



PNEUMATI-CON® PNEUMATIC CONVEYING SYSTEMS



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PNEUMATI-CON® Dilute Phase Pneumatic Conveying Systems

Flexicon PNEUMATI-CON® dilute phase pneumatic conveying systems range from single-point “up-and-in” installations to cross-plant systems with multiple pick-up and discharge points and automated controls, satisfying an exceptionally wide range of bulk conveying applications. All are custom-engineered and fully integrated with other Flexicon equipment and systems, and your new or existing process.

PNEUMATI-CON dilute phase pneumatic conveying systems move bulk materials that are suspended in an air stream that is introduced by a positive pressure blower upstream of material intake points, or by a vacuum pump that removes air from the system downstream of material discharge points. Material is separated from the conveying air at the use point, then discharged on a batch basis via butterfly or slide gate valves, or continuously via rotary airlock valves.

Positive pressure systems

Positive pressure dilute phase pneumatic conveying systems are typically employed to convey bulk materials from a single source to one or multiple destinations, over longer distances and with greater capacity than possible using vacuum systems.

These systems utilize a positive displacement blower with single or multiple downstream material entry points, each of which meters product into conveying lines by means of a rotary airlock valve that maintains the pressure differential between the ambient atmosphere and that of the conveying line. Material and air blown through the line exit at single or multiple use points where they are separated by means of a filter receiver or cyclone separator, or fed directly into process vessels that are vented to downstream dust collection devices.

Pressure systems offer higher efficiency than vacuum systems, can convey over longer distances, and can blow directly into process and storage vessels without the use of a rotary airlock valve.

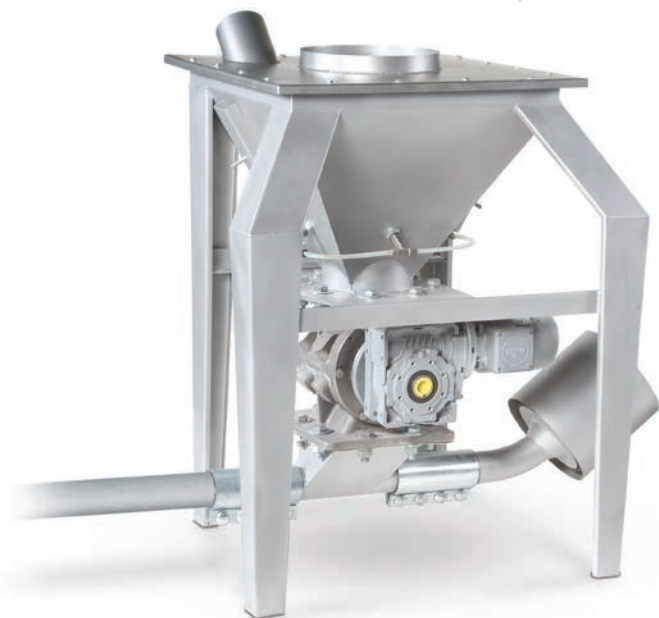
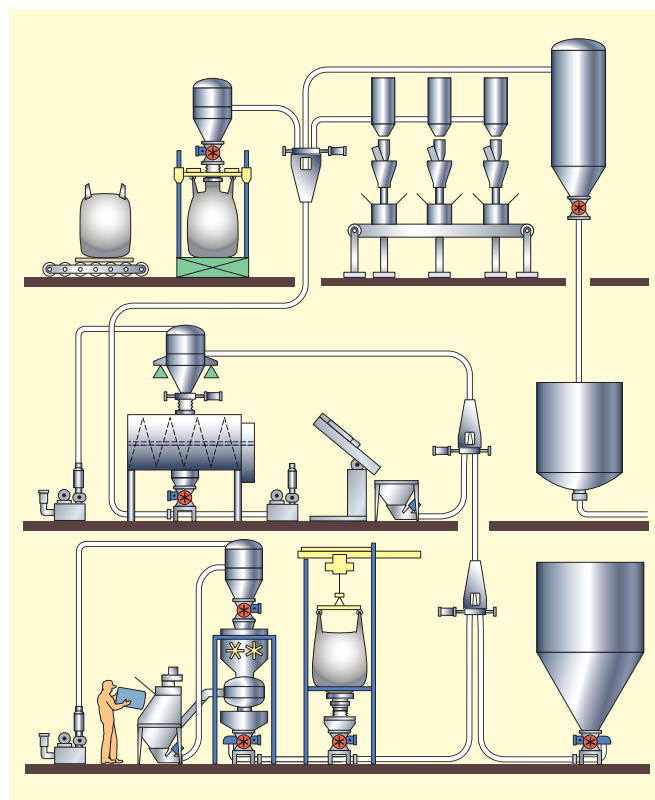
Vacuum systems

