

# AIRPINCH™

## Buyer's Guide



Aluminum

Nylon

Stainless Steel

Polypropylene

Polycarbonate

Air Operated Valves

 **RICHWAY**

(800) 553-2404

[www.airpinch.com](http://www.airpinch.com)

# AIRPINCH™

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*[blog.airpinch.com](http://blog.airpinch.com)*

Visit our blog for advice, uses, and interesting  
features about Airpinch valves

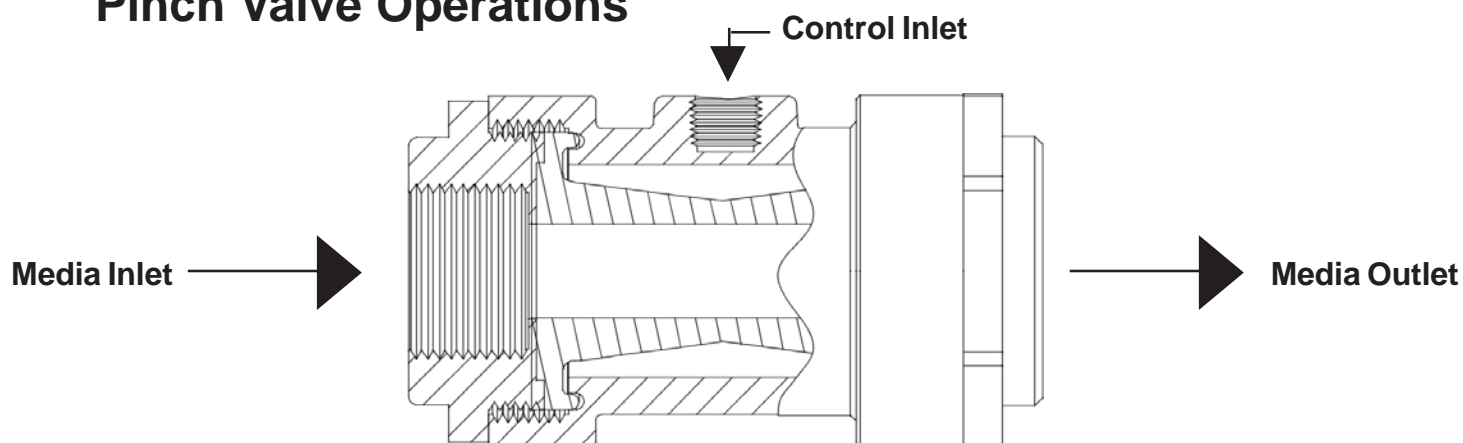
Clear polycarbonate valves now available  
on a per order basis

Stainless steel and aluminum valves  
now produced in house for lower lead times  
No minimum orders needed.

Pulse pump redesign with new 1/4" size added

1 1/2" valve coming soon

## Pinch Valve Operations



Here's how it works...

Air or liquid pressure at the control inlet collapses the internal rubber sleeve to provide immediate and positive shut-off.

The rubber sleeve closes completely, even on large particulate matter, abrasive and corrosive materials. When open, the sleeve allows full, unobstructed flow with little turbulence.

Airpinch valve sleeves can be easily and economically replaced when they wear out.

### **Positive...**

Airpinch valves give you fast, positive shut-off of most industrial materials, liquids, and dry flowables. By design, Airpinch valves will close tightly on suspended particulate materials in liquids. Even highly viscous materials are no problem.

### **Versatile...**

Airpinch valves are versatile because of their unique flow-through design. They provide rapid operation, fully unobstructed flow, and complete closure. Mount them in any position...even fully submerged.

### **Economical...**

Airpinch valve housings are precision molded of engineering grade plastics. This results in a rugged valve at an economical price. Molded pinch valves are lightweight and well suited for use where corrodible and heavy metal valves won't work.

### **Compatible...**

Airpinch valves can be a real problem solver for demanding control applications. Threaded NPT or BSPT pinch valve housings are available in molded polypropylene and nylon, or anodized aluminum. Choose from a variety of elastomers for optimum compatibility and performance with your controlled media.

NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

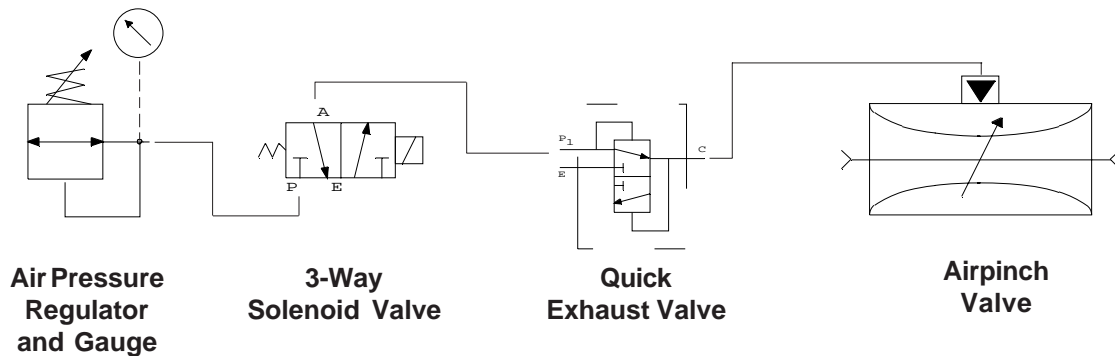
# Pinch Valve Operations

## Operation Pressures

Operating pressures for controlled material vary depending on sleeve elastomer and valve size, and can range from a moderate vacuum (up to 26" Hg) to a maximum of 90 psi when controlling with air.

