Fox clearly states what is being supplied, along with some optional improvements.

## 5) My application is in Europe, or Asia, and we have no interest in a) importing an American blower optimized for 230/460/60 power, when we are at 50 Hz or 380 V, and b) paying the freight to import a US blower.

That makes perfect sense to us. This is why we have relationships with blower suppliers in Germany, the UK, Italy, and Singapore who can ship the right voltage blower, sized and guaranteed by Fox, to your overseas location so you can have a guaranteed Fox/eductor system.

## 6) We need to locate the blower over 100 ft away from the eductor. Is that OK? Sure.

As long as the air-only piping between the blower and eductor is sized properly, this will work fine. When Fox supplies the blower, we'll be happy to provide this engineered piping selection. By contrast, we've certainly seen many pneumatic conveying systems fail miserably because, to save pennies on the blower purchase price, no engineering input was available for this critical engineering decision. The phrase "penny-wise and pound-foolish" was invented for this circumstance. \

## 7) My plant has standardized on one pd blower supplier. Can you supply that make of blower?

MD. Roots. Aerzen. Sutorbilt. Etc. We supply them all. Also X-proof. Mill & Chem Duty. Etc.

## 8) How can I control blower output to reduce air velocity when handling fragile materials? Fox has many different proven solutions to this problem.

## 9) Is there a simple Rule of Thumb I can use to predict how much SCFM and psig we need for a given conveying task? No, there isn't.

## 10) Why Fox? In addition to having supplied venturi eductors to industry since 1963, Fox is the only company to have funded a two-year, comprehensive research program at a university with venturi eductors. The results of hundreds of empirical tests, with materials ranging from expanded perlite to iron powder, enable us to accurately size the required blower pressure and volume output, resulting in a guaranteed blower/eductor conveying solution.

# Driving Fox Venturi Eductors with Rotron Blowers... Why?

## BEFORE FOX...

...started selling hundreds of Rotron blowers each year to drive eductors, the pneumatic conveying industry supplied the one-size-fits-all solution to every pneumatic conveying task: a pd blower package and a rotary airlock. No matter how small your conveying application, the smallest blower you'd see was about the size of a VW Beetle

Venturi eductors, of course, offer highly reliable conveying with no moving parts, and they are ideally suited to use of side-channel, or regenerative (regen) blowers. The result, for conveying applications within certain limits, is extremely reliable, extremely cost effective conveying solutions.

## WHY USE ROTRON BLOWERS TO DRIVE FOX EDUCTOR PNEUMATIC CONVEYING SYSTEMS?

- **24/7 Reliability; No Maintenance**—Rotron blowers have a direct-drive between the motor and impeller, with “sealed-for-life” bearings and no “oil bath.” They require no additional lubrication. (Of course, the inlet filter requires periodic inspection.)
- **Quiet**—Rotron blowers do not need to be hidden away in compressor rooms or on rooftops. When properly installed, they meet OSHA requirements. Inexpensive optional silencers can further reduce relatively low noise levels.
- **Compact**—Because they are closer in size to basketballs than Buicks, Rotrons, unlike pd blower packages, can fit snugly beneath equipment like screeners, extruders, and bulk bag unloaders. They are often mounted on small platforms off the floor - a zero footprint blower.
- **Motors**—Standard blowers can accommodate a broad range of US and international voltages at 50 or 60 Hz. Blowers are readily available to meet special requirements such as explosion proof (XP), Mill & Chemical Duty, Premium Efficiency, and Washdown.
- **Modest Capital Costs**—Rotron blowers are usually significantly less expensive than positive-displacement blowers.
- **Fast Delivery**—Standard blowers from 1 - 30 HP, are usually available for shipment in 1 - 2 days.
- **International Suppliers**—Fox works with many different blower producers who can ship similar side-channel blowers from warehouses in Germany, England, and Singapore. These blowers then meet up with Fox eductors shipped from the USA.

