



AIR CANNONS

POWERFUL, SAFE & EFFICIENT POWER
TO PUT MATERIALS IN MOTION

L3748



WHAT'S AN AIR CANNON?

Also known as a “blaster” or “ash sweep”

An air cannon is an engineered flow-aid device that strategically directs a controlled blast of air to dislodge and move material.

Enhance material flow & prevent bridging, clinging, arching, & rat-holing of bulk material.



WHAT'S AN AIR CANNON?

AIR CANNON ANATOMY

2. Valve

The valve is similar to a vehicle's engine. The valve releases the stored air as quickly as possible; in about half a second your tank is empty.

3. Solenoid

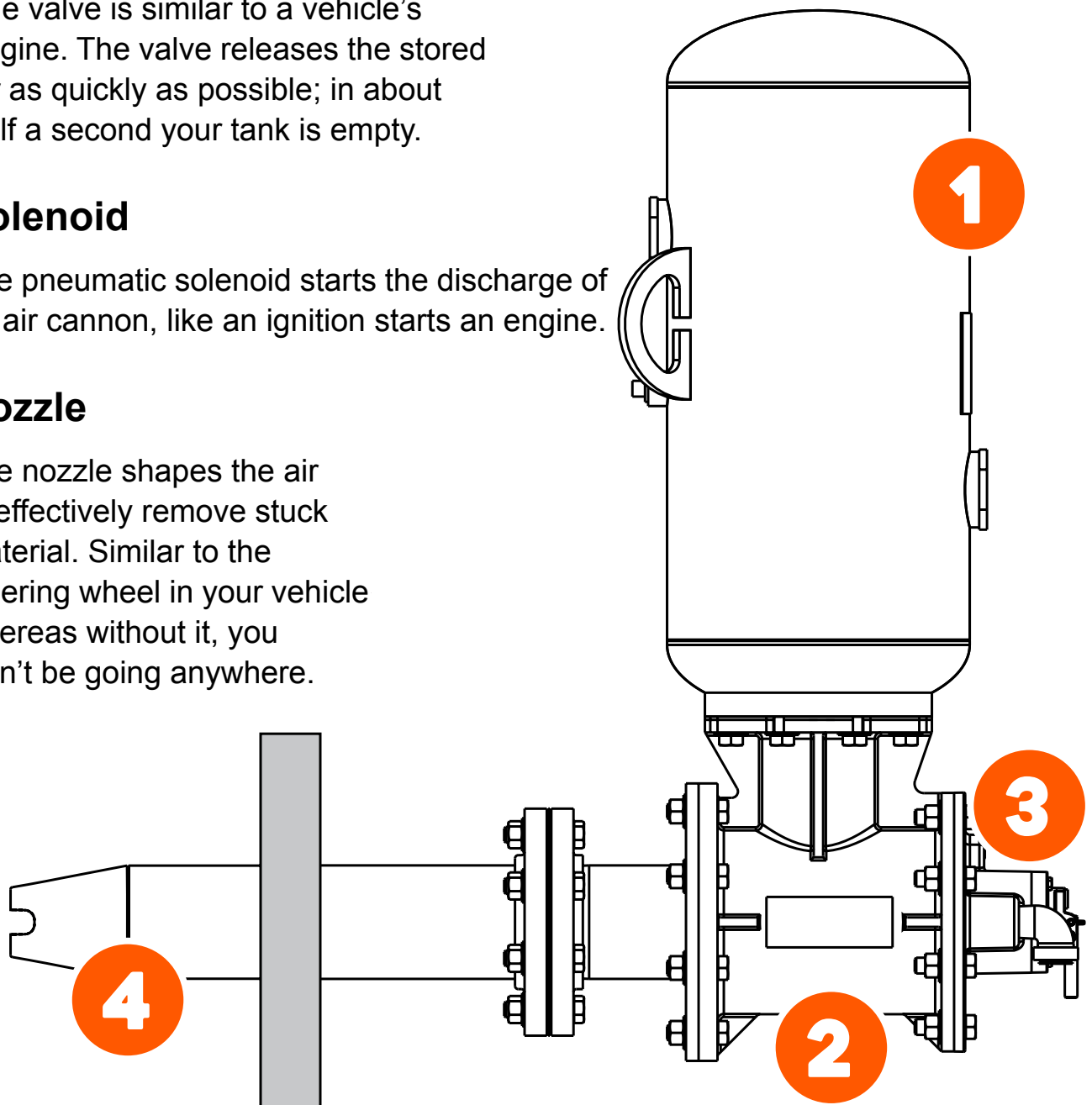
The pneumatic solenoid starts the discharge of an air cannon, like an ignition starts an engine.

4. Nozzle

The nozzle shapes the air to effectively remove stuck material. Similar to the steering wheel in your vehicle whereas without it, you won't be going anywhere.

1. Tank

A storage vessel for air similar to a gas tank in a vehicle. The bigger the tank, the longer the blast.



WHY AIR CANNONS?



Alternative to applying vibration for large structures or hard-to-reach areas prone to material bridging



Enhance flow when material conditions change, such as moisture or size



Can be used in parallel with other transfer point techniques such as rock boxes



Nozzle and pipe **options** for various attachment methods/ convenience



Adjustable air pressure and firing frequency allow for optimal flow of material while minimizing air consumption and dust production



Cannon controls can be **configured** to fire only when the conveyor is energized or if a flow sensor down stream is activated



WHY ARE CANNONS BETTER?

