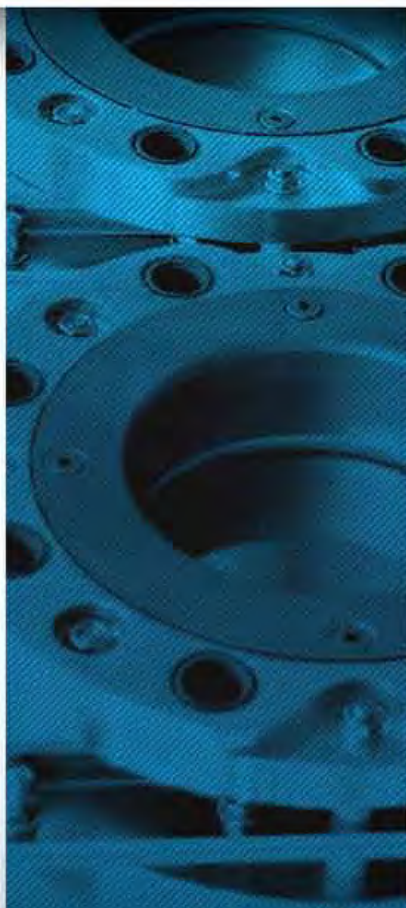




QUANTUM

S E R I E S

VALVES FOR DRY BULK PROCESSING & CONVEYING





VALVE SOLUTIONS FOR DRY BULK PROCESSING >>>

For 35 years, Vortex has supplied dry material handling valves to a global network of Original Equipment Manufacturers, Fortune 500 companies, and process engineering firms. Throughout the world, over 10,000 factories have utilized Vortex's innovative slide gates, diverters, iris valves, and custom engineered products to improve process efficiency. With sales and service offices located in North America, Europe, Asia & Latin America, Vortex's success comes from a philosophy, that focuses on quality, timely customer service and dedication to adding value to our clients' processes.

Each Vortex valve is appropriately selected to meet the demands in every application. With an in-house team of engineers, Vortex valves can be completely customized for individual applications or special installations. Vortex understands the value of your process. Our technical application and engineering team have more than 150 years of combined dry material handling experience. Vortex's knowledge of dry particle characteristics and material conveying systems is unsurpassed. Vortex delivers intelligent and cost effective valve solutions for all dry bulk materials. No application is too large, too small or too difficult to handle.

MARKETS SERVED:

- Chemicals
- Cement
- Food & Grain
- Fibers
- Minerals
- Petrochem
- Pharmaceutical
- Plastics/polymer
- Rubber
- Mining

MATERIALS HANDLED

Our Quantum Series valves handle many types of dry bulk materials throughout numerous industries that include but are not limited to: Agriculture, Chemical, Coffee, Dairy, Foods, Milling, Pet Food, Petrochemical, Pharmaceutical, Plastics, Rubber, Textiles, Tobacco, and Wood.

POWDER & DUST



GRANULES



PELLETS



MODERATE ABRASIVES



QUANTUM

VALVES FOR DRY BULK PROCESSING & CONVEYING

Vortex Quantum Series slide gates and diverters are the valves our customers have been using for years to shut off, meter, & divert their dry bulk material. It is our traditional line used for dry bulk processing through gravity flow or pneumatic (pressure or vacuum) conveying.

SLIDE GATES



ORIFICE GATE **3**



ROLLER GATE **5**



HDPV2 GATE **7**



CLEAR ACTION GATE **9**



MAINTENANCE GATE **11**



HAND SLIDE ORIFICE GATE **13**

DIVERTERS



SEAL TITE DIVERTER **17**



WYE LINE DIVERTER **19**



FLEX TUBE DIVERTER **23**



GRAVITY VEE DIVERTER **25**



FILL PASS DIVERTER **27**

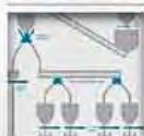


MULTI-PORT DIVERTER **31**

VALVE PLACEMENT



PNEUMATIC SYSTEM **15**



GRAVITY SYSTEM **16**

OTHERS



IRIS VALVE **33**

ORIFICE GATE

The Vortex Quantum Orifice Gate is specifically engineered to handle dry bulk solids in gravity flow, dilute phase, or vacuum conveying systems with pressures up to 15 psig (1 barg). Traditional slide gates and butterfly valves commonly allow packing of material which prevents positive air and material shutoff.

☒ **GRAVITY FLOW**

☒ **DILUTE PHASE PNEUMATIC CONVEYING** (Pressure or Vacuum)

☐ **DENSE PHASE PNEUMATIC CONVEYING**

FEATURES



Handles powders, granules and pellets



Mechanically self cleans on opening stroke



No pinch points or exposed moving parts for safe operation



Wear compensating hard polymer seals



Unobstructed opening



Seals protected from blast abrasion



Serviceable while in-line



Material construction options available



Standard sizes: 2" - 16"
Contact us for custom sizes

OPTIONS



STUDDED



ANSI / DIN



-P

DETAILS



Shim removal for seal adjustment while valve is in-line



Blade adjustment through front access panel



Mechanically self cleans on opening stroke

APPLICATIONS



10" (254mm) Quantum Orifice Gate handling cement powder



Hand crank Quantum Orifice Gate with ANSI flange



12" (305mm) Quantum Orifice Gate handling polyethylene resin powder

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

ROLLERGATE

The Vortex Roller Gate is the best choice for handling dry material in gravity flow applications. This gate is available in a wide variety of configurations including rectangular sizes and customer specific hole patterns. It has live-loaded seals that extend service life by compensating for wear. These seals provide an excellent material seal across the gate and to atmosphere. They can also be replaced while the valve is in-line.

☒ **GRAVITY FLOW**

☐ **DILUTE PHASE PNEUMATIC CONVEYING** (Pressure or Vacuum)

☐ **DENSE PHASE PNEUMATIC CONVEYING**

FEATURES



Handles powders, granules and pellets



Positive seal of dust and fine powders



Wear compensating hard polymer seals



Serviceable while in-line



Seal access ports for seal replacement while valve is in-line



Accurate metering of material with optional controls



No pinch points or exposed moving parts for safe operation



Material construction options available



Standard sizes: 4" - 30"
Contact us for custom sizes

OPTIONS



SINGLE CYLINDER



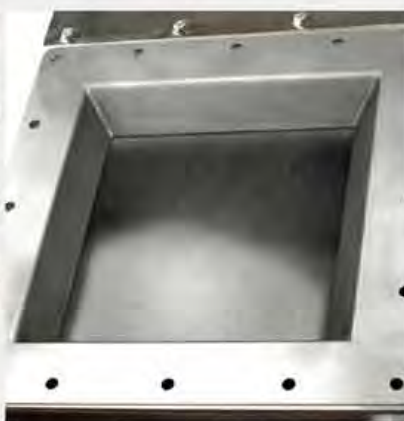
DUAL CYLINDER



RECTANGULAR



The bonnet seals can be replaced while in-line to decrease downtime



A special service inlet can be added to deflect material away from seals and rollers to reduce wear



Top blade seal & cam adjustable rollers supply smooth linear actuation and in-line adjustments

DETAILS



13" (330mm) Roller Gate below a screw conveyor



6" (152mm) Roller Gate below hopper handling flour



26" (660mm) Dual Cylinder Roller Gate

APPLICATIONS

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

HDPV2

Designed to address higher-pressure applications up to 75 psig (5barg) depending on size, the Vortex HDPV2 sets itself apart from traditional industry slide gates. The rising blade design provides positive material shut-off by means of an O-ring seal on the inlet of the valve. This design feature eliminates the issues related to packing or material causing abrasion to the end seal.

