THORLABS

Active Isolation Breadboard Support Frames

PFA Series

User Guide



Original Instructions

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Chapter 1 Overview

These workstations are designed to support Thorlabs breadboards up to 48" x 72" (1200 mm x 1800 mm) in size. They 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 PFA Series workstations are active vibration isolation systems used to isolate a breadboard from vertical and horizontal vibrations in order to provide a stable platform for sensitive experiments and applications.

The PFP Series are passive vibration isolation systems used in an environment where vibration is less critical, and can bear a load of up to 260 kg (570 lbs).

The basic workstation includes a frame consisting of four legs connected with tie bars. A breadboard, is supported on vibration isolation mounts and provides a stable platform on which to populate system components.

Chapter 2 Safety

2.1 Safety Information

For the continuing safety of the operators of this equipment, and the protection of the equipment itself, the operator should take note of the **Warnings, Cautions** and **Notes** throughout this handbook and, where visible, on the product itself.

The following safety symbols may be used throughout the handbook and on the equipment itself.



Warning: Risk of Electrical Shock

Given when there is a risk of injury from electrical shock.



Warning

Given when there is a risk of injury to users.



Trap Warning

Given when there is a risk of finger traps.



Caution

Given when there is a risk of damage to the product.

Note

Clarification of an instruction or additional information.

2.1.1 General Safety Precautions



Warning

Do:

Ensure that the workstation is securely positioned prior to any work being undertaken on the system.

If using the workstation with any electrical equipment, incorporate appropriate earthing and/or other safety circuitry as required by national standards to protect the operator.

When lifting or moving components, ensure that the proper posture is maintained. Do not lift loads in excess of nationally recognized safe working limits (25kg per operator in Europe). If in doubt use an appropriately designed lifting device.

Before lifting the breadboard, ensure it is unpopulated.

Before moving the workstation, ensure that the feet are fully retracted.

Exercise particular caution if moving the workstation on a sloping surface.

Ensure all fixings are secure prior to use.

Do not:

Get into any position where you can be trapped between a wall, door frame or other immovable object and the workstation.

Go underneath the workstation when the unit is being moved.

Move an active system when the breadboard is floating on its isolators.

Tow the workstation with any powered device.

Ride on the workstation.

Move the workstation over uneven ground.

Leave the system on its castors for prolonged periods of time.

Leave the system unattended on its castors without applying the brakes.

Sit or stand on the desk unit or any accessory.



Trap Warning

The normal, continuous operation of the equipment results in a gap between the bottom surface of the installed table and the main body cylinder of each leg. This gap will vary based on the instantaneous load and forces exerted on the table. In some instances this gap is large enough into which to insert fingers, and therefore presents a potential pinch hazard. Keep fingers clear of this gap.



Caution

Ensure that proper airflow is maintained to any electrical equipment installed on the workstation.

The workstation is designed only for indoor use.

Chapter 3 Basic Installation

Note

The equipment contains no user servicable parts. Only personnel authorized by Thorlabs Ltd and trained in the maintenance of this equipment should remove its covers or attempt any repairs.

3.1 General Description

The PFA Series Breadboard Supports are active vibration isolation systems used to isolate a breadboard from vertical and horizontal vibrations in order to provide a stable platform for sensitive experiments and applications.

The basic workstation includes a frame consisting of four legs connected with tie bars. A breadboard or table top is supported on vibration isolation mounts and provides a stable platform on which to populate system components.

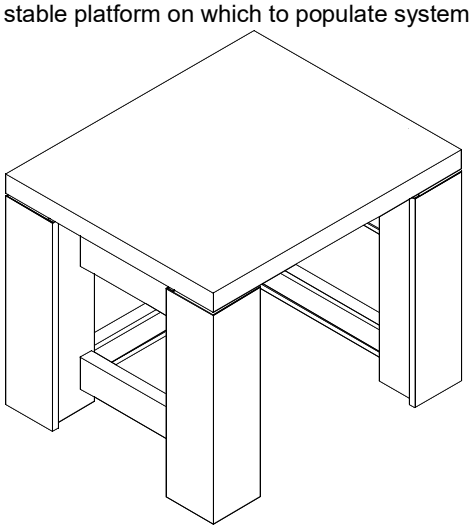


Fig. 3.1 Typical layout

3.2 Installing the Frame

1) Remove all packaging.

Warning

During item (2), safe lifting precautions must be observed. In particular, do not lift more than 25 kg (55 lb) per person. Use more people or lifting apparatus as necessary. Frame weights are detailed in Chapter 6.

2) Install the frame in the location in which it is to be used.
3) Adjust the feet until the castors (if fitted) are clear of the ground and the frame is level – see Fig. 3.2. Use a suitable levelling device as necessary.

