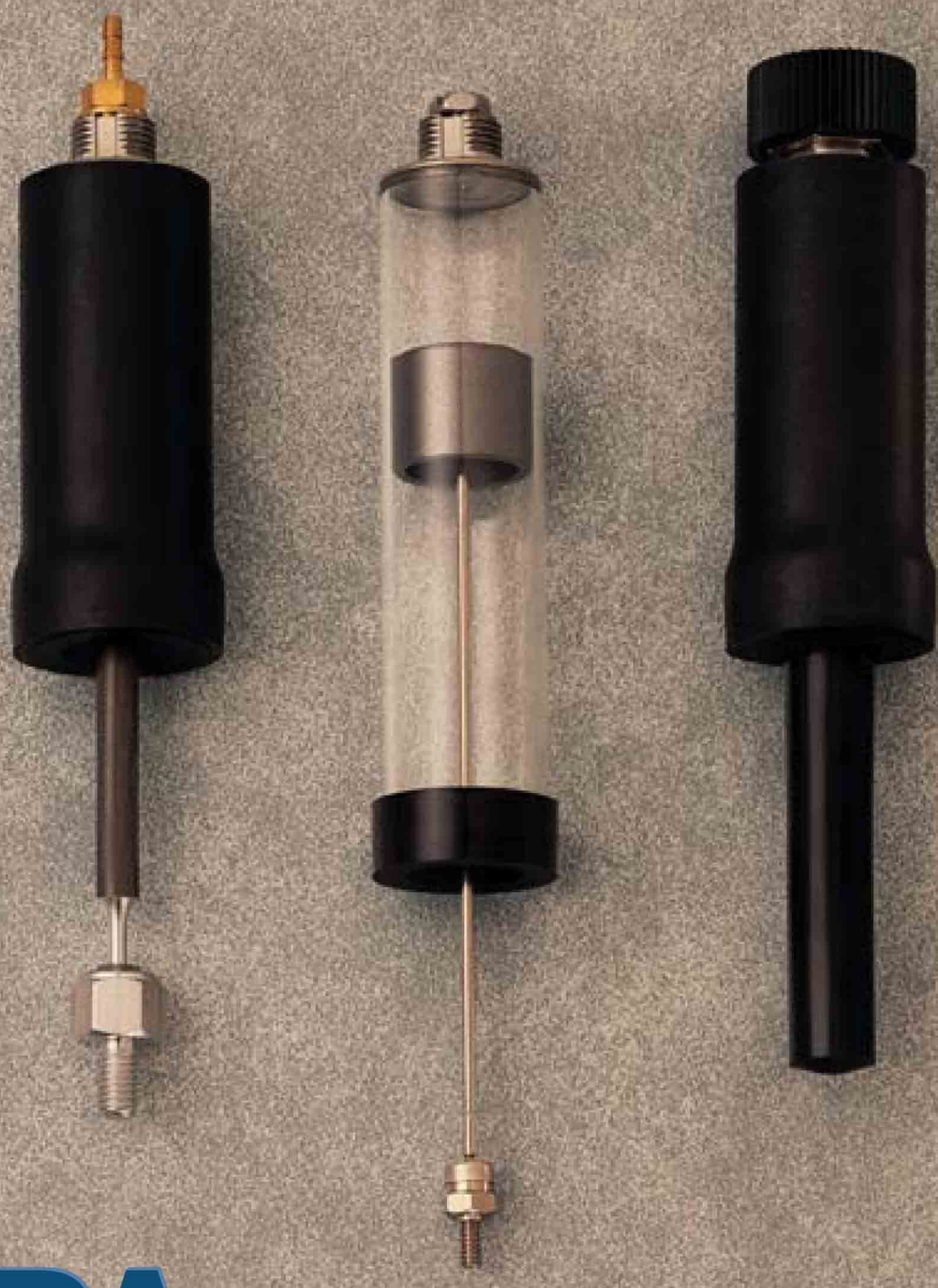
We make what you make run smoother.



LDA
Solutions for Life

Airpot®

Dashpots • Actuators • Shock Absorbers

The Airpot Dashpot *defined.*

It sounds much simpler than it is.

The Airpot Dashpot is a motion damping device that reduces velocity, vibration, and oscillation in dynamic mechanisms.

This is accomplished by using a piston to force ambient air through an orifice at a controlled rate to dissipate kinetic energy.

The benefits are worth noting:

- It prevents damage and violent or inaccurate response caused by shock and vibration in sensitive equipment and components.
- It reduces impact noise and wear.
- It provides simple, low cost, adjustable speed control without external power.
- It provides non-electrical timing capability.

What type of applications benefit most from these special capabilities?

Any kind where these conditions are present:

- Where smooth, near friction-free motion is critical.
- Where responsiveness to low forces/ low kinetic energy levels is required.
- Where equipment is sensitive and precise.
- Where clean operation is important.
- Where cycle rates are high or life span needs to be long.
- Where reliability is critical.
- Where temperatures are extreme or environments are humid.
- Where high quality is a product feature.
- Where non-electrical motion control is advantageous.

12 ways an Airpot differs from other damping devices

1. It has unparalleled low friction, responds to forces as low as only a few grams, and it's smooth.
2. Starting and running friction are almost identical, which prevents jerky, uncontrolled starts.
3. It has a life-span of multi-millions of cycles. It outlasts most any machine in which it is used.
4. No seals are required, and there are no liquids to leak.
5. There is no limit to its cycle rate. It does not heat up or change viscosity under conditions of rapid and/or continuous cycling.
6. It's made of self-lubricating materials.
7. It's precise and accurate, easily adjustable over a 10,000 to one range, and it allows fine adjustments at installation.
8. It's unaffected by extreme temperature variations and high G-loads.
9. The piston and cylinder will not rust, corrode, or deteriorate over time – even with little or no use over extended intervals.
10. It damps bi-directionally and uni-directionally.
11. It's lightweight.
12. It's easily customized to suit space availability and the majority of special performance requirements.