✓ **GRAVITY FLOW**

✓ **DILUTE PHASE PNEUMATIC CONVEYING** (Pressure or Vacuum)

✓ **DENSE PHASE PNEUMATIC CONVEYING**

FEATURES



Designed to handle abrasive and sticky materials



Seals fine material in higher aeration or pressure applications



Patented rising blade action ensures optimal seal



Seals protected from blast abrasion



Serviceable while in-line



Does not pack material up closure



Material construction options available



Standard sizes: 4" - 16"
Contact us for custom sizes

OPTIONS



STANDARD



SSi

DETAILS



The silicone blade seal is recessed to protect it from material flow and to reduce wear



The air purge is used to pressurize the bonnet and keep material in the flow stream



Lifting lugs and inserts provide a positive seal and prevent metal-on-metal contact

APPLICATIONS



16" (406mm) HDP above airlock handling calcium oxide



10" (254mm) HDP in-line handling fly ash



12" (305mm) HDP above and below a pressure pot handling PRB coal and wood chips

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

CLEAR ACTION GATE



The Vortex Clear Action Gate is designed for use in gravity flow or pneumatic conveying systems up to 15 psig (1 barg) depending on size. Mounted horizontally, the machined square-edged blade of this gate mechanically clears the material from the sealing surfaces on each closing cycle allowing it to discharge beneath the valve. Open cavities where material collects in traditional gate valves have been eliminated with the square blade and seal design.

- ☒ **GRAVITY FLOW**
- ☒ **DILUTE PHASE PNEUMATIC CONVEYING** (Pressure or Vacuum)
- ☐ **DENSE PHASE PNEUMATIC CONVEYING**

FEATURES

-  Handles powders, granules and pellets
-  Self-cleaning action on closure minimizes material build-up
-  Positive seal across the valve and to atmosphere
-  Serviceable while in-line
-  Accurate metering of materials with optional metering controls
-  No internal cavities for material build up
-  No pinch points of exposed moving parts for safe operation
-  Material construction options available
-  Standard sizes: 6" - 16"
Contact us for custom sizes

OPTIONS



INLET



OUTLET

DETAILS



Slotted end seal to eliminate material packing upon closing stroke



Replaceable bonnet seals allow for in-line maintenance



Air purge ports are used to reduce material migration between replaceable seals

APPLICATIONS



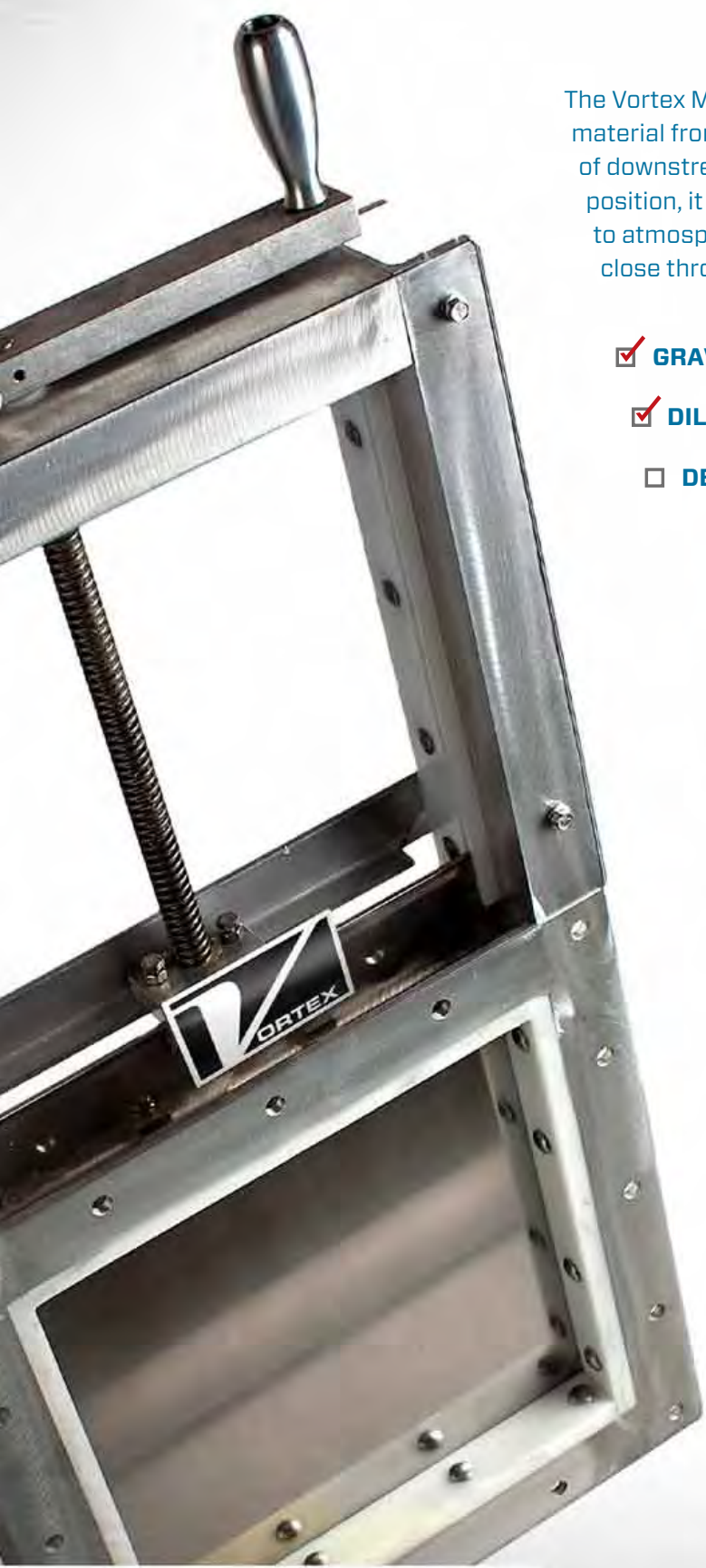
10" (254mm) Clear Action Gate below hopper handling animal feed additives



12" (305mm) Clear Action Gate above a rotary valve handling calcium carbonate with optional pre-wired terminal box

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

MAINTENANCE GATE



The Vortex Maintenance Gate is designed to shut off material from a hopper or silo when maintenance of downstream equipment is required. In the open position, it positively seals conveying air and material to atmosphere. The hand crank gearing is designed to close through material in case of an upset condition.

