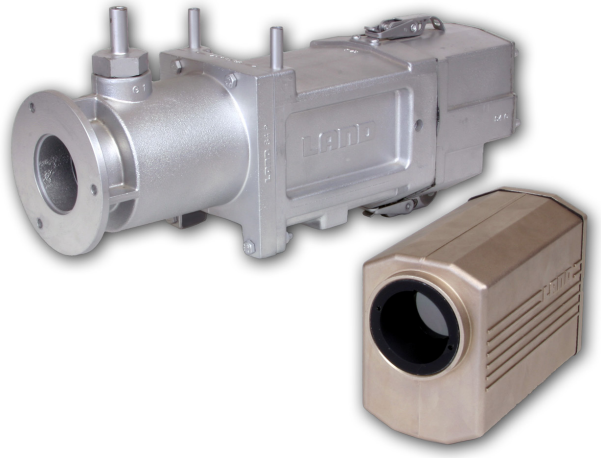

RT8B Thermometer

Installation Guide

for Roadstone Applications

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IMPORTANT INFORMATION - PLEASE READ

AMETEK®
PROCESS & ANALYTICAL INSTRUMENTS

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.

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 ISO 9001 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 About this Guide

This Installation Guide gives the basic information needed to install the RT8B thermometer correctly and get it working. More comprehensive information is given in the User Guide.

2 Preliminary Checks

Check the thermometer type and serial number against the details given on the delivery note.

Check that all the accessories required have been supplied.

Also check that the indicator/controller type and serial number correspond with the delivery note and that the flow restrictor on the air filter system is stamped 'HF'.

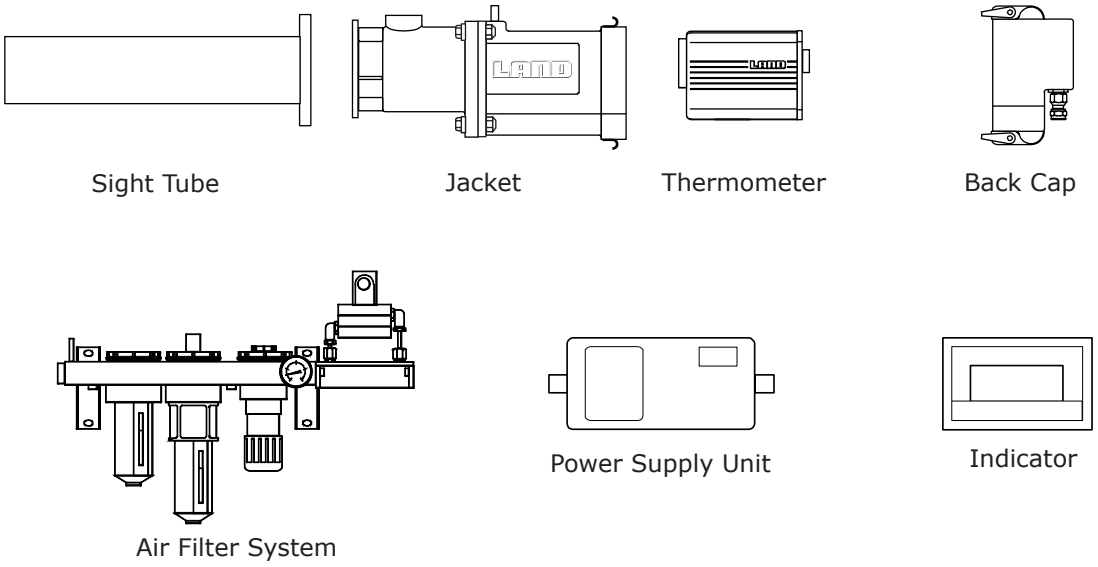


Fig. 1 Components of a typical temperature measurement system

3 System Overview

The Roadstone thermometer is mounted inside a protection jacket which has a mounting flange to facilitate mounting into the mixer/drier (in some cases via a sighting tube).

Cooling and purging air is supplied via the air purge inlet in the thermometer jacket and electrical power is connected to the thermometer via a demountable electrical connector.