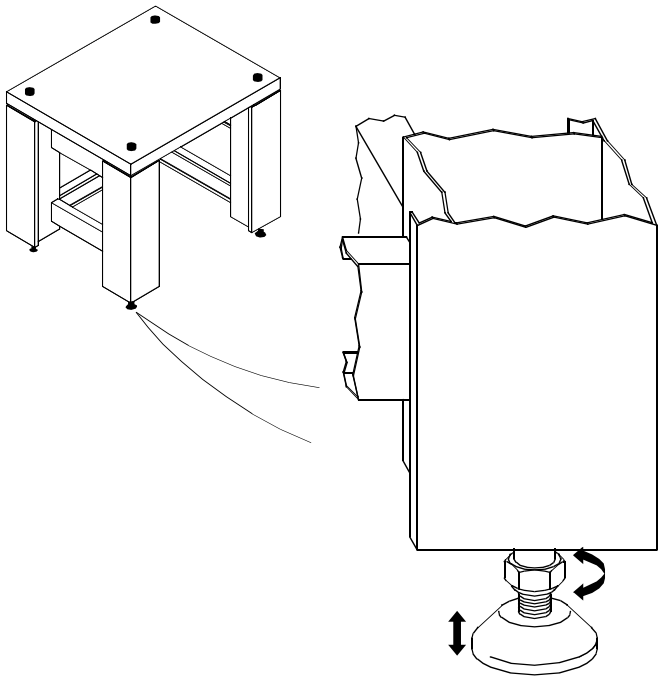


Fig. 3.2 Levelling the frame

3.3 Installing the Anti-vibration Mounts and Breadboard

Equipment Required:

Air compressor or continuous air supply

Parts supplied:

Air hose

Alloy location bosses (qty 4)

1) Ensure the frame is level – see Section 3.2.

Note

The system is supplied with the air hoses for each isolator already connected. If for any reason the hoses have been disconnected, proceed as detailed in item (2).

2) Using the 6mm outside diameter nylon tubing and T-pieces supplied, connect the isolators as shown in Fig. 3.3. Note that the slave isolator A is supplied from the master isolator D..

Warning

The air supply may come from an air line, a compressed gas bottle, or a small compressor dedicated to this installation. In all cases, to avoid injury to personnel and to reduce the risk of over-pressurizing the system, the supply to the isolators must be delivered through a pressure regulator.

Caution

When cutting the tubing to the required length, ensure that all cuts are made at 90° to allow the tube to fit flush against the end stop – see Fig. 3.4.

The push-in connectors on the T-pieces and the valves accept the nylon tube in two steps – see Fig. 3.4.

