CONSEQUENCES OF POOR MATERIAL FLOW

CHOKED PRODUCTION
REDUCED OUTPUT
STRANGLLED EFFICIENCY
MISSING MATERIAL
INCREASED MAINTENANCE
MISSED OPPORTUNITIES
LOST PROFITS
SOLVING PROBLEMS IN MATERIAL FLOW

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™
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.

**CENTRAL VALVE DESIGN**
Compact, powerful, and efficient, the complete valve assembly is centrally housed within the tank.

**EXTERNAL VALVE DESIGN**
Proven traditional valve design delivers reliable performance.

**POSITIVE-PRESSURE FIRING**
Requires pulse of air to trigger discharge, eliminating unintentional firings due to drops in pressure.

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

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**MARTIN® TORNADO**
Provides greater force, faster cycles, and improved safety.

See page 8
NEGATIVE-PRESSURE FIRING
Minimal plumbing requires only one line of air to fill tank and trigger valve.

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® 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.
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® QUICK CHANGE NOZZLE

QUICK AND EASY REPLACEMENT

The Martin® Quick Change Air Cannon 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® RETRACTABLE NOZZLE

360-DEGREE CLEANING

The Martin® Retractable Nozzle 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)
- 360 degree nozzle weldment is serviceable from the outside of the riser duct
- Controlled by one solenoid (110 volt / 220 volt / 24 volt)
- Used in place of cardox blasting
- 360-degree nozzle is less aggressive than cardox blasting, so it will not damage refractory
VALVES

MARTIN® TORNADO RETROFIT VALVE
Upgrade performance of existing air cannons to positive-firing systems

- **Simple to Install:** Eight-bolt retrofit kit converts XHV Valve to more responsive, more efficient, and safer positive-acting system.

- **Amplify Your Output:** Positive-acting valve amplifies discharge force for up to 20% more power from the same size air cannon.

- **A Safer System:** Positive action means air cannon will not fire when source pressure is removed, making system safer.

- **Upgrade:** Available to fit 2-, 4-, and 6-inch discharge air cannons from ANY manufacturer.

MARTIN® XHV RETROFIT VALVE
Enhance existing air cannons with high-performance XHV valves

- **Easy Installation:** Simple 8-bolt retrofit kit provides effective method to improve air cannon performance.

- **Upgrades Your System:** Upgrades existing systems for improved output and reduced service with proven XHV technology. Available to fit 2-, 4-, and 6-inch discharge air cannons from ANY manufacturer.

MARTIN® TORNADO EXHAUST UPGRADE
Upgrade performance of XHV Valves to positive-firing systems

- **Simple to Install:** Eight-bolt retrofit kit converts XHV Valve to more responsive, more efficient, and safer positive acting system.
ACCESSORIES

MARTIN® AIR CANNON CONTROLLER

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

- **Precision Flow Management:** Provides automatic sequencing of the discharge of up to six air 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® THERMO SAFETY SHIELD

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

- **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 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

## RETROFIT VALVES

### MARTIN® TORNADO RETROFIT VALVE
- 2-inch Valve Assembly P/N 37862
- 4-inch Valve Assembly P/N 37797
- Operator Manual P/N M3405-T

### MARTIN® XHV RETROFIT VALVE
- 4-inch Valve Assembly P/N 35062
- Operator Manual P/N M3405

### MARTIN® TORNADO EXHAUST UPGRADE
- 2-inch Valve Kit P/N 37849
- 4-inch Valve Kit P/N 37733
- Technical Data Sheet P/N L3808

## NOZZLES

### MARTIN® QUICK CHANGE 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® RETRACTABLE NOZZLE
- 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
- 6-in. Threaded Assembly P/N 38189-6
- 4-in. Plain Assembly P/N 38189-4PE
- 6-in. Plain Assembly P/N 38189-6PE
- Technical Data Sheet P/N L3622