

OPTICAL BENCH ASSEMBLY

USER GUIDE

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Optical Bench Assembly



Health and Safety Information



Read all of the instructions in this booklet - including all the **WARNINGS** and **CAUTIONS** - *before* using this product. If there is any instruction which you do not understand, **DO NOT USE THE PRODUCT.**

Safety Signs



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or personal injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury to the user or users, or result in damage to the product or to property.

NOTE

Indicates a potentially hazardous situation which, if not avoided, could result in damage or loss of data.

Signs and Symbols used on equipment and Documentation



Caution, risk of electric shock.



Caution, attention to possibility of risk of damage to the product, process or surroundings. Refer to instruction manual.



Caution, hot surface.



Protective Conductor Terminal.



Observe precautions for handling electrostatic discharge sensitive devices.

Equipment Operation

Use of this instrument in a manner not specified by AMETEK Land may be hazardous. Read **and understand** the user documentation supplied **before** installing and operating the equipment.

The safety of any system incorporating this equipment is the responsibility of the assembler.

Protective Clothing, Face and Eye Protection

It is possible that this equipment is to be installed on, or near to, machinery or equipment operating at high temperatures and high pressures. Suitable protective clothing, along with face and eye protection must be worn. Refer to the health and safety guidelines for the machinery/equipment before installing this product. If in doubt, contact AMETEK Land.



Wear Protective Gloves



Wear Protective Clothing



Wear Eye Protection



Wear Ear Protection



Wear Safety Boots



Wear Face Protection

Electrical Power Supply

Before working on the electrical connections, all of the electrical power lines to the equipment must be isolated. All the electrical cables and signal cables must be connected exactly as indicated in these operating instructions. If in doubt, contact AMETEK Land.

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Storage

The instrument should be stored in its packaging, in a dry sheltered area.

The maximum storage temperature is 10°C (18°F) higher than the maximum operating temperature.

The minimum storage temperature is 10°C (18°F) lower than the minimum operating temperature.

Refer to the Technical Specification for details of the operating temperature limits.

Unpacking

Check all packages for external signs of damage. Check the contents against the packing note.

Lifting Instructions

Where items are too heavy to be lifted manually, use suitably rated lifting equipment. Refer to the Technical Specification for weights. All lifting should be carried out in accordance with local and national regulations.

Return of Damaged Goods

IMPORTANT If any item has been damaged in transit, this should be reported to the carrier and to the supplier immediately. Damage caused in transit is the responsibility of the carrier not the supplier.

DO NOT RETURN a damaged instrument to the sender as the carrier will not then consider a claim. Save the packing with the damaged article for inspection by the carrier.

Return of Goods for Repair

If you need to return goods for repair please contact our Customer Service Department for details of the correct returns procedure.

Any item returned to AMETEK Land should be adequately packaged to prevent damage during transit.

You must include a written report of the problem together with your own name and contact information, address, telephone number, email address etc.

Design and Manufacturing Standards

The Quality Management System of Land Instruments International is approved to BS EN ISO 9001 for the design, manufacture and on-site servicing of combustion, environmental monitoring and non-contact temperature measuring instrumentation.

Registered ISO9001 Management System approvals apply in the USA.

UK Calibration Laboratory: UKAS 0034.

USA Calibration Laboratory: ANAB Accredited ISO/IEC 17025.

National Accreditation Board for Testing and Calibration Laboratories approvals apply in India.

Operation of radio transmitters, telephones or other electrical/electronic devices in close proximity to the equipment while the enclosure doors of the instrument or its peripherals are open, may cause interference and possible failure where the radiated emissions exceed the EMC directive.

The protection provided by this product may be invalidated if alterations or additions are made to the structural, electrical, mechanical, pneumatic, software or firmware components of this system. Such changes may also invalidate the standard terms of warranty.

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1

INTRODUCTION

AMETEK Land offer a range of bench-top, transportable and portable blackbody sources for the calibration of radiation thermometers.

To supplement these products, an optical bench complete with mounted calibration accessories is available.

These optical bench systems assist in the holding and precise alignment of all types of fixed system radiation thermometers manufactured by AMETEK Land.



Fig. 1-1 Optical Bench Calibration Accessory

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DESCRIPTION

The optical bench calibration accessory was designed for bench top use with the Land Instruments range of **Landcal** blackbody calibration sources. The accessory consists of 3 parts:

1. A 915 mm/36 in long optical rail supplied complete with self-levelling feet.
2. A mounting assembly supplied complete with vertical and horizontal adjustments. The mounting assembly is fitted with a camera style quick release adaptor.
3. A holder suitable for mounting thermometers from the Land System 4 range and a holder suitable for mounting other Land thermometer types are supplied. Both are fitted with quick release adaptors.