Fig. 4

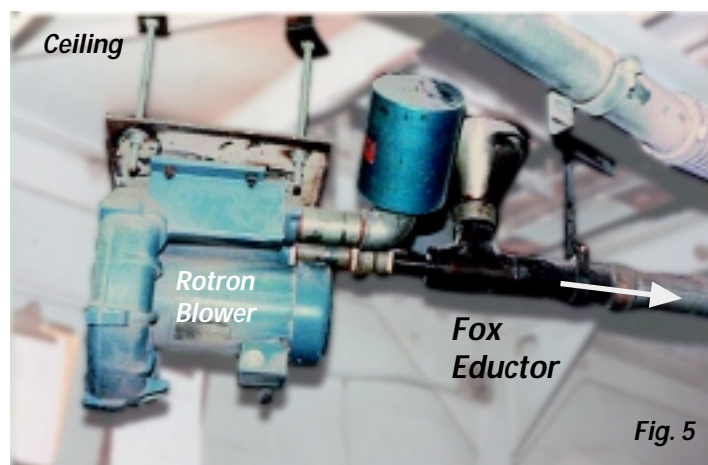
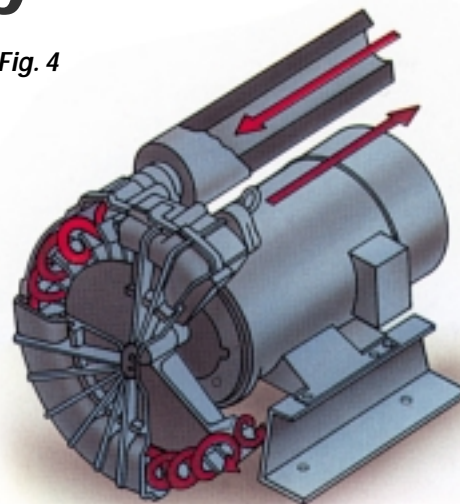
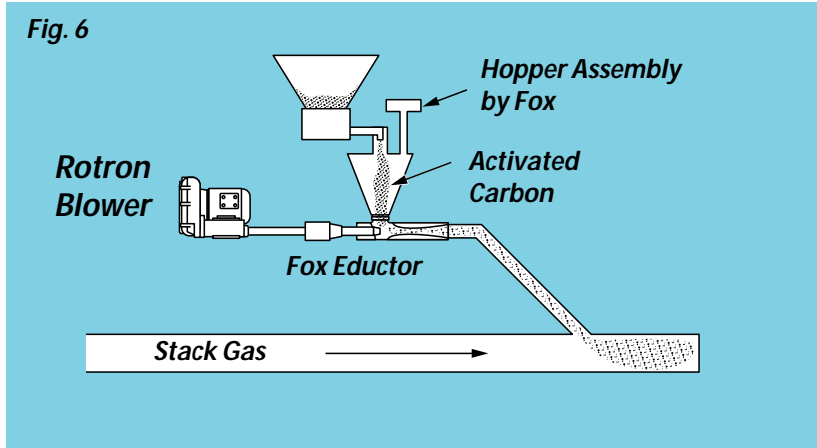


Fig. 5

*A Rotron Blower is suspended upside down from a ceiling, driving a Fox eductor which conveys material from a dust collector on the floor above. The compactness of the Rotron blower enables it to be tucked, mounted, or suspended in unusual places, enabling it - as shown here - to have a footprint of zero square feet in this plant.*

# Driving Fox Venturi Eductors with Rotron Blowers...

## When 24/7 Reliability is Critical



Maintenance-free Fox eductor/blower combinations have proven themselves the right choice in hundreds of plants where 24/7 reliability is critical. This includes activated carbon injection on stack gas emission systems or boiler additive feed for ash or slag conditioning. By contrast, the typical airlock or dense phase system offered by most pneumatic conveying system designers can suffer sudden, catastrophic failure due to their many moving parts: seals, rotating shafts, and bearings.

## Limitations w/Rotron Blowers:

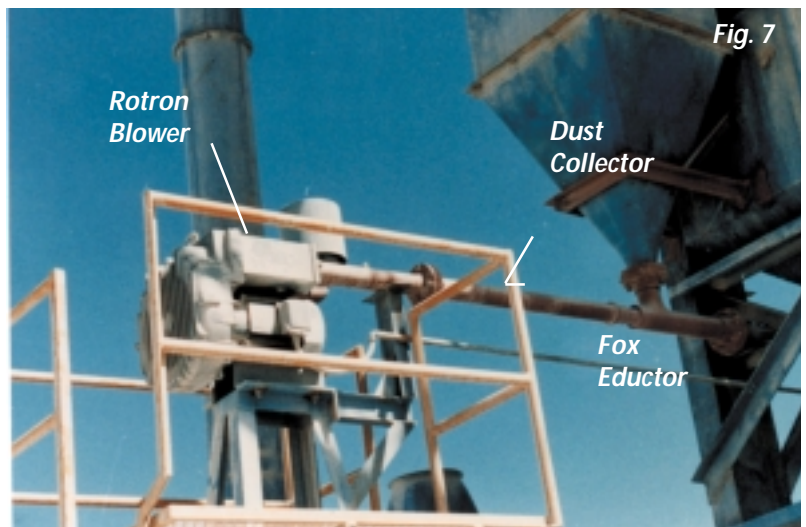
- for Convey Rates up to 10,000 lbs/hr
- for Conveying Distances up to 150 ft

