

SPRINGFIX[®] LINKAGES

...our linkages, your solution

Air Cylinders





Dashpots

A motion damping device that reduces velocity, vibration and oscillation in dynamic mechanisms. Load attaches to piston of dashpot. Level of damping is adjustable by hand.

Sizes: Bore sizes 0.22" to 1,750".



Pages 300 - 307

Actuators

Uses the same frictionless technology as the dashpots but provides the force/movement in an application rather than damping it.

Sizes Bore sizes 0.22" to 1,750".



Pages 309 - 315

Shock Absorbers

A motion damping device that reduces velocity, vibration and oscillation in dynamic mechanisms. Load strikes piston rod. Level of damping is adjustable by hand.

Sizes Bore sizes 0.627" to 1,750".



Pages 317 - 320

Cylinders/Piston Sets

The technology used in our dashpots. Cylinder/Piston sets are available on their own to put into your own design.

Sizes Bore sizes 0.22" to 1,750".



Pages 321 - 326

What is a dashpot?

A 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.

Dashpots/shock absorbers

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.

These are motion damping devices that reduce 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 of a dashpot or shock absorber

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

Why chose one of our dashpots/shock absorbers over other damping devices?

- Unparalleled low friction, responds to forces as low as only a few grams, and it's smooth.
- Starting and running friction are almost identical preventing jerky, uncontrolled starts.
- It has a life span of multi-millions of cycles.
- No seals are required and there are no liquids to leak.
- It is made of self lubricating materials.
- It's precise and accurate, easily adjustable over a 10,000 to one range, and it allows fine adjustments at installation.
- They can operate at extreme temperatures.
- The piston and cylinder will not rust, corrode or deteriorate over time.
- It's lightweight.
- Can be easily customised to suit space and special performance requirements.

Actuators

Actuators have many of the same features of the above dashpots, but rather than damping the force, actuators provide the force/movement in an application.

What type of applications benefit most from these special capabilities?

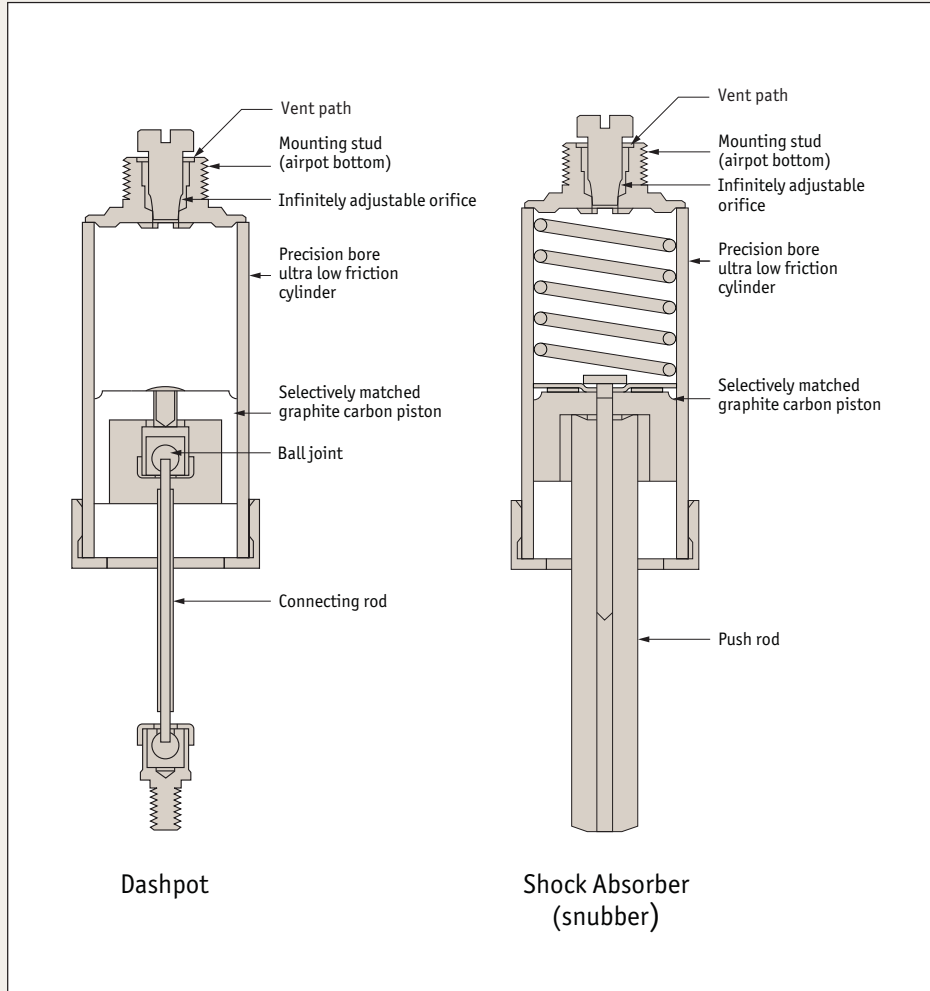
Any kind where these conditions are present:

- 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.



How they work

All our 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.

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

Dashpots from Springfix Linkages

(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

Allows the level of damping to be controlled by hand using either a screwdriver or adjustment screw. These are the most popular type where forces or energy levels can vary or are only approximately known.

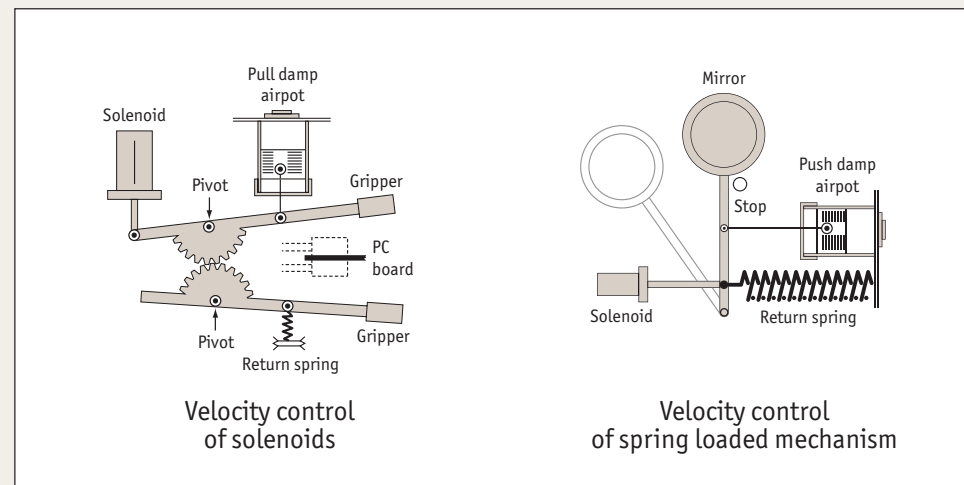
Fixed orifice

These can be set at a pre-defined dumping rate at the factory and are tamper proof.

Velocity control of solenoids

It is often desirable to slow a solenoid down to avoid a crash or high impact on closure. The dashpot 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 dashpot controls a solenoid which positions the grippers. The dashpot 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. Dashpot damping develops an opposing force to limit this velocity to a desired value.

In laser equipment (as shown below left), a push damp dashpot controls a mirror as it swings into position. The dashpot 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 dashpot provides a high ratio of damping-to-friction force.

In magnetic tape duplicators (as shown above), a two-way damping dashpot 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 a dashpot also improves the response during start-up acceleration. In high speed fibre optic filament, wire, and textile winders, a dashpot is ideal where oscillation of tension idlers can cause broken filaments.

Oscillating valve damping

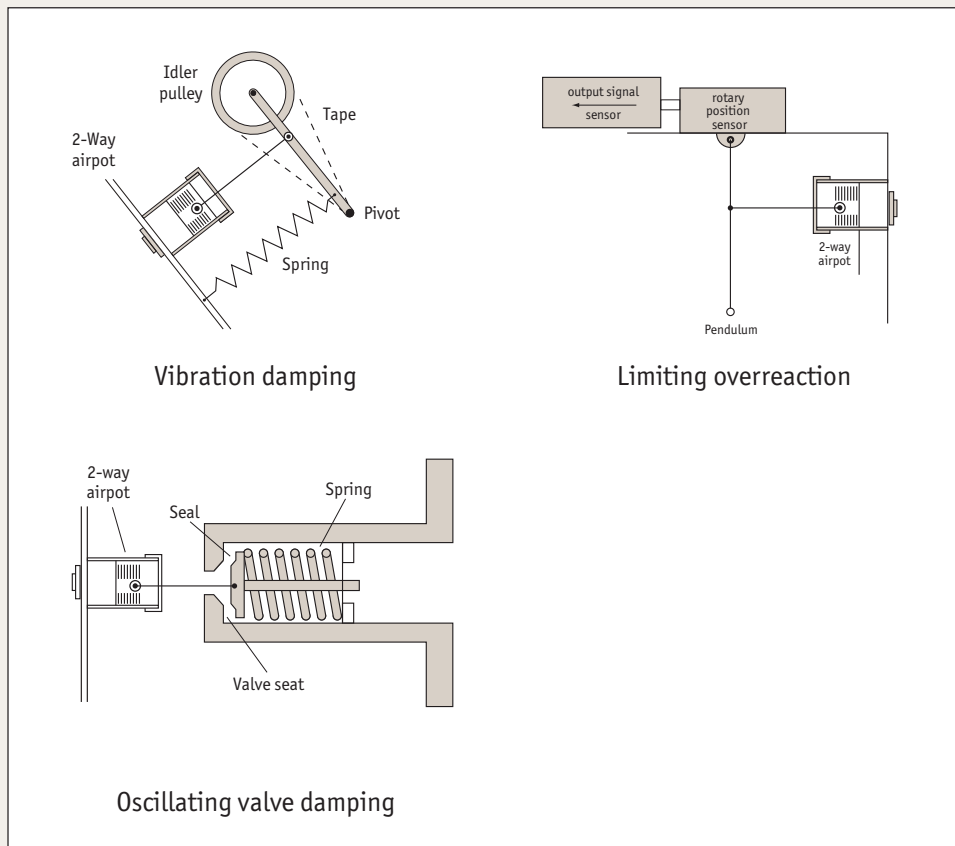
Poppet and check valves can naturally resonate, causing unwanted noise, pressure/flow fluctuations, or wear. These problems can be eliminated by precise damping.

In pneumatic valves (as shown above), a dashpot reduces the amplitude of oscillation without affecting the cracking pressure or positioning of the poppet. With dashpot's low mass, virtually frictionless motion, and minimal air spring at low forces, the steadystate 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. The dashpot is velocity sensitive and resists these surges, providing more consistent operating conditions and preventing damage.

In sensitive, tilt-sensing instruments, a two-way damping dashpot prevents the pendulum from reacting violently to sudden changes, stabilising it but allowing it to move smoothly with angular change. In sensitive scales, dashpots protect against loading shock without interfering with measurement. In magnetic tape handling equipment, dubbars, motion picture projectors, and film duplicators dashpots provide protection where high speed stop and start can lead to overshoot, fouling, and backlash.



Dashpots from Springfix Linkages

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Creating time delay

Dashpots offer reliable timing control for non-electrical systems and for electrical systems requiring non-electrical backup. In a commercial sprinkler system a pull damping dashpot 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 a dashpot 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 Springfix shock absorber configuration is particularly useful. It performs push damping only and the push rod is not connected to the work.

In office copiers (as above), a Springfix shock absorber 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 shock absorber returns the spring and 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 orifice, the dashpot is capable of acting as a pneumatic actuator, providing smooth precise positioning.