MAN VS CANNON

	MANUAL CLEANING	AIR CANNONS
SAFE?	NO! Workers interacting with material stuck in confined spaces is never a good idea.	YES. Air cannons eliminate worker contact with material & equipment.
EFFICIENT?	NO. There's only so much time in a day & labor is better applied elsewhere.	YES. Air cannons free up labor & can be automated to fire when needed.
EFFECTIVE?	NO. Manual cleaning is an attempt at a temporary fix to a persistent problem.	YES. Air cannons constantly maintain proper material flow.

WHAT DO I NEED TO CONSIDER?



Is there **hammer rash** on the structure or **air lances** leaning on the structure?



Is **chute work** **structurally sound** to support the air cannon and the blast from the cannon?



Do you have access to a **power source**, such as 24v DC / 110v A / 220v, and **compressed air**?



Are **blockages** continuous or condition-based?



MAINTENANCE IS SIMPLE

Some basic preventive maintenance will ensure you get the most mileage out of your cannon.

Air Cannons, when properly installed and maintained, will provide many years of reliable, effective service.



- Test fire the cannon/solenoid if only used seasonally
- Confirm air gauge is working
- Annually empty the tank of any water that is accumulated via the compressed air lines

WHERE CAN AIR CANNONS BE USED?

Our air cannons have been used in a wide range of applications.

- Conveyor transfer points
- Silos
- Hoppers
- Truck dumps
- Vacuum disc filters
- Stockpiles
- Coal turbine feeders
- Paper cutters
- Dust collectors
- Baghouse fly ash hoppers • *and much more!*



WHY MARTIN?



Martin Engineering is the **pioneer and industry leader** in air cannon technology.

Highest quality parts and manufacturing—
built in the USA

Our 5th-generation technology is the result of nearly 50 years of application experience and world-class product





**CONSEQUENCES OF POOR
MATERIAL FLOW**

CHOKED PRODUCTION

REDUCED OUTPUT

STRANGLING EFFICIENCY

MISSING MATERIAL

INCREASED MAINTENANCE

MISSED OPPORTUNITIES

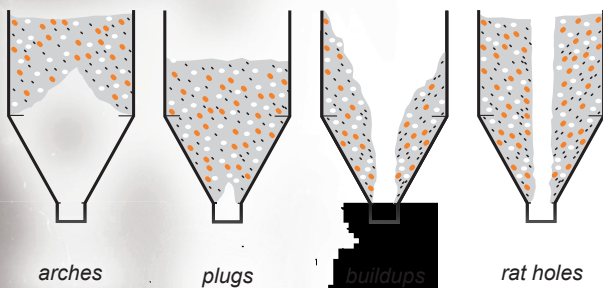
LOST PROFITS



SOLVING PROBLEMS IN MATERIAL FLOW



Hammering on the bin or chute wall leads to damage to the wall surface, often called "hammer rash."



Problems in material flow can bring an operation's efficiency and productivity to a halt. Hang-ups in storage systems and accumulations in process vessels choke material flow while bottlenecks create costly reductions in equipment and process performance. Poor material flow raises maintenance expenses and drags profits down.

Martin® Air Cannons supply a quiet but powerful release of compressed air that dislodges buildups and enhances the flow of bulk materials, to improve efficiency and maintain profitability.

Since 1974, Martin® Air Cannons have been used around the world to prevent buildups and improve material flow. Martin Engineering remains the leader in the application of air cannon technology to overcome bottlenecks and boost the movement of material through high-capacity vessels.

Problem Solved™
GUARANTEED!

UNDERSTANDING VALVE DESIGN

Martin Engineering offers a full line of air cannon technologies; representing both established traditional designs and the latest leading-edge innovations in valve design, as well as hybrid and multiple-valve technologies.

This matrix provides an overview of the range of valve designs and air cannons available from Martin Engineering.



POSITIVE-PRESSURE FIRING

Requires pulse of air to trigger discharge, eliminating unintentional firings due to drops in pressure.

CENTRAL VALVE DESIGN

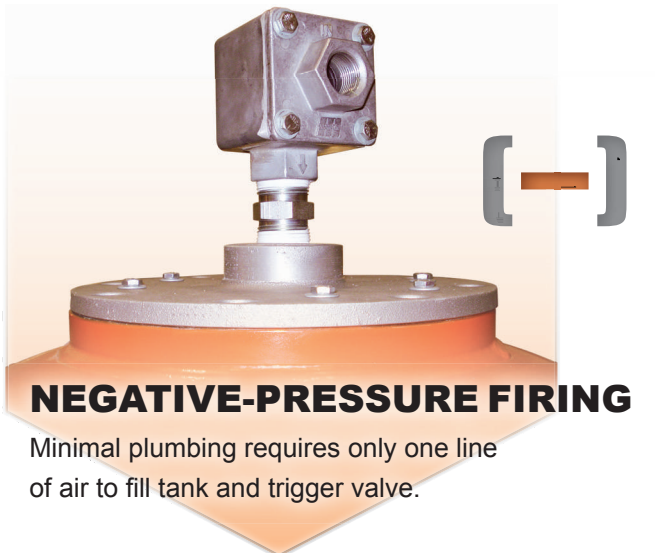
Compact, powerful, and efficient, the complete valve assembly is centrally housed within the tank.

MARTIN® HURRICANE

Most direct air path, maximum force output, minimal air consumption, smallest footprint, simplest installation, and one-step maintenance.