- ☒ **GRAVITY FLOW**
- ☒ **DILUTE PHASE PNEUMATIC CONVEYING** (Pressure or Vacuum)
- ☐ **DENSE PHASE PNEUMATIC CONVEYING**

FEATURES



Handles powders, granules and pellets



Self-cleaning action on closure eliminates material build-up



Unobstructed opening



Seals protected from blast abrasion



Serviceable while in-line



Narrow profile



Material construction options available



Standard sizes: 6" - 18"
Contact us for custom sizes

OPTIONS



SQUARE



ROUND

DETAILS



Braided Teflon packing seal gives positive material & air seal up to 15 PSIG to atmosphere in the open position



Ratio of 5:1 ACME threaded rod provides the ability to cut through a column of material in an upset condition

APPLICATIONS



8" (203mm) Maintenance Gate utilized as overflow shutoff on silo



12" (305mm) Maintenance Gate above a rotary airlock handling soda ash



10" (254mm) Maintenance Gate handling PVC resin

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

HANDSLIDE ORIFICE GATE



The Vortex Hand Slide Orifice Gate is designed specifically to handle dry bulk solids in gravity flow conveying. A full flow orifice provides unrestricted conveying of material with no disk or ledges to impede flow or cause material bridging. The gate seat and live-loaded seals are protected from material flow by a metal insert. By design, the valve “self cleans” material from the seat on each stroke of the valve blade improving overall seat life.

☒ **GRAVITY FLOW**

☐ **DILUTE PHASE PNEUMATIC CONVEYING** (Pressure or Vacuum)

☐ **DENSE PHASE PNEUMATIC CONVEYING**

FEATURES



Handles powders, granules and pellets



Mechanically self cleans on opening stroke



Wear compensating hard polymer seals



Unobstructed opening



Seals protected from blast abrasion



Narrow profile



Material construction options available



Standard sizes: 2" - 16"
Contact us for custom sizes



DOUBLE HANDLE



SINGLE HANDLE

OPTIONS



Optional locking pin secures the blade in either the open or closed position



Shim removal for seal adjustment while valve is in-line

DETAILS

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

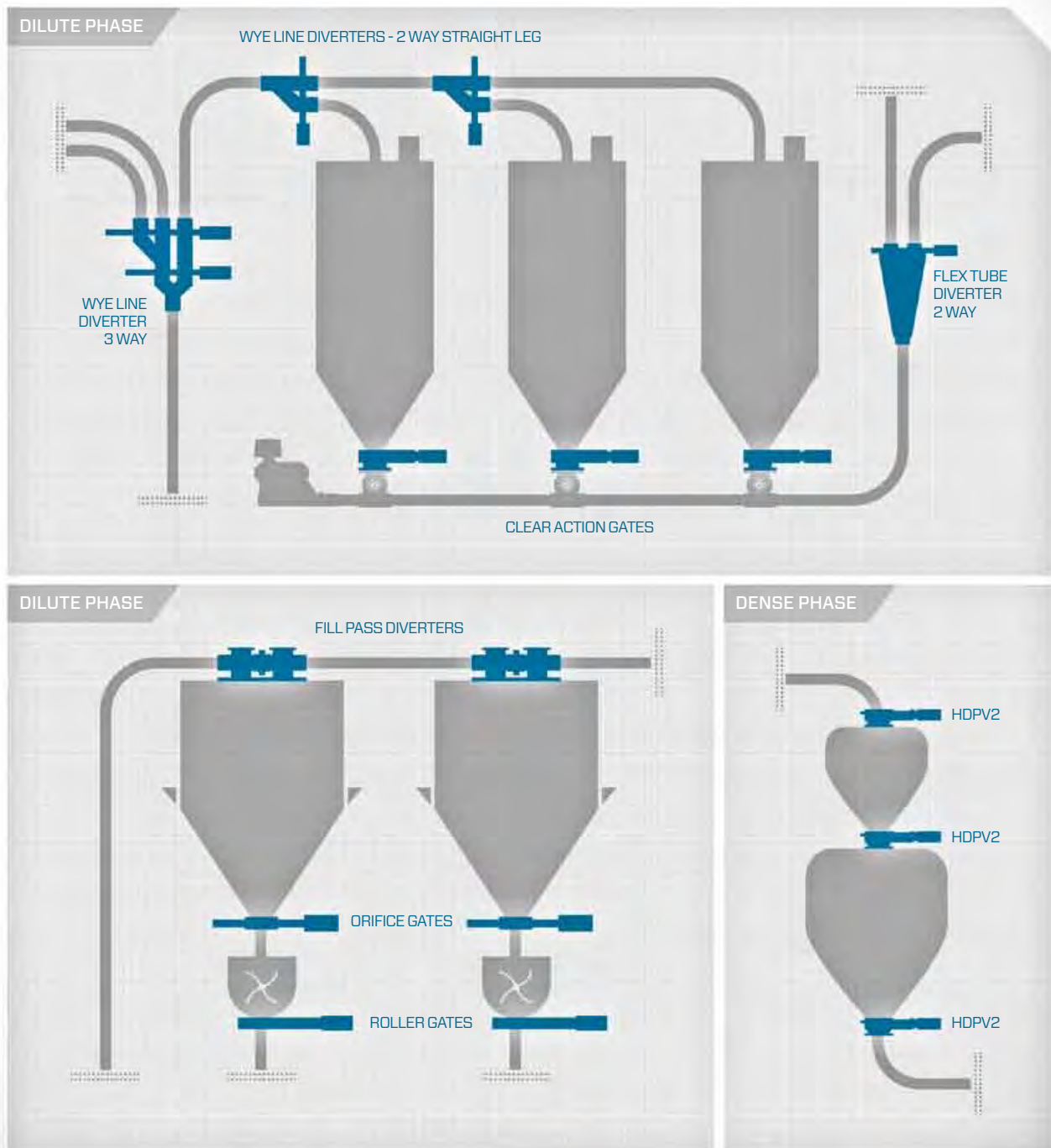


6" (152mm) Hand Slide Orifice Gate as isolation valve above a flexible screw conveyor