For conveying applications of less than 10,000 lbs/hr and shorter than 150 ft, Rotron blowers are always worth looking at as the high reliability/low-cost option. If their pressure limitations means they can't be used in your application, then a positive displacement blower will be required.

## Specialized Applications

Fox has supplied dozens of blowers that meet these special requirements:

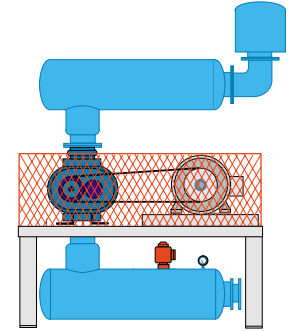
- X-Proof
- Mill & Chem Duty (for extra-dusty operating environments)
- Washdown (food applications)
- Premium Efficiency Motors
- Remote-Drive, Gas-Driven



A 10 HP Rotron blower drives a 4" ceramic-lined eductor beneath a dust collector at a limestone mine in Mexico. This is a no-maintenance, outdoors, installation that produces no fugitive dust emissions or lost product.

# Driving Fox Venturi Eductors with Positive Displacement (PD) Blowers

- for typical convey rates up to 25,000 lbs/hr
- for typical conveying distances up to 400 ft
- for typical pressure outputs of 4-15 psig



FOX HAS SUPPLIED OVER 800 POSITIVE DISPLACEMENT BLOWER PACKAGES SINCE 1980.

- **Versatile**—Standard pd blower packages include the usual appropriate accessories. In addition, Fox can supply customized packages that include everything from special motors to acoustic enclosures, starters, VFD's, instrumentation, etc.
- **Delivery**— Standard delivery for most packages is 4 - 6 weeks; however rush deliveries can occasionally be made in about 2 weeks.
- **Reliable** - When properly maintained, pd blowers are extremely reliable.

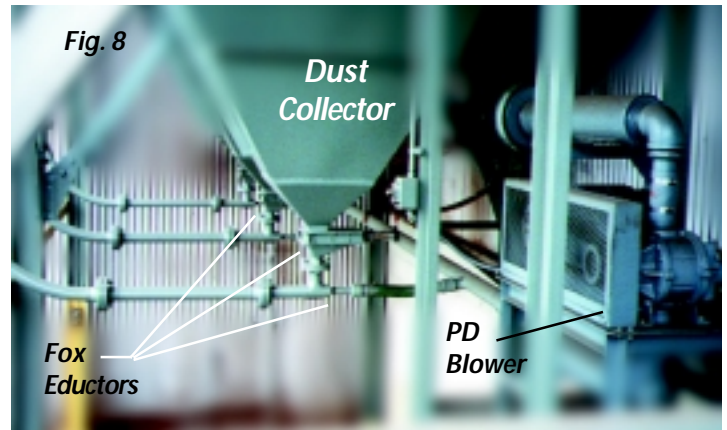


Fig. 8

A single positive displacement blower is used to drive three 2" Fox Eductors located beneath a three-cell collector at a foundry.