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A few words about *basic design* and operating *principles*

How they *work*

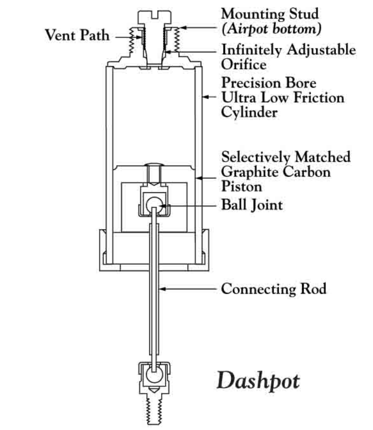
All Airpot damping devices are dashpots generically, but for ease of discussion, we identify configurations in which the piston rod is *attached* to the load being damped as *dashpots.*

We identify configurations in which the piston rod is *struck* by — but not attached to the load — as *shock absorbers* or *snubbers*. Either term is acceptable.

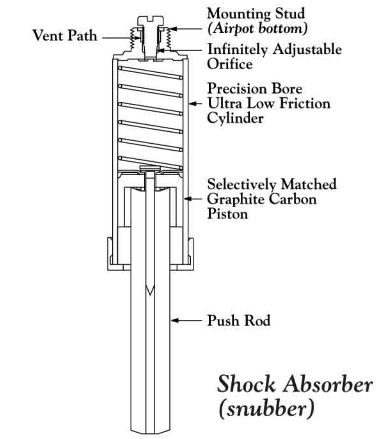
The *materials* we use

Whether it's a dashpot or a shock absorber, the materials we use are chosen for inherent lubricity, high strength-to-weight ratio, excellent stability under temperature and humidity extremes, close coefficients of thermal expansion, and non-deteriorating performance due to age or non-use. The component parts:

- Graphitized carbon piston, precision ground to millionths of an inch TIR
- Annealed, borosilicate glass cylinder. Precision fire-polished bore.



Dashpot



Shock Absorber (snubber)

Damping *direction* control

One Way Damping *(push or pull)*
In dashpot configurations, the piston is attached to the connecting rod by a low friction ball joint or pin link. Depending on the dashpot model, the ball joint will house an internal ball check valve or it will be riveted to a flexible flap valve which is externally mounted on the piston face. Any force applied to the connecting rod which can move the piston will cause air to flow through the piston's ball check or flap valve with no appreciable restriction (no damping) in one direction and will cause the valve to close in the opposite (desired damping) direction. Damping in the compression direction is referred to as *push* damping. Damping in the extension direction is referred to as *pull* damping (see dashpot illustration).

In the shock absorber configuration, the flexible flap valve is used, and damping is only available in the push direction. Since the push rod is not connected to the load, a low force return spring is provided in the cylinder to reset the piston for the next cycle (see shock absorber illustration).

Two Way Damping *(Unit damps in both directions.)*
The ball joint rod connection contains no check valve and therefore does not allow air flow through the piston. This results in approximately equal resistance to motion (damping) in both directions. Two way damping is generally not appropriate for the shock absorber configuration.

Damping *rate* control

Two methods are available to control the amount of damping:

Adjustable orifice All models come standard with an anti-vibration needle valve built into the dashpot mounting end for damping adjustment.

The design allows for screw driver, wrench, or finger adjustment of the adjustment screw. The blunt needle valve provides capability for a very wide range of continuous adjustment.

Adjustable models are the most commonly used because they allow a great deal of flexibility in controlling forces or energy levels that can only be approximately known, that may vary from machine to machine, or that may change over time due to machine wear or load variations. Their fine-tuning ability also accommodates any inherent damping variations from unit to unit.

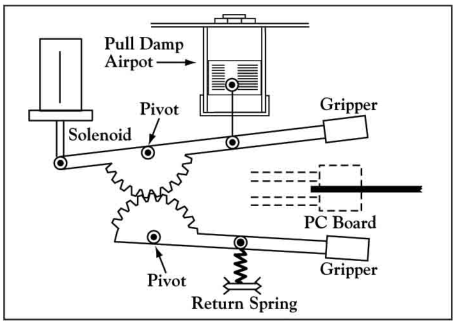
Fixed orifice In some applications, it may be possible to use a non-adjustable model. The advantages are lower cost and a tamper proof damping setting.

These models contain no orifice in the cylinder bottom. Instead, damping rates are achieved by factory selection of an appropriate piston/cylinder diametral clearance or by factory scribing of the piston to produce a precise leak.

Each method provides the leak required to yield a pre-determined damping rate. Please see further discussion under the "Orifice" heading in the "Selection guidelines" section.

Typical examples of *application*

Velocity Control of Solenoids



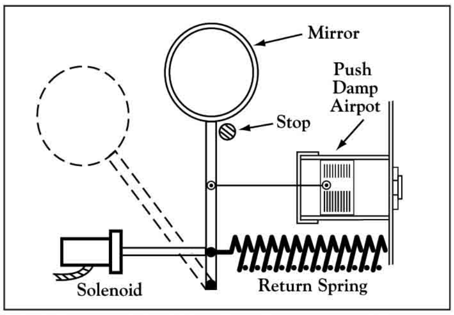
It is often desirable to slow a solenoid down to avoid a crash or high impact on closure. The Airpot tunes the solenoid to obtain the fastest motion possible without noisy impact or damage to components.

In electronics assembly equipment (as shown above) a pull damping Airpot controls a solenoid which positions the grippers. The Airpot significantly reduces gripper impact.

In automatic diagnostic equipment it controls the travel of solenoid actuated dispensers and positioners as samples move from one station to another.

In silicon wafer transport mechanisms it prevents bounce and overshoot as solenoids lift wafers into position.

Velocity Control of Spring Loaded Mechanism



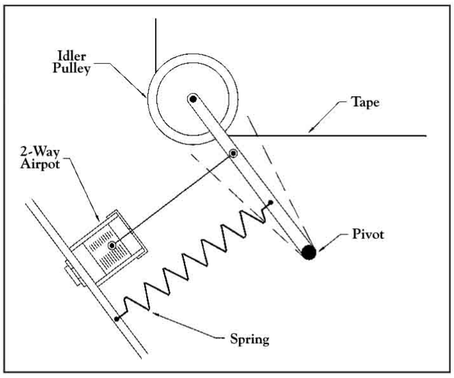
Springs provide motive force to a mass at the expense of continuously increasing velocity. Airpot damping develops an opposing force to limit this velocity to a desired value.

In laser equipment (as shown below left), a push damp Airpot controls a mirror as it swings into position. The Airpot damping increases as the mirror approaches a stop, allowing rapid positive positioning without loud noise or impact damage.