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NEGATIVE-PRESSURE FIRING

Minimal plumbing requires only one line of air to fill tank and trigger valve.

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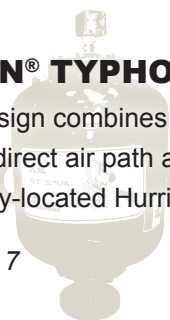
Additional 4-in. Nozzles . . page 24

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MARTIN® TYPHOON

Hybrid design combines minimal plumbing with the most direct air path and maximum force output of centrally-located Hurricane valve technology.

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MARTIN® HURRICANE

MARTIN® HURRICANE AIR CANNON

Positive-acting, centrally-located valve design represents state-of-the-art engineering, with most direct air path, maximum force output, minimal air consumption, smallest footprint, and simplest installation.

- **Positive Action, High Output:** Maximum discharge strength from high velocity output with half the air volume, for highly effective discharge and reduced operating costs.
- **Improved Safety:** Discharge requires positive signal from solenoid, eliminating the risk of accidental firing.
- **Allows Longer Air Lines:** Positive-acting valve allows control solenoid to be positioned as far as 200 feet (60 m) from the tank, keeping solenoids away from harsh conditions and difficult service.



ONE-STEP MAINTENANCE

The design of the Martin® Hurricane Air Cannon allows for simple maintenance. The complete valve assembly can be removed in one easy step, working from one side of the tank.

It can be replaced within minutes to keep your process running. There is no need to ever remove the tank from the vessel for service.





MARTIN® TYPHOON

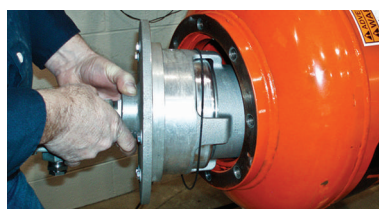
TECHNOLOGICAL HYBRID

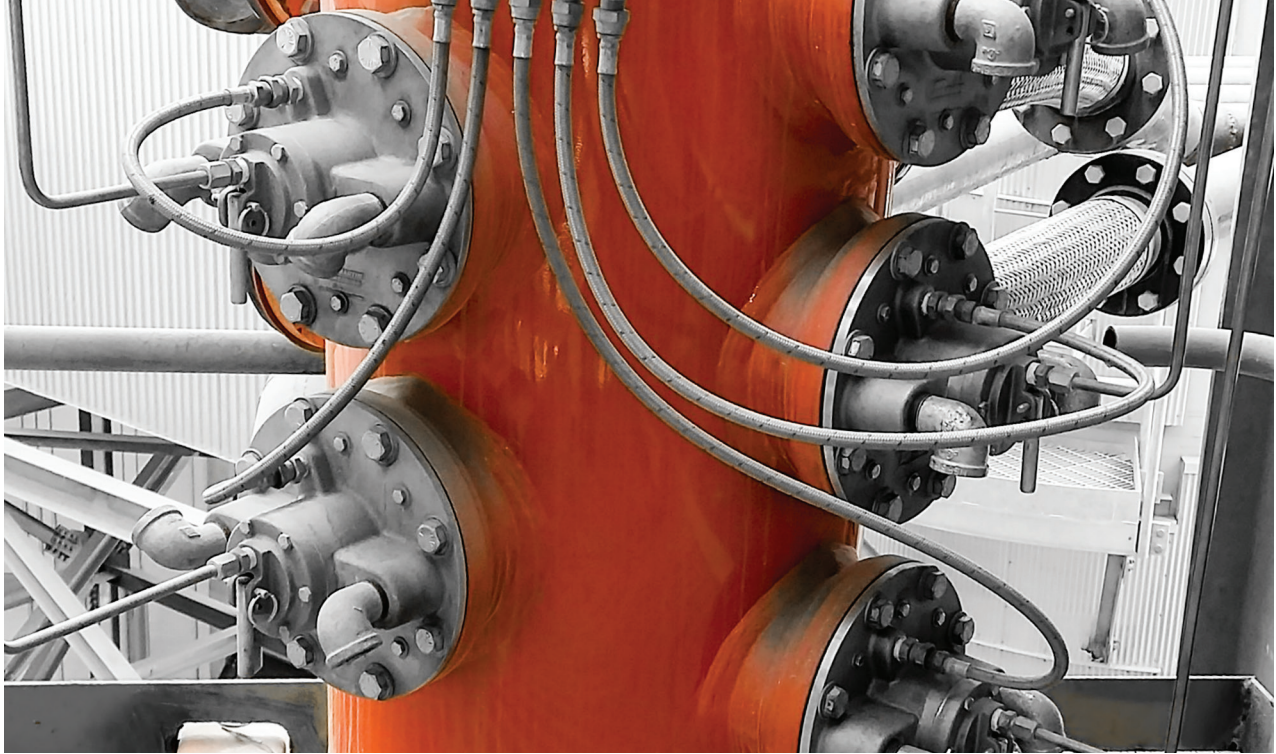
The hybrid design of the Martin® Typhoon Air Cannon offers an improvement on negative-pressure firing systems by combining the simple one-line plumbing of traditional valve design with the power, efficiency, and ease of maintenance of advanced internal valve design.

MARTIN® TYPHOON AIR CANNON

Hybrid design combines minimal one-line plumbing with compact, powerful, and efficient centrally-located valve.