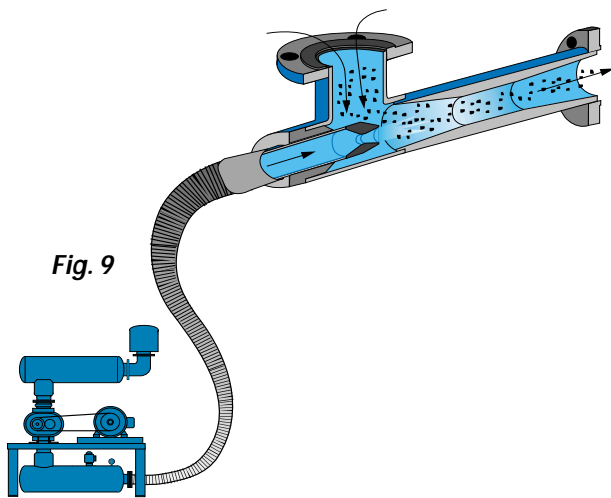


Fig. 9

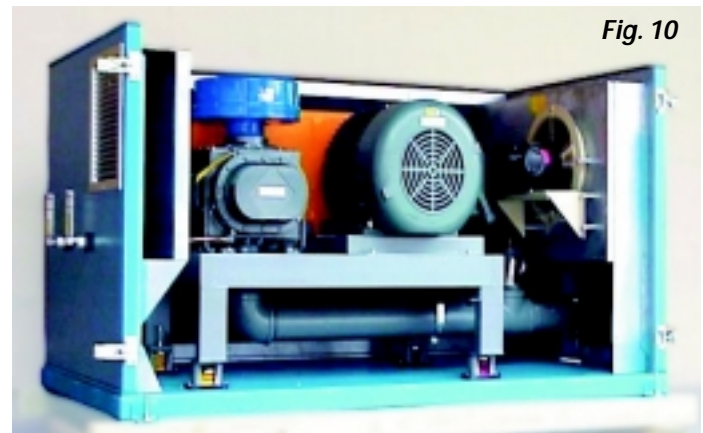
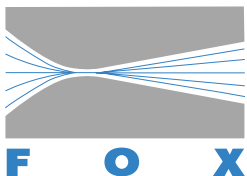


Fig. 10

When special requirements dictate unusually low noise output, Fox-supplied pd blowers are placed within an acoustic enclosure.



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# What You **CAN'T** Do with **Airlocks**: Driving Multiple Fox Venturi Eductors with a Single Blower.

Unlike rotary airlocks, many educors can be driven with a single blower. The educor nozzles control how much air enters each convey line, automatically 'balancing' the system and maintaining constant air flow to each educor. This is particularly attractive when handling the outputs of multi-cell dust collectors or a group of screeners, grinders, or feeders. Using one blower to feed a manifold with air at 3 or 6 or 12 psig, which can then drive up to 20 different educors, can enable some significant cost savings over airlock systems - which require a dedicated blower for each, individual airlock-fed convey line.

