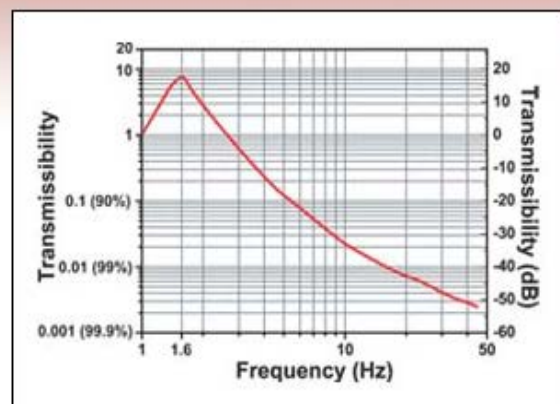


## PFA52501 - February 18, 2016

Item # PFA52501 was discontinued on February 18, 2016. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

### ACTIVE ISOLATION BREADBOARD SUPPORT FRAMES

- ▶ Designed to Maximize Vibration Isolation
- ▶ Pneumatic Self-Leveling Design
- ▶ Provides Vertical & Horizontal Vibration Isolation
- ▶ Load Capacity: 700 kg (1,545 lbs)



[Hide Overview](#)

#### OVERVIEW

##### Features

- Vertical and Horizontal Vibration Isolation
- Support Frames Accommodate Breadboard Sizes as Large as 1200 x 1800 mm (48" x 72")
- Available in 700 mm or 800 mm Frame Heights
- Sturdy, All Steel Construction
- Manually Leveling Feet to Compensate for Uneven Floors
- Set of Casters Available (PWA061)

These workstations are designed to support Thorlabs breadboards up to 48" x 72" (1200 mm x 1800 mm) in size. The SuperDamp workstations can carry loads of up to 700 kg (1545 lbs) and have a frame height of 700 mm (27.5") or 800 mm (31.5"). The systems are based on four independent, air mounted, active vibration isolators which are self leveling with a repeatability of  $\pm 0.25$  mm (0.010"). With vertical and horizontal resonance frequencies of 1.6 Hz and 1.2 Hz (accordingly) these isolators are an ideal solution for interferometry, cell injection, non-contact surface measurement, microscopy and other motion-sensitive measurements. The pneumatic isolators in the active isolation support frames require a constant source of pressurized air, such as that provided by our compressor.

[Hide Specs](#)