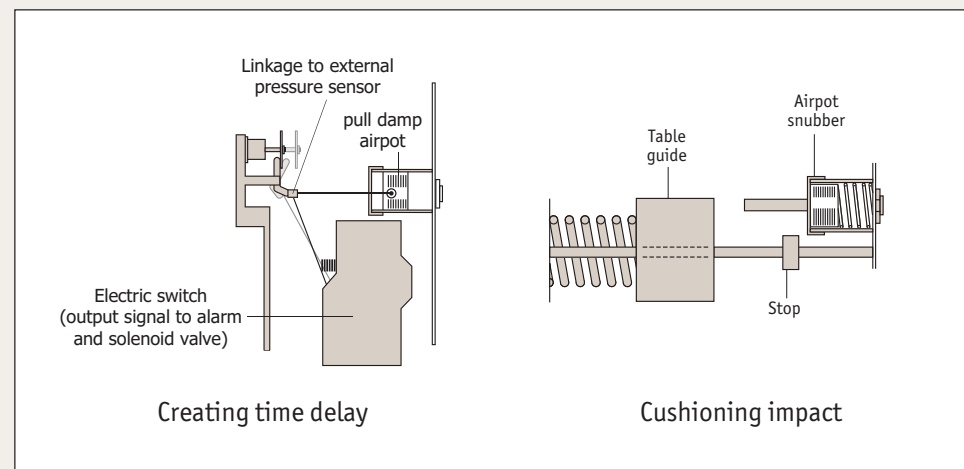
In high speed filament winders (as shown above), Springfix actuators are part of a force control system to maintain proper filament tension. The ultra-low friction actuators provide precise, hysteresis-free force control in response to small pressure or vacuum changes directed by the controller. In automatic assembly and semiconductor equipment, it smoothly dispenses and positions parts.

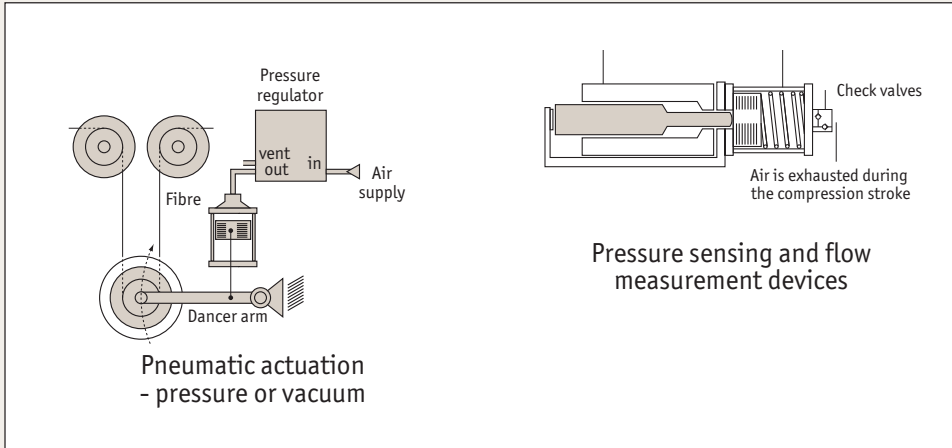
Designing your own pumping, pressure sensing, and flow measurement devices

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

For example, fitted with a hose barb, the Springfix 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 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 Springfix application engineers are available to assist customers who have these special requirements.





Model selection is based on the following criteria

Force

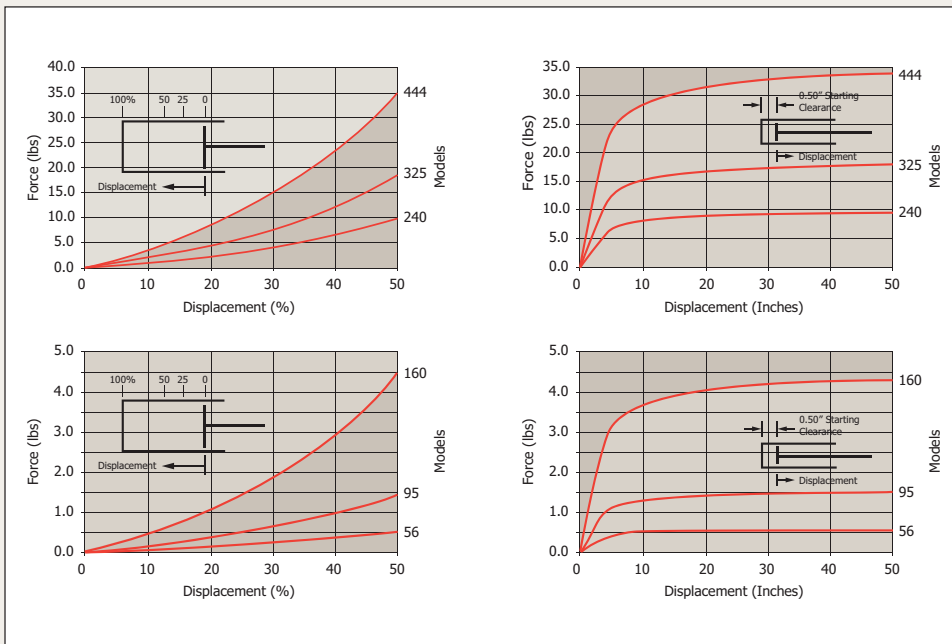
The primary consideration for dashpot configurations and all applications involving vibration, time delay, and velocity control.

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 dashpot is used in the 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 Springfix 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 ($F=PA$).



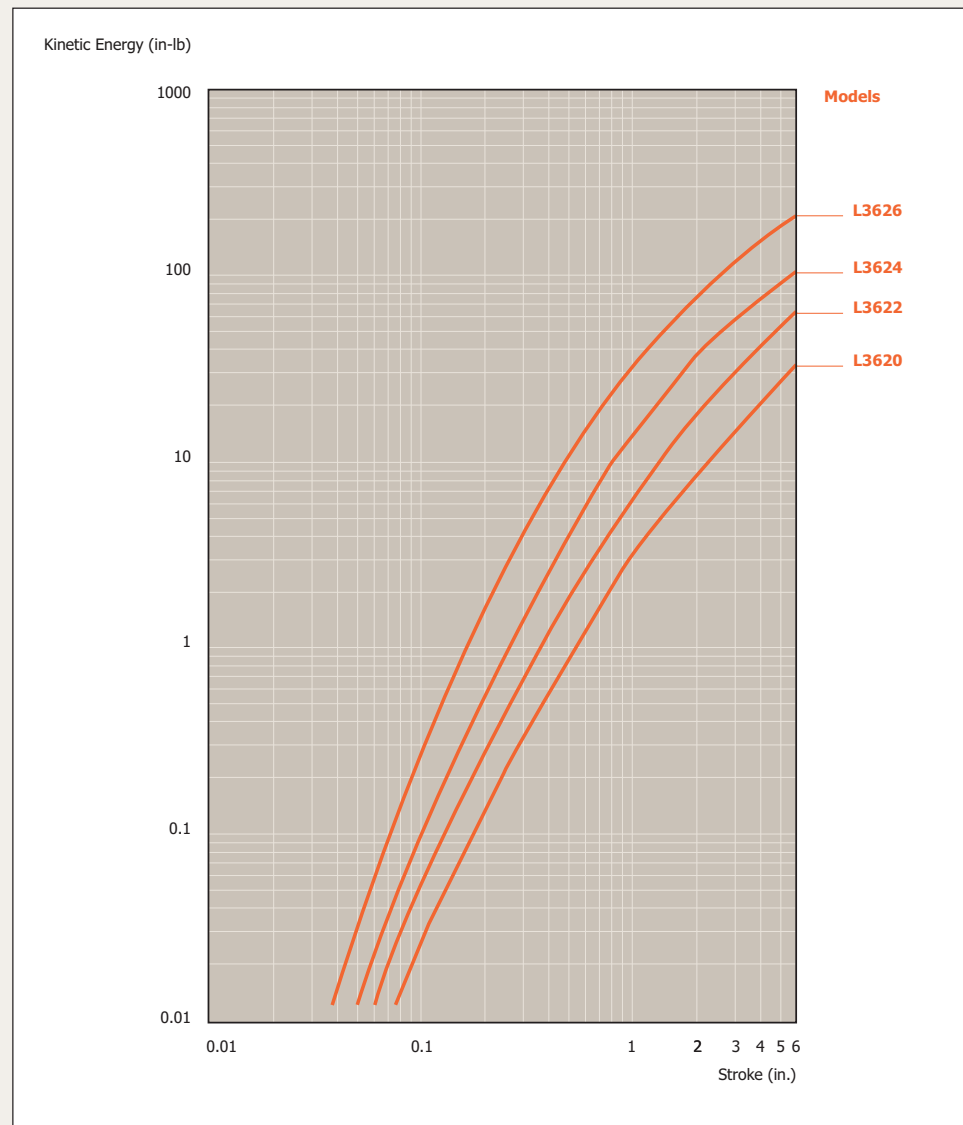
Dashpots from Springfix Linkages

Energy

The main consideration for shock absorber configurations

Kinetic energy dictates the size requirement when the dashpot 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.



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:

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



'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:

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

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.

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.

Damping direction

The choice of damping direction depends on several variables:

1 Force or energy to be applied to the 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 unit

3 Rate of force rise in the 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. 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 dashpot 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.

Samples and specials

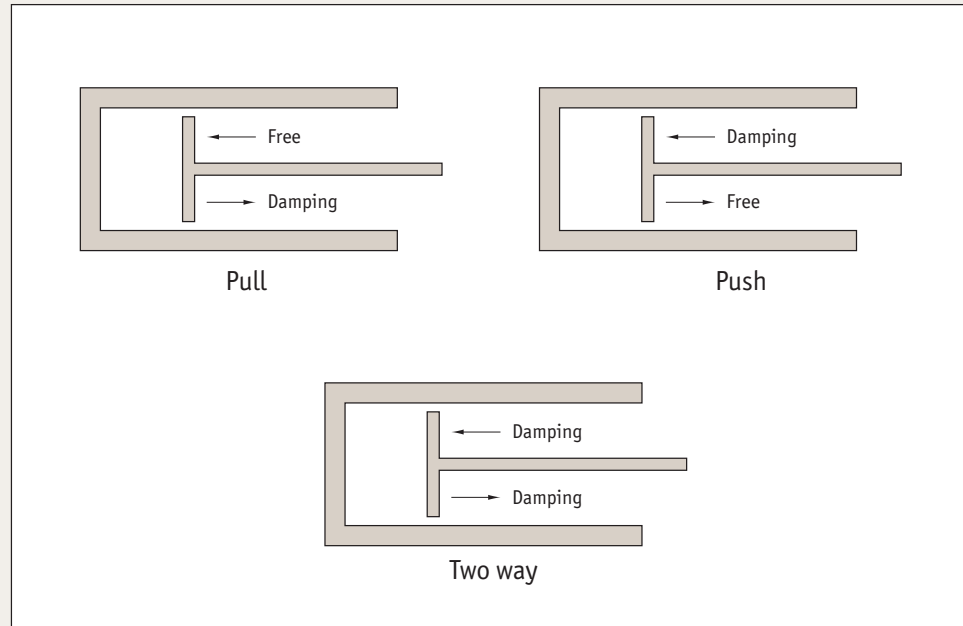
We can also supply just the cylinder/piston combinations should you wish to use the same technology but designed into your own application. We have a range of stock sizes but often design and produce specials to your individual requirements. Contact us with details of your application and we will advise you of the best solution.

The precision and response of our products are difficult to appreciate until you actually hold one in your hands, so we are offering a free sample. Contact us by either fax or email to request your free sample.

Linkages

Technical drawings for the end linkages used on dashpots are on the following pages. Only certain end linkage options are available for each dashpot. Please check the product page for information as to which linkages are available. Not all rod end linkages are available on all dashpots. Rod end linkage available as stated on each individual product.