Required control pressure is normally 20 to 40 psi greater than the material pressure. Use of excessive actuation pressure (air or liquid) than that which results in complete valve closure will impact sleeve life. Use of actuation pressure above 90 psi is not recommended.

## Recommended Configuration



By design, Airpinch valves are normally open and require constant pressure for complete closure. Therefore, a loss of control pressure will allow the valve to open. In the event of sleeve failure, controlled material can enter the the actuation system.

**CAUTION:** The designer must recognize that sleeve failure can occur at any time. Airpinch valves should not be used in applications where such conditions could cause system damage or failure.

The actuation valve controlling the Airpinch must have free exhaust to allow the Airpinch to open. A solenoid, manual or air-pilot operated 3-way control valve is required . A check valve cannot be used between the Airpinch and exhaust port of the controlling valve. Using a QEV can improve valve opening response time.

NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

# Pinch Valve Flow Capacities

Airpinch pinch valves have high flow capacity, which is measured by the flow coefficient or Cv - which is defined as the flow rate of water in gallons per minute at a pressure drop of one psi through the valve.

## Cv Values

Valve (i.d.)	1/4"	3/8"	5/8"	3/4"	1"	1 1/4"	2"
Cv	2	5	15	27	55	85	220

### Coefficient Formula

$$Cv = Q \times \sqrt{\frac{SpGr}{\Delta P}}$$

Q = GPM

SpGr = Specific gravity of controlled liquid (H<sub>2</sub>O=1)

ΔP = Pressure drop through valve

*For gravity or low head pressures, Cv does not apply.*

## Flow Rates

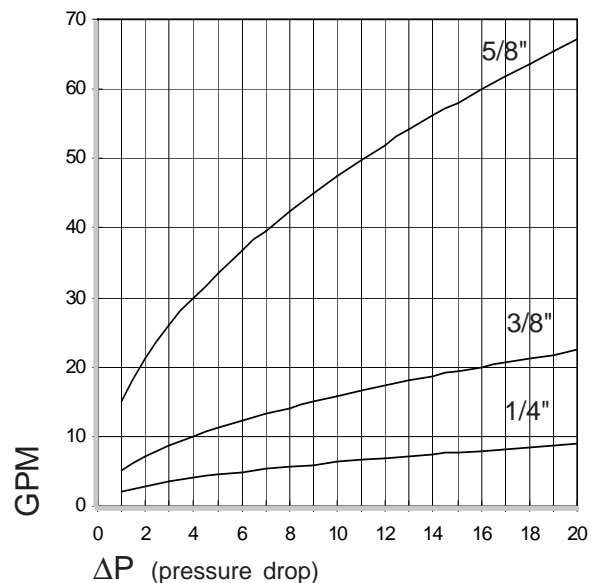
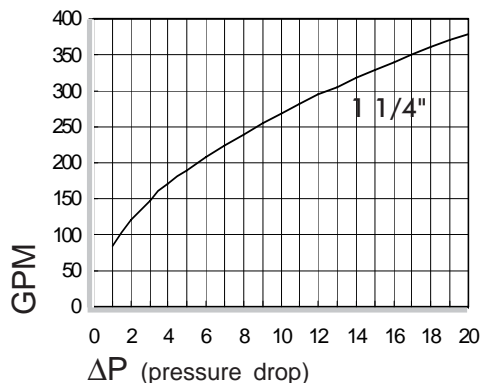
The flow coefficient (Cv) is not the maximum flow capacity in gallons per minute. The maximum flow rate is much higher than the Cv value, as is demonstrated in the example below.

EXAMPLE: Compute flow rate (gpm) for water: (SpGr=1), using the 5/8" pinch valve (Cv = 15), at a pressure drop (ΔP) of 10 psi.

$$Q = \frac{(Cv)^2 (\Delta P)}{SpGr} = \frac{(15)^2 (10)}{1} = 47.43 \text{ gpm}$$

## Flow Diagrams

GPM vs ΔP flow diagrams.



NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

# Pinch Valve Configurations

All valve descriptions can be identified using the component breakdown example shown below. Sizes are indicated in 1/8" increments( e.g. 5/8" = 05).