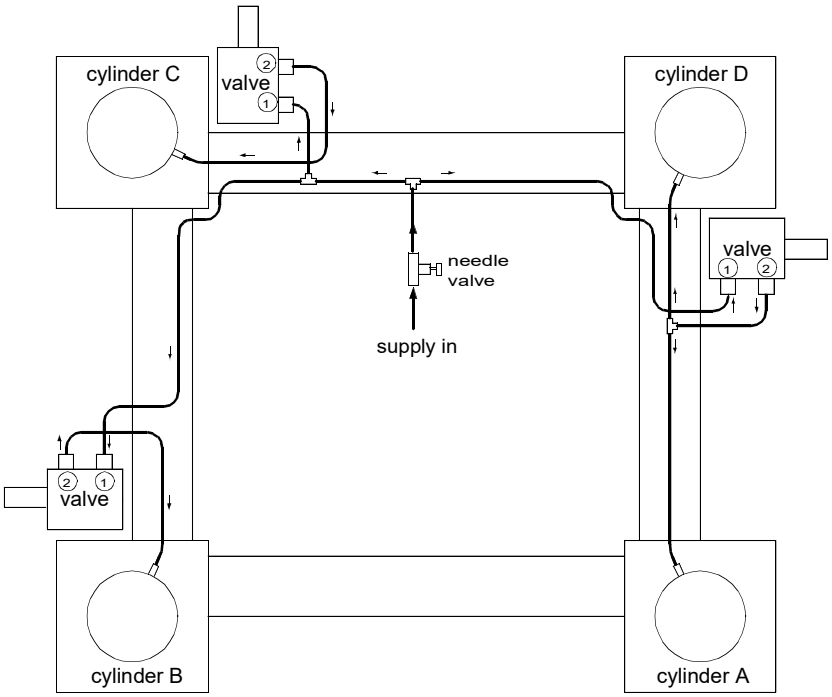


Fig. 3.3 Air supply connections

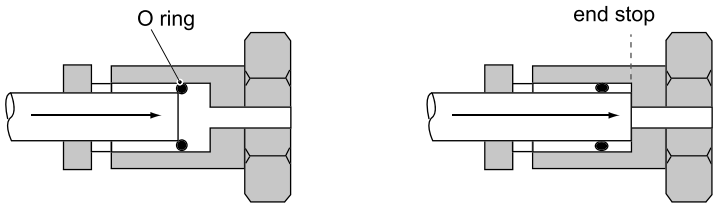
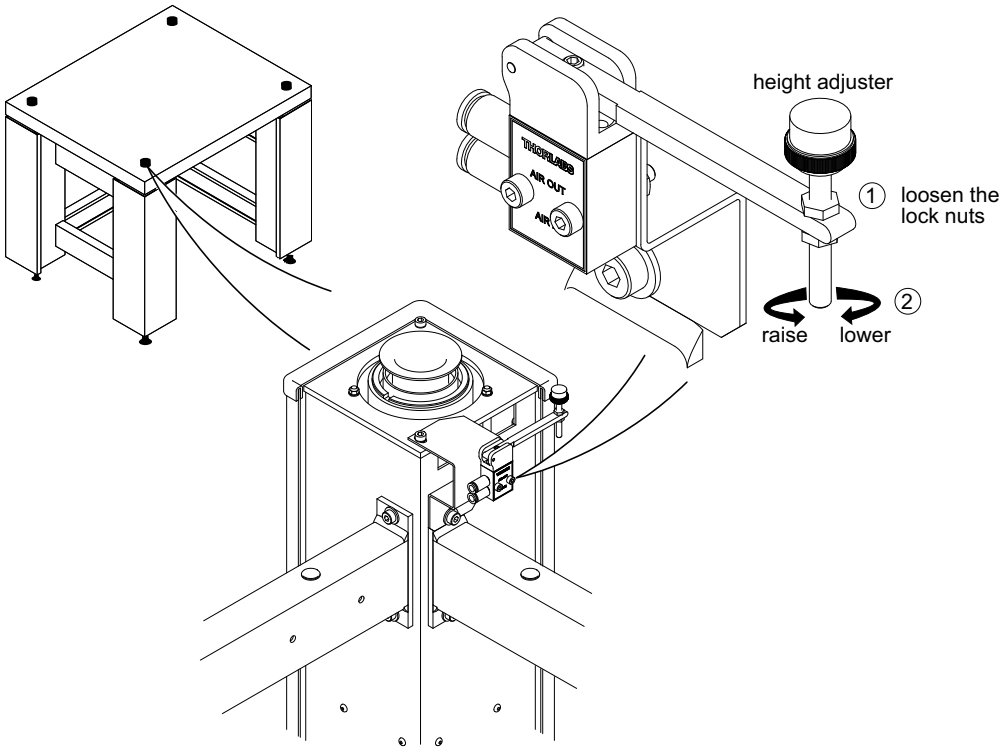


Fig. 3.4 T piece connections

3) Attach the four location bosses to the underside of the breadboard or table.



Note. Only three isolators are fitted with height adjusters, isolator A is supplied with air from isolator D – see Fig. 3.3.

Fig. 3.5 Self levelling valve mechanism

Warning

During item (4):

Safe lifting precautions must be observed. In particular, do not lift more than 25 kg (55 lb) per person.

Use more people as necessary. Frame weights are detailed in Chapter 6.

Breadboards should be lifted only in an unpopulated condition.

The space between the edge of the breadboard and the frame is very small. When lowering the breadboard into position, take care not to trap fingers or clothing.

4) Using a suitable device, lift the breadboard/table top into position, ensuring that the positioning bosses are correctly located in the cups at the top of each leg – see Fig. 3.6.

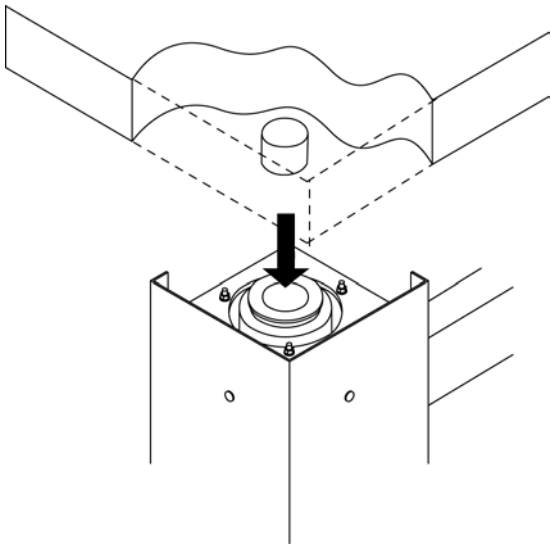


Fig. 3.6 Locating the positioning bosses

5) Ensure the compressor outlet valve or air supply is turned off.

6) Connect the air supply/compressor hose to the needle valve between legs C and D – see Fig. 3.3.

Note

Item (8) is applicable only if using a compressor to supply the air.

7) Connect the compressor to a suitable mains supply and switch on.
8) Set the outlet pressure regulator to between 50 and 100 psi.