APPLICATIONS

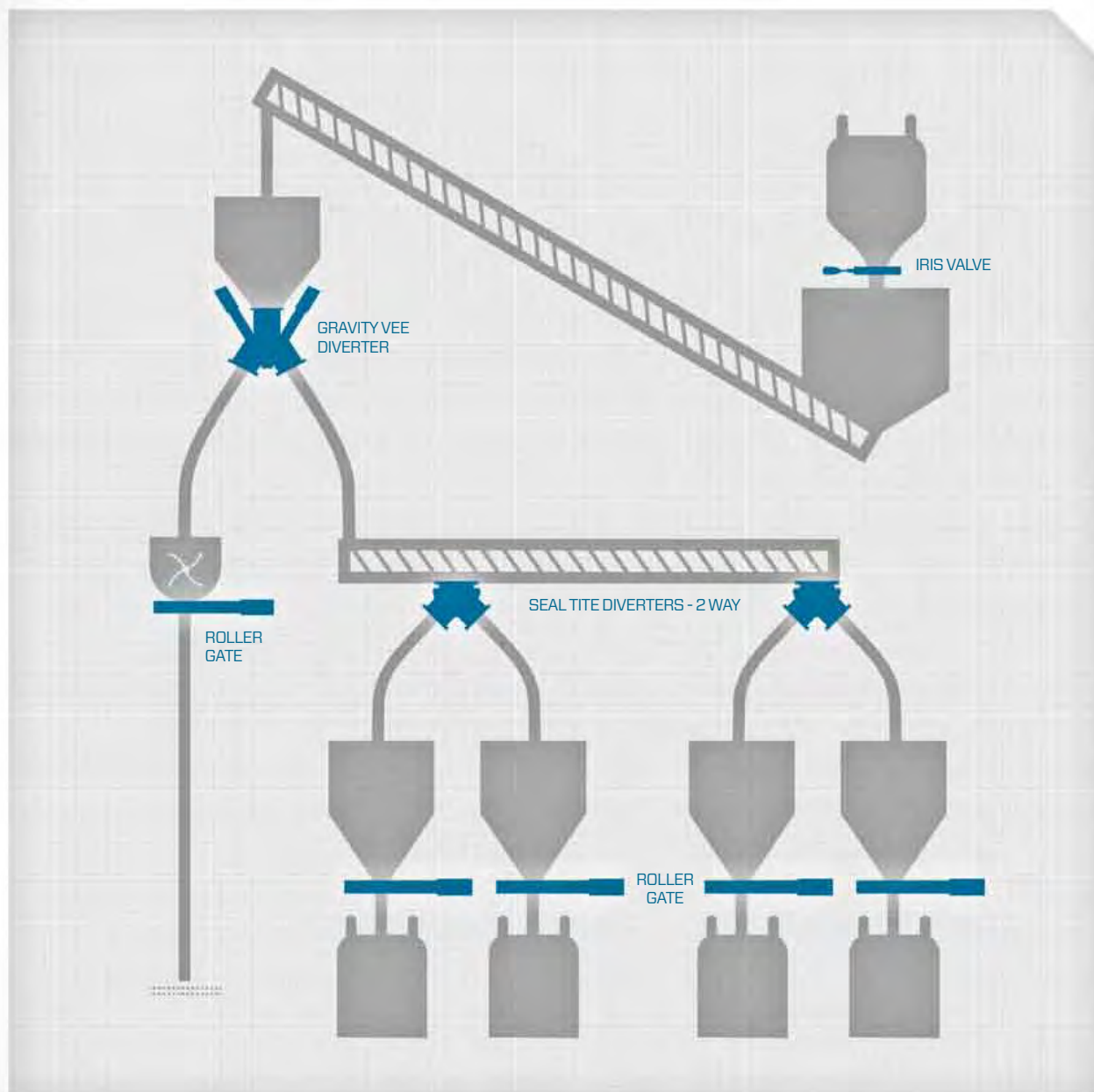
PNEUMATIC VALVE PLACEMENT

The systems below reflect potential valve placement and are for demonstrational purposes only.



GRAVITY VALVE PLACEMENT

The systems below reflect potential valve placement and are for demonstrational purposes only.



For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

SEALTITE DIVERTER












The Vortex Seal Tite Diverter is designed for use in gravity flow applications where material can be diverted from one source to either two or three destinations. The Seal Tite Diverter offers a removable access door for interior inspection, cleaning and maintenance.

☒ **GRAVITY FLOW**

☐ **DILUTE PHASE PNEUMATIC CONVEYING**
(Pressure or Vacuum)

☐ **DENSE PHASE PNEUMATIC CONVEYING**

FEATURES

-  Handles powders, granules and pellets
-  Leading edge of blade protected from material flow
-  Wear compensating shaft seal prevents leakage
-  Removable access door for internal inspection, cleaning and maintenance
-  Positive seal of dust and fine powders
-  Available in 2 and 3-way configurations
-  Internal access without tools
-  Material construction options available
-  Standard sizes: 4" - 30"
Contact us for custom sizes



2 - WAY



STRAIGHT



3 - WAY



The recessed blade protects the leading edge of seal from material flow and eliminates excess wear



A removable blade allows for seal replacement without extracting the valve from service



The shaft seal replaces the open area where migration of material to the off leg normally occurs



24" (610mm) straight line Seal Tite Diverter handling DDG



6" (152mm) Seal Tite Diverter handling flour



10" (254mm) straight line Seal Tite Diverter handling kaolin clay

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

WYELINE DIVERTER

The Vortex Quantum Series Wye Line Diverter is specifically engineered to handle dry bulk solids in vacuum or dilute phase pneumatic conveying systems with pressures up to 15 psig (1 barg) depending on size. A full flow orifice provides unrestricted conveying of material. The live-loaded seals are shielded from abrasion by a metal insert.

☐ **GRAVITY FLOW**

☒ **DILUTE PHASE PNEUMATIC CONVEYING** (Pressure or Vacuum)

☐ **DENSE PHASE PNEUMATIC CONVEYING**

FEATURES



Handles powders, granules and pellets



Shifts "on the fly"



Wear compensating hard polymer seals



Unobstructed opening



Positive seal through closed port



Serviceable while in-line



Diverts or converges material flow



Available in 2, 3, or 4-way configurations



Material construction options available



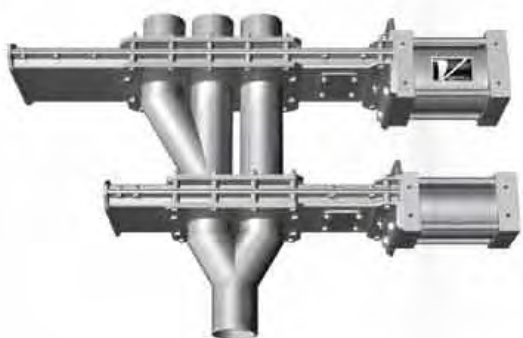
Standard sizes: 2" - 12"
Contact us for custom sizes