Vacuum dilute phase pneumatic conveying systems are generally employed for transporting material from multiple sources such as storage vessels, process equipment, trucks and railcars, to individual or multiple destinations. Unlike positive pressure systems, vacuum systems allow easy pick-up of materials from open containers using wands, and do not impart heat to the material. Since vacuum systems offer superior leak containment, they are often specified on the basis of cleanliness, particularly when handling hazardous materials.

Negative pressure is created by a positive displacement vacuum pump located at the downstream end of the system.

Material typically enters the system via upstream rotary airlock valves, hand-held pick-up wands, and non-flow-through (flood-feed) pick-up adapters, and exits the system through filter receivers or cyclone separators that separate the material from the conveying air directly above process equipment, surge hoppers, storage vessels or other discharge points.

In addition, vacuum conveying is suited to direct feeding of blenders, reactors and other enclosed process vessels that are put under vacuum by a line terminating at a downstream bag house or other dust collection device, eliminating the need for individual filter receivers or cyclone separators above each discharge point.



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Easy conveyor line routing

Since conveyor lines can be routed vertically and in any horizontal direction, over short or long distances, through small holes in walls or ceilings, Flexicon PNEUMATI-CON® systems are easy to integrate into production environments in which process equipment and other obstacles often exist, while consuming minimal floor space.

Total evacuation

PNEUMATI-CON systems fully evacuate the vessel being discharged and the conveyor line itself, minimizing cross-contamination of multi-ingredient systems. Complete transfer of material also ensures that individual and consolidated batch ingredients reach their destinations accurately by weight, maximizing quality while minimizing waste.



PNEUMATI-CON filter receivers incorporate numerous design and construction innovations offering unsurpassed separation efficiency across all capacity ranges. Low-capacity units (above) are commonly positioned above packaging lines or smaller process equipment, while medium-capacity units (right) are utilized above storage vessels and process equipment such as blenders and bulk bag fillers.

Wide capacity range

With a PNEUMATI-CON conveyor, capacity can range from several pounds to tens of tons per hour, feeding any destination from small packaging lines to silos and railcars. Moreover, a PNEUMATI-CON conveyor is well suited to excessive fluctuations in feed rate, and is capable of sustained operation when underloaded.

Diversity of materials handled by one conveyor

Powders having wide ranging bulk densities, as well as flakes, pellets, capsules, tablets, and other friable materials, can be handled by a single Flexicon pneumatic conveyor, providing the flexibility needed to transport multiple ingredients. (See Materials and Industries, page 4.)

Complete range of pneumatic system components

Flexicon provides any and all components necessary to configure your PNEUMATI-CON system including:

- Pressure blowers and vacuum pumps with integral sound enclosures with separate cooling fans, and easy-access maintenance points
- Rotary airlock valves in all popular designs and sizes
- Flex-tube diverters, wye-diverters, plug diverters and other line diverter configurations
- Filter receivers for low- to high-capacity applications
- Cyclone separators for low- to high-capacity applications
- Gain-in-weight and loss-of-weight batching systems
- Dust collectors and bin vents
- Controls and electrical equipment
- Hand-held pick-up wands
- Silos, day bins and other storage vessels

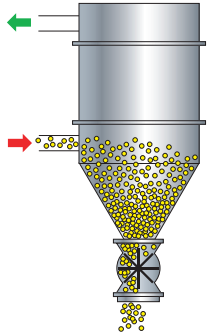


This Silo Vent is essentially the upper section of a filter receiver that can be mounted atop an existing silo or other large vessel, into which material can be conveyed.