The distance between bench top and mid point height adjustment is 350 mm/14 in when used with the System 4 thermometer holder and 370 mm/14.6 in when used with the other thermometer types holder. Additional vertical travel is ± 21 mm/0.8 in. Two sets of 4 pillars 65 mm/2.6 in long and one set of 4 pillars 35 mm/1.4 in long can be used to increase the mid point height.

To mount any thermometer at the correct height to view the centre line of the target in a **P1600B/LRC-2** source, it will be necessary to use 2 sets of pillars 65 mm/2.6 in long.

To mount any thermometer at the correct height to view the centre line of the target in the **P1200B/LRC-1** source, no pillars are required.

To mount a System 4 thermometer at the correct height to view the centre line of the target in the **R1500T** source, it will be necessary to use 1 set of pillars, 35 mm/1.4 in long.

To mount any thermometer other than a System 4 at the correct height to view the centre line of the target in the **R1500T** source, no pillars are required.

To mount any thermometer at the correct height to view the centre line of the target in the **P1600B2** source, it will be necessary to use 1 set of pillars 65 mm/2.6 in long and 1 set of pillars 35 mm/1.4 in long.

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ASSEMBLY AND ALIGNMENT OF THE OPTICAL BENCH

The optical bench calibration accessory is usually supplied assembled and ready to use. If it is not supplied pre-assembled, proceed as follows:

- 1) Screw the self-levelling feet into the cross-members. Attach the cross-member to the optical rail.
- 2) Assemble the remaining carriers in the following order. Refer to Fig. 3-1 (overleaf).

Item	Description	Part Number
1	Carrier	800447
2	Mounting Plate	800408
3	Packing Pillars (if necessary)	029.140/029.141
4	Scissor Jack	135.201
5	X-Axis	800446
6	Adaptor Plate	800408
7	Quick Release Adaptor	135.202
8	Angle Bracket Assembly or System 4 Holder Kit	

- 3) Place the carrier assembly on the optical bench.
- 4) Position the optical bench where it is to be used with its hot end between 50 mm/1.97 in and 100 mm/3.94 in away from the front of the source.
- 5) Visually align the thermometer jacket holder as accurately as possible, so that when a thermometer is mounted in the jacket/holder, it will be looking into the source cavity.

4

USING THE OPTICAL BENCH CALIBRATION ACCESSORY

4.1 General

The optical bench calibration accessory is generally supplied ready for use for the most common calibration applications, the checking of Land System 4 thermometers using the Land Landcal Blackbody Source type **P1200B**. No packing pillars are required in this application, to raise the thermometer in line with the Blackbody Source, ready for alignment.

The assembly will require modification (see section 2.0) if it is to be used with the Land Landcal Blackbody Source (types **P1600B** / **R1500T** / **LRC-2** / **P1600B2**)

4.2 System 4 Thermometers

The System 4 Thermometer calibration kit consists of a modified thermometer holder (shoe), a modified body and a quick-release adapter.

The System 4 Thermometer holder is attached to the mounting assembly using the quick-release adapter. The thermometer requiring calibration is slid into the thermometer holder and held in place by the clamps. If the calibration of the thermometer requires adjustment, the thermometer skeleton should be removed and slid into the modified body. Calibration adjustment potentiometers are visible through the cut-outs.