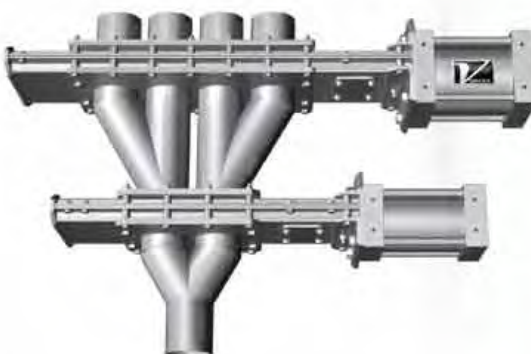
2 - WAY



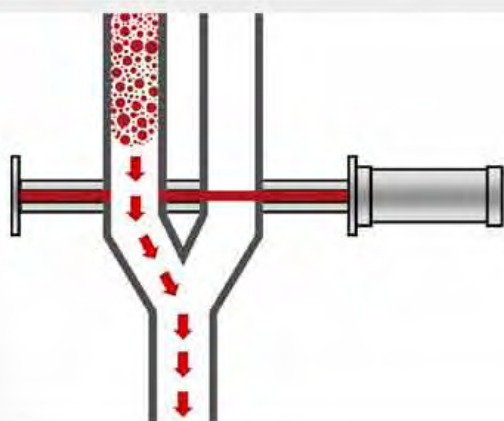
2 - WAY STRAIGHT



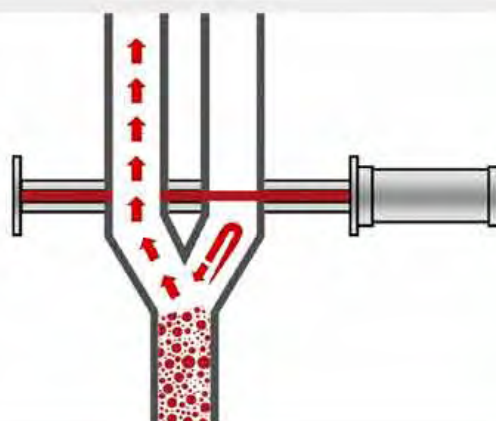
3 - WAY



4 - WAY



WYE LINE 2-WAY DIVERTER
converging material



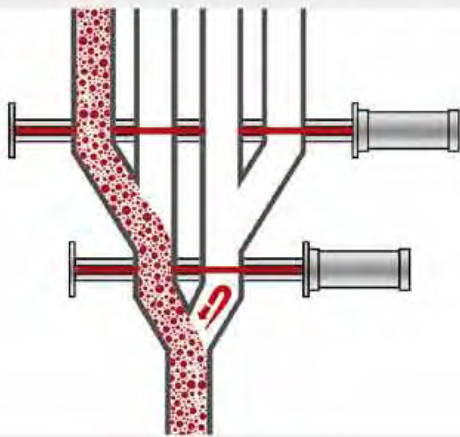
WYE LINE 2-WAY DIVERTER
diverting material

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

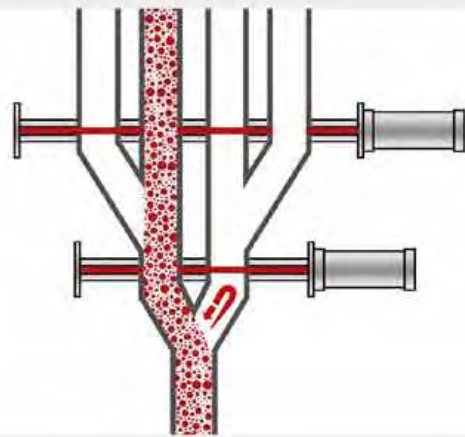
WYELINE DIVERTER

Unlike common in-line flap or plug-type diverters, Vortex's series of Wye Line Diverters offer a wider range of dilute phase and vacuum conveying options. The design features a stainless steel sliding blade with unrestricted flow ports, and is capable of shifting directions while the system's blower or vacuum pump continues to operate. If installed near a destination point, the diverter may also shear through material to facilitate continuous conveying.

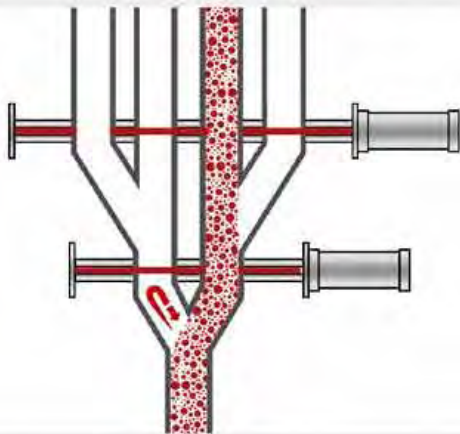
MATERIAL FLOW



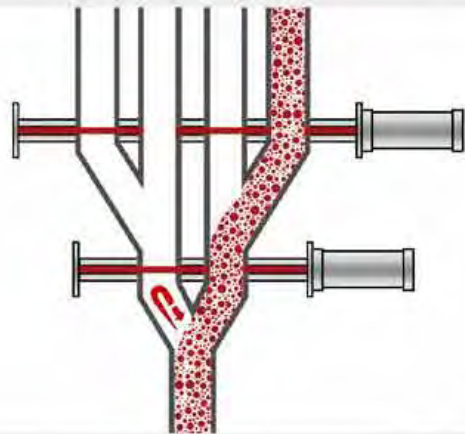
WYE LINE 4-WAY DIVERTER
PORT 1 OPEN



WYE LINE 4-WAY DIVERTER
PORT 2 OPEN



WYE LINE 4-WAY DIVERTER
PORT 3 OPEN



WYE LINE 4-WAY DIVERTER
PORT 4 OPEN



Shim removal for seal adjustment while valve is in-line



Full port opening eliminate internal ledges that can trap material



Compact lightweight design



Ability to shift "on the fly" without requiring blower shutdown



4" (101mm) Wye Line Diverter handling polypropylene pellets



2.5" (63mm) Wye Line Diverter handling dry leaf tea



6" (152mm) schedule 10 pipe Wye Line Diverter handling kaolin clay powder

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

FLEXTUBE DIVERTER









The unique design of the Vortex Flex Tube Diverter eliminates material cross contamination through a positive seal across the closed port. Pockets where material can lodge and remain trapped have also been eliminated. A smooth unobstructed transition from inlet to outlet shields the wear compensating seals from abrasion.