Example Valve Description:

<b>AT</b> - <b>05</b> - <b>NF</b> - <b>E60</b> - <b>0606</b> - <b>P</b>   <u>Valve Type</u> AB = BSPT AT = NPT AS = Sanitary	<b>05</b>   <u>Sleeve I.D.</u> 1/4" = 02 3/8" = 03 5/8" = 05 1" = 08 1 1/4" = 10 2" = 16	<b>NF</b> - <b>E60</b>   <u>Elastomer Compound</u> NF = Non FDA FG = FDA  <u>Sleeve Material &amp; Durometer</u> B = Buna-N* E = EPDM* I = Silicone N = Neoprene® V = Viton®	<b>0606</b>   <u>End Cap Threads</u> 1/4" = 02 3/8" = 03 3/4" = 06 1 " = 08 1 1/4" = 10 2" = 16	<u>Housing Material</u> P = Polypropylene N = Glass Filled Nylon S = Stainless Steel A = Aluminum
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\* FDA available

## Valve Actuation Pressures

### Pinch Valves

1/4" Valve	Media psi	10	20	30	40	50	60	70	80
	Air psi	42	53	64	76	82	X	X	X
3/8" Valve	Media psi	10	20	30	40	50	60	70	80
	Air psi	32	41	53	64	76	88	X	X
5/8" Valve	Media psi	10	20	30	40	50	60	70	80
	Air psi	40	48	57	68	79	88	X	X
1" Valve	Media psi	10	20	30	40	50	60	70	80
	Air psi	46	53	60	72	81	90	X	X
1 1/4" Valve	Media psi	10	20	30	40	50	60	70	80
	Air psi	46	53	60	72	81	90	X	X
2" Valve	Media psi	10	20	30	40	50	60	70	80
	Air psi	25	36	48	57	70	X	X	X

NOTE: Maximum valve actuation pressure is 90 psi. Air pressure required for "bubbletight" closure of the sleeves shown are based on factory test conditions using water as the controlled media. Differential pressures for controlling liquids and air will vary. To obtain maximum sleeve life, always use lowest air pressure necessary for complete closure.

Application specific testing is always recommended to determine the suitability of Airpinch valves and sleeves. This information is intended to be used as a guideline only. It is the responsibility of the user to test and determine the suitability of Airpinch valves and sleeves for any given application.

NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

## Selecting Rubber Sleeves

This information is intended to introduce the multitude of considerations that exist when determining sleeve selection and anticipating performance. In all cases, the end user is responsible for determining the suitability of a sleeve material for a specific application. Actual operating conditions and materials can greatly affect sleeve performance.

### A sampling of factors to consider when selecting rubber sleeves follows:

- Will the sleeve be exposed to fluids, oil, water, solvents or chemical solutions?
- Will the sleeve be exposed to gases or liquid vapors, ozone, high or low temperatures?
- Will the sleeve be involved in food or drug processing?
- When working with oils, inks and solvents, determine in detail the brand, type, and grade of the fluid.
- Give consideration to the fact that lubricating oils may be present in compressed air systems.

**Richway's food-grade (FG) sleeves are formulated using compounds which meet the Food & Drug Administration regulation FDA 177.2600 for use in food & contact environments.**

**NOTE:** Richway Industries, Ltd., can assume no responsibility for the accuracy and /or completeness of this information when determining sleeve selection or compatibility for any particular application.

The following pages listing technical properties and ratings of the general elastomer compounds are representative of published reference materials from various polymer suppliers. We are unable to guarantee their accuracy and assume no liability for the use thereof.

## Sleeve Dimensions

<b>Sleeve I.D.</b>	<b>1/4"</b>	<b>3/8"</b>	<b>5/8"</b>	<b>3/4"</b>	<b>1"</b>	<b>1 1/4"</b>	<b>2"</b>
Weight EPDM (gms)	5	13	38	38	96	96	108
Length (in.)	2.180	1.5	2.40	2.40	3.55	3.55	7.5
<b>Wall Thickness</b>	<b>1/4"</b>	<b>3/8"</b>	<b>5/8"</b>	<b>3/4"</b>	<b>1"</b>	<b>1 1/4"</b>	<b>2"</b>
Ave. (in.)	.112	.125	.185	.185	.200	.200	.25
<b>Flange</b>	<b>1/4"</b>	<b>3/8"</b>	<b>5/8"</b>	<b>3/4"</b>	<b>1"</b>	<b>1 1/4"</b>	<b>2"</b>
Diameter (in.)	.850	1.375	1.745	1.745	2.97	2.97	4.7
Thickness (in.)	.085	.140	.220	.220	.205	.205	.5

NOTE: Sleeve specifications shown are representative of elastomers currently offered. Actual port dimensions may vary slightly.

NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

## Buna-N Rubber

<b>Common Name:</b>	Buna N, Nitrile, NBR
<b>Chemical Definition:</b>	Butadiene Acrylonitrile
<b>Compression Set:</b>	Good
<b>Abrasion Resistance:</b>	Excellent
<b>Tear Resistance:</b>	Good
<b>Solvent Resistance:</b>	Good to Excellent
<b>Oil Resistance:</b>	Good to Excellent
<b>Temperature Usage:</b>	0 (F) to 190 (F)

Buna-N is a general purpose oil resistant polymer.  
Inherently resistant to hydraulic fluids, lubricating oils and transmission fluid  
Good compression set, abrasion resistance and tensile strength  
Nitriles should not be used with Acetone and MEK

