

Dust Collection **Solutions**



Energy Savings	<ul style="list-style-type: none"> Plants replacing a lot of diaphragms or failures go undetected for a period of time. Extending time between pulses dramatically lowers energy costs.
Access	<ul style="list-style-type: none"> Your customer may or may not go through a lot of kits, but the access is very bad and the overall cost to change is high.
Downtime	<ul style="list-style-type: none"> When the dust collector fails or goes down, your customer has to shut down the process until it is repaired.
Product	<ul style="list-style-type: none"> Dust collector collects product and downtime causes loss of production, or product contamination, or both.
Maintenance Costs	<ul style="list-style-type: none"> In many plants diaphragm pulse valves and their solenoids are a daily maintenance issue distracting staff from other tasks. When valves fail resources are redirected to find the leaks in order for the compressors to keep up with demand.
Filter Bag or Cartridge Life	<ul style="list-style-type: none"> Better cleaning could result in longer filter life and lower overall costs.
Ease of Use	<ul style="list-style-type: none"> Only the Mac solenoid pilot offers a manual override to test the pulse valve. There is no method on current diaphragm valves or pilot solenoids to test an individual valve.



MAC® PULSE VALVES

High Performance. Long Life.

The MAC Pulse Valve series was developed to replace current diaphragm style technology and create a more robust and reliable valve solution in industrial applications. MAC Pulse Valves are ideal to replace existing diaphragm technology in applications such as reverse jet bag houses and dust collectors, pneumatic conveying and bulk material handling.

The MAC Pulse Valve utilises the MAC 46 Lifting series' balanced pilot technology to ensure fast, repeatable pulses. It also utilises bonded spool technology in the main valve for superior reliability beyond existing diaphragm technology. A checked accumulator and a main spool with memory spring are used to ensure a shift back to the home position, for times when air supply may not be adequate. A line of adapter plates has also been released to replace existing diaphragm pulse valves with a direct drop-in, without disturbing existing plumbing.

It is currently available in two sizes; the PV03, for ¾" and 1" applications and the PV06, for 1 ½" applications.

THE CURRENT ENVIRONMENT

The problem with diaphragm valves.

High Energy Consumption

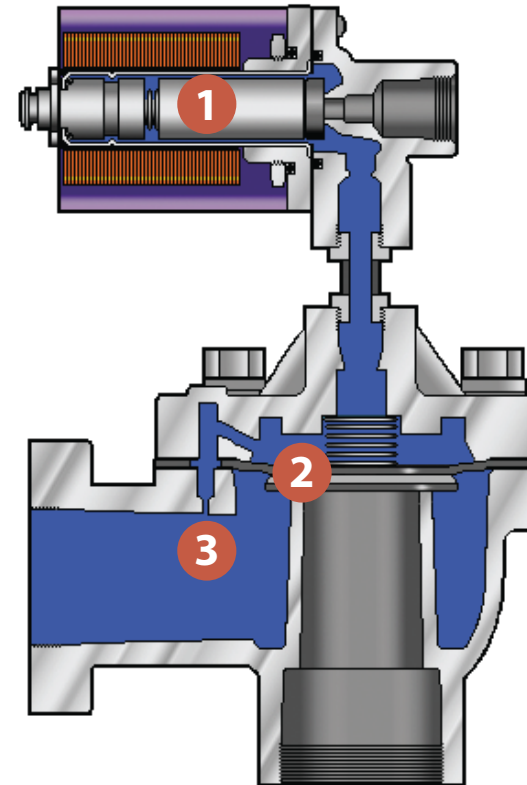
Dust collector systems are one of the largest consumers of air and energy in a factory environment. Energy savings for replacing diaphragm valves with a spool valve can be 20 - 30%.

Low Cycle Rate

Diaphragm valves are rated at 1 million cycles, resulting in more frequent downtimes and higher labour costs compared to the 10 million cycle rate of a MAC® spool-type valve.

High Cost of Ownership

Many leaks in diaphragm valves occur after only a short time and are not easily detected. These leaks are caused by tears on the diaphragm. As a result, air compressors work much harder to supply the same air pressure, causing higher electricity usage. When diaphragm valves tear, they can cause negative performance in other air valves on the manifold.