Dashpot damping directions





Dashpot performance specifications

Helpful guideline

For continuous damping, choose bore size by the force acting upon the dashpot. For impact absorption, choose by the kinetic energy to be dumped.

Compare stock vs custom

Model	L3570	L3572	L3574	L3576	L3578	L3580
Bore (inches)	.22	.366	.627	.945	1.281	1.75
Strokes available - stock units (inches)	.5, 1.0, 1.5, 2.0	.5, 1.0, 1.5, 2.0	.5, 1.0, 1.5, 2.0, 3.0	.5, 1.0, 2.0, 3.0	.5, 1.0, 2.0, 3.0	.5, 1.0, 2.0, 3.0
Stroke range - custom units (inches) (any x.xxx)	.125 - 11.0	.125 - 11.0	.125 - 13.0	.125 - 12.0	.125 - 10.0	.125 - 8.0
Fixed stroke for snubber units (inches)	n/a	n/a	1.5	2	2	2
Force capacity guidelines**						
Pull damping direction in lbs force (starting from fully retracted position)	.5	1.4	4	9	17	30
Push damping direction in lbs force (starting from fully extended position)	.35	1	3	7	13	24

**Note: Best performance for each model will be achieved at or below input forces shown above. Maximum force capacity is higher and is based on % of available volume displaced.

Approximate energy capacity at reference strokes						
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 in inch-lbs	.22/.75	.64/2.2	1.8/6.1	4.1/14	7.5/26	14/48
Push damping direction in inch-lbs	.28/1.5	.80/4.2	2.2/12	5.2/27	9.5/50	18/93
Snubber models to standard stroke (ft-lbs)	n/a	n/a	0 - .3	0 - .75	0 - 3	0 - 7
Damping coefficient range						
Force/velocity: lbs/(in/sec)	0 - .5	0 - 2	0 - 5	0 - 30	0 - 40	0 - 40

**Note: Higher damping rates available, please contact our Technical Department for more information.

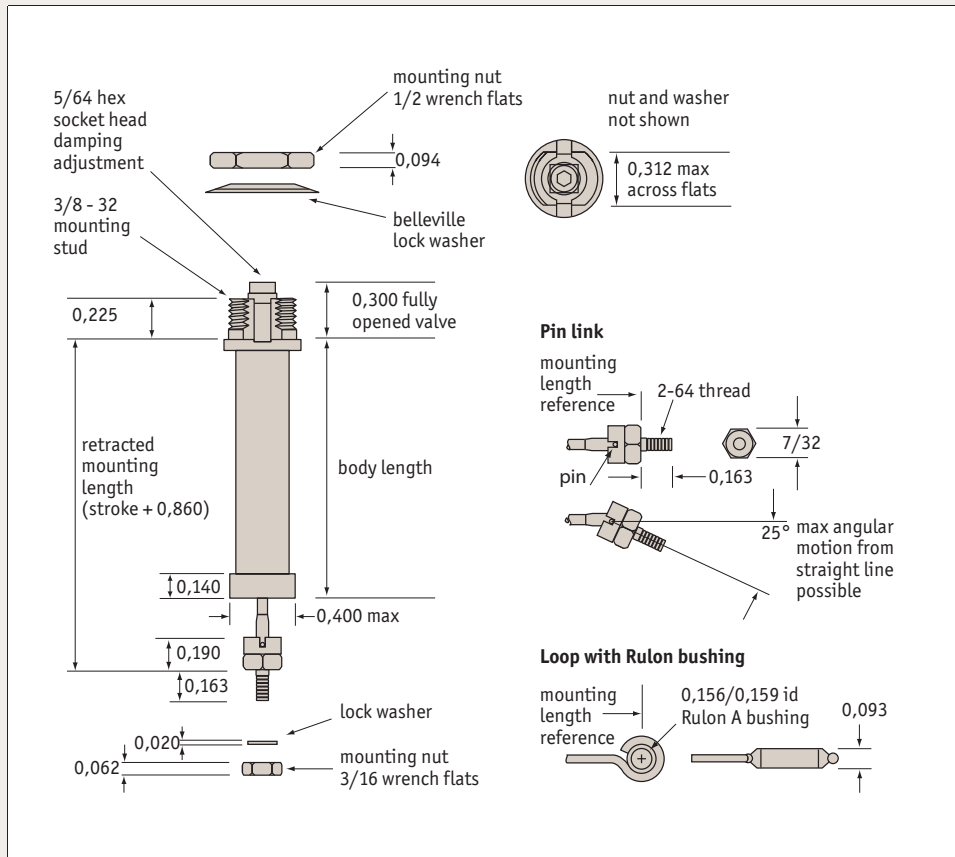
Other specifications						
Frictional coefficient	.2	.2	.2	.2	.2	.2
Piston friction when horizontal (without side load): grams	<1	<1	<1	<1	<4	<8
Operating temperature range*	-55° to +150°C	-55° to +150°C	-55° to +150°C	-55° to +150°C	-55° to +150°C	-55° to +150°C

**Note: If operating at temperatures over 70° C (158°F) please contact us first.

Component weights						
Fixed mass in grams	C1	1.2	2.9	11.5	17.5	25.7
(cylinder, bottom, etc) = (C1 x stroke) + C2	C2	6.4	8.9	40.6	60.3	82.1
Movable mass in grams	C3	.2	.4	1.3	6.3	6.3
(piston and rod) = (C3 x stroke) + C4	C4	1.4	4.3	8.3	13.6	31.6



L4570



Material

Graphite carbon piston.
Annealed borosilicate glass cylinder.
Precision fire-polished bore.
Stainless steel piston rod (AISI 304)

Technical Notes

Damping coefficient = 0-0,16 N/(mm/s).
Friction coefficient = 0.2.
Force without side load: <1g.
Operating temperature range: -55°C to 150°C.

* If operating temperature is above +70°C, please advise at time of ordering.

Important Notes

Mounting data:
Mounting hole:
Rectangular = 0.312 x 0.375 (8mm x 10mm)
Round = 0.375" (10mm)
Suggested mounting bracket thickness = 0.06 - 0.125 (1.52mm - 3.18mm)
Mounting nut torque:

Head = 4-8 in-lb (0.45 - 0.90 Nm)
Rod end = 1-3 in-lb (0.11-0.34 Nm)

Full stroke is obtained with customer held mounting tolerance of ±0.015" (0.38mm).

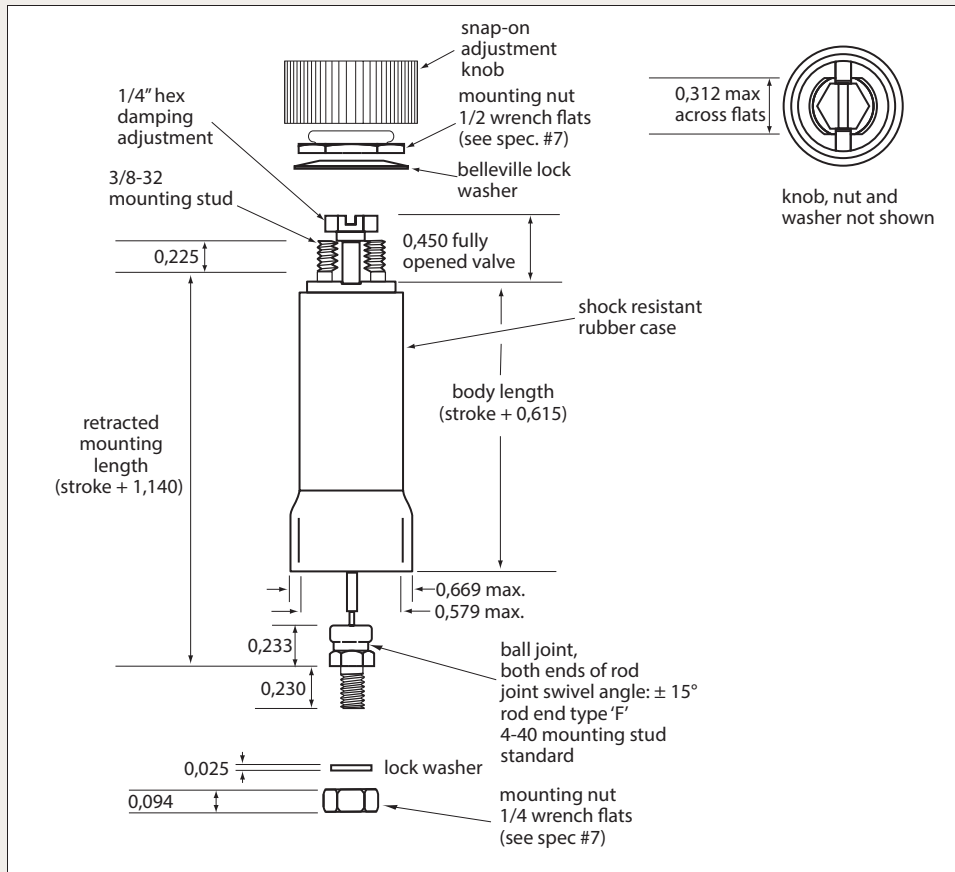
Level of damping is adjustable by hand. If you know the level of damping required we can pre-set this in the factory.

Order no.	Stroke	Rod end linkage	Bore size	Max. pull damping force N	Max. push damping force N	Body length
L4570.A0500	0,5"	Pin	0,22"	2,22	1,55	0,937"
L4570.A1000	1,0"	Pin	0,22"	2,22	1,55	1,437"
L4570.A1500	1,5"	Pin	0,22"	2,22	1,55	1,937"
L4570.A2000	2,0"	Pin	0,22"	2,22	1,55	2,437"
L4570.B0500	0,5"	Loop	0,22"	2,22	1,55	0,937"
L4570.B1000	1,0"	Loop	0,22"	2,22	1,55	1,437"
L4570.B1500	1,5"	Loop	0,22"	2,22	1,55	1,937"
L4570.B2000	2,0"	Loop	0,22"	2,22	1,55	2,437"

Push/Pull Dashpot

0.366" bore

Dashpots



L4572

Material

Graphite carbon piston.
 Annealed borosilicate glass cylinder.
 Precision fire-polished bore.
 Stainless steel piston rod (AISI 304)
 Shock resistant rubber case.

Technical Notes

Damping coefficient = 0-0,44 N/(mm/s).
 Friction coefficient = 0.2.
 Force without side load: <1g.
 Operating temperature range: -55°C to

150°C.

*If operating temperature is above +70°C, please advise at time of ordering.

Important Notes

Mounting data:
 Mounting hole:
 Rectangular = 0.312 x 0.375 (8mm x 10mm)
 Round = 0.375" (10mm)
 Suggested mounting bracket thickness = 0.06 - 0.125 (1.52mm - 3.18mm)

Mounting nut torque:

Head = 4-8 in-lb (0.45 - 0.90 Nm)
 Rod end = 2-5 in-lb (0.23-0.56 Nm)

Full stroke is obtained with customer held mounting tolerance of ±0.015" (0.38mm).

Level of damping is adjustable by hand. If you know the level of damping required we can pre-set this in the factory.