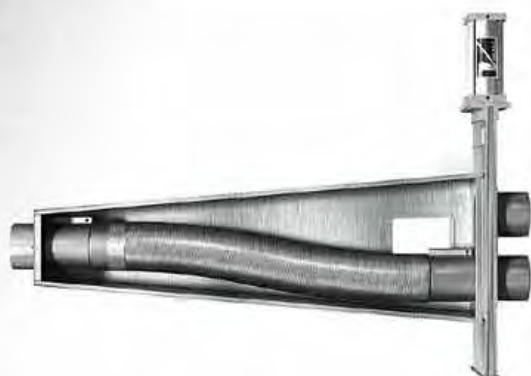
☒ **GRAVITY FLOW**

☐ **DILUTE PHASE PNEUMATIC CONVEYING** (Pressure or Vacuum)

☐ **DENSE PHASE PNEUMATIC CONVEYING**

FEATURES

-  Handles powders, granules and pellets & is excellent for sugar-based solids
-  Eliminates cross contamination
-  Diverts or converges material flow
-  Unobstructed opening
-  Available in 2 or 3-way configurations
-  No pinch points or exposed moving parts for safe operation
-  Material construction options available
-  Standard sizes: 2" - 8"
Contact us for custom sizes



2 - WAY



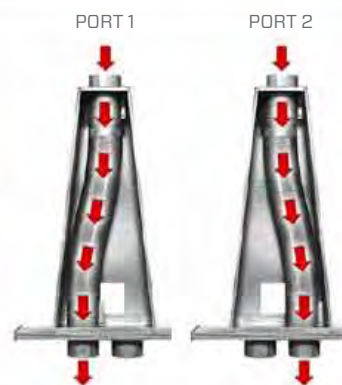
3 - WAY



Housing encloses all moving parts to eliminate external pinch points and support the flex tube



Shim removal for seal adjustment while valve is in-line



This diagram shows the isolation of the off leg to eliminate material cross contamination



8" (203mm) Flex Tube Diverter handling PVC compound



6" (152mm) Flex Tube Diverter handling coffee beans

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM









GRAVITYVEE DIVERTER

The Vortex Gravity Vee Diverter is designed to divert dry bulk solids in gravity flow conveying systems. The design allows for material flow through both outlets simultaneously, one outlet at a time, or a complete shut-off of flow. The Gravity Vee Diverter is also capable of metering flow through either outlet port.

- ☒ **GRAVITY FLOW**
- ☐ **DILUTE PHASE PNEUMATIC CONVEYING**
- ☐ **DENSE PHASE PNEUMATIC CONVEYING**



FEATURES

-  Handles powders, granules and pellets
-  Design allows for total material flow control
-  Wear compensating hard polymer seals
-  Seals protected from blast abrasion
-  Positive seal of dust and fine powders
-  Serviceable while in-line
-  Material construction options available
-  Standard sizes: 5" - 24"
Contact us for custom sizes



SQUARE



ROUND



Multiple actuators allow for independent control of material flow through each outlet



The bonnet seals can be replaced while valve is in-line



8" (203mm) Gravity Vee Diverter below a rotary valve handling zinc oxide



24" (610mm) Dual Cylinder Gravity Vee Diverter for handling flour

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

FILLPASS DIVERTER

The Vortex Fill Pass Diverter is specifically engineered to handle dry bulk solids in vacuum or dilute phase pneumatic conveying systems with pressure up to 15 psig (1 barg) depending on size. It provides a versatile and reliable solution for filling one or more in-line weigh hoppers when material is conveyed pneumatically through a closed loop system. The design of the Fill Pass Diverter utilizes spread hopper inlet/outlet stacks for improved air and material separation reducing fill time and down line material carryover.

☐ **GRAVITY FLOW**

☒ **DILUTE PHASE PNEUMATIC CONVEYING** (Pressure or Vacuum)

☐ **DENSE PHASE PNEUMATIC CONVEYING**

FEATURES



Separates air and material before filling the hopper



Shifts "on the fly"