In automatic mailing and addressing equipment it regulates the positioning mechanisms and feed roller pressure.

In spring loaded doors, x-y slides, and tape cartridge carriers it prevents damage on release.

Vibration Damping

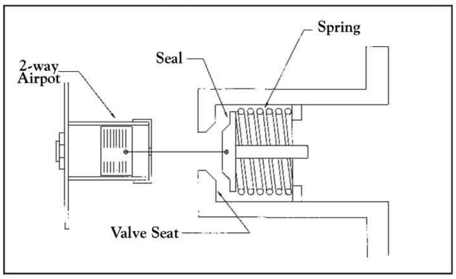


Dashpot damping is one of the simplest ways of eliminating vibration. The Airpot dashpot excels in providing a high ratio of damping-to-friction force.

In magnetic tape duplicators (as shown above), a two-way damping Airpot significantly reduces idler arm vibration caused by stiction or take-up drive pulsation. The idler can still move freely to accommodate changes in the loop profile. Using an Airpot also improves the response during start-up acceleration.

In high speed fiber optic filament, wire, and textile winders, an Airpot is ideal where oscillation of tension idlers can cause broken filaments.

Oscillating Valve Damping



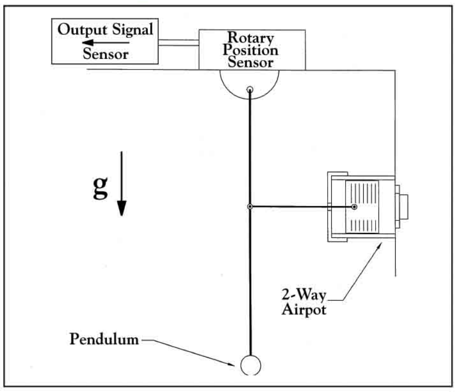
Poppet and check valves can naturally resonate, causing unwanted noise, pressure/flow fluctuations, or wear. These problems can be eliminated by precise damping.

In pneumatic valves (as shown above), an Airpot reduces the amplitude of oscillation without affecting the cracking pressure or positioning of the poppet. With Airpot's low mass, virtually frictionless motion, and minimal air spring at low forces, the steady-state positioning of the poppet is essentially unaffected by the dashpot.

In a vacuum regulator it improves regulation and eliminates noise caused by the oscillating poppet striking the valve seat.

In a patient ventilator it damps the check valve to eliminate downstream pressure fluctuations.

Limiting Overaction



Many instruments are susceptible to random pulses and surges, which can lead to harmful, over-range conditions.

Typical examples of *application* continued

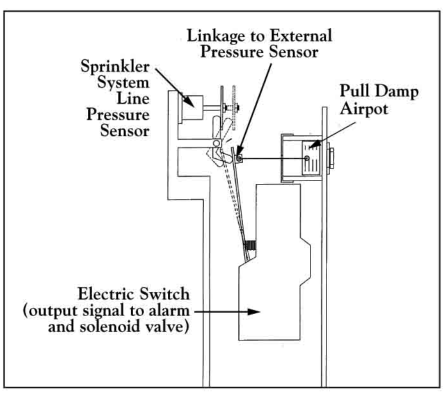
The Airpot is velocity sensitive and resists these surges, providing more consistent operating conditions and preventing damage.

In sensitive, tilt-sensing instruments (as shown below left), a two-way damping Airpot prevents the pendulum from reacting violently to sudden changes, stabilizing the pendulum but allowing it to move smoothly with angular change.

In sensitive scales, Airpot protects against loading shock without interfering with measurement.

In magnetic tape handling equipment, dubbers, motion picture projectors, and film duplicators Airpot provides protection where high speed stop and start can lead to overshoot, fouling, and backlash.

Creating Time Delay



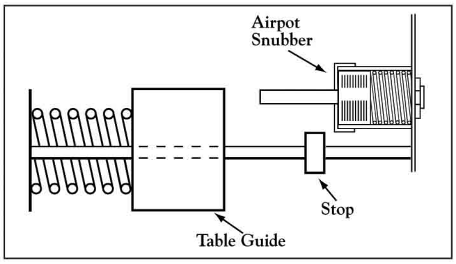
Airpot offers reliable timing control for non-electrical systems and for electrical systems requiring non-electrical backup.

In a commercial sprinkler system a pull damping Airpot times a switch (as shown above) which actuates a solenoid valve in response to ambient conditions. The time delay prevents short term, non-threatening signals from actuating the sprinklers, while allowing actuation if the signal persists beyond the desired time.

In refrigerator ice dispensers an Airpot slows closure of the spring loaded ice chute doors.

In beverage vending machines it controls descent of filling compartment access doors.

Cushioning Impact

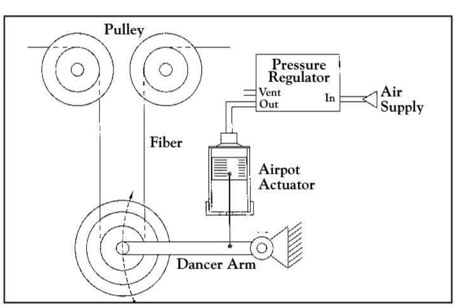


When controlled deceleration is required at the end of the stroke of your mechanism, the Airpot snubber configuration is particularly useful. It performs push damping *only* and the push rod is not connected to the work.

In office copiers (as above), an Airpot snubber damps the lens carriage at the end of its return stroke. Because of this controlled deceleration, impact noise and bounce are prevented, permitting faster machine operation. The Airpot return spring quickly resets the piston for the next cycle.

In semi-conductor wafer transport mechanisms, it dampens firm positioning against hard stops.

Pneumatic Actuation – Pressure or Vacuum

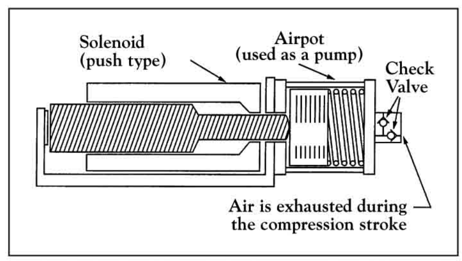


Using a threaded port in place of the adjustable oriface, the Airpot is capable of acting as a pneumatic actuator, providing smooth precise positioning.