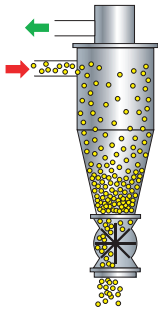
Material discharge methods

Material typically exits pressure and vacuum pneumatic conveying systems via filter receivers, cyclone separators, or fill/pass valves, or discharges directly into process or storage vessels.



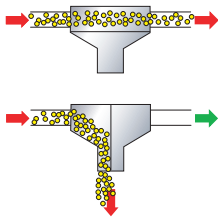
Filter Receivers

Flexicon filter receivers separate solids from the air stream using filter media and gravity, and are generally specified when materials contain smaller particles that are prone to dusting and/or when dust containment is a primary requirement. They are normally located above material use points, and employ reverse-pulse jet filter cleaning to dislodge accumulated dust from filter surfaces, allowing continuous and efficient separation of material from the air stream.



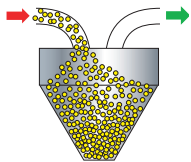
Cyclone Separators

Cyclones separate solids from the conveyor air stream using centrifugal force and gravity, and are typically specified when materials are comprised of larger particle sizes that are not prone to dusting. Auxiliary filtration can also be incorporated as a secondary means of capturing airborne solids.



Fill/Pass Valves

Fill/pass valves are commonly used to discharge material directly into individual or multiple process vessels and/or to deliver it to several destinations along a common conveying line. Downstream of the last fill/pass valve, the conveying line is normally routed to the original material source point or into a dust collection device.



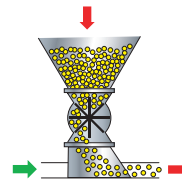
Directly Into Process Vessels

Both pressure and vacuum systems can feed material directly into blenders, reactors and other enclosed process vessels that are vented to a downstream bag house or other dust collection device, eliminating the need for individual filter receivers.



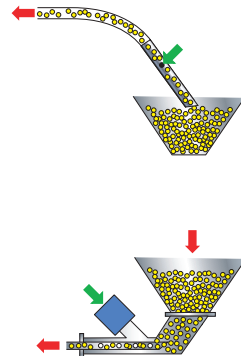
Material intake methods

Pressure and vacuum conveying systems commonly utilize rotary airlock valves to introduce material to the air stream. Hand-held wands and non-flow-through (flood-feed) pick-up adapters can be utilized with vacuum systems.



Rotary Airlock Valves with Flow-Through Pick-Up Adapters

Rotary airlock valves with flow-through pick-up adapters can be utilized in pressure and vacuum systems for both controlled metering of material into the conveying system, and maintaining the pressure differential between the conveying system and ambient atmosphere.



Wands

Hand-held pick-up wands plumbed to vacuum conveyor lines with flexible hose are used to vacuum material from hoppers, drums, paper bags, barrels or other containers.

Non-Flow-Through Pick-Up Adapters

Material can be introduced into vacuum conveyor lines via non-flow-through (flood-feed) pick-up adapters, which are typically used at pick-up points where lower volumes of material are fed manually.



Material pick-up points, clockwise from top left, include hand-held pick-up wand, inline rotary airlock with flow-through adapter, non-flow-through pick-up adapter and initial pick-up inline rotary airlock with flow-through adapter.

Enclosed system prevents contamination

Totally enclosed and dust-free, a PNEUMATI-CON® conveying system prevents contamination of the product and plant environment, allowing safe transfer of contamination-sensitive materials including dusty and hazardous materials.

High reliability and ease of maintenance

Flexicon PNEUMATI-CON systems feature easy-to-maintain filter receivers with access doors and inspection ports, as well as rotary airlock valves with optional rotor support bars for easy access, cleaning and inspection.

Mobile and custom configurations

Self-contained Flexicon PNEUMATI-CON conveying systems complete with feed hopper and/or pick-up wand, blower unit, filter receiver and control package, are available pre-engineered and configured on caster-mounted frames for in-plant mobility.

Designed, constructed and finished to industrial and sanitary standards

PNEUMATI-CON conveying systems are available in carbon steel with durable industrial finishes, or stainless steel finished to standards required for industrial, food, dairy and pharmaceutical applications. Available upgrades include quick-access and quick-disconnect features.