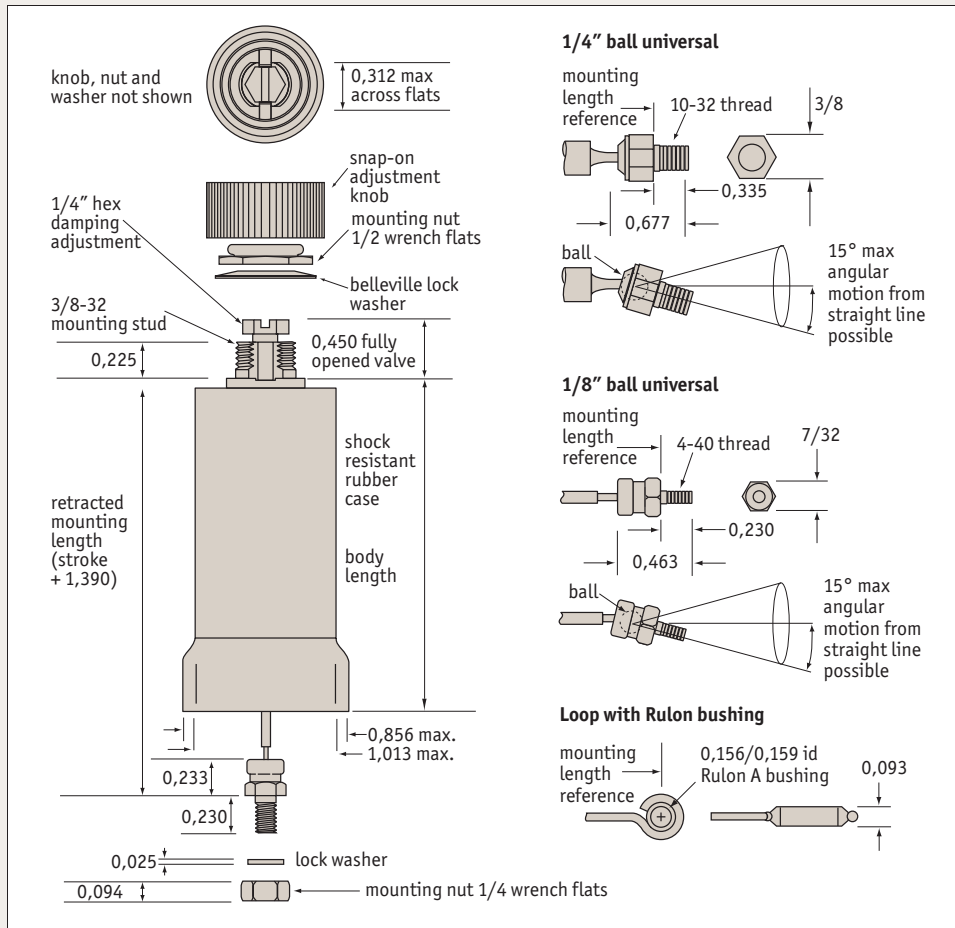
Order no.	Stroke	Damping direction	Rod end linkage	Bore size	Max. pull damping force N	Max. push damping force N	Body length
L4572.A0500-TW	0,5"	Two-way	1/8" Ball	0,366"	6,23	4,45	1,115"
L4572.A1000-TW	1,0"	Two-way	1/8" Ball	0,366"	6,23	4,45	1,615"
L4572.A1500-TW	1,5"	Two-way	1/8" Ball	0,366"	6,23	4,45	2,115"
L4572.A2000-TW	2,0"	Two-way	1/8" Ball	0,366"	6,23	4,45	2,615"
L4572.B0500-TW	0,5"	Two-way	Loop	0,366"	6,23	4,45	1,115"
L4572.B1000-TW	1,0"	Two-way	Loop	0,366"	6,23	4,45	1,615"
L4572.B1500-TW	1,5"	Two-way	Loop	0,366"	6,23	4,45	2,115"
L4572.B2000-TW	2,0"	Two-way	Loop	0,366"	6,23	4,45	2,615"

Order no.	Stroke	Damping direction	Rod end linkage	Bore size	Max. pull damping force N	Max. push damping force N	Body length
L4572.A0500-PL	0,5"	Pull	1/8" Ball	0,366"	6,23	4,45	1,115"
L4572.A1000-PL	1,0"	Pull	1/8" Ball	0,366"	6,23	4,45	1,615"
L4572.A1500-PL	1,5"	Pull	1/8" Ball	0,366"	6,23	4,45	2,115"
L4572.A2000-PL	2,0"	Pull	1/8" Ball	0,366"	6,23	4,45	2,615"
L4572.B0500-PL	0,5"	Pull	Loop	0,366"	6,23	4,45	1,115"
L4572.B1000-PL	1,0"	Pull	Loop	0,366"	6,23	4,45	1,615"
L4572.B1500-PL	1,5"	Pull	Loop	0,366"	6,23	4,45	2,115"
L4572.B2000-PL	2,0"	Pull	Loop	0,366"	6,23	4,45	2,615"
L4572.A0500-PS	0,5"	Push	1/8" Ball	0,366"	6,23	4,45	1,115"
L4572.A1000-PS	1,0"	Push	1/8" Ball	0,366"	6,23	4,45	1,615"
L4572.A1500-PS	1,5"	Push	1/8" Ball	0,366"	6,23	4,45	2,115"
L4572.A2000-PS	2,0"	Push	1/8" Ball	0,366"	6,23	4,45	2,615"
L4572.B0500-PS	0,5"	Push	Loop	0,366"	6,23	4,45	1,115"
L4572.B1000-PS	1,0"	Push	Loop	0,366"	6,23	4,45	1,615"
L4572.B1500-PS	1,5"	Push	Loop	0,366"	6,23	4,45	2,115"
L4572.B2000-PS	2,0"	Push	Loop	0,366"	6,23	4,45	2,615"

Push/Pull Dashpot

0.627" bore

Dashpots



L4574

Material

Graphite carbon piston.
Annealed borosilicate glass cylinder.
Precision fire-polished bore.
Stainless steel piston rod (AISI 304) or Aluminium 2024-T4

Technical Notes

Damping coefficient = 0-1,75 N/(mm/s).
Friction coefficient = 0.2.
Force without side load: < 1g.
Operating temperature range: -55°C to 150°C.

* If operating temperature is above +70°C, please advise at time of ordering.

Important Notes

Mounting data:
Mounting hole:
Rectangular = 0.312 x 0.375 (8mm x 10mm)
Round = 0.375" (10mm)
Suggested mounting bracket thickness = 0.06 - 0.093 (1.52mm - 2.36mm)
Mounting nut torque:
Head = 4-8 in-lb (0.45 - 0.90 Nm)

Rod end = 2-5 in-lb (0.23-0.56 Nm)

Full stroke is obtained with customer held mounting tolerance of ±0.015" (0.38mm).

1/4" ball joint linkage option only available with aluminium rod.

Level of damping is adjustable by hand. If you know the level of damping required we can pre-set this in the factory.

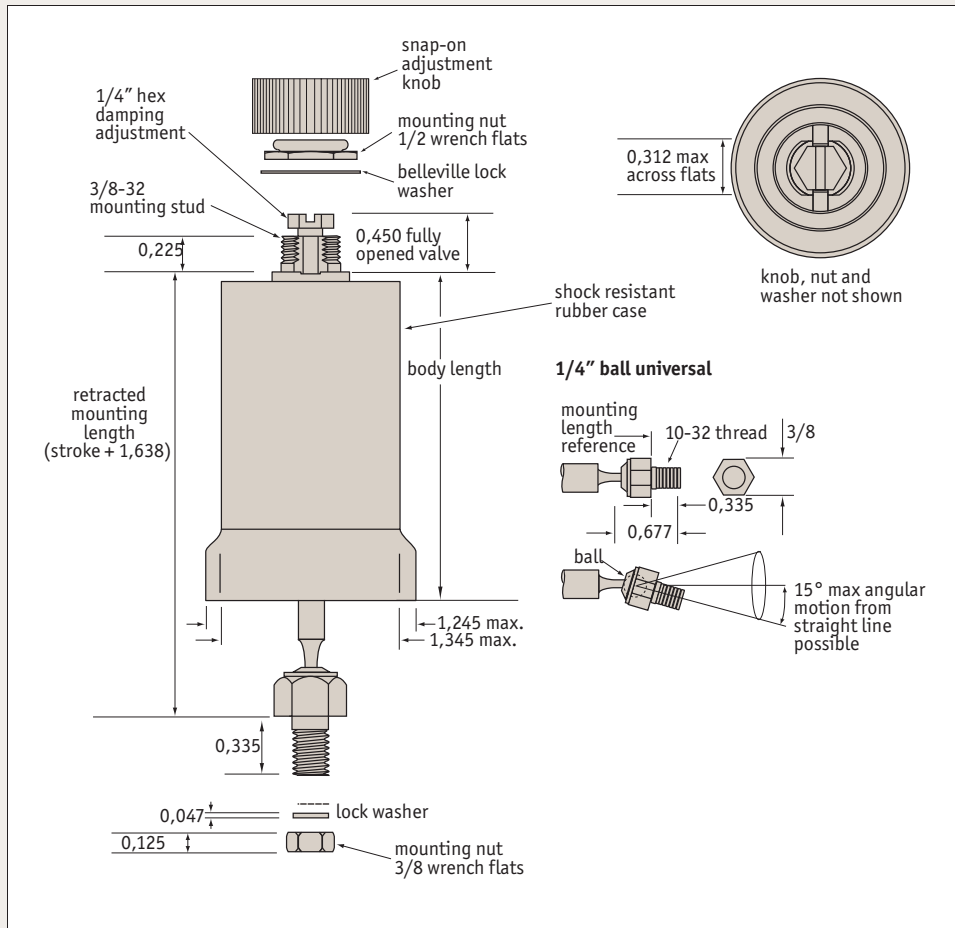
Order no.	Stroke	Damping direction	Rod end linkage	Bore size	Piston rod	Max. pull damping force N	Max. push damping force N	Body length
L4574.A0500-TW	0,5"	Two-way	1/8" Ball	0,627"	Stainless	18	13	1,255"
L4574.A1000-TW	1,0"	Two-way	1/8" Ball	0,627"	Stainless	18	13	1,755"
L4574.A1500-TW	1,5"	Two-way	1/8" Ball	0,627"	Stainless	18	13	2,255"
L4574.A2000-TW	2,0"	Two-way	1/8" Ball	0,627"	Stainless	18	13	2,755"