## EPDM Rubber

<b>Common Name:</b>	EPDM
<b>Chemical Definition:</b>	Ethylene Propylene Diene Monomer
<b>Compression Set:</b>	Fair
<b>Abrasion Resistance:</b>	Good
<b>Tear Resistance:</b>	Fair
<b>Solvent Resistance:</b>	Poor
<b>Oil Resistance:</b>	Poor
<b>Temperature Usage:</b>	-30 (F) to 275 (F)

EPDM is a polymer with outstanding properties.  
Excellent resistance to water, acids, alkalis and steam  
Excellent resistance to gas permeability and ozone  
Fairly good in ketones and alcohols

## Fluoro Elastomers

<b>Common Name</b>	FKM, Fluorel®, Viton® <small>(Fluorel is a registered trademark of 3M, Viton is a registered trademark of DuPont/Dow)</small>
<b>Chemical Definition</b>	Fluorinated Hydrocarbon
<b>Compression Set:</b>	Good
<b>Abrasion Resistance:</b>	Good
<b>Tear Resistance:</b>	Good
<b>Solvent Resistance:</b>	Excellent
<b>Oil Resistance:</b>	Excellent
<b>Temperature Usage:</b>	0 (F) to 450 (F)

Fluoro Elastomers can often be the elastomer of choice for applications in severe environments due to their long useful service life with oil, gasoline, hydraulic fluids and hydrocarbon solvents.  
Outstanding resistance to a wide range of solvents and petroleum based solvents  
Very low compression set, even at high temperatures  
Not recommended for use with ketones

NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

## Neoprene Rubber

<b>Common Name:</b>	Neoprene®, CR
<b>Chemical Definition:</b>	Polychloroprene
<b>Compression Set:</b>	Good
<b>Abrasion Resistance:</b>	Excellent
<b>Tear Resistance:</b>	Good
<b>Solvent Resistance:</b>	Fair
<b>Oil Resistance:</b>	Fair
<b>Temperature Usage:</b>	-10 (F) to 225 (F)

Neoprene is an all purpose polymer with great characteristics, many of which are similar to those of Nitrile (Buna-N).

Excellent flex fatigue with low compression set

Flame resistance

Suitable for petroleum based oils, animal/vegetable fats and greases

## Silicone Rubber

<b>Common Name:</b>	Silicone, VMQ
<b>Chemical Definition:</b>	Polysiloxane
<b>Compression Set:</b>	Good to Excellent
<b>Abrasion Resistance:</b>	Fair to Poor
<b>Tear Resistance:</b>	Poor
<b>Solvent Resistance:</b>	Poor
<b>Oil Resistance:</b>	Fair to Poor
<b>Temperature Usage:</b>	-70 (F) to 425 (F)

Silicone offers extreme temperature range stability, low temperature flexibility and in some cases, is suitable for many food and medical applications as it typically does not impart odor or taste.

Excellent low temperature properties

High resistance to oxidation and ozone attack

## Natural Rubber

<b>Common Name:</b>	Natural Rubber, NR
<b>Chemical Definition:</b>	Polyisoprene
<b>Compression Set:</b>	Excellent
<b>Abrasion Resistance:</b>	Excellent
<b>Tear Resistance:</b>	Excellent
<b>Solvent Resistance:</b>	Poor
<b>Oil Resistance:</b>	Poor
<b>Temperature Usage:</b>	-40 (F) to 150 (F)

Natural Rubber has many good characteristics.

Good low temperature properties

Usable for ketones and alcohols

NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

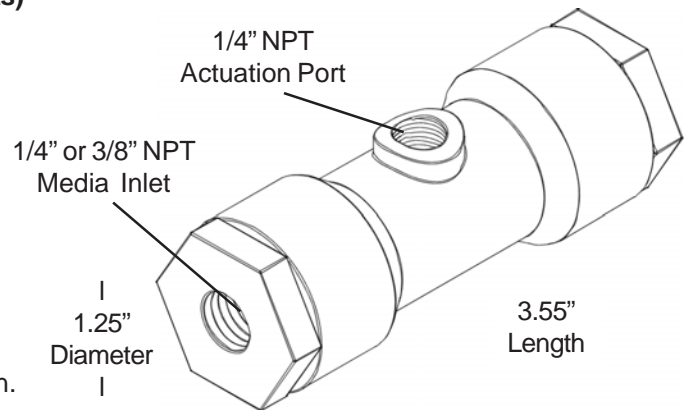
# Airpinch Valves

## 1/4" Pinch Valves (1/4" NPT Media Inlets)

Description

AT - 02 - NF - B60 - 0202 - N  
 FG E60 P  
 E30  
 I 60  
 N60  
 R60  
 V65

Actuation Displacement: 0.1 cu. in.  
 Weight: 2 oz



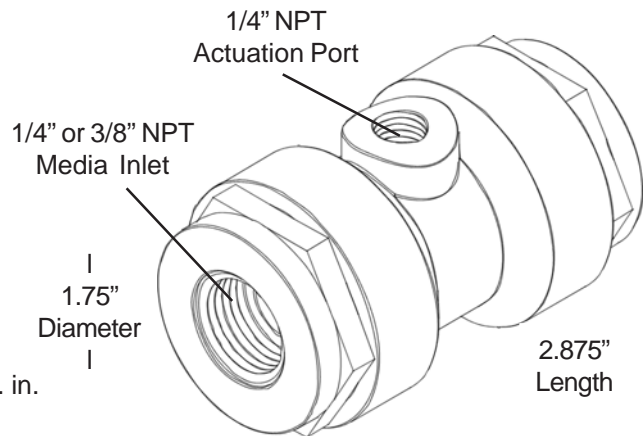
Also available with  
 3/8" end caps.