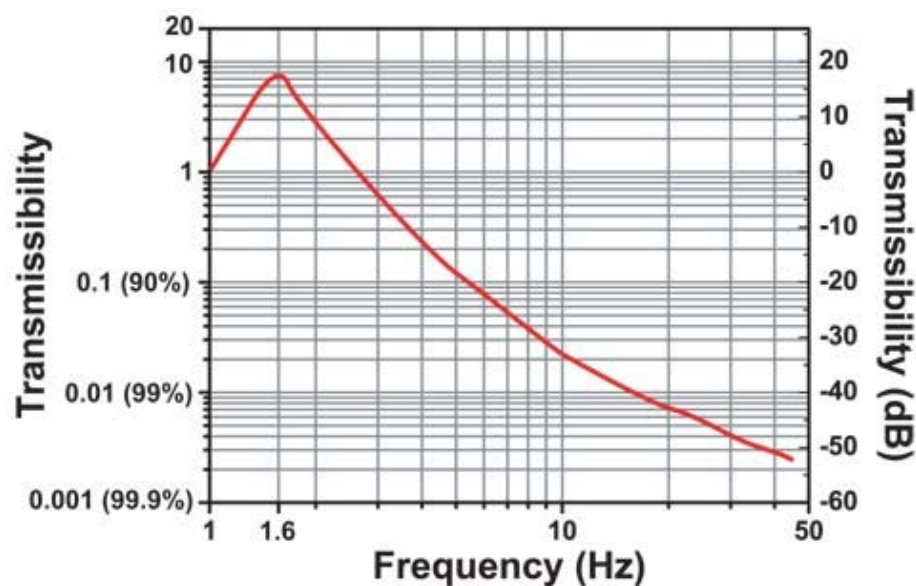
## S P E C S

## Specifications

Specification	Value
Vertical Resonant Frequency	<1.6 Hz
Horizontal Resonant Frequency	<1.2 Hz
Vertical Transmissibility at Resonance	<13 dB
Horizontal Transmissibility at Resonance	<8 dB
Vertical Transmissibility at 5 Hz	-18 dB (87.5%)
Horizontal Transmissibility at 5 Hz	-18 dB (87.5%)
Vertical Transmissibility at 10 Hz	-34 dB (98%)
Horizontal Transmissibility at 10 Hz	-34 dB (98%)
Load Capacity	700 kg (1,545 lbs)
Height	800 mm (31.5"). 700 mm (27.5")
Isolators Height Adjustment Range	±6 mm (0.25")
Self Leveling Repeatability	±0.25 mm (0.010")
Legs Height Adjustment Range	±10 mm (0.4")
Air Pressure Required	690 kPa (100 psi) Maximum
Finish	Black Paint

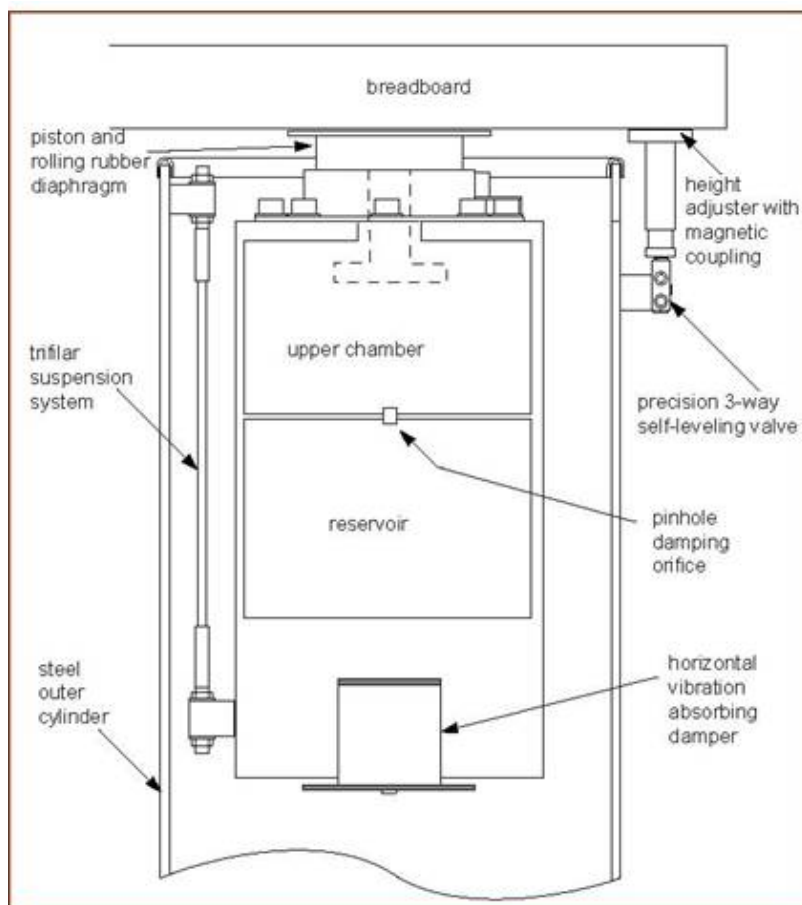
## Vertical Transmissibility Plot

A vibration isolation system is subjected to continuous vibrational impulses from the laboratory floor. These vibrations may be caused by large machinery within the building or even by wind or traffic excited building resonances (swaying). Transmissibility is a measure of the isolators efficiency at damping out these vibrations and is defined as the ratio of the amplitude of the transmitted vibration to that of the forcing vibration.