In high speed filament winders (as shown below left), Airpot actuators are part of a force control system to maintain proper filament tension. The ultra-low friction Airpots provide precise, hysteresis-free force control in response to small pressure or vacuum changes directed by the controller.

In automatic assembly and semi-conductor equipment, it smoothly dispenses and positions parts.

Designing Your Own Pumping, Pressure Sensing, and Flow Measurement Devices



Innovative customers have taken advantage of the special properties provided by the Airpot piston and cylinder combination to produce pumping and pressure handling devices of their own design.

For example, fitted with a hose barb, the Airpot cylinder/piston assembly can be connected to a motor or solenoid (as shown above) and used to pump air. Its low friction and inherent lubricity reduce power requirements and concerns about contamination from lubricants.

Used as a pressure sensor or flow indicator, the Airpot's inherently low friction allows response to extremely low pressures and small pressure changes. The piston can provide a mechanical output, and the glass cylinder allows visible indication of piston position changes. Piston/cylinder sets can be purchased for these purposes and Airpot application engineers are available to assist customers who have these special needs.

Proper model selection is based on the following criteria:

Force **The primary consideration for dashpot configurations and all applications involving vibration, time delay, and velocity control.**

Limits based on damping direction. Force always relates to the *net load* which is pushing or pulling on the dashpot. Typically, force will dictate the unit's size when the Airpot is used in the dashpot configuration.

At rest, the dashpot is a passive device and has no force output. In motion, the dashpot offers a resisting force which rises to equal the force of the input load, achieving a zero net force. This results in zero acceleration and constant velocity.

Force limits of Airpot dashpots are determined by the direction of damping and the diameter of the piston.

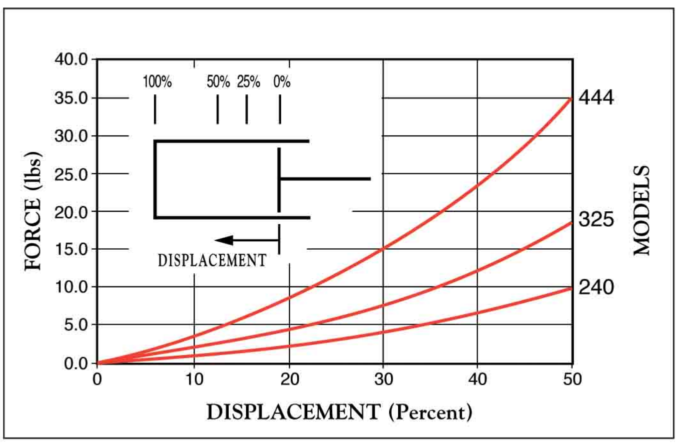
In pull damping units, a vacuum is being created in the dashpot as the piston moves outward. Thus, the maximum resisting force limit of the unit is a direct function of atmospheric pressure and the area of the piston (F=PA).

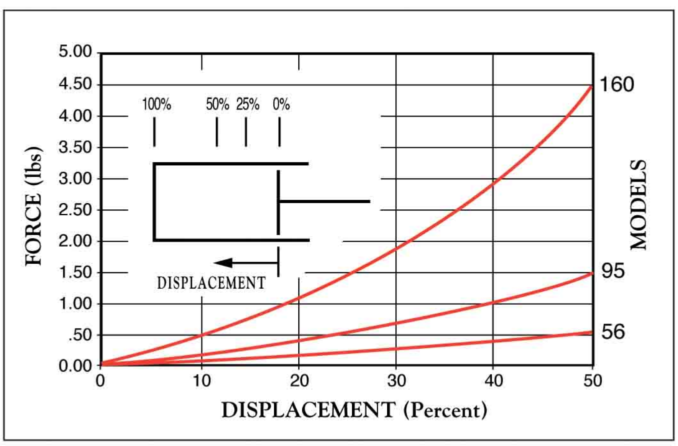
Assuming an equal ambient pressure, larger diameter units will have force limits higher than smaller diameter units; the limits being directly proportional to their piston areas. (Model force limits are summarized in the specifications section.)

In the push damping (compression) direction, air must be compressed into an ever decreasing space; the force can rise to a level which is higher than is possible in the pull damping direction. Therefore, it is possible for a smaller diameter push damping unit to achieve greater resisting forces than a larger diameter pull damping unit. However, stroke lost to compression should be taken into consideration.

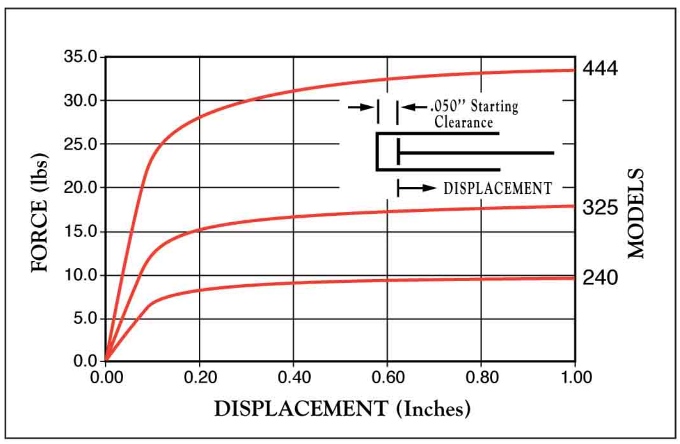
Rate of force rise – air spring characteristic. Damping direction and starting position of the piston

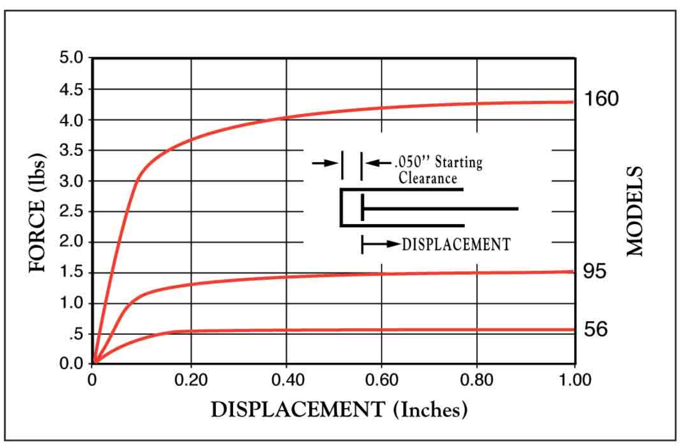
PUSH DAMPING





PULL DAMPING





Air spring distance is least, and force rise is fastest when the piston starts moving from a position as close to the bottom (closed end) of the cylinder as possible, without actually bottoming out, regardless of the direction of damping.

combine to affect the rate of force rise.