- **Minimal Plumbing:** Requires only one air line to fill tank and trigger valve.
- **Outstanding Performance, Modest Price:** Negative-pressure firing and the most direct air path provides effective performance in challenging applications with limited budgets.
- **One-Step Maintenance:** The complete valve assembly can be removed in one easy step, working from one side of the tank, and replaced within minutes to keep your process running. There is no need to ever remove the tank from the vessel for service.



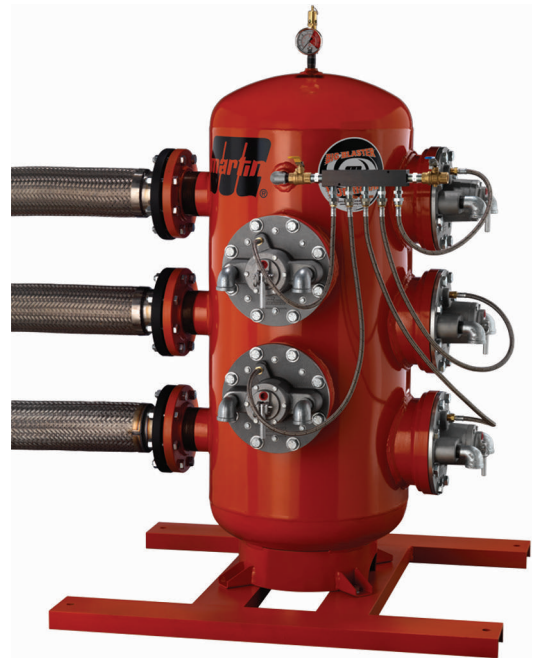


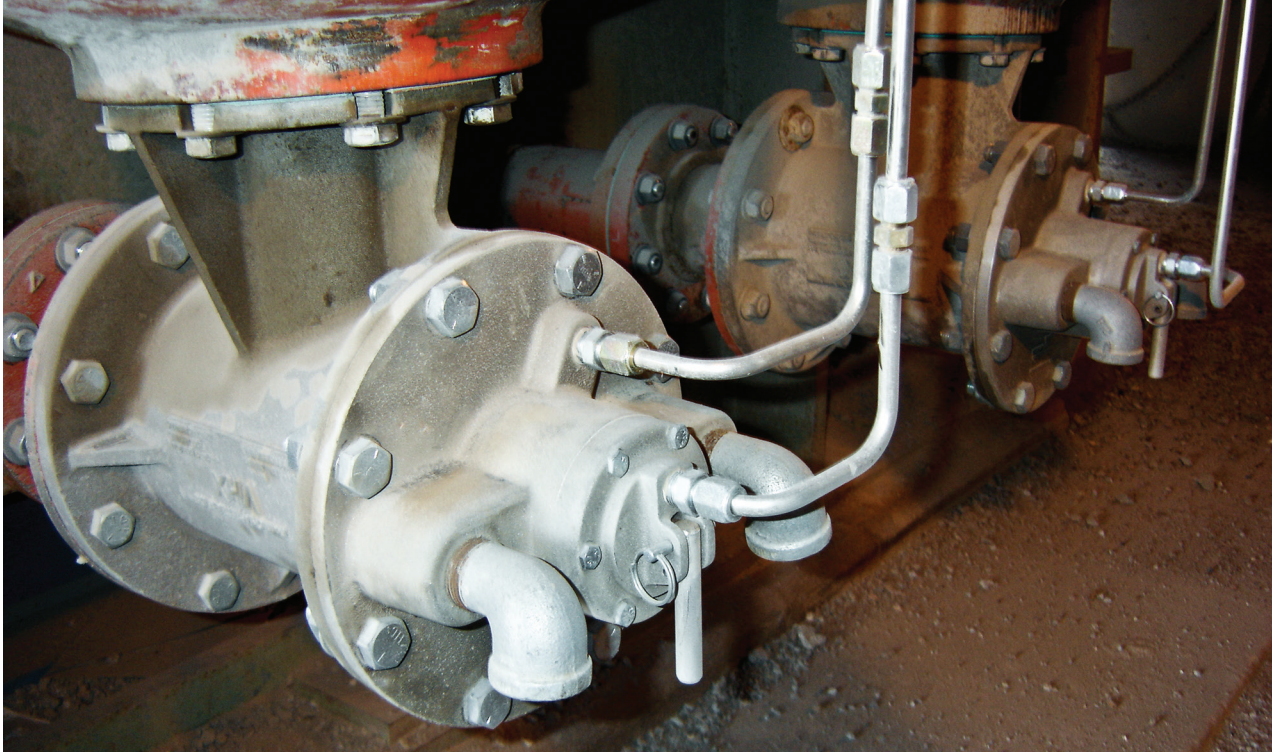
MARTIN® MULTI VALVE AIR CANNON

EFFICIENCY MULTIPLIED

The latest innovation in air cannon systems, the Martin® Multi Valve Air Cannon incorporates Martin's advanced Hurricane Valve design with multiple-port application technology. The multiple-port system incorporates one air reservoir to provide the air to improve flow at a number of points in a process vessel.

- **Service for Five:** One installation supplies up to 5 individual discharge points through flexible stainless steel hose.
- **Shelters the Moving Parts:** Centralized location removes working components from exposure to high temperatures and process dust.
- **Improved Service and Access:** All the accessibility benefits of a multiple port system for convenient installation and service.
- **Improved Reliability:** Even if one valve requires service, the multiple valve air cannon continues to function with low maintenance requirements.