Order no.	Stroke	Damping direction	Rod end linkage	Bore size	Piston rod	Max. pull damping force N	Max. push damping force N	Body length
L4574.A3000-TW	3,0"	Two-way	1/8" Ball	0,627"	Stainless	18	13	3,755"
L4574.B0500-TW	0,5"	Two-way	Loop	0,627"	Stainless	18	13	1,255"
L4574.B1000-TW	1,0"	Two-way	Loop	0,627"	Stainless	18	13	1,755"
L4574.B1500-TW	1,5"	Two-way	Loop	0,627"	Stainless	18	13	2,255"
L4574.B2000-TW	2,0"	Two-way	Loop	0,627"	Stainless	18	13	2,755"
L4574.B3000-TW	3,0"	Two-way	Loop	0,627"	Stainless	18	13	3,755"
L4574.A0500-PL	0,5"	Pull	1/8" Ball	0,627"	Stainless	18	13	1,255"
L4574.A1000-PL	1,0"	Pull	1/8" Ball	0,627"	Stainless	18	13	1,755"
L4574.A1500-PL	1,5"	Pull	1/8" Ball	0,627"	Stainless	18	13	2,255"
L4574.A2000-PL	2,0"	Pull	1/8" Ball	0,627"	Stainless	18	13	2,755"
L4574.A3000-PL	3,0"	Pull	1/8" Ball	0,627"	Stainless	18	13	3,755"
L4574.E0500-PL	0,5"	Pull	1/4" Ball	0,627"	Aluminium	18	13	1,260"
L4574.E1000-PL	1,0"	Pull	1/4" Ball	0,627"	Aluminium	18	13	1,760"
L4574.E1500-PL	1,5"	Pull	1/4" Ball	0,627"	Aluminium	18	13	2,260"
L4574.E2000-PL	2,0"	Pull	1/4" Ball	0,627"	Aluminium	18	13	2,760"
L4574.E3000-PL	3,0"	Pull	1/4" Ball	0,627"	Aluminium	18	13	3,760"
L4574.B0500-PL	0,5"	Pull	Loop	0,627"	Stainless	18	13	1,255"
L4574.B1000-PL	1,0"	Pull	Loop	0,627"	Stainless	18	13	1,755"
L4574.B1500-PL	1,5"	Pull	Loop	0,627"	Stainless	18	13	2,255"
L4574.B2000-PL	2,0"	Pull	Loop	0,627"	Stainless	18	13	2,755"
L4574.B3000-PL	3,0"	Pull	Loop	0,627"	Stainless	18	13	3,755"
L4574.A0500-PS	0,5"	Push	1/8" Ball	0,627"	Stainless	18	13	1,255"
L4574.A1000-PS	1,0"	Push	1/8" Ball	0,627"	Stainless	18	13	1,755"
L4574.A1500-PS	1,5"	Push	1/8" Ball	0,627"	Stainless	18	13	2,255"
L4574.A2000-PS	2,0"	Push	1/8" Ball	0,627"	Stainless	18	13	2,755"
L4574.A3000-PS	3,0"	Push	1/8" Ball	0,627"	Stainless	18	13	3,755"
L4574.E0500-PS	0,5"	Push	1/4" Ball	0,627"	Aluminium	18	13	1,281"
L4574.E1000-PS	1,0"	Push	1/4" Ball	0,627"	Aluminium	18	13	1,781"
L4574.E1500-PS	1,5"	Push	1/4" Ball	0,627"	Aluminium	18	13	2,281"
L4574.E2000-PS	2,0"	Push	1/4" Ball	0,627"	Aluminium	18	13	2,781"
L4574.E3000-PS	3,0"	Push	1/4" Ball	0,627"	Aluminium	18	13	3,781"
L4574.B0500-PS	0,5"	Push	Loop	0,627"	Stainless	18	13	1,255"
L4574.B1000-PS	1,0"	Push	Loop	0,627"	Stainless	18	13	1,755"
L4574.B1500-PS	1,5"	Push	Loop	0,627"	Stainless	18	13	2,255"
L4574.B2000-PS	2,0"	Push	Loop	0,627"	Stainless	18	13	2,755"
L4574.B3000-PS	3,0"	Push	Loop	0,627"	Stainless	18	13	3,755"
L4574.E0500-TW	0,5"	Two-way	1/4" Ball	0,627"	Aluminium	18	13	1,300"
L4574.E1000-TW	1,0"	Two-way	1/4" Ball	0,627"	Aluminium	18	13	1,800"
L4574.E1500-TW	1,5"	Two-way	1/4" Ball	0,627"	Aluminium	18	13	2,300"
L4574.E2000-TW	2,0"	Two-way	1/4" Ball	0,627"	Aluminium	18	13	2,800"
L4574.E3000-TW	3,0"	Two-way	1/4" Ball	0,627"	Aluminium	18	13	3,800"

Push/Pull Dashpot

0.945" bore

Dashpots



L4576

Material

Graphite carbon piston.
Annealed borosilicate glass cylinder.
Precision fire-polished bore.
Aluminium 2024-T4 Piston rod.

Technical Notes

Damping coefficient = 0-5,25 N/(mm/s).
Friction coefficient = 0.2.
Force without side load: < 1g.
Operating temperature range: -55°C to 150°C.
*If operating temperature is above

+70°C, please advise at time of ordering.

Important Notes

Mounting data:
Mounting hole:
Rectangular = 0.312 x 0.375 (8mm x 10mm)
Round = 0.375" (10mm)
Suggested mounting bracket thickness = 0.06 - 0.093 (1.52mm - 2.36mm)
Mounting nut torque:
Head = 4-8 in-lb (0.45 - 0.90 Nm)
Rod end = 5-15 in-lb (0.56-1.70 Nm)

Full stroke is obtained with customer held mounting tolerance of ±0.015" (0.38mm).

1/4" ball joint linkage option only available with aluminium rod.

Level of damping is adjustable by hand. If you know the level of damping required we can pre-set this in the factory.

Order no.	Stroke	Damping direction	Rod end linkage	Bore size	Max. pull damping force N	Max. push damping force N	Body length
L4576.0500-TW	0,5"	Two-way	1/4" Ball	0,945"	40	31,1	1,296"
L4576.1000-TW	1,0"	Two-way	1/4" Ball	0,945"	40	31,1	1,796"
L4576.1500-TW	1,5"	Two-way	1/4" Ball	0,945"	40	31,1	2,296"
L4576.2000-TW	2,0"	Two-way	1/4" Ball	0,945"	40	31,1	2,796"

Order no.	Stroke	Damping direction	Rod end linkage	Bore size	Max. pull damping force N	Max. push damping force N	Body length
L4576.0500-PL	0,5"	Pull	1/4" Ball	0,945"	40	31,1	1,296"
L4576.1000-PL	1,0"	Pull	1/4" Ball	0,945"	40	31,1	1,796"
L4576.1500-PL	1,5"	Pull	1/4" Ball	0,945"	40	31,1	2,296"
L4576.2000-PL	2,0"	Pull	1/4" Ball	0,945"	40	31,1	2,796"
L4576.0500-PS	0,5"	Push	1/4" Ball	0,945"	40	31,1	1,277"
L4576.1000-PS	1,0"	Push	1/4" Ball	0,945"	40	31,1	1,777"
L4576.1500-PS	1,5"	Push	1/4" Ball	0,945"	40	31,1	2,277"
L4576.2000-PS	2,0"	Push	1/4" Ball	0,945"	40	31,1	2,777"

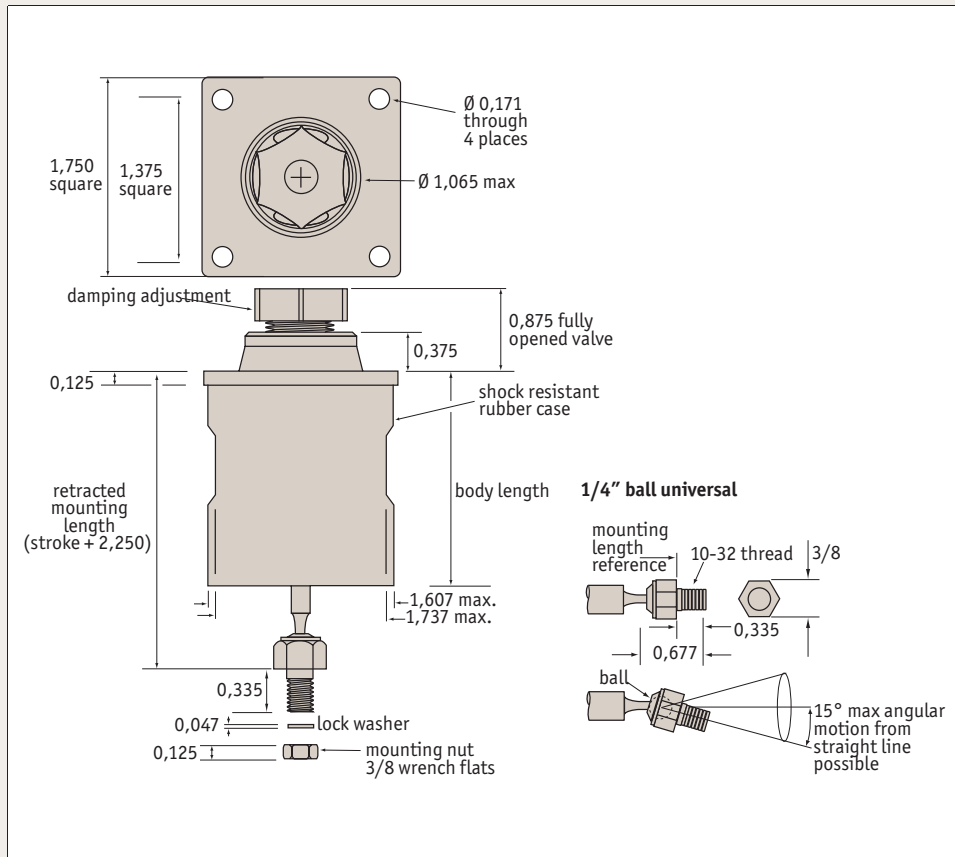
Push/Pull Dashpot

1,281" bore

Dashpots



L4578



Material

Graphite carbon piston.
Annealed borosilicate glass cylinder.
Precision fire-polished bore.
Stainless steel piston rod (AISI 304).

Technical Notes

Damping coefficient = 0-7, N N/(mm/s).
Friction coefficient = 0.2.
Force without side load: <4g.

Operating temperature range: -55°C to 125°C.

* If operating temperature is above +70°C, please advise at time of ordering.

Important Notes

Mounting data:
Mounting nut torque:
Rod end = 5-15 in-lb (0.56-1.7 Nm)

Full stroke is obtained with customer held mounting tolerance of $\pm 0.015"$ (0.38mm).

Level of damping is adjustable by hand. If you know the level of damping required we can pre-set this in the factory.

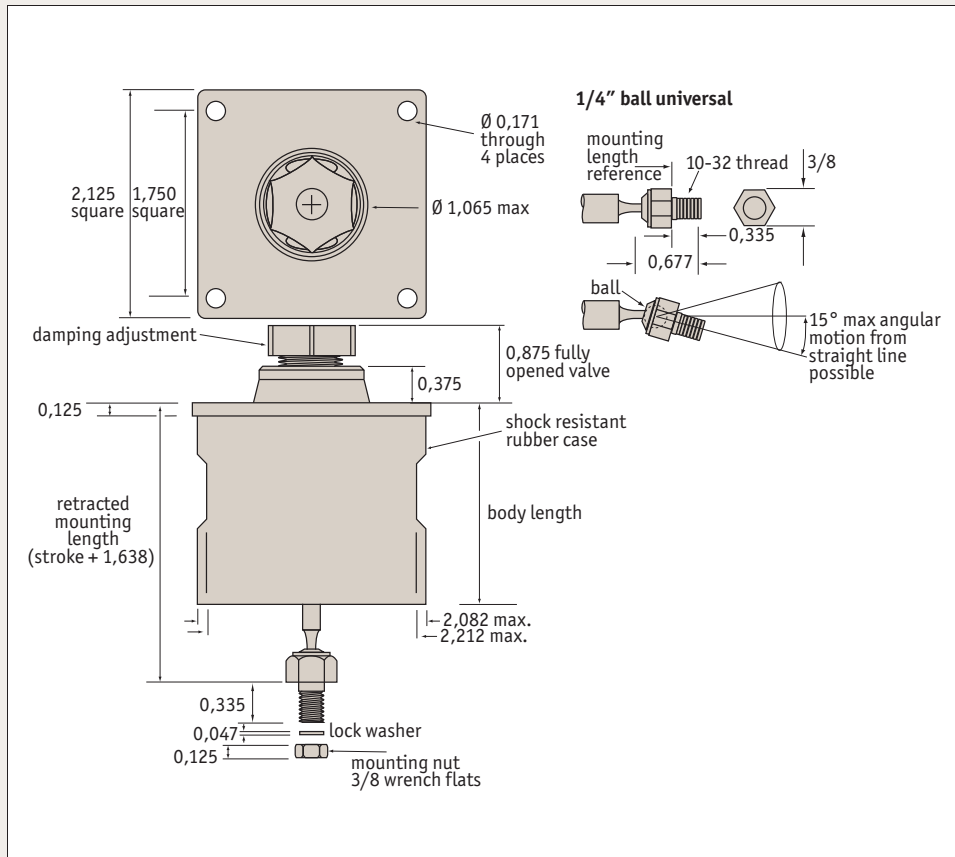
Order no.	Stroke	Damping direction	Rod end linkage	Bore size	Max. pull damping force N	Max. push damping force N	Body length
L4578.0500-TW	0,5"	Two-way	1/4" Ball	1,281"	75,62	57,83	1,880"
L4578.1000-TW	1,0"	Two-way	1/4" Ball	1,281"	75,62	57,83	2,380"
L4578.1500-TW	1,5"	Two-way	1/4" Ball	1,281"	75,62	57,83	2,880"
L4578.2000-TW	2,0"	Two-way	1/4" Ball	1,281"	75,62	57,83	3,380"
L4578.3000-TW	3,0"	Two-way	1/4" Ball	1,281"	75,62	57,83	4,380"
L4578.0500-PL	0,5"	Pull	1/4" Ball	1,281"	75,62	57,83	1,880"
L4578.1000-PL	1,0"	Pull	1/4" Ball	1,281"	75,62	57,83	2,380"
L4578.1500-PL	1,5"	Pull	1/4" Ball	1,281"	75,62	57,83	2,880"
L4578.2000-PL	2,0"	Pull	1/4" Ball	1,281"	75,62	57,83	3,380"
L4578.3000-PL	3,0"	Pull	1/4" Ball	1,281"	75,62	57,83	4,380"