In an air dashpot, at the beginning of the stroke, the piston will quickly travel a finite distance with relatively little resistance. We refer to this as "air spring." This occurs until the pressure builds or drops (depending on damping direction) to the point where the exchange of air between the dashpot and the ambient environment is just enough for cylinder pressure to reach and maintain an equilibrium value. (See graphs at left.)

The result of air spring is that it provides a gradual ramping up of damping. Therefore, for practical purposes, the effective damping distance is not the entire stroke length.

Effective damping distance equals the total available dashpot stroke minus the stroke lost to air spring.

The stroke lost to the air spring effect can be approximated by Boyle's Law : $P_1V_1=P_2V_2$. Consider the lost stroke to be the distance required to build to a force in the dashpot which is approximately equal to the applied force.

Air spring does not normally appreciably affect response unless strokes are very short relative to the distance between the piston and Airpot bottom, or forces are very high for the dashpot diameter selected.

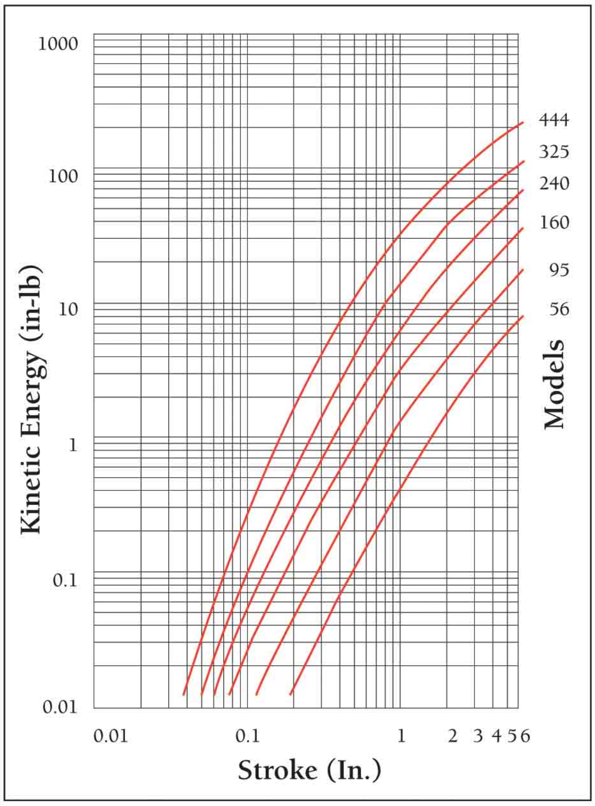
In some cases, particularly for solenoid damping, air spring may actually be helpful since it can allow rapid motion at the beginning of travel and bring the load into a gentle cushion of air at the end of the stroke. Moreover, after motion has stopped, any force remaining in the air spring will quickly bleed off to zero.

Energy

The main consideration for shock absorber configurations.

Kinetic energy dictates the size requirement when the Airpot unit is to be used in the shock absorber (snubber) configuration.

Maximum energy handling capability is simply a function of the volume of air that is forced out of the dashpot on each cycle. Equal volumes of expelled air will handle equal amounts of energy. Therefore, small diameters with long strokes can equal the energy capability of larger diameters with short strokes. The only difference is the rate at which the energy is dissipated relative to each increment of stroke. (See graph above right.)



Damping Coefficient

Use for time delay applications.

Damping coefficient is almost always the primary determinant for applications where a specific time delay is required.

This is because the coefficient expresses time as it relates to stroke and force:

$$\text{Required Damping Coefficient} = \frac{\text{Force x Time}}{\text{Distance}}$$

Force equals the input to the dashpot, *Time* is the time delay desired of the dashpot, and *Distance* is the stroke used by the dashpot.

In the English system of units, the damping coefficient is expressed as:

$$\frac{\text{lbs} \bullet \text{s}}{\text{in}}$$

Often, it is written as:

$$\frac{\text{lbs}}{\text{in/s}}$$

We typically express this as "pounds per inch per second".

This ratio expresses the dashpot's resistance to motion, given the rate of air leak inherent in the dashpot. With a closed orifice, the dashpot's leak becomes a function of clearance around the piston.

Damping ratings for each model are shown in the performance specification section. The ratings represent guaranteed minimums with a closed orifice. It is common for most units to have damping capabilities in excess of the ratings.

It is important to understand that the damping coefficient is a ratio, and the rating of any dashpot does not imply an absolute amount of force which the dashpot is capable of resisting.

For example, a rating of 50 lbs/in/sec does not mean that the dashpot can resist a 50 lb load. It only means that a one pound load would take 50 seconds to travel one inch, and a 5 pound load would take

10 seconds, and so forth. All computations must be scaled to accommodate the maximum force and stroke limitations of the dashpot model selected.

When calculating the required damping coefficient, it is important to consider the air spring characteristics of the model selected. It is helpful to review the Air Spring explanation (pg. 5) and use the effective damping distance in the coefficient formula, and ***not*** the total available stroke. Please contact Airpot's engineering department if you'd like assistance.

Damping Direction

The choice of damping direction depends on several variables:

1. **Force or energy to be applied to the Airpot unit –** Select a model whose diameter can provide the required force in the desired direction of damping. If this is a shock absorption application, determine the stroke/diameter combination that will provide the required energy capability.
2. **Space available for mounting the Airpot unit –** Space must accommodate the diameter and stroke required to achieve desired Airpot damping performance in the damping direction selected.
3. **Rate of force rise in the Airpot damping unit –** Can the application tolerate some gradual force buildup (as in the compression direction), or must the resisting force be immediate (as in the pull direction)?
4. **Partial stroke damping –** If damping is desired only at the *beginning* of the stroke, a pull damping unit with a port in the side of the cylinder will provide damping until the piston passes the port.

   If damping is needed only near the end of the stroke and the stroke is long, a push damping dashpot with a port in the side of the cylinder will provide damping only after the piston passes the port.