Note

Item (10) is applicable only if using a compressor to supply the air.

9) Wait for the compressor to reach full pressure.

Note

For further details on the operation of the air compressor see Handbook HA 0103T – Air Compressor.

10) Turn on the outlet valve for the air supply, then open the needle valve just sufficiently to inflate the system.
11) Allow sufficient time for the isolators to fill and reach pressure. With heavy loads, the isolators will take longer to reach optimum pressure.



Trap Warning



The normal, continuous operation of the equipment results in a gap between the bottom surface of the installed breadboard and the main body cylinder of each leg. This gap will vary based on the instantaneous load and forces exerted on the breadboard. In some instances this gap is large enough into which to insert fingers, and therefore presents a potential pinch hazard. Keep fingers clear of this gap.

12) Adjust the thumbscrew on leg D to raise the table. Note that there is always a delay between adjusting the screw, and the isolator reaching its new position. This is due to the time taken for air to flow through the system.
13) Repeat item (11) for legs B and C.
14) Repeat items (11) and (12) until there is a gap of 9mm between the underside of the table and the edging strip at the top of each leg – see Fig. 3.7.
15) Using a suitable levelling device, check that the breadboard is level. If not, adjust the three height adjusters as necessary.
16) Test the vertical isolation system by disturbing the table up or down. This should cause the valve to operate to correct the displacement. If the correction is very slow, or the table 'hunts' about its mean position, open the needle valve to increase the supply pressure.
17) Populate the breadboard.

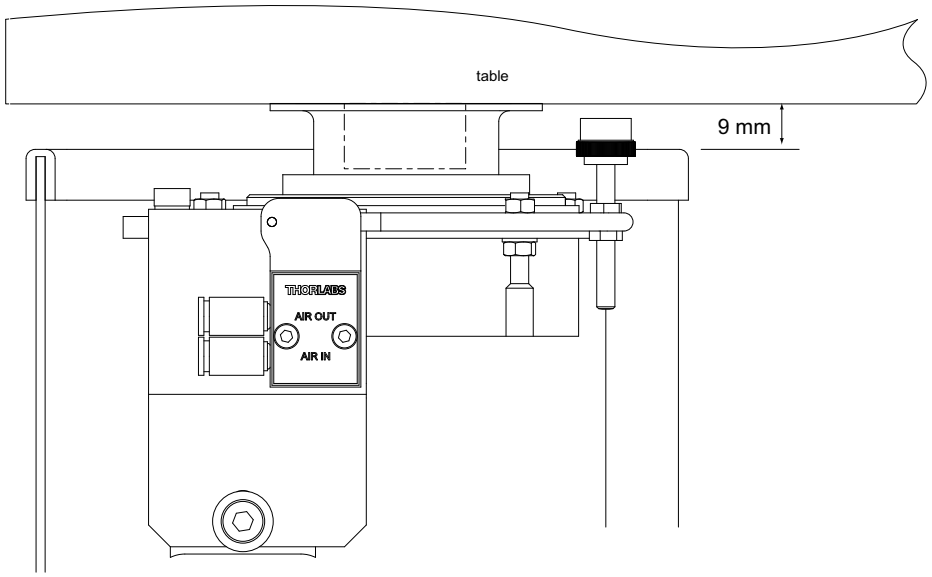


Fig. 3.7 Levelling the system

Chapter 4 Considerations For Ergonomic Layout

Note

The workstation and its accessories have been designed to provide maximum adaptability, thereby ensuring the most ergonomically favorable work environment for the operator. When setting up the final layout of the workstation, consideration should be given to the position of the operator, the positioning of the various pieces of equipment in relation to the operator, and the duration of use for each unit.

4.1 Ergonomic Guidelines

The following information from ISO 6385 is provided as a guide.

The work area should be adapted to the operator:

- Height of work area should be adapted to body dimensions and work performed.
- Seating arrangements should be adjusted to the individual.
- Sufficient space should be provided for body movements.
- Controls should be within reach. (preferably within the working area defined – see Fig. 4.1)

The work should be adapted to the operator:

- Unnecessary strain should be avoided.
- Strength requirements should be within reasonable limits.
- Body movements should follow natural rhythms.
- Posture, strength and movement should be harmonized.

Particular attention should be paid to:

- Where possible, alternate between sitting and standing postures (if only one position is available, sitting is preferable to standing).
- Keep the chain of force vectors through the body short and simple.
- Allow suitable body posture and provide appropriate support.
- Provide auxiliary energy if strength demands are excessive.
- Avoid immobility.
- Use preferred motions. Repetitive twisting should be avoided, especially when seated.

The user should be supplied with a chair providing good body support, and adjustable height and posture. An inclined foot support is recommended, where necessary, to aid user comfort. This should be adequately adjustable in height and inclination to provide good support for the feet and legs.