This modular vacuum receiver features a rugged clamp-together design that facilitates rapid disassembly for filter maintenance and cleaning. Whereas conventional filter receivers employ multiple smaller elements, this design employs a single, large diameter filter cartridge, and offers an ideal solution for low-throughput-rate, short-distance pneumatic conveying applications.



Unlike filter receivers, cyclone separators require no filters to separate solid particles from the gas stream, instead relying on cyclonic action alone. An air stream containing material enters the separator at a tangential angle and is spun rapidly, creating a circular flow that imparts centrifugal force to the particles which strike the wall of the cyclone and fall through a bottom outlet, into a process vessel.



Configurations (Page 1 of 2)



*Pneumatic Weigh Hopper
with Fill/Pass Valve*



*Vacuum Receiver with
Pneumatic Dump Valve*



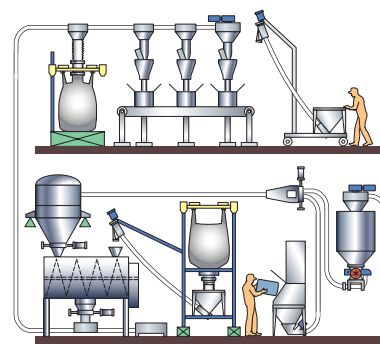
*Skid-Mounted Pneumatic
Bulk Bag Discharging System*



*Pneumatic Conveyor
for Gain-In-Weight Filling System*



Sanitary Bag Dump Station



*Engineered, Integrated
Bulk Handling Systems*



*Manual Dumping Station for
Pneumatic Conveyors*



*Pneumatic Conveyor
with BFF Bulk Bag Unloader*



*Pneumatic Conveyor
with Dust-Free Bulk Bag
Discharger*

Configurations *(Page 2 of 2)*



*Half Frame Low Cost Bulk Bag
Unloader for Pneumatic
Conveying Systems*



*Pneumatic Conveyor
for Batching from
Bulk Bags, Dump Station*



*Pneumatic Conveyor
for Gain-In-Weight Batching*



*Pneumatic Conveyor
for Bulk Bag Filling*



*Pneumatic and Flexible Screw
Conveyors for Weigh Batching*

Broad Range of Bulk Handling Equipment and Systems



FLEXICON® Flexible Screw Conveyors transport free- and non-free-flowing bulk solid materials from large pellets to sub-micron powders, including products that pack, cake or smear, with no separation of blends.



FLEXI-DISC® Tubular Cable Conveyors gently slide friable bulk material through smooth stainless tubing at any angle to single/multiple points.



PNEUMATI-CON® Pneumatic Conveying Systems move a broad range of bulk materials over short or long distances, between single or multiple inlet and discharge points in low to high capacities.



SWING-DOWN®, REAR-POST and TWIN-CENTERPOST™ Bulk Bag Fillers can fill one bulk bag per week or 20 per hour at the lowest cost per bag. Numerous performance options.



BLOCK-BUSTER® Bulk Bag Conditioners loosen solidified material. Variable height turntable positions bag for conditioning on all sides at all heights.



BULK-OUT® Bulk Bag Dischargers unload free- and non-free-flowing solids from bulk bags automatically. Allows untying, discharging, retying and collapsing.



FLEXICON® Manual Dumping Stations allow dust-free dumping of bulk material from bags and other containers. Automatic filter cleaning allows continuous, efficient operation.



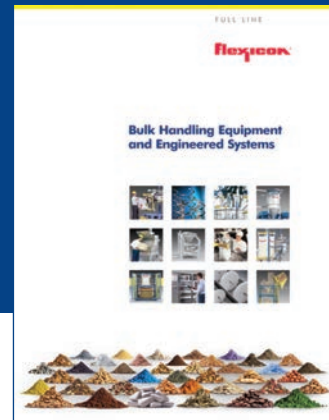
TIP-TITE® Container Dumpers empty bulk material from drums into vessels up to 10 ft (3 m) high. Dust-tight (shown) or open chute models.



FLEXICON® Weigh Batching Systems weigh and blend bulk ingredients automatically. Gain-in-weight (shown) and loss-of-weight systems available.

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Flexicon products are manufactured on four continents, and marketed through an extensive sales network throughout Europe, Australia, Southeast Asia, Africa and North/Central/South America.

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