   If the stroke is long but damping is required only near the end, a shock absorber (snubber) configuration might be more suitable than the dashpot, since it does not have to be connected throughout the entire stroke of the mechanism being damped.

Orifice – adjustable or non-adjustable

Non-adjustable units are more economical and less vulnerable to tampering than adjustable units. However, for a non-adjustable unit to be used, the application must be able to tolerate a range of damping variation from unit to unit. The degree of variation experienced will depend on the specific damping values required by the application and the diameter of the Airpot unit selected.

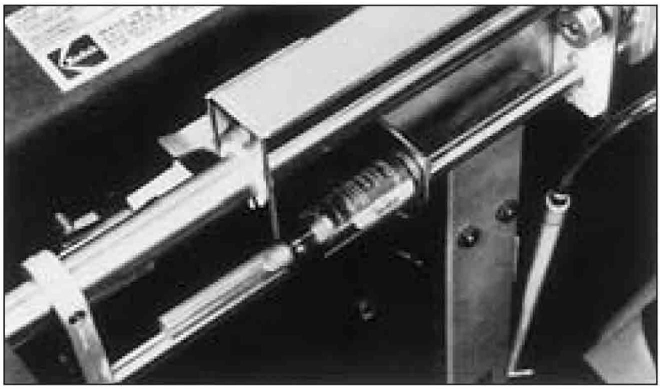
To evaluate the possibility of using a fixed orifice unit, the damping variation range acceptable in the application must first be determined empirically in functional tests. The process is simple.

Design engineers interested in exploring the possibility of using non-adjustable units should contact an Airpot application engineer for assistance.

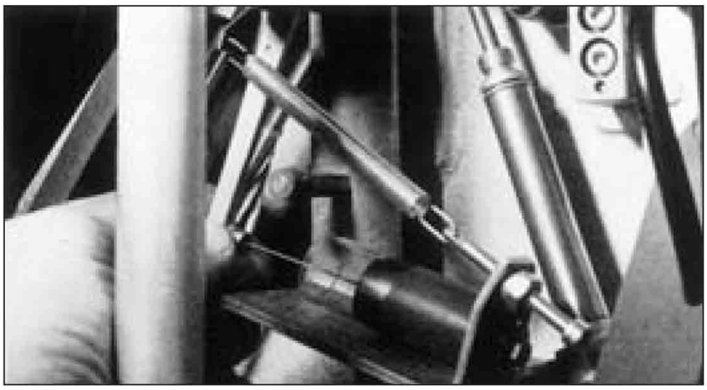
Dashpot Rod selection

Strength considerations. Airpot offers several choices of connecting rods for most models. Usually, the primary selection criterion will be strength required for the application.

If the dashpot must provide damping in the push direction, the rod will experience compressive forces and its buckling strength will



Snubbing paper carrier in an office copier.



Tension arm damping in a professional video recorder.

be a function of its diameter and length. Check the rod buckling curves (below) to determine the best size rod, considering the forces and length being used in the application.

If the dashpot is damping in the pull direction, the rod's yield strength is the main consideration. All Airpot connecting rods are capable of withstanding any load applied in the tensile direction which does not exceed the force of atmospheric pressure on the piston.

Rod End selection

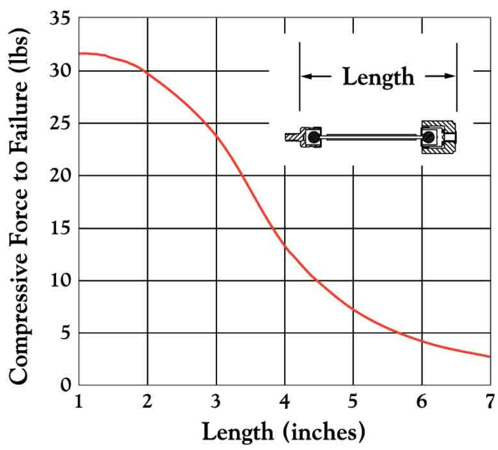
Mounting configurations. Choosing the right rod end can greatly facilitate mounting as well as avoid friction and wear in the mechanism being damped. Standard choices are: plain end, loop or rod eye (depending on rod diameter), threaded ball joint, and threaded plain end.

Ball joints are the most forgiving of off-axis alignments, allowing angular motion up to 30 degrees, (+/-15) and 360 degrees of rotation about the rod's longitudinal axis. All dashpots come standard with rod end ball or pin link joints.

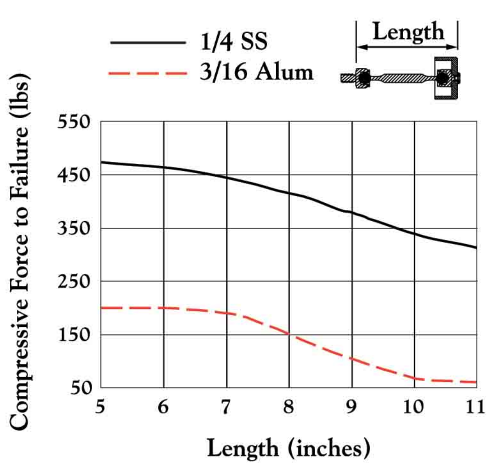
Loops and rod eyes are useful for attachment with pins or shoulder screws and allow for rotational motion of the connected piece. When using either of these methods, some side motion should be afforded.

Plain ends and threaded plain ends are the least forgiving of misalignment unless there is some freedom of X and Z axis movement in the piece to which they are being attached (assuming piston travel is considered to be in the Y axis).