[Hide Design](#)

## D E S I G N

Vertical damping is achieved by the use of a dual chamber, damped pneumatic spring. The breadboard is supported by the air pressure in these chambers, and sits on a piston which is sealed to the upper chamber with a rolling rubber diaphragm. This allows virtually friction free motion between piston and chamber. Floor or tabletop motion forces air to flow from the upper chamber to the reservoir bottle through a high-resistance damper.



This restriction of airflow damps oscillatory motion between the floor and breadboard, dramatically reducing settling time. The volume ratio of the chambers has been optimized to maximize damping performance for our complete range of breadboards while preserving a low resonant frequency.

Damping of horizontal vibrations is accomplished by supporting the pneumatic vertical isolator on a trifilar suspension system. This innovative pendulum design uses gravity to provide the restoring force after horizontal disturbances. Horizontal oscillations at the system's resonant frequency are damped by linking the base of the vertical isolator to the outer cylinder with an oil-free vibration-absorbing damper.

To allow for changes in load distribution, SuperDamp™ isolators also feature a self-levelling system incorporating precision three way valves that do not compromise vertical isolation when the system is at rest. Because these valves are actuated by worksurface movement, the system returns to its original level position within  $\pm 0.25\text{mm}$  (0.01in.) after disturbances. The valves also compensate automatically for any changes in load distribution.

Additionally, this system allows the breadboard height to be adjusted over a range of 26mm (1.02in) and can be used to compensate for an uneven floor. These isolators require a constant supply of air. When the air supply is removed, the breadboard rests securely on top of the frame with the isolation system disabled.

Please see the [Vibration Isolation Tutorial](#) for more information the design of our products and the theory of vibration isolation and damping.

[Hide Selection Guide](#)

## SELECTION GUIDE

### Selecting a Vibration System

Thorlabs offers three types of breadboard support systems: Active Isolation, Passive Isolation and a rigid support system.

The Active and the Passive isolation systems are both based on compressed air, providing vibration isolation in frequencies above 2Hz and 10Hz (respectively) making them ideal systems for demanding photonic experiments or for work in a noisy environment. In addition, Thorlabs also offers rigid support systems with no vibration isolation for less demanding applications which require only breadboard isolation. The table below compares the isolation performance of our different isolation systems.

	Active Vibration Isolators	Standard Passive Vibration Isolators	Heavy Duty Passive Vibration Isolators	Rigid, Non-Isolating	Optics a la Cart Rigid Lab Cart
Vertical Resonant Frequency	<1.6 Hz	3.5 Hz	3.5 Hz	N/A	N/A
Horizontal Resonant Frequency	<1.2 Hz	N/A	N/A	N/A	N/A
Vertical Transmissibility at Resonance	<13 dB	24 dB	24 dB	N/A	N/A
Horizontal Transmissibility at Resonance	<8 dB	N/A	N/A	N/A	N/A
Vertical Transmissibility at 10Hz	-34 dB	-16 dB	-16 dB	N/A	N/A
Horizontal Transmissibility at 10Hz	-34 dB	N/A	N/A	N/A	N/A
Isolation Type	Active	Passive	Passive	N/A	N/A
Damping Efficiency	Best	Good	Good	N/A	N/A
Height	700 mm (27.5") 800 mm (31.5")	700 mm (27.5") 800 mm (31.5")	700 mm (27.5") 800 mm (31.5")	700 mm (27.5") 800 mm (31.5")	870 mm (34.3")
Load capacity	700 kg (1540 lbs)	24 to 260 kg (50 to 570 lbs)	135 to 700 kg (300 to 1540 lbs)	700 kg (1540 lbs)	320 kg (705 lbs)
Mobility	N/A	N/A	N/A	N/A	Lockable casters
Storage	N/A	N/A	N/A	N/A	Bottom Shelf Optional Drawer