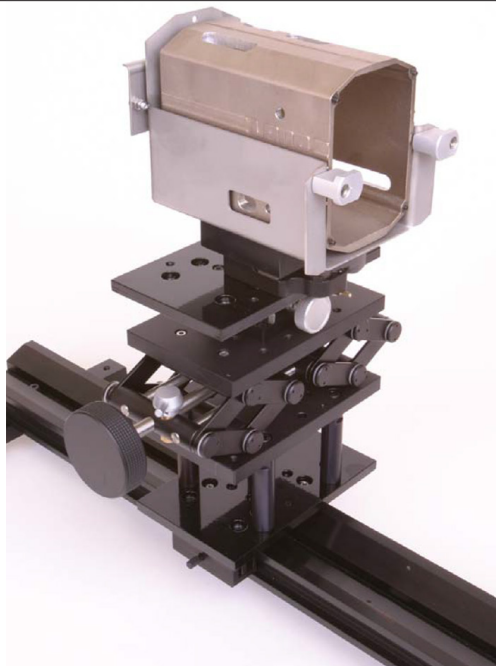
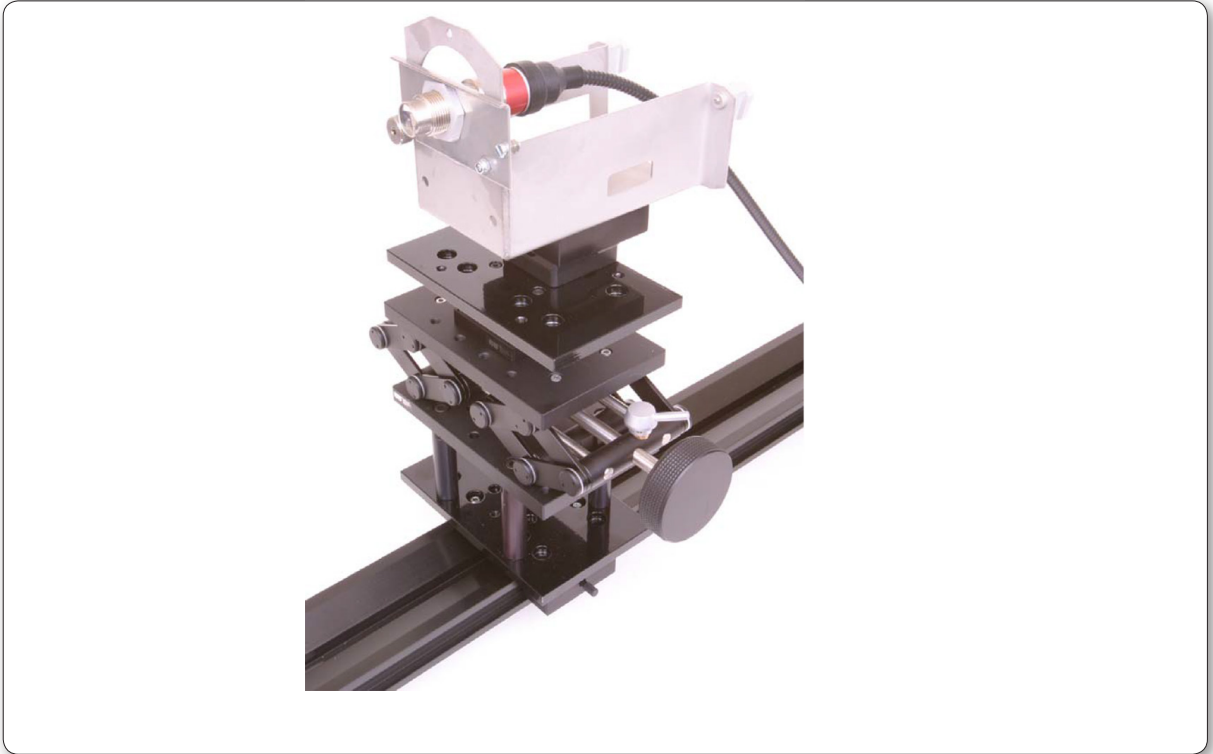