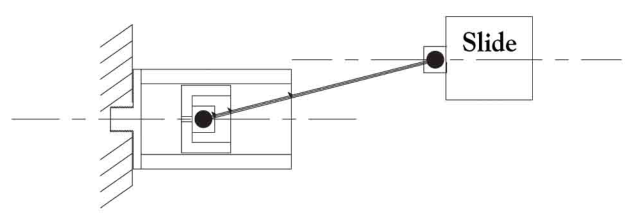
Rod N (.058″ OD SS Tube) with Two Ball and Socket Joints



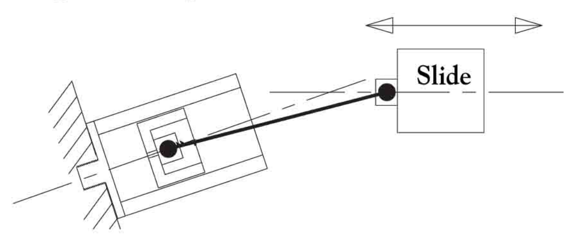
Rod T (3/16" OD Aluminum or 1/4" Stainless Steel) with Two Ball Joints



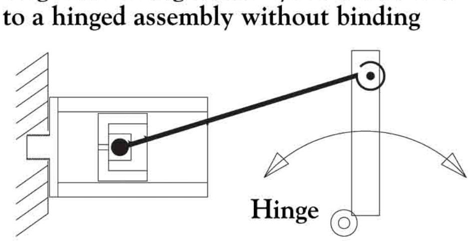
Two ball and socket joints compensate for parallel misalignment



Two ball and socket joints compensate for angular misalignment



Ball joint or pin joint used with loop or rod eye allows for rigid mounting of the cylinder and rod attached to a hinged assembly without binding



Dependable *service*

The success of every Airpot application depends on more than the reliability of our components. It is equally important to choose the best device and configuration for your needs, and implement it properly.

We recognize that the kinds of motion problems our engineers work with every day may be experienced only occasionally by any other engineer. Therefore, our expertise and background of thousands of applications will help ensure that you save time and energy in meeting your motion control requirements, even if it means directing you to products made by another manufacturer.

To insure that you receive the most value and satisfaction from Airpot products, we are always eager to provide skilled, cooperative application engineering. From the moment you contact us to explore possibilities, to the production of all your machines in which Airpot components are used, an Airpot engineer will be assigned to your application. Every step of the way, the goal will be to enhance the performance of your product, while helping to make your design responsibilities easier, faster, and less expensive to accomplish.

But expert technical assistance is only the beginning of our service. The foundation of our service policy is to keep our promises to our clients. And this begins with delivering the promised level of quality, at the promised time. If circumstances beyond our control should interfere with our pledge, we will take every possible measure to alleviate any inconvenience to our clients. This includes informing our clients about any impending disruptive situation — ahead of time.

It is also our policy to do everything we can to assist with your ordering needs.

This includes JIT and ship-to the-line deliveries, liberal order rescheduling and cancellation policies, credit card purchases and ***RAPID*** response to all inquiries, requests, and emergency situations.

At Airpot, we are committed to making applications of our products work to their fullest potential.

Quality and *warranty*

Properly selected and applied Airpot products are among the most reliable and consistently high quality mechanical components that you will ever use. Every Airpot unit must pass a host of in-process checks, including functional tests to insure that each one meets the high standards that we promise.

We are so confident with our quality that we back up our promise with a solid warranty. For one full year following the date of manufacture, we will provide replacement units for any properly used Airpot found to be defective or that failed to meet published or otherwise agreed upon specifications.

Specifications and *ordering*

1

Airpot Performance *specifications*

MODEL	56	93	160	240	325	444
BORE *(inches)*	0.22	0.366	0.627	0.945	1.281	1.75
PISTON AREA *(sq inches)*	0.038	0.105	0.309	0.701	1.289	2.405

FORCE CAPACITY GUIDELINES**

PULL DAMPING DIRECTION: *lbs force (starting from fully retracted position)*	0.5	1.4	4	9	17	30
PUSH DAMPING DIRECTION: *lbs force (starting from fully extended position)*	0.35	1	3	7	13	24

**NOTE: *Best performance for each model will be achieved at or below input forces shown above.*
Maximum force capability is higher and is based on % of available volume displaced. Please see page 5.

APPROXIMATE ENERGY CAPACITY AT REFERENCE STROKES

AT STROKE=	1 in	3 in	1 in	3 in	1 in	3 in	1 in	3 in	1 in	3 in	1 in	3 in
PULL DAMPING DIRECTION: *inch-lbs*	.22	.75	.64	2.2	1.8	6.1	4.1	14	7.5	26	14	48
PUSH DAMPING DIRECTION: *inch-lbs*	28	1.5	.80	4.2	2.2	12	5.2	27	9.5	50	18	93

DAMPING COEFFICIENT RANGE

FORCE/VELOCITY: *lbs/(in/sec)*	0-0.5	0-2	0-5	0-30	0-40	0-40

NOTE: *Higher damping rates are available. Please consult an Airpot applications engineer.*

MAX LEAK AT REFERENCE PRESSURES FOR ACTUATOR MODELS

AT PRESSURE PSI =	65	125	50	100	50	100	50	100	50	100	50	100
MAX. LEAK RATE: *SL/min*	.190	.570	.36	1.17	7.4	2.78	1.06	5.60	2.12	9.6	3.6	15.0

NOTE: *Lower leak rates are available upon request. Please consult an Airpot applications engineer.*

OTHER SPECIFICATIONS

FRICTION COEFFICIENT	0.2	0.2	0.2	0.2	0.2	0.2
PISTON FRICTION *(without side load): grams*	< 1	< 1	< 1	< 4	< 8	< 8
OPERATING TEMPERATURE RANGE*	-55C to +150C	-55C to +150C	-55C to +150C	-55C to +150C	-55C to +150C	-55C to +150C
MAX. PRESSURE RATING *(for actuator use): psi*	125	100	100	100	100	100

*NOTE: *If operating at temperatures over 70°C (158°F) please advise factory.*

COMPONENT WEIGHTS

Fixed mass in grams (cylinder, bottom, etc.) = (C1 x stroke) + C2	C1	1.2	2.9	6.1	11.5	17.5	25.7
	C2	6.4	8.9	13.6	40.6	60.3	82.1
Movable mass in grams (piston and rod) = (C3 x stroke) + C4	C3	0.2	0.4	0.4	1.3	6.3	6.3
	C4	1.4	2.8	4.3	8.3	13.6	31.6

2

Ordering *guidelines*

The data sheets for the above models show the stock and custom configuration details for each model. Here are some simple guidelines to consider when deciding between a stock or custom unit:

Stock Configurations

Model numbers begin with 2KS

If you require fewer than 25 units or need just a few in a hurry, a stock (preconfigured) unit will be the fastest to obtain — usually withing five working days. Airpot stocks a variety of configurations designed to satisfy most applications.