- 1 Contaminated Air** Passes Through Unbalanced Solenoid
- 2 Diaphragm Ruptures** (Air Leaks)
- 3 Small Fixed Orifice** (Blocked By Contaminants)
- 4 No Manual Override**

Image of dust collection system filters using competitor diaphragm pulse valves >>>>>>



BEFORE

THE MAC® PULSE VALVE ADVANTAGE

The benefits of spool type valves.

The MAC® Pulse Valve series is designed to be a direct drop-in replacement for existing pulse technology. The MAC® solution utilises a long life, bonded-spool design, instead of the traditional diaphragm style. MAC® also uses a balanced pilot valve that isolates the solenoid from airline contamination. Available with integral solenoid pilot as well as bleed pilot configurations.

Maintenance

Lower cost of ownership through reduction in downtime due to high reliability. When necessary, maintenance is simplified with available spool kits.

Return on Investment

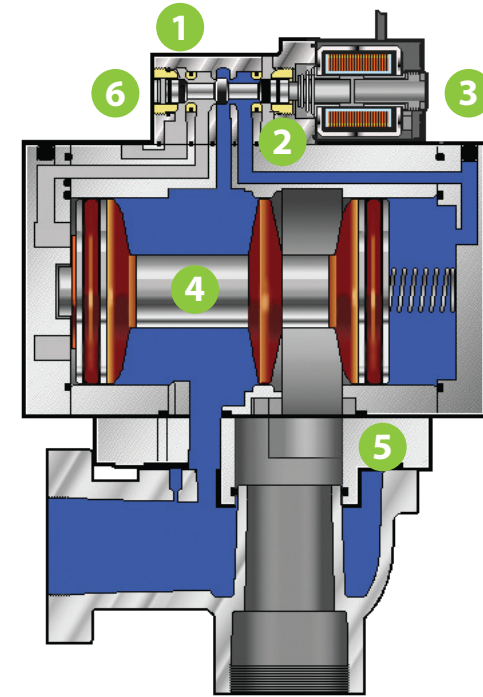
MAC® spool valves do not leak or experience blowouts. ROI is very short due to significant energy savings, greatly reduced replacement costs, reduction in downtime and labour savings.

Harsh Environment Compatible

An aluminium die-cast body, nitrile seals and an environmentally protected solenoid are standard features. Viton® seals are also available for extreme temperature environments and chemical resistance.

Direct Drop-in

The MAC® Pulse Valve is available with various adapter options. These adapter options allow the MAC® valve to directly replace the diaphragm technology with their bonded-spool technology without disturbing plumbing. The MAC® bleed configuration works with existing remotely located solenoids.



- 1 4-Way Pilot** (Maximised Shifting Forces)
- 2 D-Seal Technology Isolates Solenoid** (Longer Life)
- 3 Lifting Solenoid** (Consistent Response)
- 4 Dynamic Bonded Rubber Spool** (Balanced, Wiping Action.)
- 5 Adapter Plate** (Drop-in Replacement to Existing Base)
- 6 Manual Override**

The valve for the far left filter was replaced with a MAC® Pulse Valve. This image shows the results after just 2 cycles. >>>>>>



AFTER



Competitor diaphragm valve installation

CASE STUDY

: Bakery

PROBLEM

A production bakery facility was changing filters in their dust collection system every 2 to 3 weeks due to accumulation of product.

ANALYSIS

The customer's dust collection system was utilising diaphragm valves to clean their filters. These valves were grossly under-performing.

SOLUTION

The diaphragm valve under-performing the most was removed and replaced with MAC[®] Pulse Valve. After manually cycling the MAC[®] spool valve twice, the filter was rechecked and appeared to be brand new.

BENEFIT

Customer will realise cost reductions from a decrease in time spent changing filters and total number of filters used in a fiscal year.

CASE STUDY

: Concrete Production

PROBLEM

A concrete production facility could not run all of their equipment simultaneously because their dust collection system was unable to handle the amount of dust produced. This caused added time in prepping material for shipment, resulting in shipping delays and increased employee overtime.

ANALYSIS

The current diaphragm valves utilised by the customer in their dust collection system were leaving excessive amounts of dust and material on the systems filters.

SOLUTION

The diaphragm valves were removed and replaced with MAC® Pulse Valves.