Once the user is seated, their seating height and footrest (if used) should be adjusted so the interface with the workstation is comfortable – See Fig. 4.1 for guidance on preferred workspaces.

Note

For simplicity, only one body size is shown and adaptations for other body sizes will be necessary. It is advisable to leave legroom, which is free from obstructions/ bump hazards, under the desk.

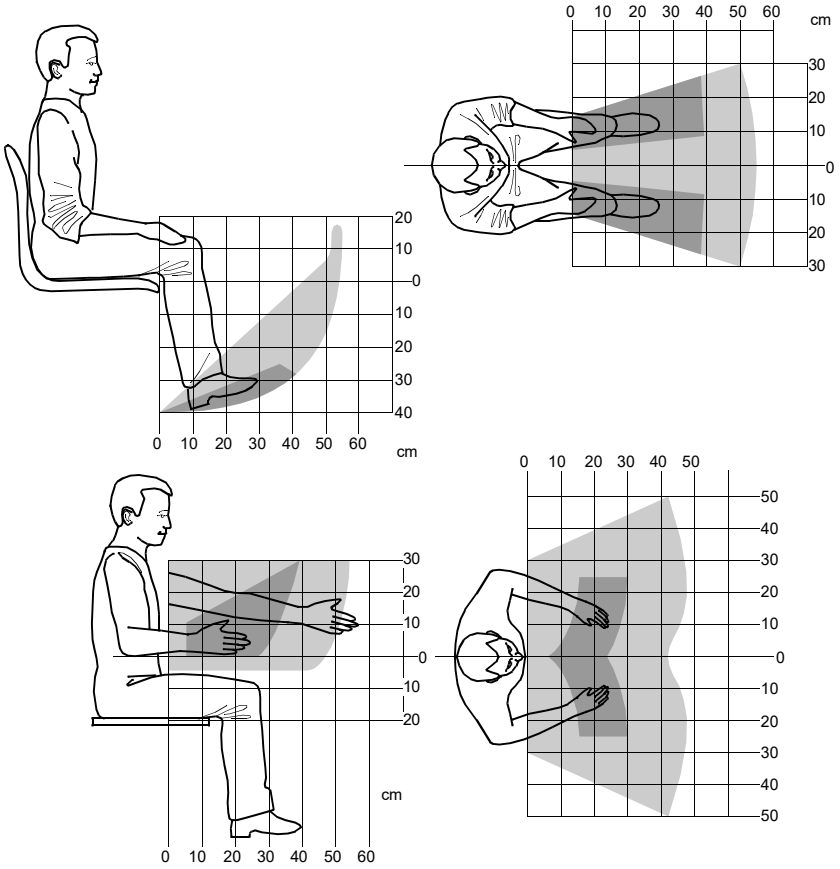


Fig. 4.1 Preferred workspaces for feet and hands

Where operators are required to visually monitor work, displays, control devices etc., of any nature these should, where practicable, be placed so that the top edge of the viewed area is on or below the operator's horizontal line of sight. If possible, it is good practise to have all viewed areas in the range of 0° (horizontal sight) to 30° below that line. A maximum angle of 45° below horizontal is acceptable for intermittent use only.

All keyboards, mice and other control equipment should be mounted and used in a manner appropriate to the task in hand. For example if the keyboard is only to be used occasionally, perhaps during set-up, it should be placed on a side table or even the breadboard and stored after use, whereas a fully engineered ergonomic solution would be better for an application requiring large amounts of typing.

Lighting is also an important issue that must be addressed at the system design stage and there are many national standards to cover appropriate lighting levels.

Finger traps should be avoided. Operation of components should not interfere with other settings or adjacent equipment.

All warning labels must adhere to the end user's national standards and should be placed in a prominent and appropriate position.

Chapter 5 Fitting Casters

5.1 Procedure

5.1.1 Component Parts

Bolt (qty 4)

Washer (qty 8)

Nut (qty 4).

End Cap (qty 4)

Caster Assembly (qty 4)

5.1.2 Fitting the Caster Assemblies

Referring to Fig 2.1:

1) Fit a washer to the attachment bolt and pass the bolt through the holes in the lower support strut.
2) Fit a washer to the end of the bolt protruding through the support strut.
3) Using an open ended spanner, turn each mounting foot and adjust the height of the frame sufficiently to allow the caster assembly to be fitted.
4) Fit the castor assembly onto the bolt.
5) Fit the retaining nut and tighten.
6) Fit the plastic end cap to the head of the bolt.
7) Repeat items 1) to 6) for the remaining 3 casters.