Order quantities of 25 units or more are placed in our standard production schedule with deliveries of three to six weeks.

Custom Configurations

Model numbers begin with 2K

If you prefer to select a non-stock configuration, Airpot accepts orders in any quantity for custom units configured from any of the options shown on the data sheet. Delivery for most custom units will range from two to six weeks depending on the quantity, and there is no pricing premium for ordering these custom units.

We are also happy to work with customers on special designs that may require non-standard parts. Price and delivery for non-standard designs are quoted on a case-by-case basis.

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CUSTOM DASHPOT Call (800) 848-7681 • Fax (203) 849-0539 • e-mail: sales@airpot.com • www.airpot.com **Airpot**

Model
2K56
See reverse for stock models selection

Specifications

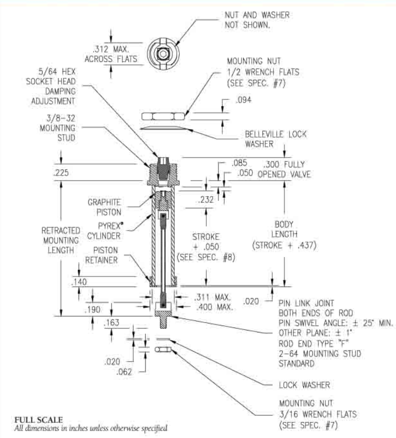
Bore: .220" (5.59 mm)

PERFORMANCE

1. **Damping Coefficient**
   0–0.5 lb/(in/s) adjustable
   0–0.8 N/(mm/s)
2. **Force Guidelines**
   Pull Damping: .50 lb max (2.22 N)
   Push Damping: .35 lb max (1.55 N)
3. **Friction**
   Coefficient: 0.2
   Force without side load: < 1 g
4. **Operating Temperature Range**
   -55°C to +150°C
   If operating at temperatures above +70°C, please advise factory.

MOUNTING DATA

5. **Mounting Hole**
   Rectangular: .312" x .375" or 8 mm x 10 mm
   Round: .375" or 10 mm
6. **Suggested Mounting Bracket Thickness**
   .060"–.125" (1.52–3.18 mm)
7. **Mounting Nut Torque**
   Head: 4–8 in-lb (0.45–0.90 Nm)
   Rod End: 1–3 in-lb (0.11–0.34 Nm)
8. **Stroke**
   Full stroke is obtained with customer held mounting tolerance of ± .015" (0.38 mm).



FULL SCALE
All dimensions in inches unless otherwise specified

Custom Part Description Fill in the blank boxes at the right with choices from the list below. *Example: Model 2K 56 A 1.5 N F 2.00 K*

	MODEL 2K56
DAMPING DIRECTION TWO-WAY DAMPING .... **A**	**A**
STROKE MIN = .125 inch **Specify increments of 0.125 inch**	
ROD TYPE .058 DIA. S.S. – STANDARD .... **N**	**N**
ROD END PIN LINK 2-64 THD .... **F** LOOP WITH .156 ID BUSHING .... **Y** PLAIN .... **W**	Choose One
RETRACTED MOUNTING LENGTH MINIMUMS BY ROD END TYPE **Specify to x.xxx** **F** 1.360 **Y** 1.360 **W** 1.360	
OTHER OPTIONS EPDM PROTECTIVE CASE .... **K** SIDE PORT (include location i.e. Rx.xxx) .... **R**	Choose One

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1.4 Airpot is a registered trademark of Airpot Corporation. Pyrex is a registered trademark of Corning Glass Works. APC-12/00F

This section contains the specifications and data you need to select the appropriate Airpot model for your application.

How To Use This Section

See **Airpot Performance Specifications** 1 on the back of this tab to identify a basic model that meets your performance requirements.

Note the **Ordering Guidelines** 2 shown on the lower section. They will help you decide between an off-the-shelf (stock) model or a custom unit.

Go to the tabbed product section and find the divider for that model and review the data sheet 3. The data sheet contains the dimensional details and additional performance and mounting information.

Choose the configuration options you need from those shown on the data sheet 4 and detailed in the chart on the back of the divider 5. The part description will become obvious. For example: 2K56A1.0NF

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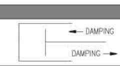
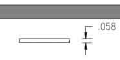
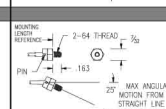
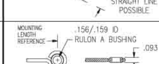
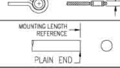
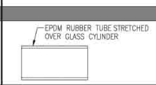
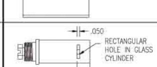
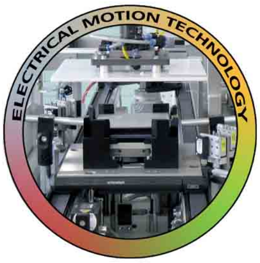
CONFIGURATION OPTIONS FOR DASHPOT MODELS 2KS56 AND 2K56

Please see the model specification sheet to define the specific model you require.

	OPTIONS	DRAWING	MODELS		COMMENTS and OTHER SPECIFICATIONS
			STOCK	CUSTOM	
	DASHPOT DAMPING DIRECTION		2KS56	2K56	
A	TWO -WAY		STANDARD	STANDARD	
	STROKE				
	MIN (inch)		0.5	0.125	Please specify to .125 inch for custom models if possible.
	MAX (inch)		2.0	11.0	Please consult factory if longer strokes are required.
	ROD TYPES				
N	.058 DIA.ROD – 304 STAINLESS STEEL		STANDARD	STANDARD	
	ROD ENDS				
F	PIN LINK WITH 2-64 THREAD		CHOICE	STANDARD	
Y	LOOP WITH .156 ID REMOVABLE RULON BUSHING		CHOICE	OPTIONAL	Requires Rod Type N.
W	PLAIN END			OPTIONAL	
	MOUNTING LENGTH				
	See Model Spec Sheet for Reference Points and Minimums		PER SPEC SHEET	SPECIFY TO X.XXX	
	ACCESSORIES				
K	IMPACT RESISTANT CASE – EPDM			OPTIONAL	
R	CYLINDER PORT (CROSS SLOT)			OPTIONAL	

12.1 *Airpot Corporation (800) 848-7681 fax: (203) 849-0539 e-mail: sales@airpot.com www.airpot.com* APC-01G



We look forward to your application.

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