MARTIN® TORNADO

POSITIVELY SAFER

The Martin® Tornado's positive-pressure firing valve requires a pulse of air delivered through a second line to trigger its discharge. This prevents unintentional firings due to drops in pressure as seen with negative-pressure firing valves. Eliminating accidental firings creates a safer work environment.

MARTIN® TORNADO AIR CANNON

Positive action takes a big step up the evolutionary ladder for air cannon design to provide greater force, faster cycles, and improved safety.

- **Amplify Your Output:** Positive-acting valve amplifies discharge force for up to 20% more power from the same size XHV Air Cannon.
- **A Safer System:** Positive action means air cannon will not fire when source pressure is removed.
- **Easier Installation and Maintenance:** Positive action allows solenoid valves to be up to 200 feet (60 m) from air cannon.



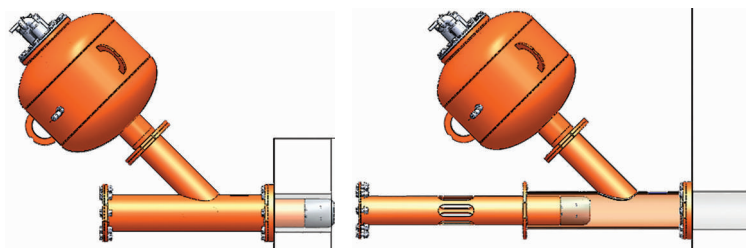


MARTIN® SMART™ SERIES JET NOZZLE

QUICK AND EASY REPLACEMENT

The Martin® SMART™ Series Jet Nozzle offers a simple yet innovative solution to the age-old problem of labor-intensive nozzle replacement. Eliminate the time and cost of cutting holes and breaking refractory to replace worn out nozzles.

- Replacement is quick and easy
- Limits or entirely eliminates damage to surrounding refractory
- No need to remove the air cannon tank
- Eliminates improper alignment
- No entry required into the tower or cooler
- Provides the wide area of influence of a standard fan nozzle
- Available in straight or "Y" pipe arrangement



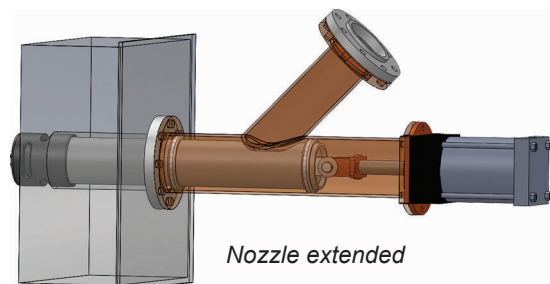
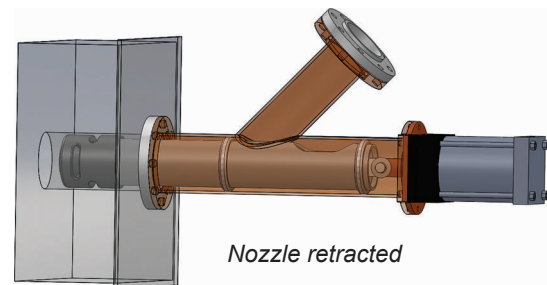


MARTIN® SMART SERIES RETRACTABLE NOZZLE 360°

360-DEGREE CLEANING

The Martin® SMART™ Series Retractable Nozzle 360° is used for hard to reach locations in cement towers and other high-temp applications. The 360-degree nozzle makes cleaning on the center of the wall possible. Serviceable from the outside of the tower/vessel, so no waiting until the next scheduled outage for nozzle assembly replacement.

- 360-degree effective cleaning area
- Nozzle extends to fire then retracts to protect exposed tip from extreme heat
- Works with standard air cannons (150L Martin® Hurricane is recommended)
- Nozzle weldment is serviceable from the outside of the riser duct
- Controlled by one solenoid (110 volt / 220 volt / 24 volt)
- Less aggressive than blasting, eliminating damage to refractory from improper use of compressed CO₂



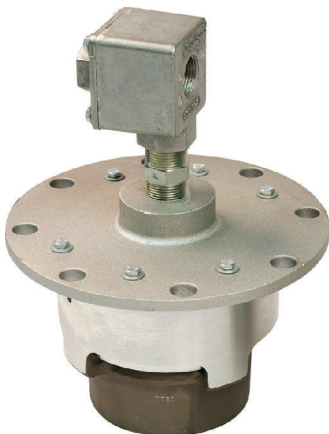
VALVES



MARTIN® HURRICANE RETROFIT VALVE

Martin® Hurricane Air Cannon improves the flow of bulk materials and prevent outages due to discharge blockages, buildups and ratholes. The Hurricane features a new valve concept that provides more force, uses less air and simplifies installation and maintenance.

- **Twice the force for half the air consumption** when compared to our standard XHV 20-30 Air Cannon.
- **Simple one-step maintenance program** with all moving parts contained within a single assembly.
- **Increased safety** with a positive firing system; ensures the cannon fires only when you want it to.



MARTIN® TYPHOON RETROFIT VALVE

The Martin® Typhoon Air Cannon features a hybrid valve concept that provides more force, uses less air and simplifies maintenance in challenging applications with limited budgets.

- **60% more blast force and half the air consumption** when compared to our standard XHV 20-30 Air Cannon.
- **Single air line system.**
- **Simple one-step maintenance program** with all moving parts contained within a single assembly.