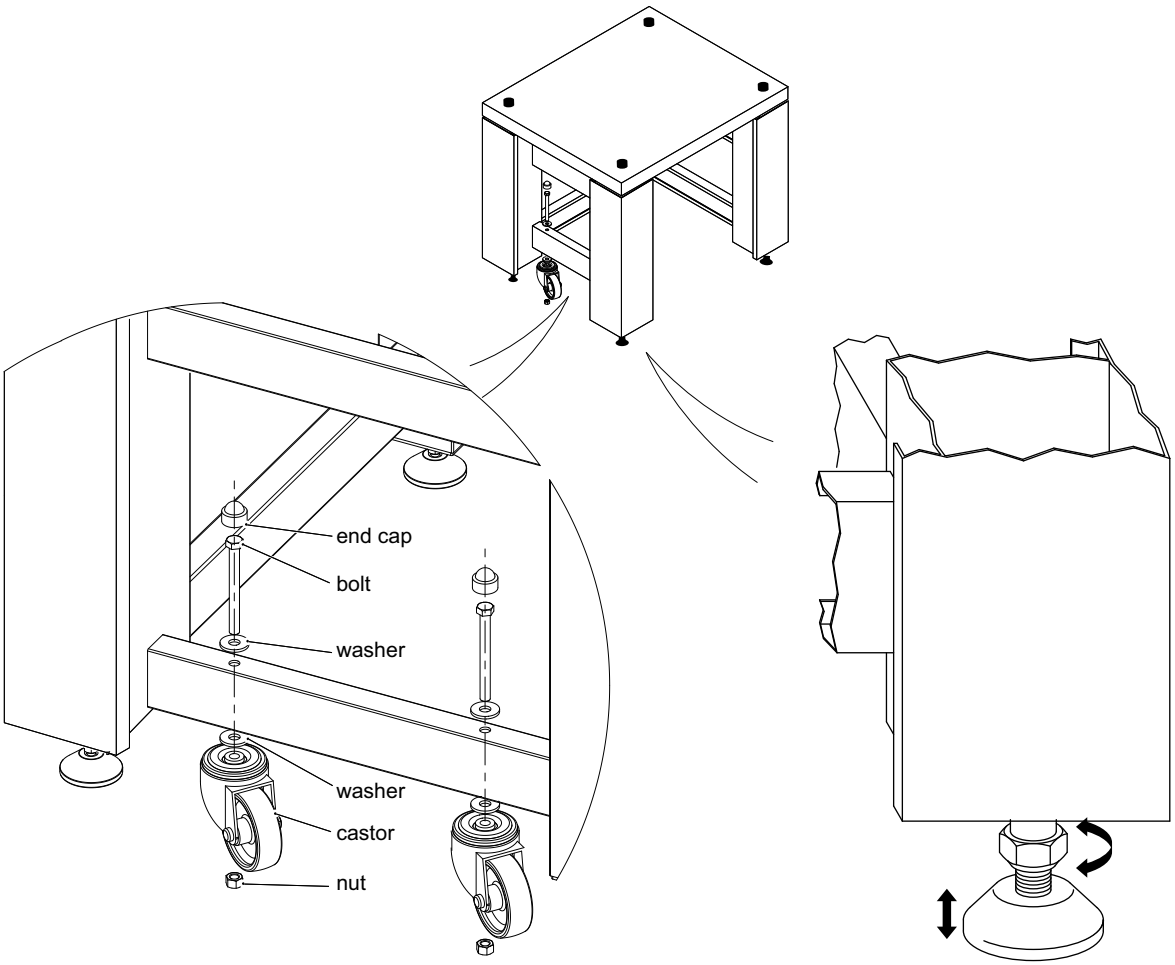


Fig. 5.1 Fitting a caster assembly]