Weigh from up to 5 sources and/or materials



Positive seal through closed ports



Unobstructed opening



Serviceable while in-line



Material construction options available

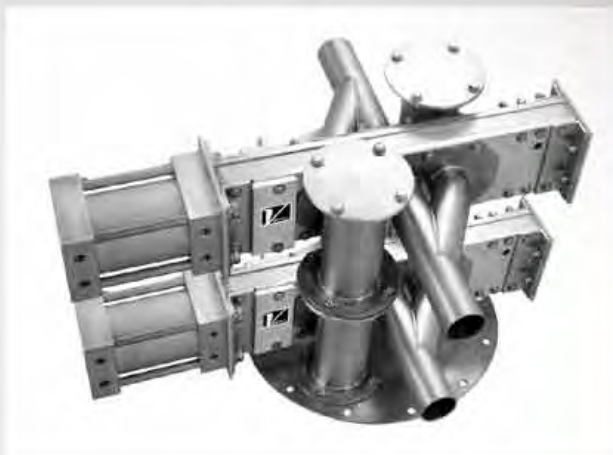


Standard sizes: 2" - 6"
Contact us for custom sizes

OPTIONS



SINGLE



STACKED

DETAILS



Shim removal for seal adjustment while valve is in-line



The valve's spread stack offers better material/air separation



The material deflector directs material flow to minimize material carryover

APPLICATIONS



5" (127mm) Fill Pass Diverter above a scale hopper handling calcium carbonate

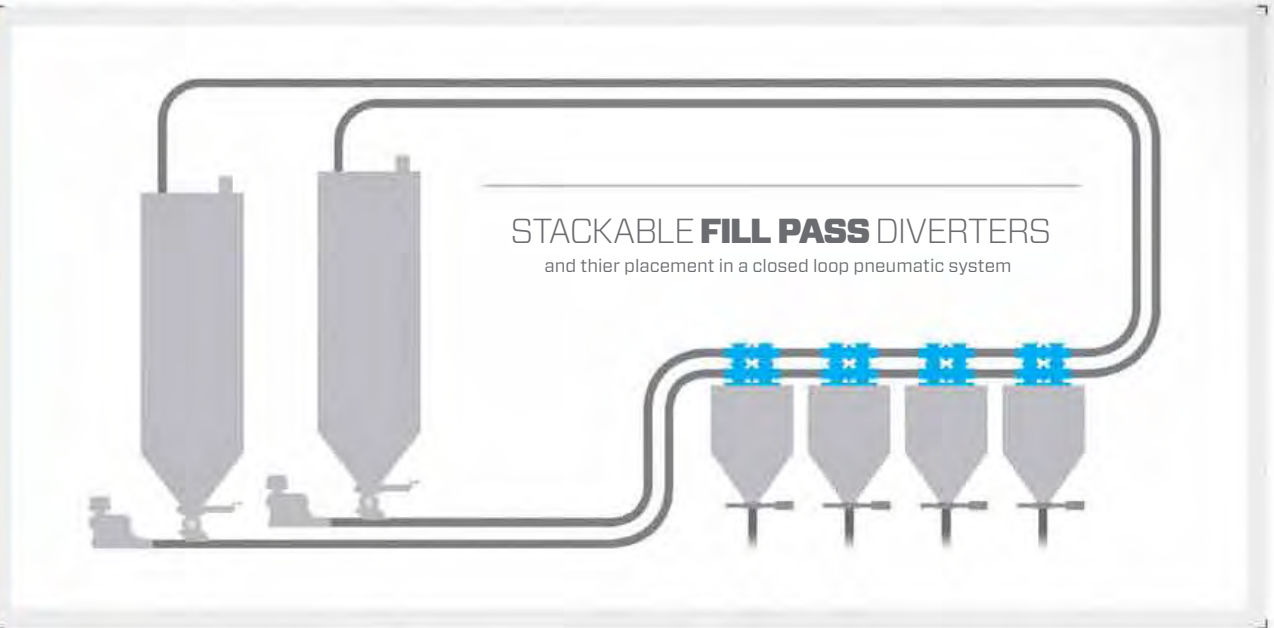


6" (152mm) Fill Pass Diverter above a scale hopper handling baking mixtures

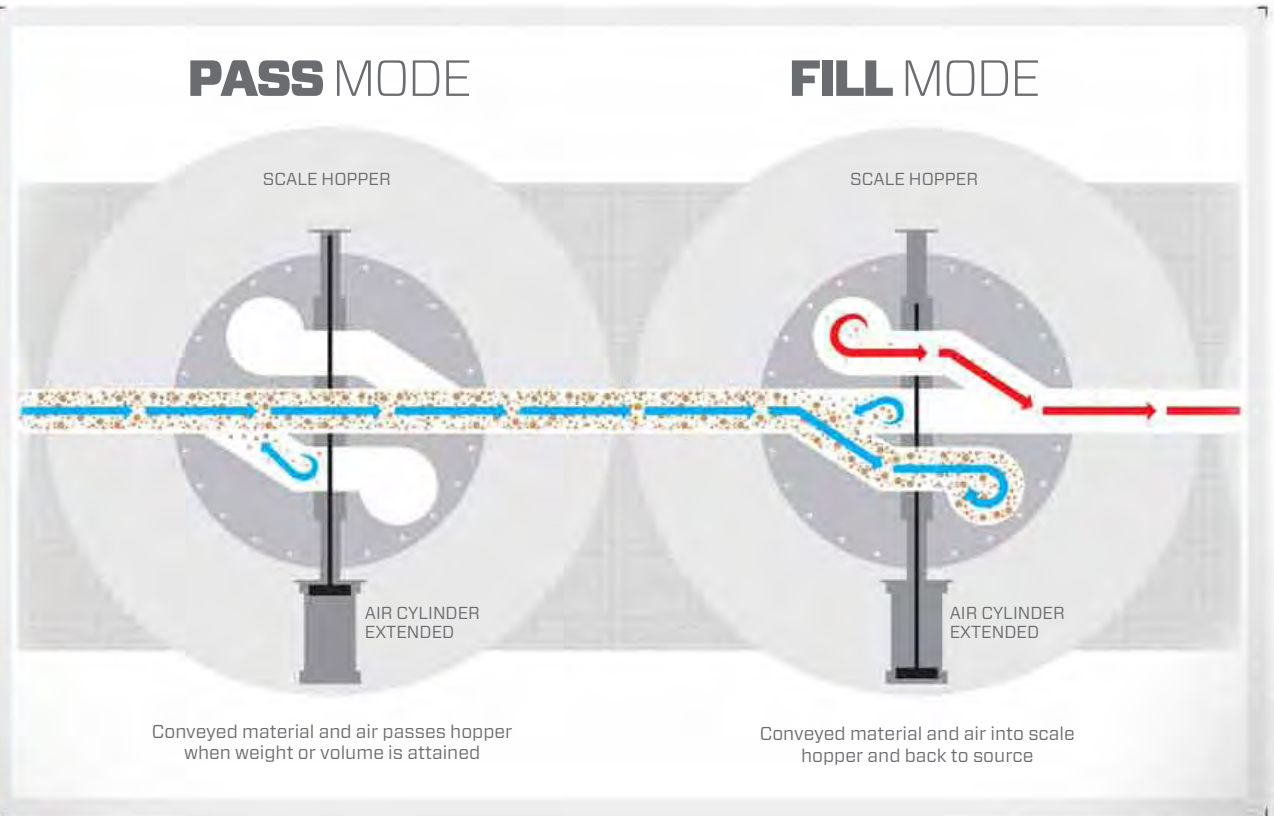
For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