## 3/8" Pinch Valves (1/4" or 3/8" NPT Media Inlets)

Description

AT - 03 - NF - B60 - 0202 - N  
 FG E60 P  
 E30  
 I 60  
 N60  
 R60  
 V65

Actuation Displacement: 0.5 cu. in.  
 Weight: 5 oz

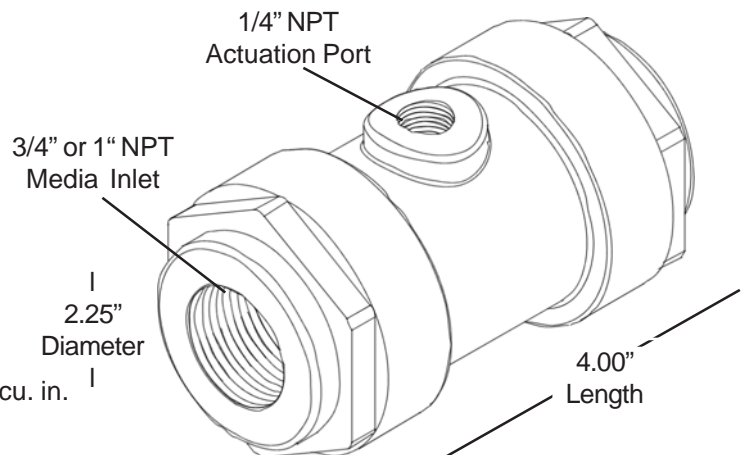


## 5/8" Pinch Valves (3/4" or 1" NPT Media Inlets)

Description

AT - 05 - NF - B60 - 0606 - N  
 FG E60 P  
 E30  
 I 60  
 N60  
 R60  
 V65

Actuation Displacement: 1.1 cu. in.  
 Weight: 7 oz



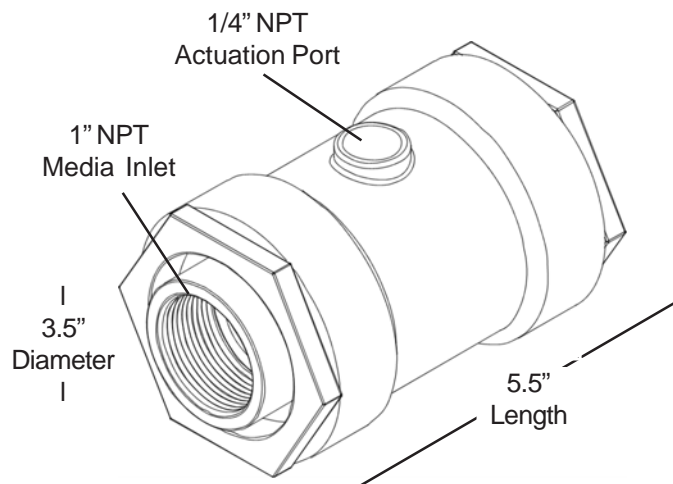
NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