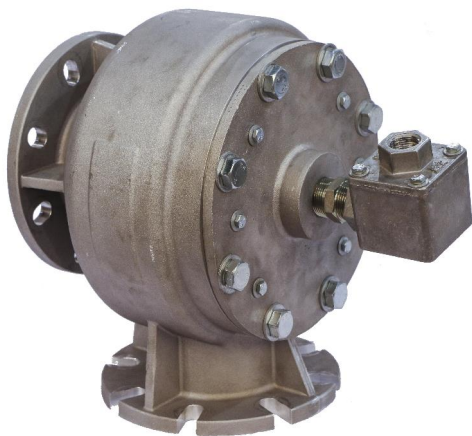


Martin® PassPort Retrofit Valve

To upgrade performance and reduce maintenance, the **Martin® PassPort Retrofit Valve** can be retrofit onto air cannon systems from any manufacturer. A simple, 8-bolt attachment allows the valve assembly to be installed on existing Martin Engineering air cannons.

BENEFITS

- **Leading-Edge Valve Technology**
- **Increase Performance**
- **Ease of Maintenance**
- **Keep Existing Tank**
- **Upgrades All Air Cannon Models**

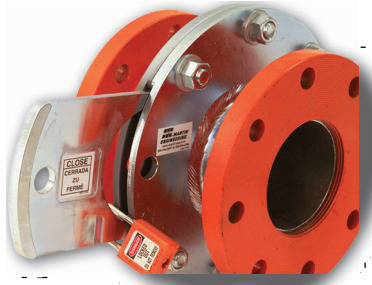


Negative Pressure Firing



Positive Pressure Firing

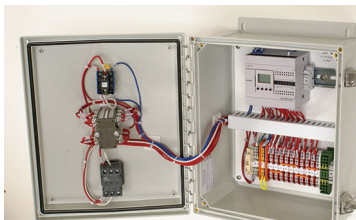
ACCESSORIES



MARTIN® THERMO SAFETY SHIELD

Slide gate safety valve allows timely maintenance on air cannons in high temperature processes without requiring the tank to be dismantled.

- **Improve Employee Safety:** Shelters workers from exposure to severe heat, gases, and high temperature material.
- **Simple to Install:** Sliding shield bolts between air cannon valve and mounting flange.
- **Secure, yet Simple to Operate:** Sliding shield operates under tough conditions, yet can be locked out to prevent intrusion.



MARTIN® AIR CANNON CONTROLLER

Energizes the solenoid valves to control the discharge for a system of up to ten Martin® Air Cannons.

- **Precision Flow Management:** Provides automatic sequencing of the discharge of up to ten cannons.
- **Easy to Program:** Integral keypad and LCD make it simple to set or adjust firing schedule.
- **Indoor or Outdoor Installation:** NEMA-4X Enclosure is water-tight/dust-tight/corrosion-resistant.



MARTIN® ROLL GEN™ SYSTEM

Self-contained, mini 24-Volt DC power station that generates enough power to run a wide variety of electronic systems. Can be used to power a PLC or timer to operate air cannons mounted inside of a transfer chute.

Martin® Roll Gen™ System consists of:

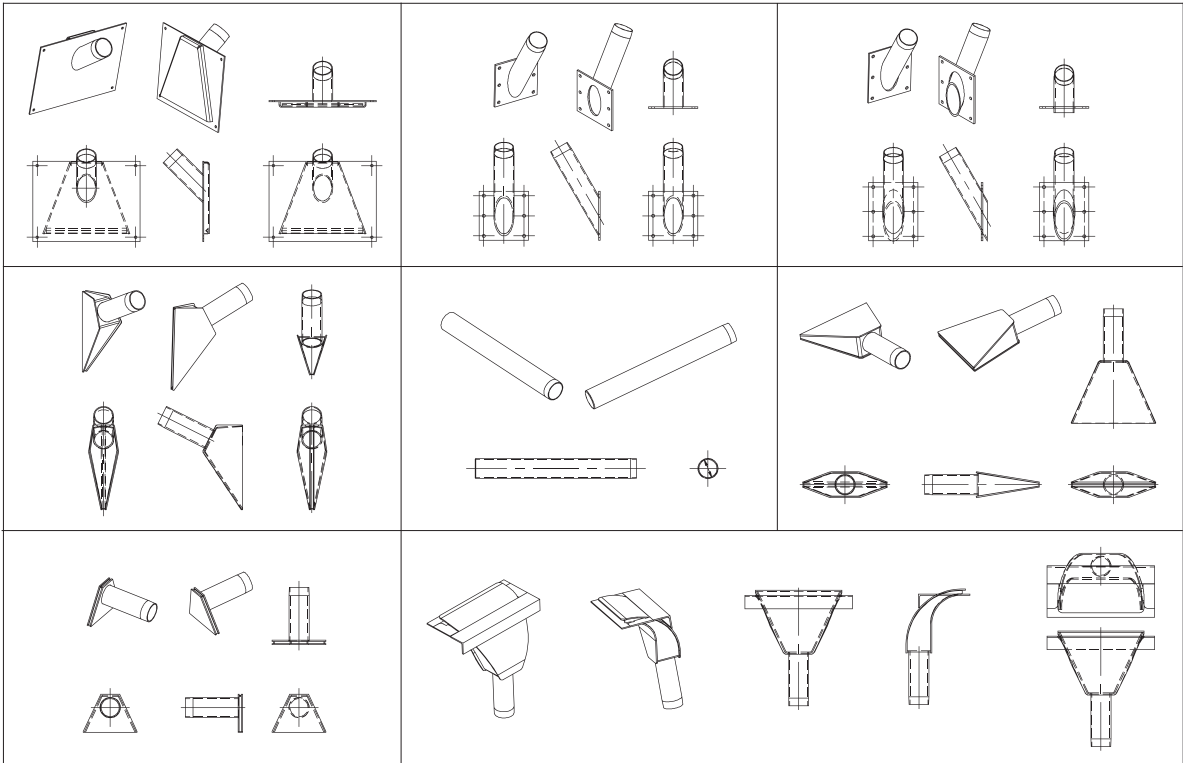
- **Martin® Roll Generator**
coupled with either:
- **Martin® Roll Gen™ Power Supply**
- **Martin® Roll Gen™ Continuous Power Supply**