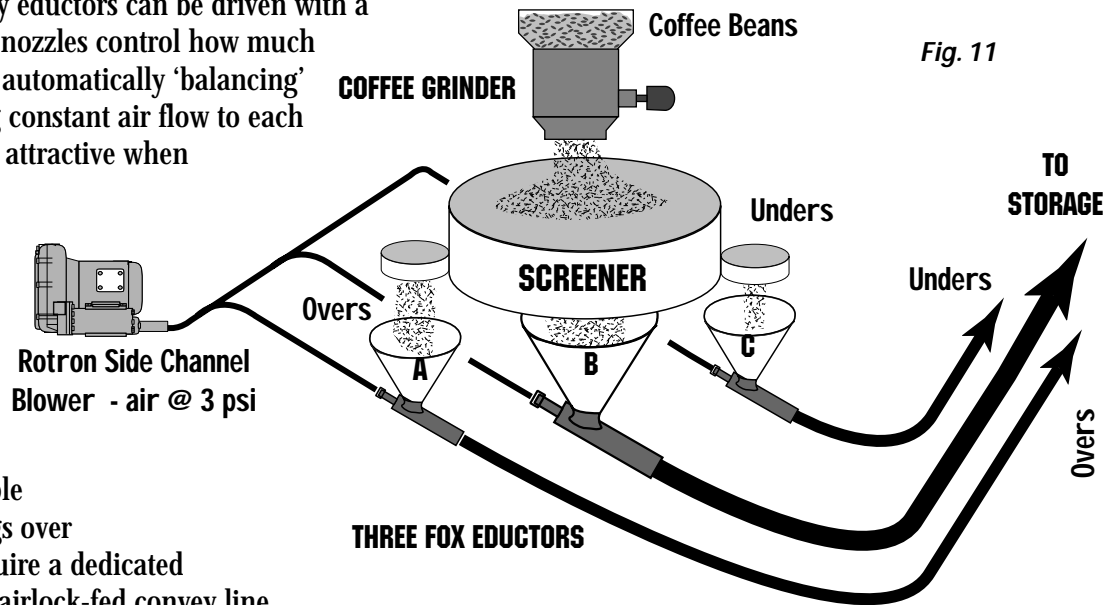


Fig. 11

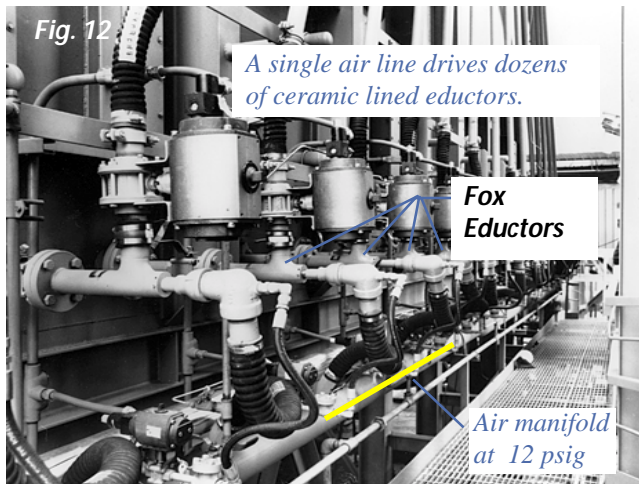


Fig. 12

A single air line drives dozens of ceramic lined educors.

Fox Eductors

Air manifold at 12 psig

At this cogen plant in California, over (25) ceramic-lined venturi educors are simultaneously fed from a single manifold, supplied by one pd blower running at 12 - 13 psig.

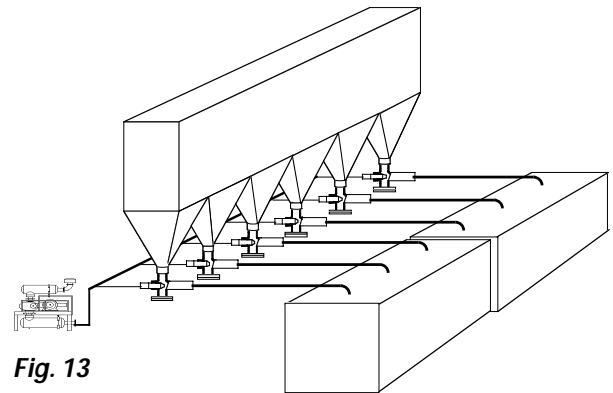


Fig. 13

In this schematic of a very common Fox educor installation, six educors placed beneath six dust collectors are driven by one pd blower, fed by a common manifold supplied by Fox. Material is conveyed to dumpsters for disposal.

One Rotron blower is supplied by Fox with all necessary blower accessories to simultaneously drive two educors. Each educor will be fed by a screw feeder dosing additives for injection into a boiler.

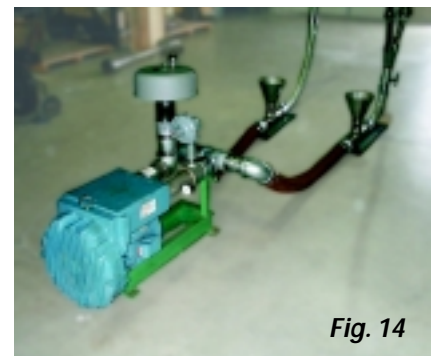
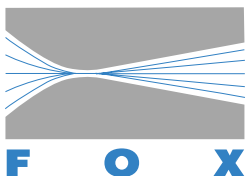


Fig. 14



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# Packaging Fox Eductors and Blowers with the Other Stuff You Need!

## Skid or Cart-Mounted Packages

Unlike airlocks and p-d blowers, a complete eductor/Rotron conveying system can be neatly assembled on a small skid. Smaller systems can be cart-mounted and moved to different extruders, screeners, grinders, or other equipment as needed.



Fig. 15

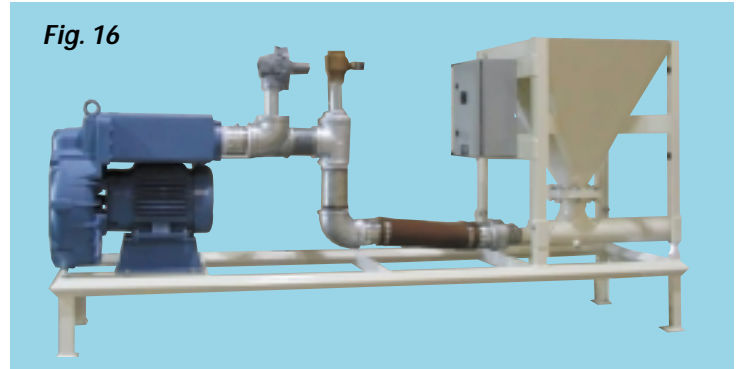


Fig. 16

## Coolers, Dehumidifiers, Dryers, HEPA Filters

Fox has supplied coolers, filters, and dehumidifiers since the 1970's for conveying temperature or moisture-sensitive products such as milk powders, sugar, pigments, and pharmaceuticals. Fox supplies air and liquid cooled heat exchangers, HEPA filters, and dessicant dryers as part of our systems.