Fig. 4-1 System 4 Thermometer Mounting

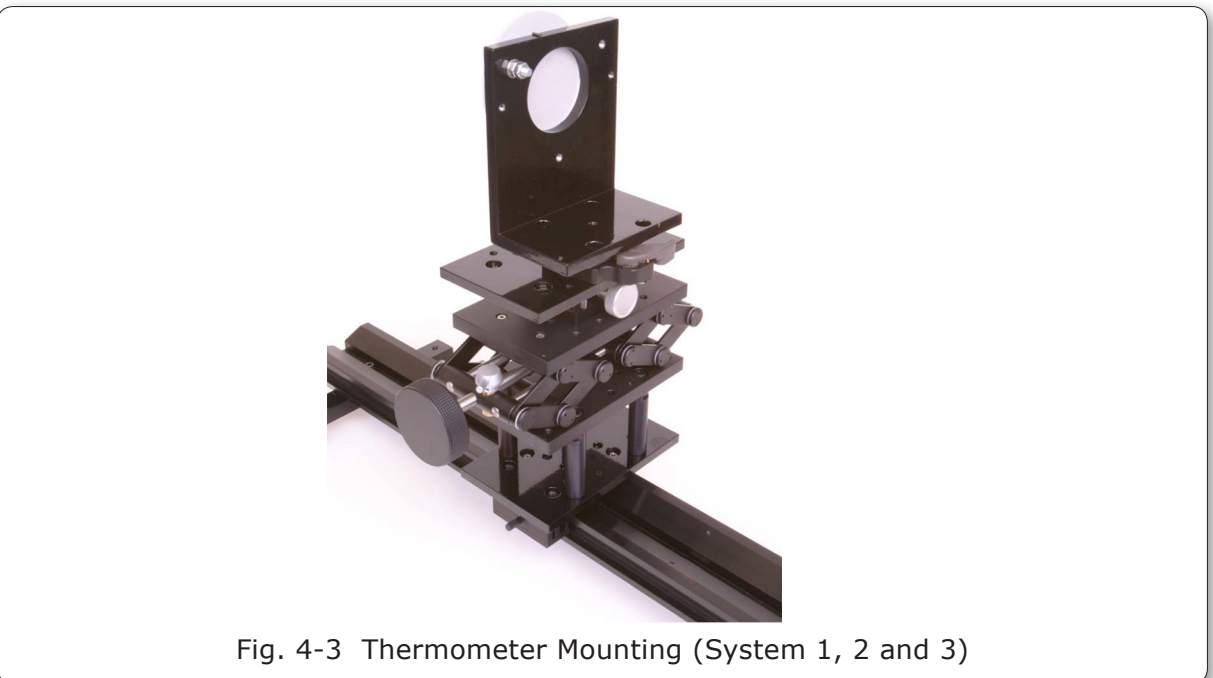
4.3 System 4 Fibroptic Thermometers

Fibroptic System 4 Thermometers are mounted in the front of a standard System 4 Thermometer adapter and are positioned at the correct height by utilising the Fibroptic adapter plate.



4.4 System 1, System 2 and System 3 Thermometers

To calibrate System 1, 2 and 3 thermometers, the angle bracket assembly should be fitted to the linear stage assembly of the optical bench. A thermometer jacket will be required to hold the thermometer in place in the angle bracket. The jacket is secured in place using the three equi-spaced M6 bolts, found on the angle bracket upright. If you do not have a thermometer jacket, contact AMETEK Land.



4.5 Solo Thermometers with Purge Assembly Attached

To calibrate Solo thermometers, the angle bracket assembly should be fitted to the linear stage assembly of the optical bench. Remove the three screws from the angle bracket upright (System 1, 2 and 3 use) and store them in the mini storage unit supplied with the optical bench assembly.

Remove the two M5 screws from the mini storage unit and screw them into the relevant holes in the angle bracket upright. The Solo thermometer purge assembly can now be located onto the two M5 screws and secured using the washers and nuts provided.



Fig. 4-4 Solo Thermometer Mounting

4.6 Micratherm 3 Thermometers

To calibrate Micratherm 3 thermometers, the angle bracket assembly should be fitted to the linear stage assembly of the optical bench. An optional Micratherm 3 mounting bracket (Part No. 199.147) will be required to hold the thermometer in place. This bracket utilises the two M5 screws used in Solo thermometer calibration and should be secured using the washers and nuts provided.

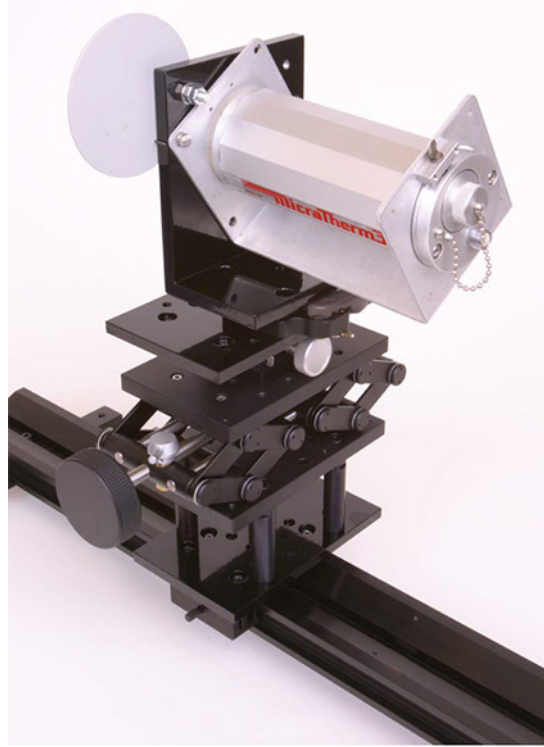
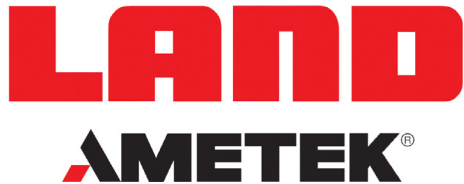


Fig. 4-5 Micratherm 3 Thermometer Mounting

OPTICAL BENCH ASSEMBLY

FOR CALIBRATION OF AMETEK LAND INFRARED THERMOMETERS



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