BENEFIT

The customer is now able to run all equipment simultaneously, resulting in reduced employee overtime and the ability to meet customer deadlines. Clean-up time has been greatly reduced. Old material has been purged from the system, allowing the system to operate at a higher efficiency.



MAC PV06 spool valve installation

Available in 2 direct *DROP-IN* options

MAC® Pulse Valve PV03 Series

for ¾" and 1" applications



FLOW
24 Cv

SPOOL KITS
Viton® K-PV001-05

BASE ADAPTERS*

- M-PV001-01 - ASCO® / Flexclean® ¾" Adapter
- M-PV001-01 - ASCO / Flexclean ¾" Adapter
- M-PV002-01 - Goyen ¾" Adapter
- M-PV003-01 - ASCO 1" Adapter
- M-PV004-01 - Turbo 1" Adapter
- M-PV005-01 - Goyen 1" Adapter
- M-PV009-01 - ASCO ¾" External Adapter

**Additional configurations available upon request*

MAC® Pulse Valve PV06 Series

for 1½" applications



FLOW
53.2 Cv

SPOOL KITS
Viton® K-PV002-05

BASE ADAPTERS*

- M-PV006-01 - 1 1/2" Goyen Adapter
- M-PV007-01 - 1 1/2" ASCO Adapter
- M-PV008-01 - 1 1/2" Norgren Adapter
- M-PV010-01 - 1 1/2" Turbo D-Series Adapter
- M-PV011-01 - 1 1/2" Turbo F-Series Adapter

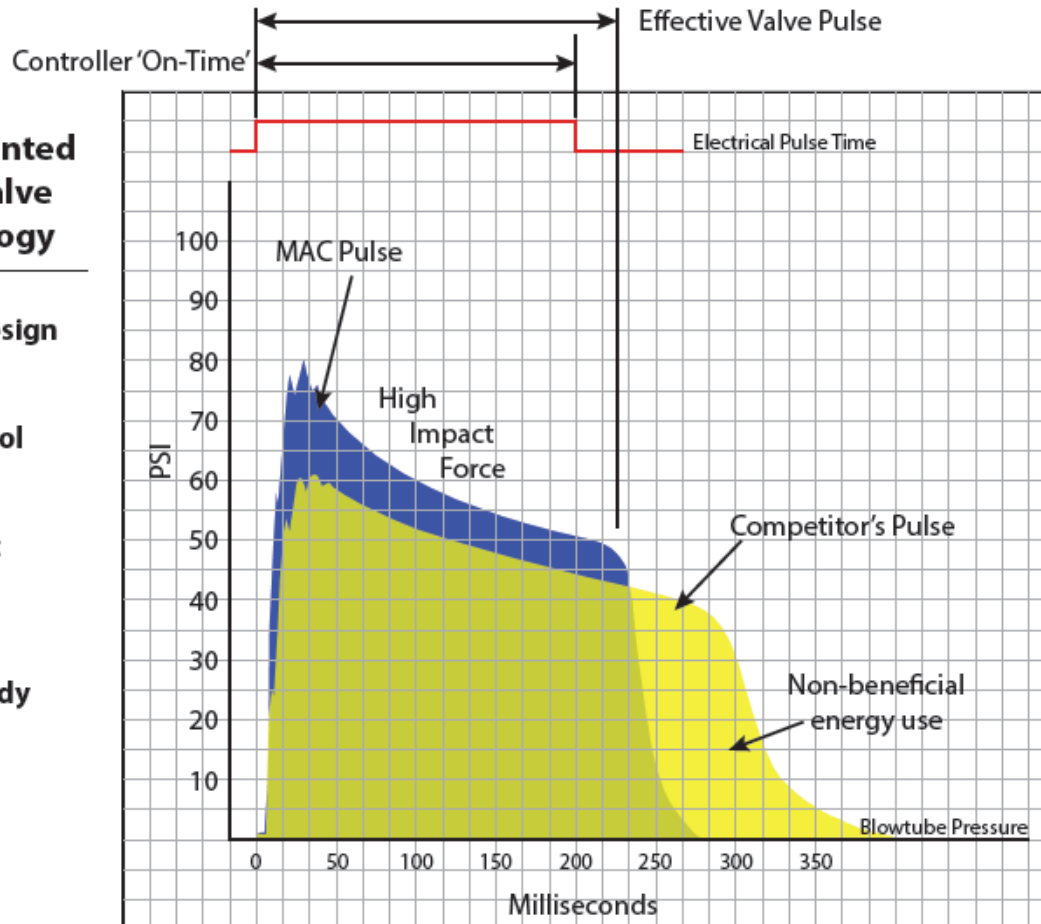
**Additional configurations available upon request*