## Hoppers and Bag Dumps w/ Lids and Grates,

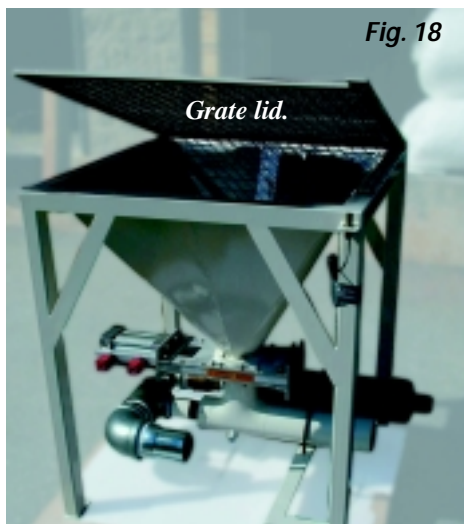


Fig. 18

Fox has supplied coolers, filters, and dehumidifiers since the 1970's for conveying temperature or moisture-sensitive products such as milk powders, sugar, pigments, and pharmaceuticals. Fox supplies air and liquid cooled heat exchangers, HEPA filters, and dessicant dryers as part of our systems.

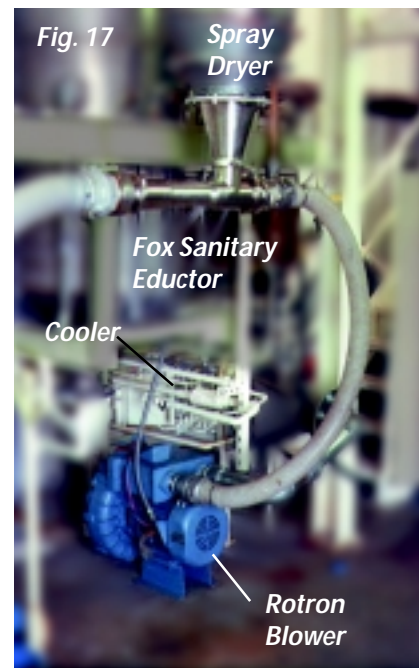


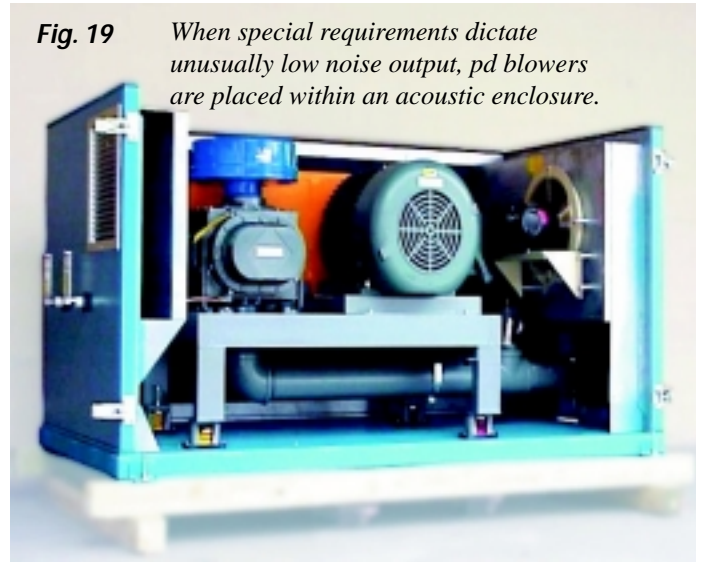
Fig. 17

Fig. 17 - Fox supplied the blower, cooler, and fully sanitary eductor, which all fit snugly beneath this spray dryer, handling artificial creamer. What would this look like if the typical airlock /pd blower solution had been used instead of the Fox Eductor/Rotron alternative?

# Noise Matters: Driving Fox Venturi Eductors with Rotron Blowers...

Unlike positive displacement blowers, most Rotron side-channel blowers operate below 85 dBA noise levels without any additional silencers. This means they can be placed right at your point of operation - say, beneath a screener or next to an extruder - rather than hidden away in a compressor room with a long air-only pipeline.

Positive Displacement blowers often require silencers and/or an acoustic enclosure, as shown at right.