Order no.	Stroke	Damping direction	Rod end linkage	Bore size	Max. pull damping force N	Max. push damping force N	Body length
L4578.0500-PS	0,5"	Push	1/4" Ball	1,281"	75,62	57,83	1,947"
L4578.1000-PS	1,0"	Push	1/4" Ball	1,281"	75,62	57,83	2,447"
L4578.1500-PS	1,5"	Push	1/4" Ball	1,281"	75,62	57,83	2,947"
L4578.2000-PS	2,0"	Push	1/4" Ball	1,281"	75,62	57,83	3,447"
L4578.3000-PS	3,0"	Push	1/4" Ball	1,281"	75,62	57,83	4,447"

Push/Pull Dashpot

1,750" bore

Dashpots



L4580

Material

Graphite carbon piston.
Annealed borosilicate glass cylinder.
Precision fire-polished bore.
Stainless steel piston rod (AISI 304).

Technical Notes

Damping coefficient = 0-7,0 N/(mm/s).
Friction coefficient = 0.2.
Force without side load: <8g.

Operating temperature range: -55°C to 125°C.

* If operating temperature is above +70°C, please advise at time of ordering.

Important Notes

Mounting data:
Mounting nut torque:
Rod end = 5-15 in-lb (0.56-1.7 Nm)

Full stroke is obtained with customer held mounting tolerance of ±0.015" (0.38mm).

Level of damping is adjustable by hand. If you know the level of damping required we can pre-set this in the factory.

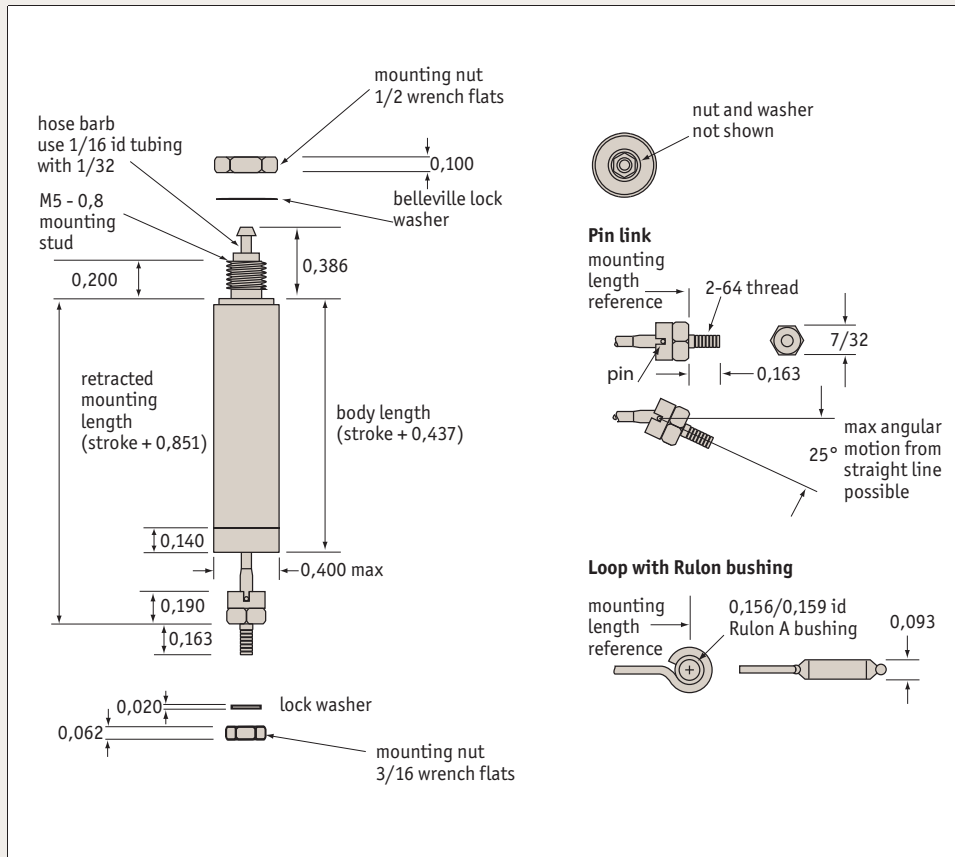
Order no.	Stroke	Damping direction	Rod end linkage	Bore size	Max. pull damping force N	Max. push damping force N	Body length
L4580.0500-TW	0,5"	Two-way	1/4" Ball	1,750"	133,45	106,76	1,852"
L4580.1000-TW	1,0"	Two-way	1/4" Ball	1,750"	133,45	106,76	2,352"
L4580.2000-TW	2,0"	Two-way	1/4" Ball	1,750"	133,45	106,76	3,352"
L4580.3000-TW	3,0"	Two-way	1/4" Ball	1,750"	133,45	106,76	4,352"
L4580.0500-PL	0,5"	Pull	1/4" Ball	1,750"	133,45	106,76	1,852"
L4580.1000-PL	1,0"	Pull	1/4" Ball	1,750"	133,45	106,76	2,352"
L4580.2000-PL	2,0"	Pull	1/4" Ball	1,750"	133,45	106,76	3,352"
L4580.3000-PL	3,0"	Pull	1/4" Ball	1,750"	133,45	106,76	4,352"
L4580.0500-PS	0,5"	Push	1/4" Ball	1,750"	133,45	106,76	1,987"

Order no.	Stroke	Damping direction	Rod end linkage	Bore size	Max. pull damping force N	Max. push damping force N	Body length
L4580.1000-PS	1,0"	Push	1/4" Ball	1,750"	133,45	106,76	2,487"
L4580.2000-PS	2,0"	Push	1/4" Ball	1,750"	133,45	106,76	3,487"
L4580.3000-PS	3,0"	Push	1/4" Ball	1,750"	133,45	106,76	4,487"

Actuator

0,22" bore

Dashpots



L4590

Material

Graphite carbon piston.
Annealed borosilicate glass cylinder.
Precision fire-polished bore.
Stainless steel piston rod (AISI 304).
Shock resistant rubber case.

Technical Notes

Piston area = 0.038 in² (24.54mm²)
Pressure range = full vacuum - 125 psi (0.86 MPa)
Force factor:
Piston area x pressure = output force.
Max force = 21.13N (at 0.86 MPa)

Minimum pressure differential required for actuation = 0.05 psi (345 Pa)
Friction coefficient = 0.2
Force without side load typically 0.5% - 1.5% of load.
Operating temperature range: -55°C to 150°C.
If operating at temperatures about +70°C, please advise when placing order.

Mounting data:
Suggested mounting bracket thickness = 0.050" - 0.100" (1.27mm -

2.54mm).
Mounting nut torque:
Head = 2-4 in-lb (0.23-0.45 Nm).
Rod end = 1-3 in-lb (0.11-0.34 Nm).
*Full stroke is obtained with customer held mounting tolerance of ±0.015" (0.038mm).

Important Notes

Please see technical pages for information on end linkages.

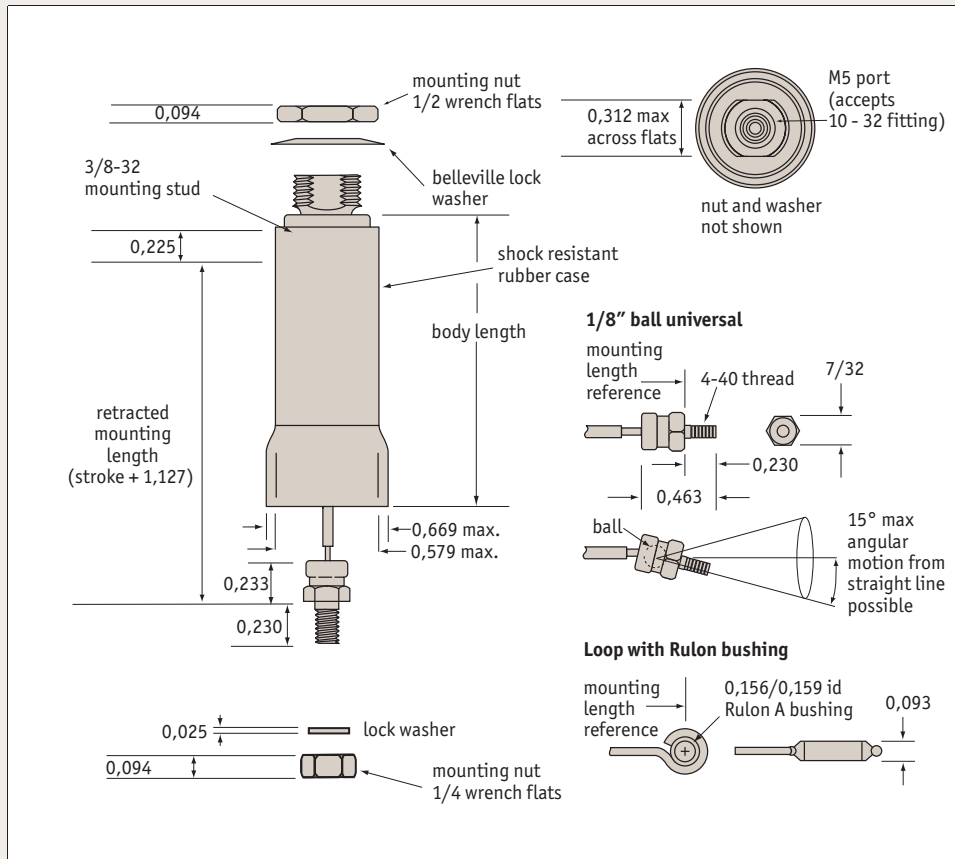
Order no.	Stroke	Rod end linkage	Bore size	Max leak at 65psi SL/min	Max leak at 125 psi SL/min	Body length
L4590.A0500	0,5"	Pin	0,22"	0,19	0,57	0,916"
L4590.A1000	1,0"	Pin	0,22"	0,19	0,57	1,416"
L4590.A1500	1,5"	Pin	0,22"	0,19	0,57	1,916"
L4590.A2000	2,0"	Pin	0,22"	0,19	0,57	2,416"
L4590.B0500	0,5"	Loop	0,22"	0,19	0,57	0,916"

Order no.	Stroke	Rod end linkage	Bore size	Max leak at 65psi	Max leak at 125 psi	Body length
				SL/min	SL/min	
L4590.B1000	1,0"	Loop	0,22"	0,19	0,57	1,416"
L4590.B1500	1,5"	Loop	0,22"	0,19	0,57	1,916"
L4590.B2000	2,0"	Loop	0,22"	0,19	0,57	2,416"

Actuator

0,366" bore

Dashpots



L4592

Material

Graphite carbon piston.
Annealed borosilicate glass cylinder.
Precision fire-polished bore.
Stainless steel piston rod (AISI 304).
Shock resistant rubber case.