Pulse Valve Performance Curve

MAC Valves = Energy Savings

MAC Patented Pulse Valve Technology

- Balanced Design
- Bonded Spool
- 4 - Way Pilot
- High Flow Manifold Body



Competitor diaphragm pulse graph produced from independent OEM study

Benefits

Improved Pulse Efficiency

High Impact Force -

- Better Cleaning
- Less Pulsing
- Improved Bag and Filter Life
- Air Savings

Whip Action

- Better Cleaning
- Short Pulse Duration - Air Savings

Reliability

- 4 Way Balanced Pilot
- Bonded Spool
- No Diaphragm

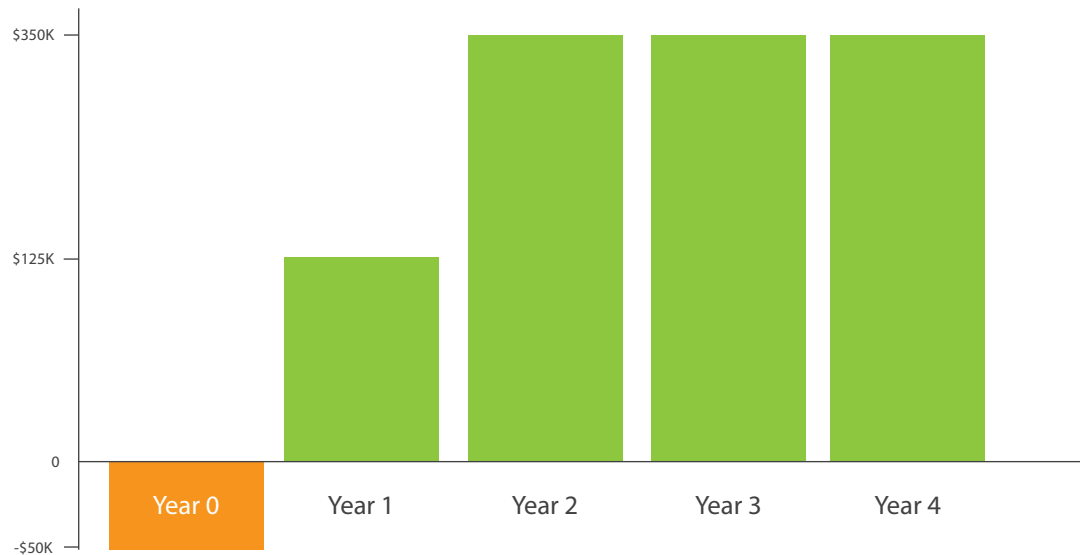
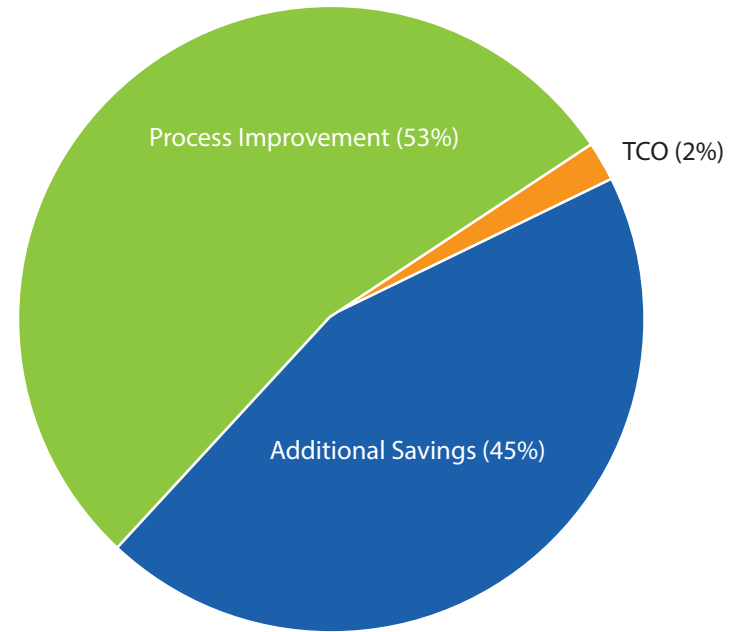