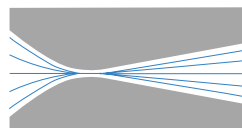
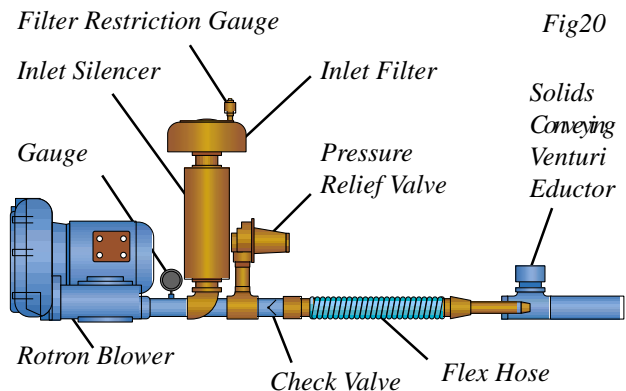


**Fig. 19** When special requirements dictate unusually low noise output, pd blowers are placed within an acoustic enclosure.

## Complete Blower Packages...

designed by **pneumatic conveying experts** for your pneumatic conveying application.

Selecting the right accessories for your blower can make all the difference. Conveying powders and bulk solids - in particular, your powder or your solids - requires Fox's 35+ years of experience. Oversize filters, coolers, the right hose, quick disconnect fittings....whatever you need.



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## When Products Require Testing:

- Degradation Trials of Fragile Products
- Unusual Handling Characteristics

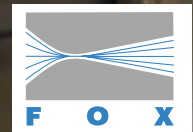
Some applications require that a pneumatic conveying test be conducted in our test facility before we can guarantee a system. In these cases, Fox customers are invited to send a sample of the material and to witness the conveying of their product in our test lab.

No testing is necessary for Fox to accurately predict eductor system performance with hundreds of different products for which we already have data and experience. However, cohesive, poorly flowing, oddly-shaped, or fragile materials often require testing. Because Fox

eductors are so widely used by the food industry to eliminate airlocks and product damage from their conveying systems, we are very familiar with running exhaustive degradation trials with foods such as breakfast cereals, nuts, cacao nibs, and extruded food/snack products.

The Fox test rig contains 1", 2", 3", and 4" lines, with adjustable pipe runs up to 250 ft long. We have both pd and Rotron blowers, air coolers, feeders, and a comprehensive data acquisition system.

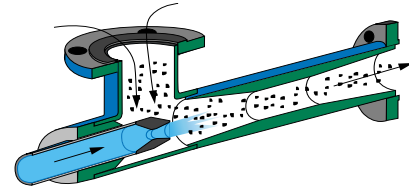
*Fox's test rig is available for running pneumatic conveying trials with unusual materials or when degradation trials must be run to determine whether a fragile material can be conveyed with acceptable levels of product damage.*



**Fox Venturi Eductors**  
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# For a Quote on the Fox Venturi Eductor/ Blower System You Need... Please Complete and fax to 973-328-3651



Please provide the requested information so that Fox can prepare a quotation on a performance guaranteed venturi eductor.

Company Name & Address: \_\_\_\_\_

Email: \_\_\_\_\_

Contact: \_\_\_\_\_ Phone no.: \_\_\_\_\_ Fax: \_\_\_\_\_

Material To Be Conveyed: \_\_\_\_\_

Bulk Density \_\_\_\_\_ Particle Size \_\_\_\_\_ Max = \_\_\_\_\_

Temperature: \_\_\_\_\_ Abrasive Characteristics \_\_\_\_\_ Free flowing? \_\_\_\_\_

Moisture or fat content: \_\_\_\_\_ Max allowable temp (if temp. sensitive) \_\_\_\_\_

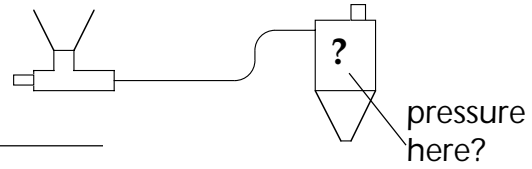
Required Solids Flow Rate: Nominal \_\_\_\_\_ Max. \_\_\_\_\_

Distance Mat'l to be Conveyed: Horizontal \_\_\_\_\_ Vertical \_\_\_\_\_

Numbers of Elbows: 90° \_\_\_\_\_ 45° \_\_\_\_\_ Other \_\_\_\_\_

Geometry of elbows, i.e. Long, short radius, blind tee, etc (long radius preferred)