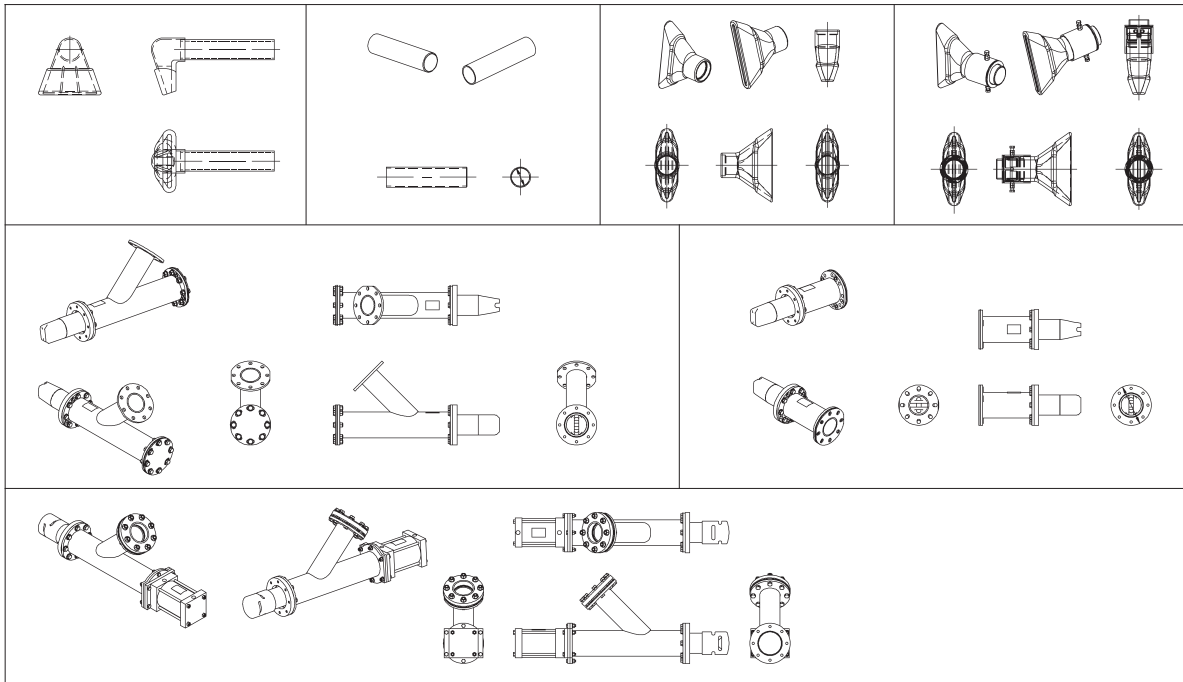


4-INCH NOZZLES

AMBIENT-TEMPERATURE NOZZLES



HIGH-TEMPERATURE NOZZLES



Martin provides a wide range of nozzles to suit your specific applications.

AIR CANNONS

MARTIN® HURRICANE

35L Assembly P/N	38005-35
70L Assembly P/N	38005-70
150L Assembly P/N	38005-150
Technical Data Sheet P/N	L3800

MARTIN® TYPHOON

35L Assembly P/N	38005-35FD
70L Assembly P/N	38005-70FD
150L Assembly P/N	38005-150FD
Technical Data Sheet P/N	L3809

MARTIN® MULTI VALVE AIR CANNON

Hurricane Assembly P/N	38625
Technical Data Sheet P/N	L3821

MARTIN® TORNADO

2-inch Valve	
8x12-in. Tank Assembly P/N	37864-0812
8x20-in. Tank Assembly P/N	37864-0820
Technical Data Sheet P/N	L3723

REPLACEMENT VALVES

MARTIN® HURRICANE VALVE

Valve Assembly P/N	38071
Operator Manual P/N	M3737

MARTIN® TYPHOON VALVE

Valve Assembly P/N	38071-FD
Operator Manual P/N	M3813

MARTIN® PASSPORT RETROFIT VALVE

Negative Pressure Firing P/N	A20001
Positive Pressure Firing P/N	A20002
Operator Manual P/N	M4122

SMART™ SERIES NOZZLES

MARTIN® SMART™ SERIES JET NOZZLE

Straight Nozzle Assembly P/N	39185S
Replacement Straight Nozzle P/N	39184S-NW
Y-Pipe Nozzle Assembly P/N	39185Y
Replacement Y-Pipe Nozzle P/N	39184Y-NW
Technical Data Sheet P/N	L3986