## Vibration Isolation

Vibration isolation is needed to isolate between noises originating around the workstation and breadboard surface. Such vibrations may result from machinery in the building such as elevators or compressors, pedestrians, building vibrations and nearby street traffic. The role of the vibration system is to dampen, both horizontally and vertically, the noises generated by the surrounding environment. Such noises are typically in the range of 10-100 Hz. the table below depicts common vibration sources:

Types	Frequency (Hz)	Amplitude (inches)
Air Compressors	4 – 20	$10^{-2}$
Handling Equipment	5 – 40	$10^{-3}$
Pumps*	5 – 25	$10^{-3}$
Building Services	7 – 40	$10^{-4}$
Foot Traffic	0.5 – 6	$10^{-5}$
Acoustics	100 – 10,000	$10^{-2}$ to $10^{-4}$
Punch Presses	Up to 20	$10^{-2}$ to $10^{-5}$
Transformers	50 – 400	$10^{-4}$ to $10^{-5}$
Elevators	Up to 40	$10^{-3}$ to $10^{-5}$
Building Motion	46/Height in meters	$10^{-1}$
Building Pressure Waves	1 – 5	$10^{-5}$
Railroad	5 - 20	$\pm 0.15$ g
Highway Traffic	5 - 100 Hz	$\pm 0.001$ g

\*Vacuum, Compressed, or Non-Compressed Fluids

[Hide Active Isolation 700 mm Support Frames](#)

### Active Isolation 700 mm Support Frames



- ▶ Sturdy, All-Steel Construction
- ▶ 700 mm (27.5") Frame Heights
- ▶ Load Capacity: 700 kg (1545 lbs)
- ▶ Height Adjustment Range:
  - Leveling Pads:  $\pm 9.5$  mm ( $\pm 0.375$ " )
  - Leveling Feet:  $\pm 5$  mm ( $\pm 0.2$ " )

These 700 mm (27.5") high, active isolation frames offer the maximum isolation for vibration sensitive applications. They feature a pneumatic self-leveling design that provides both vertical and horizontal vibration isolation of the worksurface and effective attenuation of low frequency vibrations. These pneumatic isolators will require a constant source of pressurized air, such as that provided by our compressor.

The table to the right lists the frame suitable for each breadboard size. Custom sizes may also be available upon request; please contact Tech Support with your requirements and for pricing.

Frame Item #	Compatible Breadboard Size	
	Metric	Imperial
PFA51509	750 x 750 mm	30" x 30"
PFA51505	750 x 900 mm	30" x 36"
PFA51508	750 x 1200 mm	30" x 48"
PFA51501	750 x 1500 mm	30" x 60"
PFA51506	900 x 900 mm	36" x 36"
PFA51507	900 x 1200 mm	36" x 48"
PFA51502	900 x 1500 mm	36" x 60"
	900 x 1800 mm	36" x 72"
PFA51504	1200 x 1500 mm	48" x 60"
	1200 x 1800 mm	48" x 72"

Part Number	Description	Price	Availability
PFA51509	700 mm (27.5") Active Isolation Support Frame 750 x 750 mm (30" x 30")	\$2,445.14	Lead Time
PFA51505	700 mm (27.5") Active Isolation Frame 750 x 900 mm (30" x 36")	\$2,461.81	Today
PFA51508	700 mm (27.5") Active Isolation Frame 750 x 1200 mm (30" x 48")	\$2,477.78	Lead Time
PFA51501	700 mm (27.5") Active Isolation Frame 750 x 1500 mm (30" x 60")	\$2,477.78	Lead Time
PFA51506	700 mm (27.5") Active Isolation Support Frame 900 x 900 mm (36" x 36")	\$2,477.78	Lead Time
PFA51507	700 mm (27.5") Active Isolation Frame 900 x 1200mm (36" x 48")	\$2,607.80	Today
PFA51502	700 mm (27.5") Active Isolation Frame 900 x 1500 mm (36" x 60")	\$2,511.11	Lead Time
PFA51504	700 mm (27.5") Active Isolation Frame 1200 x 1500 mm (48" x 60")	\$2,576.39	Lead Time