Pressure at exit end of Conveying line: \_\_\_\_\_



Existing Conveying Line? yes/no If yes, ID = \_\_\_\_\_

Gravity Feed: Yes  No  What is eductor fed from? (e.g screener, dust collector)

Should Fox quote hopper or transition? Yes  No  (If yes, fax sketch)

Preferred End Connections of Eductor: NPT  150# Flgd.  Butt Weld

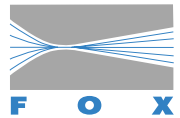
Plain Pipe  Tube (inch OD)  Tri-Clamp  Other \_\_\_\_\_

Req'd Material of Eductor: Stainless  Carbon Steel  Wear Treated  Sanitary

Motive Air Available: Should Fox quote blower?  Yes  No

Special Requirements: ( Voltage, X-Proof, Altitude)

**Fox Venturi Eductors**  
Dover NJ USA  
Voice - 973 328 1011,  
Fax to 973 328 3651



# Additional Technical Literature Available Upon Request

To receive any of the following technical information, please just contact us (email, fax, or phone) and request this literature, along with a brief explanation of your possible application:

## Brochures

- **Cement** Plant Applications - Bull. 307
- **Food** Industry Applications - Bull. 350
- **Foundry** Applications - Bull. 317
- **Plastics** Industry Applications - Bull. 336
- **Power** Industry Applications - Bull. 308
- Fox **Venturi Eductors** - Bulletin 301
- Venting **Blowback** from Airlocks with Fox RVE Eductors - Bulletin 360
- Flue Gas Conditioning/Additive Injection into Ducts with Fox Systems - Bull. 305
- **Slurry Eductors** for Liquid/Powders - Bull. 106
- **Air Ejectors** - Bull. 251
- **Steam Ejectors** - Bull. 201
- **Water Eductors** - Bull. 101

## Published Case Histories/Reprints

- Ten Years of Maintenance-Free Conveying with Fox eductors at metal processor
- Cement - Convey Kiln Spill at 700° C with No moving parts
- Cement - Convey waste/alternative fuels into cement kiln with 24/7 reliability
- Power - Spent Bed Recirculation, at high temps, at fluidized bed cogen plant
- Power - Dried sludge injection at cogen power plant
- Pigment powders at dye mfr.
- Foundry: Spent sand Conveying and dust collector retrofit
- Limestone Dust at Mexican mine
- Convey Dense Metal powders at magnet producer

## Case Studies

Fox constantly publishes new Case Studies as our venturi eductors are applied by new customers in new applications conveying new products. Here is just a partial list of case Studies that can be emailed or faxed to you upon request, grouped by industry. Request the Case Study You need by the Case Study Number:

### Food:

- 63 Corn snacks from extruder
- 59 Frozen cranberries
- 55 Puffed rice from reel
- 50 Oat bran from dust coll.
- 49 Ground coffee; screener
- 42 Cereal; package reclaim
- 39 Sugar; bulk bags
- 34 Whey; spray dryers
- 24 Salt flakes; screw feeder
- 17 Minors; spices - screw fdr.

### Plastics

- 45 Cryogenic grinding; mill
- 44 Screener - overs/unders
- 47 Acrawax feed to line
- 4 Reduce streamers and angelhair

### Diapers/ Hygenic

- 84 SAP/ Absorbant polymer in diaper production

## Building Products

- 79 Pumice/grout from dust collectors
- 83 Ground Cement Boards
- 85 Phenolic Resin at chipboard plants
- 20 Copper pellets, 400 pcf

## Minerals/Mines/ Metals

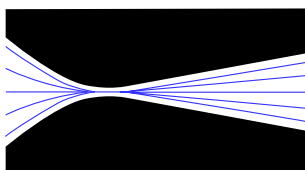
- 20 Copper pellets at 400 pcf
- 70 Copper-based caalciate @ 700\* F
- 81 Shredded Aluminum
- 20 Copper pellets, 400 pcf

## Cement

- 74 Inject alt fuels/waste (shredded tires, carpets) into cement kiln
- 80 CKD @ 700\* F
- 77 Dried sludge into kiln

## Power/FGD/Environmental

- 52 Hydrated lime, FGD
- 6 Flyash at 700° F
- 71 Boiler additive injection
- 72 Activated Carbon inj. into ducts
- 27 Pulverized Limestone, screw feeder
- 78 Dried sludge at cogen plant
- 74 Alt fuels; shredded waste



F O X

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