## 1" Pinch Valves (1" NPT Media Inlets)

### Description

AT - 08 - NF - B60 - 0808 - N  
 FG E60 P  
 E30  
 I 60  
 N60  
 R60  
 V65

Actuation Displacement: 6.1 cu. in.  
 Weight: 16 oz

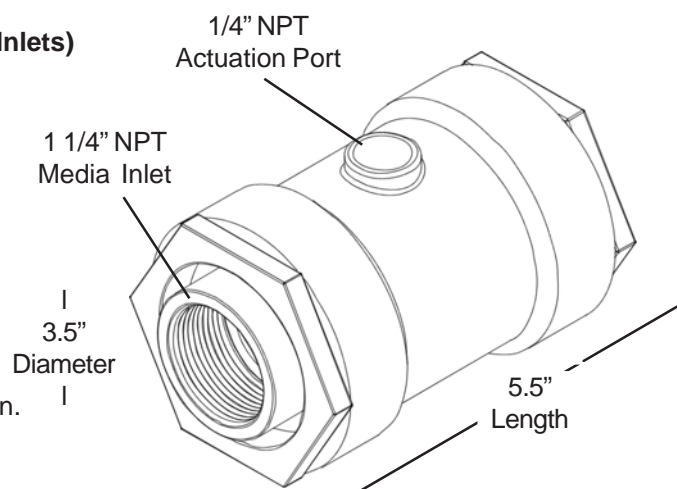


## 1 1/4" Pinch Valves (1 1/4" NPT Media Inlets)

### Description

AT - 10 - NF - B60 - 1010 - N  
 FG E60 P  
 E30  
 I 60  
 N60  
 R60  
 V65

Actuation Displacement: 5.5 cu. in.  
 Weight: 16 oz

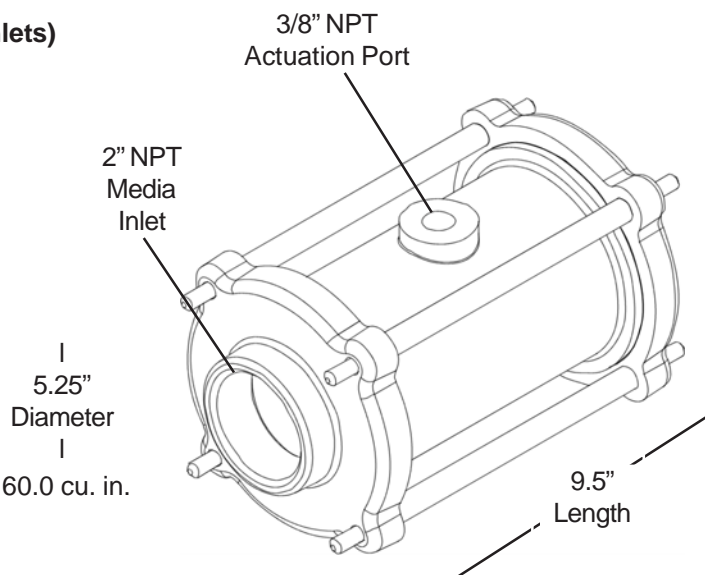


## 2" Pinch Valves (2" NPT Media Inlets)

### Description

AT - 16 - NF - B60 - 1616 - N  
 FG E60 P  
 V65

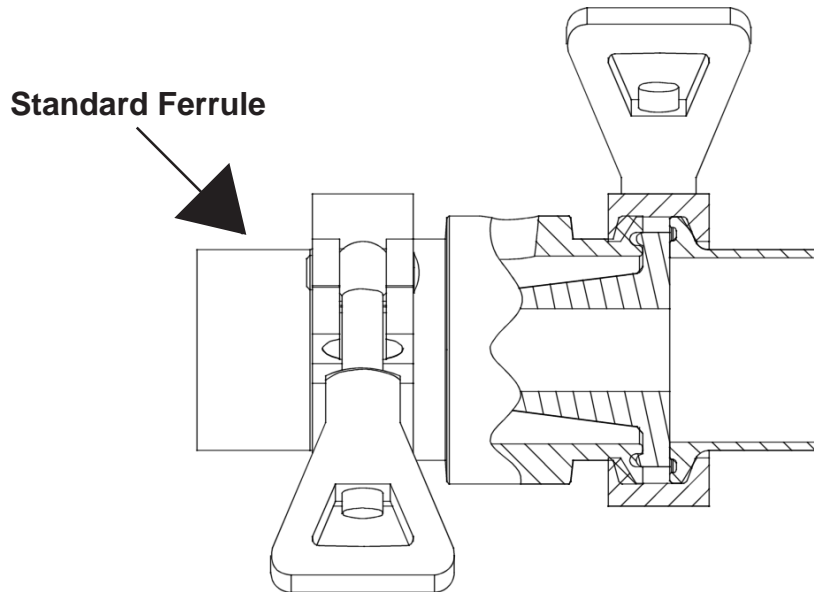
Actuation Displacement: 60.0 cu. in.  
 Weight: 4.75 lbs.




NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

## Sanitary Valve Installation

Airpinch sanitary style pinch valves can be well suited for a variety of uses in food contact environments. They are unique in that the internal rubber sleeve is the only wetted part - having exclusive contact with the controlled media. The valve housing features an integrated ferrule and is compliant with C.I. P. (clean-in-place) processes in food contact environments. Valve outlet indicates maximum tubing size. Clamps are not included.



	<u>Valve Size</u>	<u>Waukesha Cherry-Burrell Part #</u>
	5/8"	3023014
	1 1/4"	3023019
	2"	3023025

  
**Waukesha  
Cherry-Burrell  
" I " Clamp**

Airpinch sanitary valves are designed to work with Waukesha Cherry-Burrell " I " Clamps. Clamps and ferrule fittings are not included with your sanitary valve purchase. Richway recommends contacting Waukesha Cherry-Burrell direct to order those fittings. Please note that the Airpinch sanitary valve is to be used with standard ferrule fittings only. " I " series ferrules will not work with the Airpinch valve and " I " series clamp.

For ordering " I " series clamps, contact: Waukesha Cherry Burrell  
 611 Sugar Creek Road  
 Delavan, WI 53115 USA  
 Tel: 1-800-252-5200 or 414-728-1900  
 web site: [www.waukesha-cb.com](http://www.waukesha-cb.com)

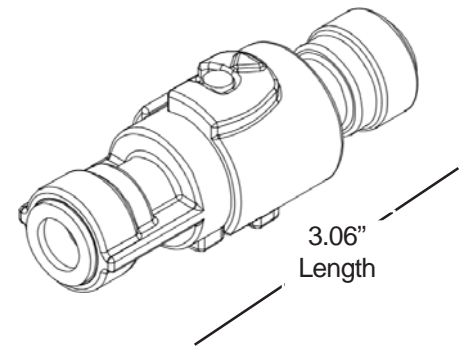
NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

## 1/4" Quick Connect Duckbill Check Valve

### Description

AC - 02 - NF - B60 - 0202 - QCP  
FG E60 0303  
V65

This check valve quickly assembles and disassembles for quick servicing. Ends come with integrated quick to connect fittings for either 1/4" or 3/8" tubing. Call for additional information.