Return on your investment

ANNUAL PROFIT IMPACT

Total Cost of Ownership	\$5,666.67
Process Improvement	\$183,820.00
	\$157,088.72
Total	\$346,575.39
Investment	(\$265,000.00)

ROI **0.76 years**



This is a sample CPR report prepared for a potential MAC® Pulse Valve customer



Savings Summary

PROCESS IMPROVEMENT

Downtime Reduction

Weekly unscheduled downtime caused by dust collector	\$161,920.00
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Scrap Improvement Savings

Reduced scrap due to failure of dust collector. 12,500 lbs/hr x 24 x 365 = 109,500,000 lbs	\$21,900.00
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ADDITIONAL SAVINGS

Lowered Cost of Carrying Inventory

50% of total on shelf for competitor vs. 20% of total on shelf for MAC	\$125.00
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Energy Savings Per Year

Catastrophic Failure \$207.36 cost per day x 6 days before changing = \$1,244.16 per occurrence (24x/yr)	\$29,859.84
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(Estimated cost of air leakage/day)*(number of days of leakage)*(number of valves leaking at a time) = difference between spool and diaphragm <i>Existing: 600ccpm x 30 valves. Proposed: 50ccpm x 30 valves</i>	\$55,103.88
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Alternative Cost Avoidance

EPA Cost reduction	\$0.00
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Equipment Rental? (crane...)	\$0.00
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Reduced Labour due to checking for leaks: (number of instances)*(length in hours)*(fully burdened labour rate) = (2 people * 3 times per week)*(4 hrs)*(\$60.00)	\$72,000.00
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Production Loss	\$0.00
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Miscellaneous Savings

Safety Costs????	\$0.00
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Customer
Profit
Reinforcement

CPR® = Supplier-Assisted LEAN Manufacturing

MAC
VALVES

The screenshot shows the CPR software interface. At the top, there are navigation tabs: SETUP, GO TO WORK, REPORTS, and ADMIN. Below this is a 'Go To Work' section with a 'Client' dropdown menu. The main area is divided into three columns: 'Projects/Lines', 'Machines', and a description area. The 'Projects/Lines' column shows 'Project Name (2)'. The 'Machines' column shows 'Machine Name (6)'. The description area contains text: 'Replacing Component A with B. Things happen and then you have to redesign it. B Presented 20/09/10'. Below this are icons for 'Component Details', 'LCO', 'Process Improvement', and 'Additional'. A 'Return on Investment (y-e-10)' section shows '0.0017' and 'Solutions Savings \$3,494.00'. At the bottom, there are 'Proposed' and 'Existing' tabs, and a 'Select Manufacturer: ()' dropdown.

Pneutech
Pneumatics Australia



Report Summary:

Included in Report

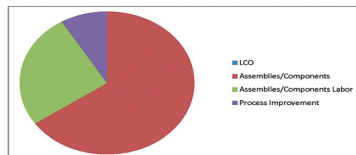
- Component/Assembly Overview
- Component/Assembly Details
- Process Improvements

Solution Sum Totals:

Type of Savings	Totals
Lowest Cost of Ownership (LCO)	\$0
Assemblies/Components	\$40,920.00
Assemblies/Components Labor	\$16,260.00
Process Improvement	\$5,400
Additional Savings/Income	\$0

Total Profit Improvement \$62,580.00

Extra Services Provided \$0



CPR® solution software

Shows our customers how to:

- Evaluate, diagnose and treat problem
- Reduce total operating cost
- Build stronger profits

Call for a free CPR® evaluation today.

HEAD OFFICE

Toll Free: T > 1300 879 613 F > 1300 952 641
E > sales@pneutech.com.au W > www.pneutech.com.au

3 Argent Place, Ringwood Victoria 3134 Australia