FILLPASS DIVERTER

VALVE PLACEMENT



VALVE MODES - TOP VIEW



BLUE represents airflow toward hopper

RED represents airflow away from hopper

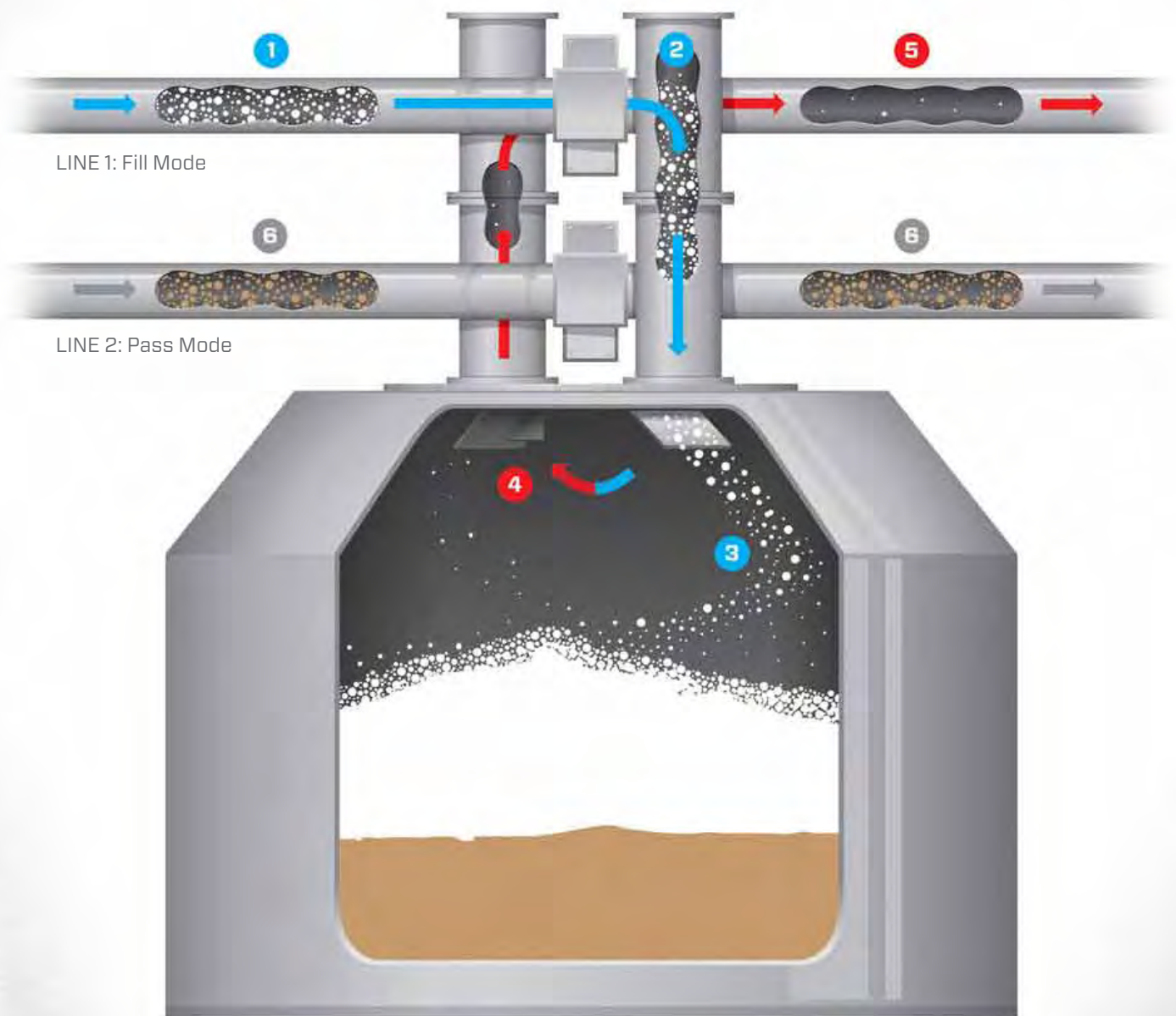
STACKABLE **FILL PASS** DIVERTERS

are used to batch different materials using two separate systems into multiple hoppers

PRODUCT BENEFITS

- Positive seal in pass mode reduces material carryover
- Material and air separation also reduces material carryover
- Less carryover means faster hopper fill times
- Positive seal also results in more accurate batching
- Hopper is vented as it fills eliminating the need for a bin vent
- Stacked Fill Pass Diverters reduce required footprint

- 1 Air and material X move toward hopper in line 1
- 2 Air and material X are diverted down into hopper
- 3 Material X is deflected away from vent as it fills the hopper
- 4 Air is vented back in-line with minimal material carryover
- 5 Air pressure continues in-line with minimal material carryover
- 6 Air and material Z in line 2 move pass hopper when in pass mode



BLUE represents airflow toward hopper

RED represents airflow away from hopper








For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

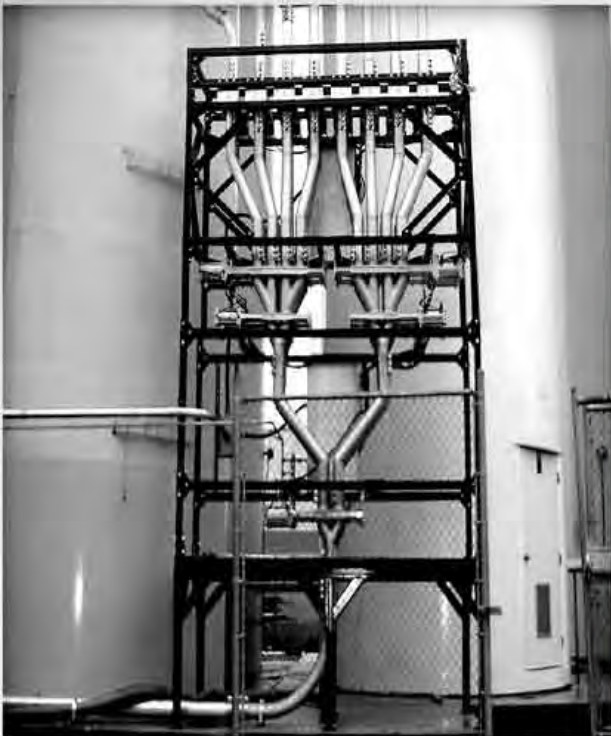
MULTI-PORT DIVERTER



The Vortex Multi-Port Wye Line Diverter is specifically engineered to handle dry bulk solids in vacuum or dilute phase pneumatic conveying systems with pressures up to 15 psig (1 barg) depending on size. The multi-port eliminates the need for complicated hose manifold stations. This helps address potential errors when manually switching hoses and greatly reduces safety hazards.

FEATURES

-  Handles powders, granules and pellets
-  Mechanically self cleans on opening stroke
-  Shifts “on the fly”
-  Wear compensating hard polymer seals
-  Unobstructed opening
-  Serviceable while in-line
-  Material construction options available



2 x 8 Multi-Port Diverter
handling PVC compounds



4" (102mm) Cross-Over Diverter
handling titanium dioxide



2 x 8 Multi-Port Diverter
handling plastic pellets



5 x 5 Multi-Port Diverter with all lines
running simultaneously handling plastic resin

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM

IRIS VALVE

The Vortex Iris Valve is designed specifically to handle dry bulk solids in gravity discharge of free-flowing material from bins, bulk bags, chutes, and hoppers. The Vortex Iris Valve is designed with stainless steel control rings, metal handle and trigger lock, and nylon shim for durability and smooth actuation. A form fitted fabric sleeve provides a dust tight seal and product barrier that prevents material leakage to atmosphere.

☒ **GRAVITY FLOW**

☐ **DILUTE PHASE PNEUMATIC CONVEYING** (Pressure or Vacuum)

☐ **DENSE PHASE PNEUMATIC CONVEYING**

FEATURES

-  Handles powders, granules and pellets
-  Ideal for bulk bag unloading
-  Smooth actuation with no binding or galling
-  Unobstructed opening
-  Fabric sleeve prevents material degradation
-  Stainless steel control ring
-  Material construction options available
-  Standard sizes: 4" - 18"
Contact us for custom sizes

OPTIONS



INFINITE POSITION



QUICK LOCK



TOTE HANDLE

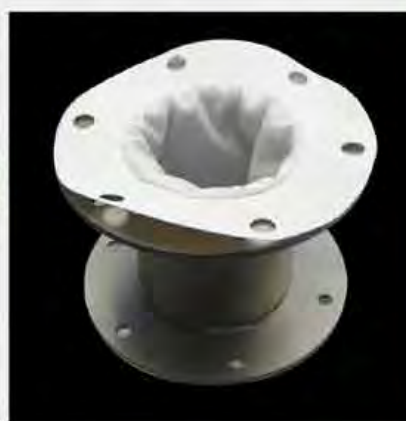
DETAILS



Preset positions for quick adjustments of material flow



Stainless steel control ring increases torque when closing on a column of material



Optional replaceable wear liner reduces sleeve contact and extends valve life

APPLICATIONS



12" (305mm) Iris Valve on bulk bag discharge



18" (457mm) Iris Valve on bulk bag discharge



15" (381mm) Iris Valve on bulk bag discharge

For a complete list of specifications, modifications, dimensional drawings and measurements, visit WWW.VORTEXVALVES.COM



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PRODUCT LINES

QUANTUM
VALVES FOR DRY BULK PROCESSING & CONVEYING

TITAN
GATES AND DIVERTERS FOR HEAVY DUTY MATERIAL HANDLING

ENGINEERED
CUSTOM SOLUTIONS DESIGNED FOR APPLICATION