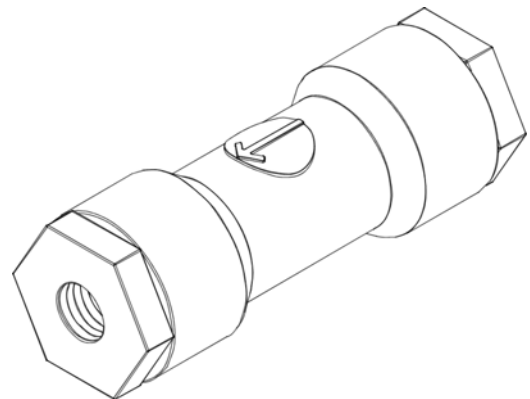


Reducing configurations are available (1/4" x 3/8"). Call for ordering information.

## 1/4" Duckbill Check Valves

### Description

AC - 02 - NF - B60 - 0202 - N  
FG E60 P  
V65

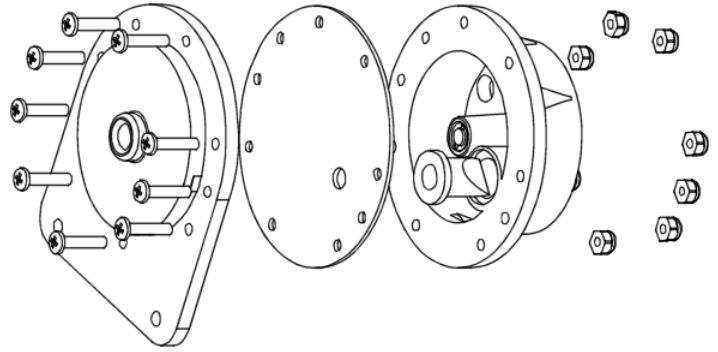


NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

## Quick Exhaust Valves

### Description

AQ - 02 - NF - E60 - 0202 - P  
V65



Richway's quick exhaust valve (QEV) helps maintain a positive barrier between the control air supply and the exhaust air from the controlled component. Fast air removal action increases system efficiency and speeds.

A QEV installed in the airline between the actuation control valve and pinch valve can improve valve opening response time. It especially improves if there is a considerable distance between the two components.

The QEV valve body is molded of polypropylene, with choice of rubber diaphragm and duckbill elements.

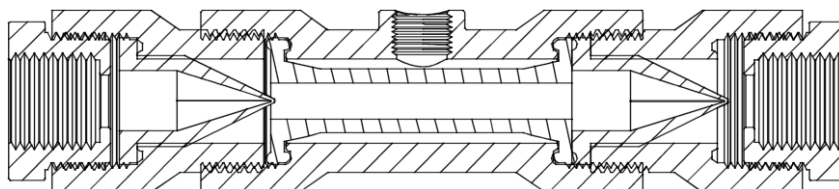
All ports 1/4" NPT.

NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

## Pulse Pumps

### Description

AP - 05 - NF - B60 - 0303 - N  
10 E60 0608 P  
V65



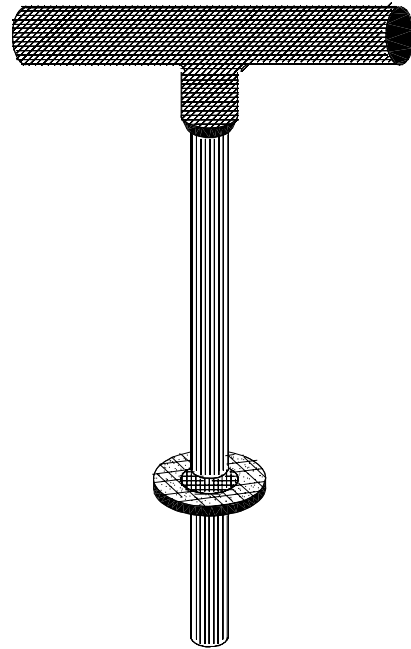
Richway's versatile pulse pumps can be operated while submerged or in-line with the pumped liquid. The pulse pump consists of two duckbill check valve elements and one Airpinch valve sleeve. Volume per pulse for actuation pressures ranging from 30 to 70 psi at 50 cycles per minute are indicated below.

<u>Size</u>	<u>Length</u>	<u>Volume / Pulse</u>
1/4"	5.75"	0.05 oz. / pulse
5/8"	7.50"	0.40 oz. / pulse
1 1/4"	11.375"	1.75 oz. / pulse

NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

## Sleeve Replacement

1. Remove expired sleeve from valve housing.
2. Lubricate one end of the sleeve with a liquid soap solution. **DO NOT** use a petroleum product such as WD-40 Ⓡ.
3. Insert the tip of the insertion tool into the replacement sleeve.
4. Place the valve body on a solid surface.
5. Start the lubricated end of the sleeve at an angle to the valve body and push it into the valve body until the top flange is seated.
6. If the bottom flange is not completely seated, use the insertion tool to wedge it into place.
7. When replacing valve end caps, be sure both flange ends are well lubricated.