Chapter 6 Weights and Dimensions

Part Number	Compatible Breadboard Size mm (in)	Frame Size mm (in) H x D x W	Frame weight Kg (lb)	Packed Weight kg (lb)
PFA51509	750 x 750 mm (30” x 30”)	700 x 745.5 x 745.5 (27.56” x 29.35” x 29.35”)	87 Kg (191.4 lb)	141 Kg (310.2 lb)
PFA51505	750 x 900 mm (30” x 36”)	700 x 745.5 x 895.5 (27.56” x 29.35” x 35.26”)	89 Kg (195.8 lb)	148 Kg (325.6 lb)
PFA51508	750 x 1200 mm (30” x 48”)	700 x 745.5 x 1195.5 (27.56” x 29.35” x 47.07”)	90 Kg (198.0 lb)	155 Kg (341.0 lb)
PFA51501	750 x 1500 mm (30” x 60”)	700 x 745.5 x 1495.5 (27.56” x 29.35” x 58.88”)	99 Kg (217.8 lb)	168 Kg (369.6 lb)
PFA51506	900 x 900 mm (36” x 36”)	700 x 895.5 x 895.5 (27.56” x 35.26” x 35.26”)	92 Kg (202.4 lb)	148 Kg (325.6 lb)
PFA51507	900 x 1200 mm (36” x 48”)	700 x 895.5 x 1195.5 (27.56” x 35.26” x 47.07”)	98 Kg (215.6 lb)	166 Kg (365.2 lb)
PFA51502	900 x 1500 mm (36” x 60”) 900 x 1800 mm (36” x 72”)	700 x 895.5 x 1495.5 (27.56” x 35.26” x 58.88”)	102 Kg (224.4 lb)	175 Kg (385.0 lb)
PFA51504	1200 x 1500 mm (48” x 60”) 1200 x 1800 mm (48” x 72”)	700 x 1195.5 x 1495.5 (27.56” x 47.07” x 58.88”)	108 Kg (237.6 lb)	202 Kg (444.4 lb)
PFA52509	750 x 750 mm (30” x 30”)	800 x 745.5 x 745.5 (31.5” x 29.35” x 29.35”)	93 Kg (204.6 lb)	148 Kg (325.6 lb)
PFA52505	750 x 900 mm (30” x 36”)	800 x 745.5 x 895.5 (1.5”x 29.35” x 35.26”)	96 Kg (211.2 lb)	158 Kg (347.6 lb)
PFA52508	750 x 1200 mm (30” x 48”)	800 x 745.5 x 1195.5 (1.5” x 29.35” x 47.07”)	97 Kg (213.4 lb)	163 Kg (358.6 lb)
PFA52501	750 x 1500 mm (30” x 60”)	800 x 745.5 x 1495.5 (1.5” x 29.35” x 58.88”)	105 Kg (231.0 lb)	174 Kg (382.8 lb)
PFA52506	900 x 900 mm (36” x 36”)	800 x 895.5 x 895.5 (1.5” x 35.26” x 35.26”)	99 Kg (217.8 lb)	168 Kg (369.6 lb)
PFA52507	900 x 1200 mm (36” x 48”)	800 x 895.5 x 1195.5 (1.5”x 35.26” x 47.07”)	104 Kg (228.8 lb)	186 Kg (409.2 lb)
PFA52502	900 x 1500 mm (36” x 60”) 900 x 1800 mm (36” x 72”)	800 x 895.5 x 1495.5 (1.5” x 35.26” x 58.88”)	108 Kg (237.6 lb)	189 Kg (415.8 lb)
PFA52504	1200 x 1500 mm (48” x 60”) 1200 x 1800 mm (48” x 72”)	800 x 1195.5 x 1495.5 (1.5” x 47.07” x 58.88”)	114 Kg (250.8 lb)	210 Kg (462.0 lb)

Chapter 7 Active Work Station Packing List

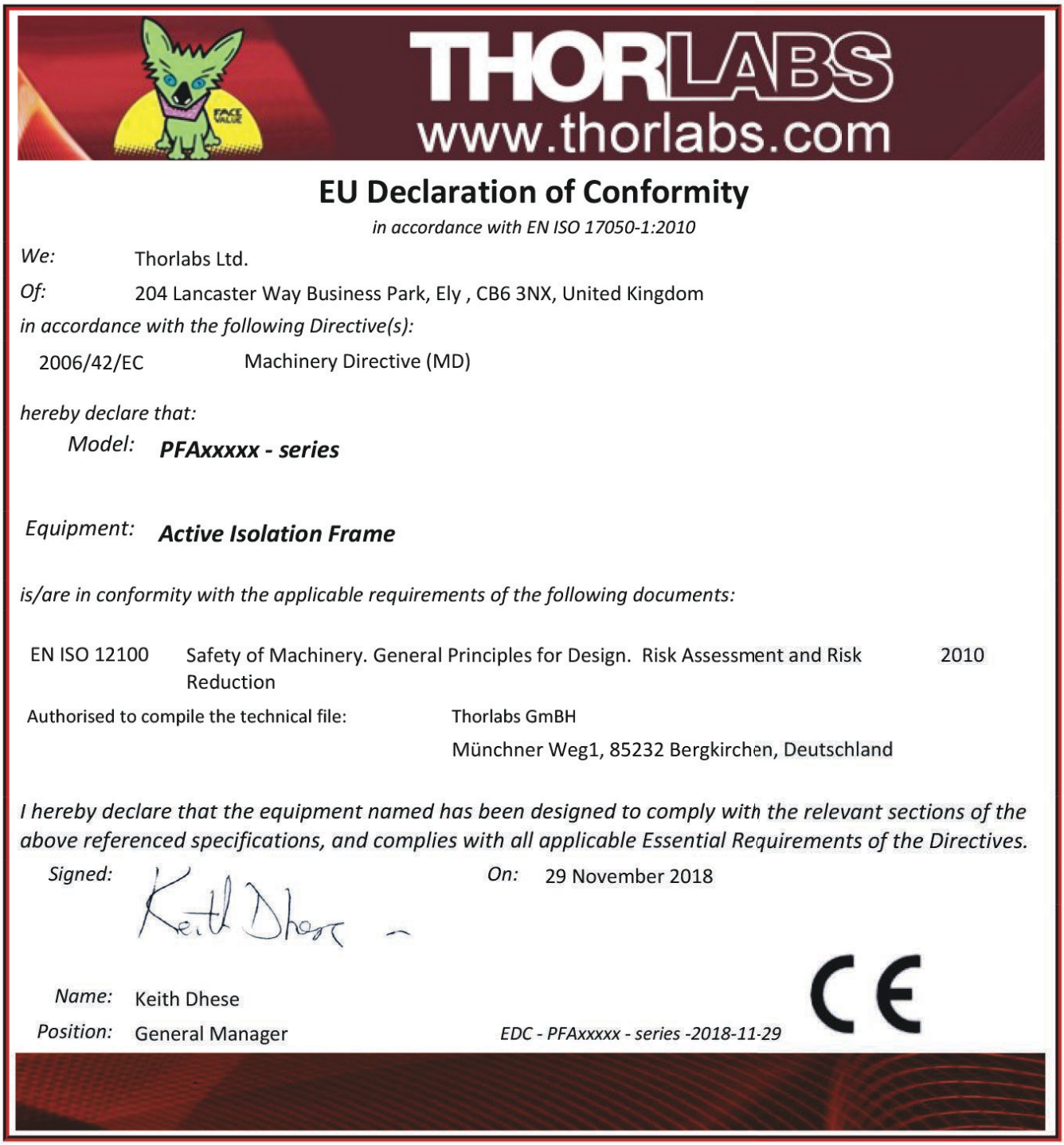
Manual HA0108T		Fitting CE0225		Boss 116112 Qty 4			
BNP Screws DB0257 Qty 4		Tube 9m		M6 x 16 Screws DB0061 Qty 4			