MARTIN® SMART SERIES RETRACTABLE NOZZLE 360°

Nozzle Assembly P/N	38984
Replacement Nozzle P/N	38983-NW
Technical Data Sheet P/N	L3935

ACCESSORIES

MARTIN® AIR CANNON CONTROLLER

Single Circuit	
Assembly P/N	38902
w/20 Amp output relay	38902-20
Technical Data Sheet P/N	L3880
Multiple Circuit	
Assembly P/N	38901
Technical Data Sheet P/N	L3873

MARTIN® THERMO SAFETY SHIELD

4-in. Threaded Assembly P/N	38189-4
4-in. Plain Assembly P/N	38189-4PE
Technical Data Sheet P/N	L3622

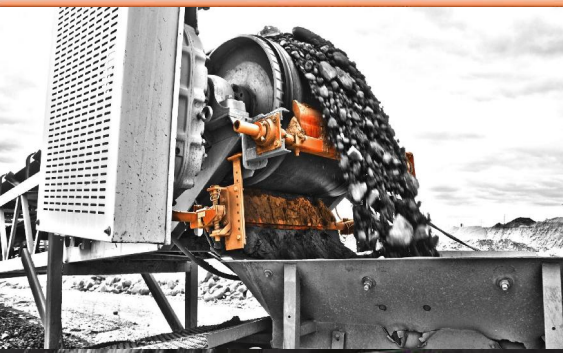
MARTIN® ROLL GEN™ SYSTEM

Roll Generator	RG1-010-XXPX
Roll Gen™ Power Supply	39413
Roll Gen™ Continuous Power Supply	contact for specs

Martin® SOLUTIONS

Martin specializes in conveyor components, flow aid devices, and providing advanced solutions to help your operation run cleaner, safer, and more productive.

Delivering tough, tested, and innovative material handling solutions, backed by genuine and dependable industry experience since 1944.



Available in a wide variety of sizes, duties, and high-performance urethanes, **Martin® Belt Cleaning Systems** minimize carryback, reduce emergency outages and maintenance expenses, and maximize equipment life, resulting in cleaner, safer, and more productive conveyor systems. Our patented CARP (Constant Angle/Area Radial Pressure) blades maintain consistent cleaning through all stages of blade wear, cleaning better, lasting longer, and costing less.

Primary Cleaners | Secondary Cleaners | Specialty Cleaners |
Replacement Blades | Tensioners | Accessories

Proper design of **Transfer Point Solutions** improve material handling by preventing spillage and airborne dust, reducing equipment damage and cleanup, controlling maintenance expenses, and improving plant safety and productivity.

Belt Support | Sealing Systems | Belt Tracking | Tail Pulley Protection |
Chute Structure | Dust Management

Martin® Air Cannons provide a quiet yet powerful release of compressed air to dislodge buildups and enhance material flow, improving efficiency and maintaining profitability. Our **SMART™ Series Nozzles** allow for easy nozzle replacement without the need to remove air cannons and damage refractory in high-temperature applications. With a variety of cannons and accessories, Martin has models specifically suited to benefit your application.

Cannons | Nozzles | Accessories

Problem Solved™ *GUARANTEED!*



Using the power of applied vibration, **Martin® Vibration Technologies** energize material, reducing friction against container walls as well as internal particle-to-particle cohesion. Material moves more freely, feeds more effectively, sorts more consistently, compacts more efficiently, and handles more easily. Our line of **Truck Vibrators** eliminates the need for manual bed cleanout, increasing safety and efficiency.

Electric | Hydraulic | Pneumatic | Piston | Turbine | Screen | Roller | Ball | Mobile | Railcar



Unloading railcars is slow, labor-intensive, messy, noisy, and unsafe. **Martin® Railcar Unloading Systems** improve safety and proficiency by eliminating the need for workers to go underneath the car for connection, powering open stubborn car-bottom gates, and enhancing material flow.

Connector | Opener | Vibration



Dust presents many risks: potential health problems, manual cleanup, dirty environments, low morale, regulatory fines, explosions, material loss, equipment damage, neighborhood relations, and decreased productivity. **Martin® Dust Management Solutions** look at the big picture when it comes to evaluating your needs and customizing a unique solution for you, we also monitor your systems for continuous improvements.

Prevention | Containment | Suppression | Filtration



MartinPLUS® Services handle any material handling challenge you have. Our veteran field service technicians provide the expertise and knowledge to take your operation to the next level. MartinPLUS® Services keep your systems running, material flowing, and costs controlled, saving you money on parts, labor, and unexpected downtime. MartinPLUS® **Silo Solutions** eliminate the need for confined space entry and allow hung-up material to be recaptured and used. Our highly-trained crews have the knowledge and experience to improve your plant's storage efficiency.

Installation | Maintenance | Process Improvement | Silo Cleaning | Dust Monitoring | Laser Surveying | Walk the Belt™ | Mr. Blade Program



Foundations™ Training and Education encompasses industry training programs as well as our authoritative reference books that help plant personnel run clean, safe, and productive conveyors. **Foundations™ Workshops** are offered at four levels (Basic | Operations & Maintenance | Advanced Engineering & Design | **NEW!** Advanced Conveyor Safety) to suit varied ranges of responsibility and knowledge. The Foundations™ books focus on how and why to improve conveyor productivity and safety and the return on safety investments.

Foundations™ Training | Foundations™ Books | Foundations™ for Conveyor Safety Book



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