[Hide Active Isolation 800 mm Support Frames](#)

### Active Isolation 800 mm Support Frames



- ▶ Sturdy, All-Steel Construction
- ▶ 800 mm (31.5") Frame Heights
- ▶ Load Capacity: 700 kg (1545 lbs)
- ▶ Height Adjustment Range:
  - Leveling Pads:  $\pm 9.5$  mm ( $\pm 0.375$ " )
  - Leveling Feet:  $\pm 5$  mm ( $\pm 0.2$ " )

These 800 mm (31.5") high, active isolation frames offer the maximum isolation for vibration sensitive applications. They feature a pneumatic self-leveling design that provides both vertical and horizontal vibration isolation of the worksurface and effective attenuation of low frequency vibrations. These pneumatic isolators will require a constant source of pressurized air, such as that provided by our compressor.

The table to the right lists the frame suitable for each breadboard size. Custom sizes may also be available upon request; please contact Tech Support with your requirements and for pricing.

Frame Item #	Compatible Breadboard Size	
	Metric	Imperial
PFA52509	750 x 750 mm	30" x 30"
PFA52505	750 x 900 mm	30" x 36"
PFA52508	750 x 1200 mm	30" x 48"
PFA52501	750 x 1500 mm	30" x 60"
PFA52506	900 x 900 mm	36" x 36"
PFA52507	900 x 1200 mm	36" x 48"
PFA52502	900 x 1500 mm	36" x 60"
	900 x 1800 mm	36" x 72"
PFA52504	1200 x 1500 mm	48" x 60"
	1200 x 1800 mm	48" x 72"

Part Number	Description	Price	Availability
PFA52509	800 mm (31.5") Active Isolation Support Frame 750 x 750 mm (30" x 30")	\$2,454.86	Lead Time
PFA52505	800 mm (31.5") Active Isolation Frame 750 x 900 mm (30" x 36")	\$2,471.53	Lead Time
PFA52508	800 mm (31.5") Active Isolation Frame 750 x 1200 mm (30" x 48")	\$2,488.19	Lead Time
PFA52501	800 mm (31.5") Active Isolation Frame 750 x 1500 mm (30" x 60")	\$2,488.19	Lead Time
PFA52506	800 mm (31.5") Active Isolation Support Frame 900 x 900 mm (36" x 36")	\$2,488.19	Lead Time
PFA52507	800 mm (31.5") Active Isolation Frame 900 x 1200 mm (36" x 48")	\$2,618.00	Today
PFA52502	800 mm (31.5") Active Isolation Frame 900 x 1500 mm (36" x 60")	\$2,618.00	Today
PFA52504	800 mm (31.5") Active Isolation Frame 1200 x 1500 mm (48" x 60")	\$2,686.00	Today

[Hide Casters \(for Breadboard Support Frames\)](#)

### Castors (for Breadboard Support Frames)



- ▶ 360° Swivel Allows Ease of Movement for Large Systems
- ▶ Highly Durable, Non-Marring Polyurethane Wheels
- ▶ Load Capacity: 200 kg (440 lbs) Each, 800 kg (1760 lbs) for a Set of Four

These castors are designed to permit easy relocation of the breadboard support frames, without removal of equipment or disassembly of the system. They are ideal for positioning the frames within tight spaces. Each castor rides on a non-marring wheel for smooth and quiet operation. Supplied as a set of four.

Part Number	Description	Price	Availability
PWA061	4" Caster Kit, Set of 4	\$118.00	Today

Visit the *Active Isolation Breadboard Support Frames* page for pricing and availability information:

[http://www.thorlabs.com/newgrouppage9.cfm?objectgroup\\_id=1873](http://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=1873)