Technical Notes

Piston area = 0.701 in² (452.25mm²)
Pressure range = full vacuum - 100 psi (0.69 MPa)
Force factor:
Piston area x pressure = output force.
Max force = 46.83N (at 0.69 MPa)

Minimum pressure differential required for actuation = 0.05 psi (345 Pa)
Friction coefficient = 0.2
Force without side load typically 0.5% - 1.5% of load.
Operating temperature range: -55°C to 150°C.
If operating at temperatures about +70°C, please advise when placing order.

Mounting data:
Mounting hole:

Round 0.375" (10mm)
Suggested mounting bracket thickness = 0.060" - 0.125" (1.52mm - 3.18mm).
Mounting nut torque:
Head = 4-8 in-lb (0.45-0.90 Nm).
Rod end = 2-5 in-lb (0.23-0.56 Nm).
Fitting = 12 in-lb max

*Full stroke is obtained with customer held mounting tolerance of ±0.015" (0.038mm).

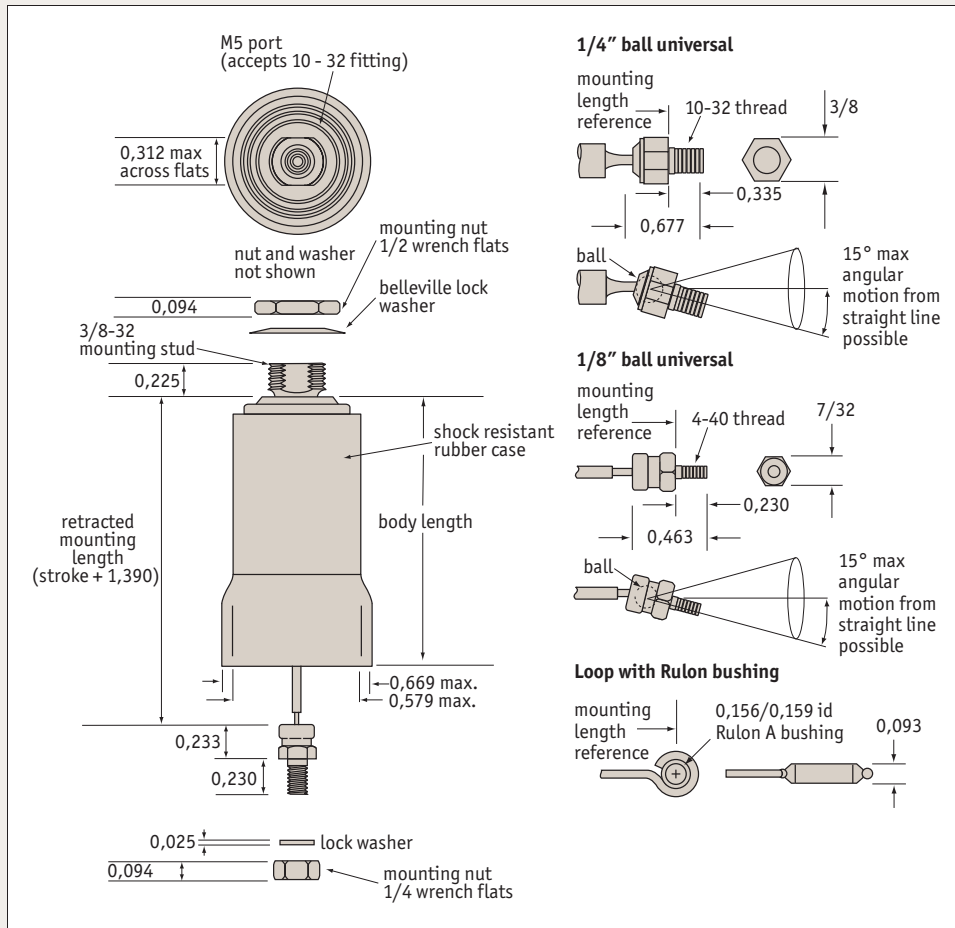
Order no.	Stroke	Rod end linkage	Bore size	Max. leak at		Body length
				50psi SL/min	100 psi SL/min	
L4592.A0500	0,5"	1/8" Ball	0,366"	0,36	1,17	1,092"
L4592.A1000	1,0"	1/8" Ball	0,366"	0,36	1,17	1,492"
L4592.A1500	1,5"	1/8" Ball	0,366"	0,36	1,17	2,092"
L4592.A2000	2,0"	1/8" Ball	0,366"	0,36	1,17	2,492"
L4592.A3000	3,0"	1/8" Ball	0,366"	0,36	1,17	3,492"
L4592.A4000	4,0"	1/8" Ball	0,366"	0,36	1,17	4,492"
L4592.B0500	0,5"	Loop	0,366"	0,36	1,17	1,092"

Order no.	Stroke	Rod end linkage	Bore size	Max. leak at 50psi	Max leak at 100 psi	Body length
				SL/min	SL/min	
L4592.B1000	1,0"	Loop	0,366"	0,36	1,17	1,592"
L4592.B1500	1,5"	Loop	0,366"	0,36	1,17	2,092"
L4592.B2000	2,0"	Loop	0,366"	0,36	1,17	2,592"
L4592.B3000	3,0"	Loop	0,366"	0,36	1,17	3,592"
L4592.B4000	4,0"	Loop	0,366"	0,36	1,17	4,592"

Actuator

0,627" bore

Dashpots



L4594

Material

Graphite carbon piston.
Annealed borosilicate glass cylinder.
Precision fire-polished bore.
Stainless steel piston rod (AISI 304) or Aluminium 2024-T4.
Shock resistant rubber case.

Technical Notes

Piston area = 0.309 in² (199.20mm²)
Pressure range = full vacuum - 100 psi (0.69 MPa)
Force factor:
Piston area x pressure = output force.
Max force = 137.45N (at 0.69 MPa)
Minimum pressure differential required for actuation = 0.05 psi (345 Pa)
Friction coefficient = 0.2
Force without side load typically 0.5% - 1.5% of load.
Operating temperature range: -55°C to 150°C.

If operating at temperatures about +70°C, please advise when placing order.

Mounting data:
Mounting hole:
Rectangular: 0.312" x 0.375" (8mm x 10mm)
Round: 0.375" (10mm)
Suggested mounting bracket thickness = 0.060" - 0.125" (1.52mm - 3.18mm).
Mounting nut torque:
Head = 4-8 in-lb (0.45-0.90Nm).
Rod end = 2-5 in-lb (0.23-0.56 Nm).
Fitting = 12 in-lb max.

*Full stroke is obtained with customer held mounting tolerance of ±0.015" (0.038mm).

Important Notes

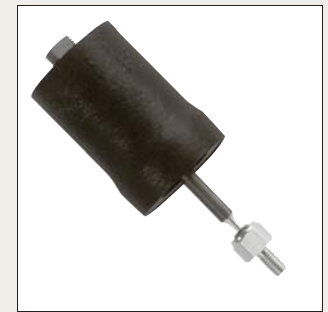
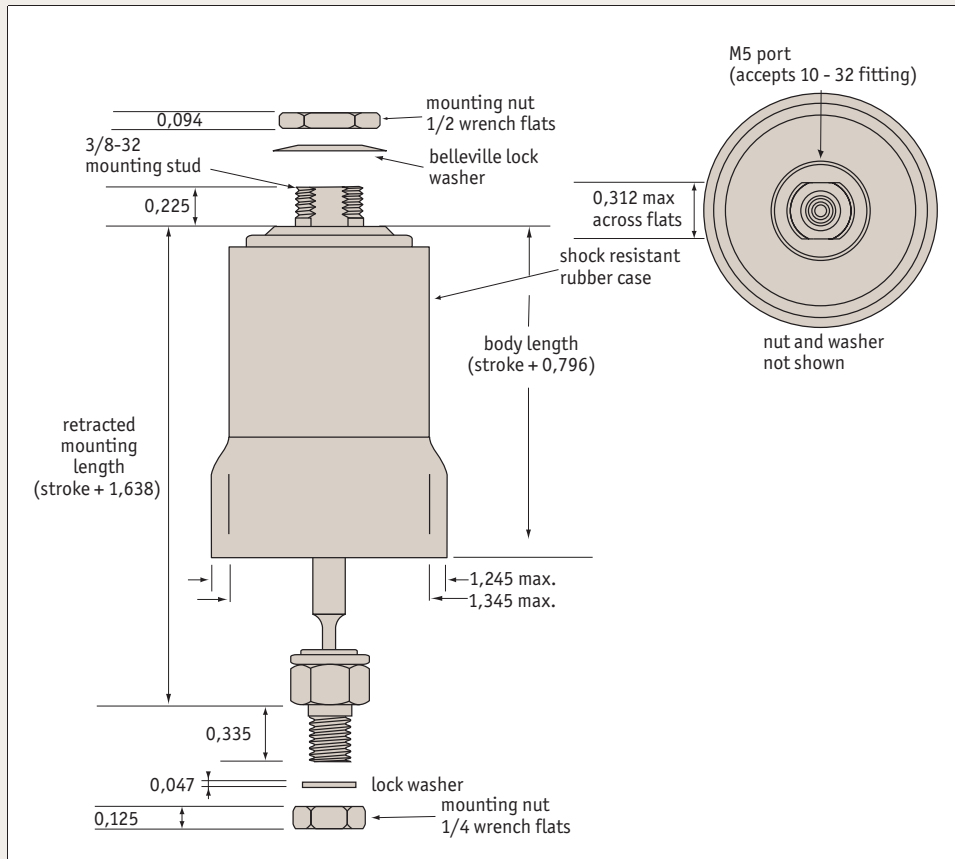
Stainless steel piston rod not for use above 35 psi.

Order no.	Stroke	Rod end linkage	Piston type	Bore size	Max. leak at 50psi SL/min	Max leak at 100 psi SL/min	Body length
L4594.A0500	0,5"	1/8 Ball	Stainless	0,627"	-	-	1,255"
L4594.A1000	1,0"	1/8 Ball	Stainless	0,627"	-	-	1,755"
L4594.A1500	1,5"	1/8 Ball	Stainless	0,627"	-	-	2,255"
L4594.A2000	2,0"	1/8 Ball	Stainless	0,627"	-	-	2,755"
L4594.A3000	3,0"	1/8 Ball	Stainless	0,627"	-	-	3,755"
L4594.A4000	4,0"	1/8 Ball	Stainless	0,627"	-	-	4,755"
L4594.A5000	5,0"	1/8 Ball	Stainless	0,627"	-	-	5,755"
L4594.A6000	6,0"	1/8 Ball	Stainless	0,627"	-	-	6,755"
L4594.B0500	0,5"	Loop	Stainless	0,627"	-	-	1,255"
L4594.B1000	1,0"	Loop	Stainless	0,627"	-	-	1,755"
L4594.B1500	1,5"	Loop	Stainless	0,627"	-	-	2,255"
L4594.B2000	2,0"	Loop	Stainless	0,627"	-	-	2,755"
L4594.B3000	3,0"	Loop	Stainless	0,627"	-	-	3,755"
L4594.B4000	4,0"	Loop	Stainless	0,627"	-	-	4,755"
L4594.B5000	5,0"	Loop	Stainless	0,627"	-	-	5,755"
L4594.B6000	6,0"	Loop	Stainless	0,627"	-	-	6,755"
L4594.E0500	0,5"	1/4 Ball	Aluminium	0,627"	0,74	2,78	1,300"
L4594.E1000	1,0"	1/4 Ball	Aluminium	0,627"	0,74	2,78	1,800"
L4594.E1500	1,5"	1/4 Ball	Aluminium	0,627"	0,74	2,78	2,300"
L4594.E2000	2,0"	1/4 Ball	Aluminium	0,627"	0,74	2,78	2,800"
L4594.E3000	3,0"	1/4 Ball	Aluminium	0,627"	0,74	2,78	3,800"
L4594.E4000	4,0"	1/4 Ball	Aluminium	0,627"	0,74	2,78	4,800"
L4594.E5000	5,0"	1/4 Ball	Aluminium	0,627"	0,74	2,78	5,800"
L4594.E6000	6,0"	1/4 Ball	Aluminium	0,627"	0,74	2,78	6,800"

Actuator

0,945" bore

Dashpots



L4596

Material

Graphite carbon piston.
Annealed borosilicate glass cylinder.
Precision fire-polished bore.
Aluminium 2024-T4 piston rod.
Shock resistant rubber case.