**CAUTION:** Upon completion, look through the valve center to assure that the sleeve did not become twisted inside the housing when end caps were reconnected and tightened. Twisting may cause immediate sleeve failure.

NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

## Limited Warranty

Airpinch valves and components (excluding rubber components) are warranted against defects in materials and workmanship for a period of 180 days from date of shipment. During this warranty period, Richway will repair or replace at no charge, those parts or components which prove to be defective.

This warranty shall not apply to components not manufactured by Richway Industries, Ltd. The warranty of such items are limited to the actual warranty extended to Richway Industries, Ltd. by its supplier.

This warranty does not include failures or damage due to misapplication, misuse, abuse, breakage, improper installation, storage, handling, abnormal conditions of temperature, water, dirt, corrosive substances, or other contaminants.

Products covered by this warranty must be used in compliance with all federal, state, local, and international regulations.

### **Disclaimer of other warranties...**

The foregoing limited warranty is in lieu of all other warranties, expressed or implied, including merchantability or fitness for a particular purpose. In no event shall Richway Industries, Ltd., be liable for any indirect, consequential, or special damages of any nature whatsoever.

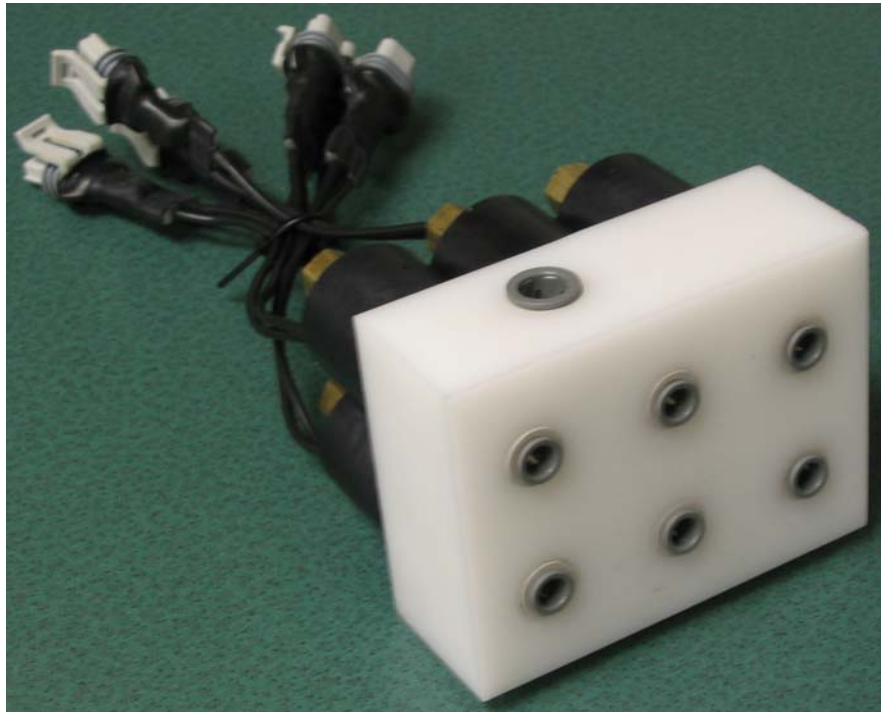
Airpinch is a trademark of Richway Industries, Ltd.

Manufactured by: Richway Industries, Ltd.  
P.O. Box 508  
504 North Maple  
Janesville, Iowa 50647 USA  
(319) 987-2976  
(800) 553-2404  
(319) 987-2251 fax  
info@richway.com

NOTE: It is the responsibility of the user to determine suitability of sleeve material for any particular control application.

# Pneumatic Control Manifold

Electric control of pneumatic devices



## Air Actuation Control

The Richway Control Module™ is an economical solution to your air-actuation controls. The compact and rugged design allows for easy servicing and numerous configuring options.

The Richway Control Module™ is available in four and six port modules. This allows for versatility in configuring your controls by plugging off ports or adding controls to your modules to control the exact number of air-actuated systems as needed.

Servicing is simple when using the Richway Control Module™. Typical stack valves need to all be disassembled to service one individual solenoid. Our design allows to control valves to be simply unthreaded for service. Once serviced, the control valve easily threads back into its port for immediate use.

Call for additional information

*At a glance...*  **RICHWAY**



Our 55,000 square foot factory includes plastic and rubber molding, metal fabrication, powder coating, assembly and packaging. Richway Industries, Ltd. has manufactured products for a wide variety of industries using the highest quality components and materials since 1973.

Customer Service / Orders (800) 553-2404  
Fax (319) 987-2251  
Office Hours Monday - Friday 8:00 am - 5:00 pm



504 N. Maple/ P.O. Box 508 Janesville IA 50647 USA