Signed..... Countersigned..... Date.....

Chapter 8 Regulatory

8.1 Declarations Of Conformity

8.1.1 For Customers in Europe



THORLABS
www.thorlabs.com

EU Declaration of Conformity

in accordance with EN ISO 17050-1:2010

We: Thorlabs Ltd.

Of: 204 Lancaster Way Business Park, Ely , CB6 3NX, United Kingdom

in accordance with the following Directive(s):

2006/42/EC Machinery Directive (MD)

hereby declare that:

Model: ***PFAxxxxx - series***

Equipment: ***Active Isolation Frame***

is/are in conformity with the applicable requirements of the following documents:

EN ISO 12100	Safety of Machinery. General Principles for Design. Risk Assessment and Risk Reduction	2010

Authorised to compile the technical file: Thorlabs GmBH
Münchner Weg1, 85232 Bergkirchen, Deutschland

I hereby declare that the equipment named has been designed to comply with the relevant sections of the above referenced specifications, and complies with all applicable Essential Requirements of the Directives.

Signed: Keith Dhese *On:* 29 November 2018

Name: Keith Dhese

Position: General Manager

CE

EDC - PFAxxxxx - series -2018-11-29

Appendix I Thorlabs Worldwide Contacts

For technical support or sales inquiries, please visit us at www.thorlabs.com/contact for our most up-to-date contact information.



USA, Canada, and South America
Thorlabs, Inc.
sales@thorlabs.com
techsupport@thorlabs.com

Europe
Thorlabs GmbH
europe@thorlabs.com

France
Thorlabs SAS
sales.fr@thorlabs.com

Japan
Thorlabs Japan Inc.
sales@thorlabs.jp

UK and Ireland
Thorlabs Ltd.
sales@uk.thorlabs.com
techsupport.uk@thorlabs.com

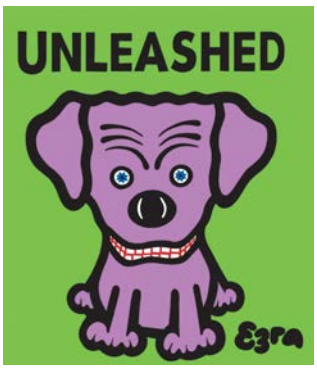
Scandinavia
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brasil@thorlabs.com

China
Thorlabs China
chinasales@thorlabs.com

Thorlabs verifies our compliance with the WEEE (Waste Electrical and Electronic Equipment) directive of the European Community and the corresponding national laws. Accordingly, all end users in the EC may return "end of life" Annex I category electrical and electronic equipment sold after August 13, 2005 to Thorlabs, without incurring disposal charges. Eligible units are marked with the crossed out "wheelie bin" logo (see right), were sold to and are currently owned by a company or institute within the EC, and are not dissembled or contaminated. Contact Thorlabs for more information. Waste treatment is your own responsibility. "End of life" units must be returned to Thorlabs or handed to a company specializing in waste recovery. Do not dispose of the unit in a litter bin or at a public waste disposal site.





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