Technical Notes

Piston area = 0.701 in² (452.25mm²)
Pressure range = full vacuum - 100 psi (0.69 MPa)
Force factor:
Piston area x pressure = output force.
Max force = 312.05N (at 0.69 MPa)
Minimum pressure differential required

for actuation = 0.05 psi (345 Pa)
Friction coefficient = 0.2
Force without side load typically 0.5% - 1.5% of load.
Operating temperature range: -55°C to 150°C.
If operating at temperatures about +70°C, please advise when placing order.

Mounting data:
Mounting hole:
Rectangular: 0.312" x 0.375" (8mm x 10mm)

Round: 0.375" (10mm).

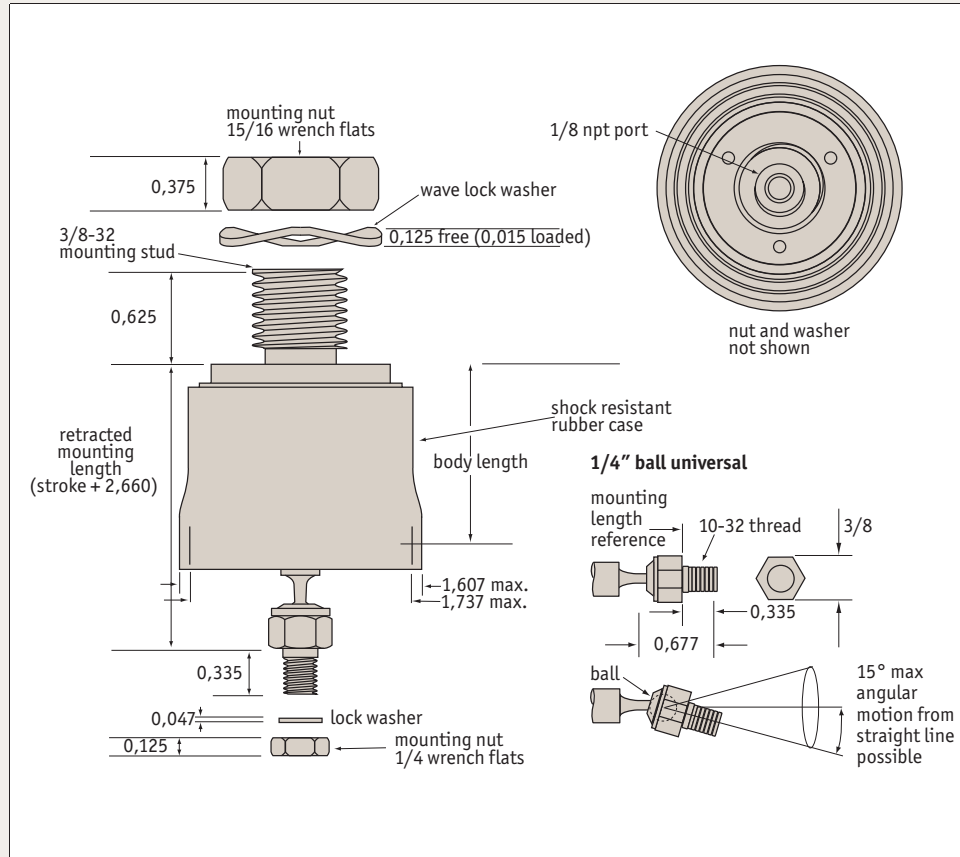
Suggested mounting bracket thickness = 0.060" - 0.125" (1.52mm - 3.18mm).
Mounting nut torque:
Head = 4-8 in-lb (0.45-0.90 Nm).
Rod end = 5-15 in-lb (0.56-1.70 Nm)
Fitting = 12 in-lb max.

*Full stroke is obtained with customer held mounting tolerance of ±0.015" (0.038mm).

Order no.	Stroke	Rod end linkage	Bore size	Max. leak at 50psi SL/min	Max leak at 100 psi SL/min	Body length
L4596.0500	0,5"	¼" Ball	0,945"	1,06	5,60	1,296"
L4596.1000	1,0"	¼" Ball	0,945"	1,06	5,60	1,796"
L4596.2000	2,0"	¼" Ball	0,945"	1,06	5,60	2,796"
L4596.3000	3,0"	¼" Ball	0,945"	1,06	5,60	3,796"
L4596.4000	4,0"	¼" Ball	0,945"	1,06	5,60	4,796"
L4596.5000	5,0"	¼" Ball	0,945"	1,06	5,60	5,796"
L4596.6000	6,0"	¼" Ball	0,945"	1,06	5,60	6,796"



L4598



Material

Graphite carbon piston.
 Annealed borosilicate glass cylinder.
 Precision fire-polished bore.
 Stainless steel piston rod (AISI 304).
 Shock resistant rubber case.

Technical Notes

Piston area = 1.288 in² (830.97mm²)
 Pressure range = full vacuum - 100 psi (0.69 MPa)
 Force factor:
 Piston area x pressure = output force.

Max force = 573.37N (at 0.69 MPa)
 Minimum pressure differential required for actuation = 0.05 psi (345 Pa)
 Friction coefficient = 0.2
 Force without side load typically 0.5% - 1.5% of load.

Operating temperature range: -55°C to 150°C.

If operating at temperatures about +70°C, please advise when placing order.

Mounting data:

Mounting hole:

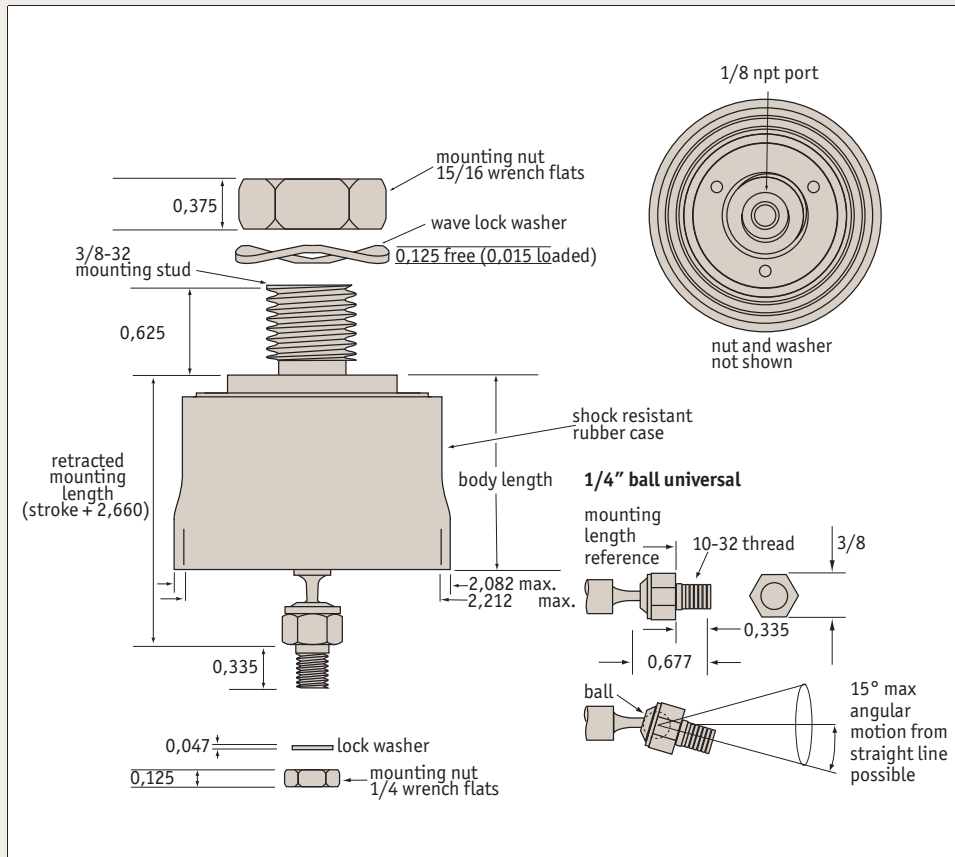
Round: 0.625" (16mm).
 Suggested mounting bracket thickness = 0.250" max (6.35mm).

Mounting nut torque:

Head = 40-60 in-lb (4.5-6.8 Nm).
 Rod end = 5-15 in-lb (0.56-1.70 Nm).

*Full stroke is obtained with customer held mounting tolerance of ±0.015" (0.038mm).

Order no.	Stroke	Rod end linkage	Bore size	Max. leak at 50 psi	Max leak at 100 psi	Body length
				SL/min	SL/min	
L4598.0500	0,5"	1/4" Ball	1,281"	2,12	9,6	1,725"
L4598.1000	1,0"	1/4" Ball	1,281"	2,12	9,6	2,225"
L4598.2000	2,0"	1/4" Ball	1,281"	2,12	9,6	3,225"
L4598.3000	3,0"	1/4" Ball	1,281"	2,12	9,6	4,225"
L4598.4000	4,0"	1/4" Ball	1,281"	2,12	9,6	5,225"
L4598.5000	5,0"	1/4" Ball	1,281"	2,12	9,6	6,225"
L4598.6000	6,0"	1/4" Ball	1,281"	2,12	9,6	7,225"



L4600

Material

Graphite carbon piston.
 Annealed borosilicate glass cylinder.
 Precision fire-polished bore.
 Stainless steel piston rod (AISI 304).
 Shock resistant rubber case.

Technical Notes

Piston area = 2.405 in² (1551.61mm²)
 Pressure range = full vacuum - 100 psi (0.69 MPa)
 Force factor:
 Piston area x pressure = output force.

Max force = 1070.61N (at 0.69 MPa)
 Minimum pressure differential required for actuation = 0.05 psi (345 Pa)
 Friction coefficient = 0.2
 Force without side load typically 0.5% - 1.5% of load.
 Operating temperature range: -55°C to 150°C.
 If operating at temperatures about +70°C, please advise when placing order.

Mounting data:

Mouting hole:
 Round: 0.625" min (16mm).
 Suggested mounting bracket thickness = 0.250" max (6.35mm).
 Mounting nut torque:
 Head = 40-60 in-lb (4.5-6.8 Nm).
 Rod end = 5-15 in-lb (0.56-1.70 Nm).

*Full stroke is obtained with customer held mounting tolerance of ±0.015" (0.038mm).

Order no.	Stroke	Rod end linkage	Bore size	Max. leak at 50psi	Max leak at 100 psi	Body length
				SL/min	SL/min	
L4600.0500	0,5"	1/4" Ball	1,75"	3,6	15,0	1,697"
L4600.1000	1,0"	1/4" Ball	1,75"	3,6	15,0	2,197"
L4600.2000	2,0"	1/4" Ball	1,75"	3,6	15,0	3,197"
L4600.3000	3,0"	1/4" Ball	1,75"	3,6	15,0	4,197"
L4600.4000	4,0"	1/4" Ball	1,75"	3,6	15,0	5,197"
L4600.5000	5,0"	1/4" Ball	1,75"	3,6	15,0	6,197"
L4600.6000	6,0"	1/4" Ball	1,75"	3,6	15,0	7,197"