Access to the thermometer speed of response and emissivity controls is via a removable cover on the rear of the thermometer.

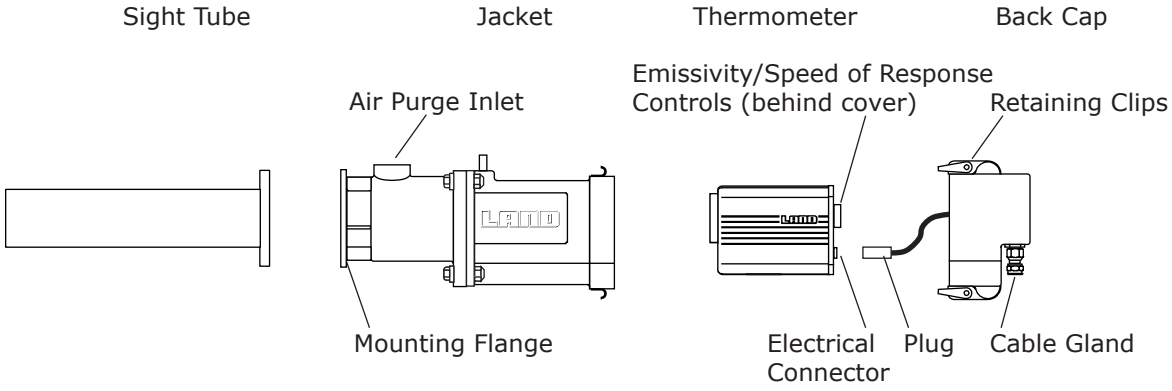


Fig. 2 System overview

4 Positioning the Thermometer

4.1 Drier Exit Chute

Mount the thermometer on a sight tube and insert the tube vertically through the top plate of the exit chute, approximately midway along the chute.

To ensure that the sight path is not obscured by airborne dust , the tip of the sight tube must not be more than 50mm (2 in) above the level of the stone (See Fig. 3).

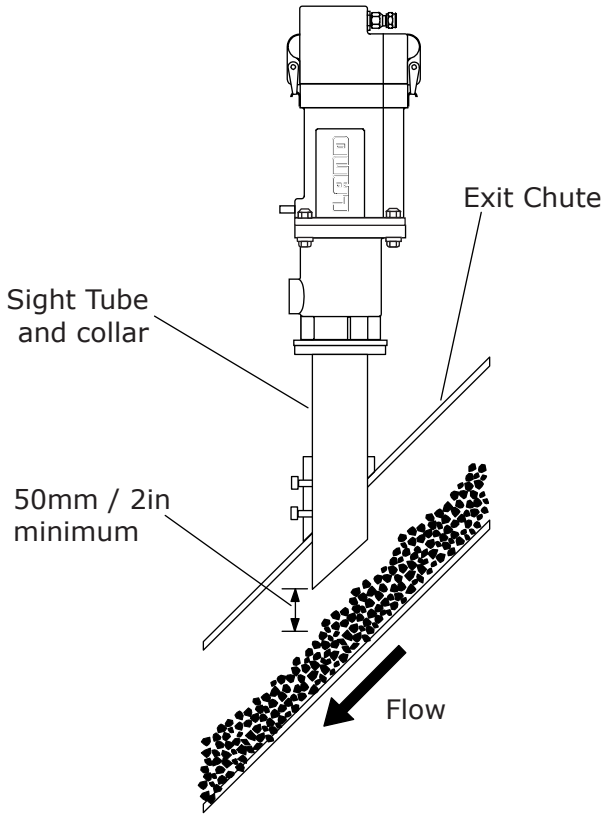


Fig. 3 Temperature Measurement at the Exit Chute

4.2 Mixer

Mount the thermometer either vertically on top of the mixer, or use a sight tube to mount it on the side of the mixer (See Fig. 4).

Choose a point where the thermometer will not see the mixer paddles or, on a batch mixer, reflected flame via the discharge chute.

Ensure that the thermometer lens cannot be splashed with the binder. If this cannot be prevented it is suggested that a shutter is fitted to protect the thermometer during the spray period.

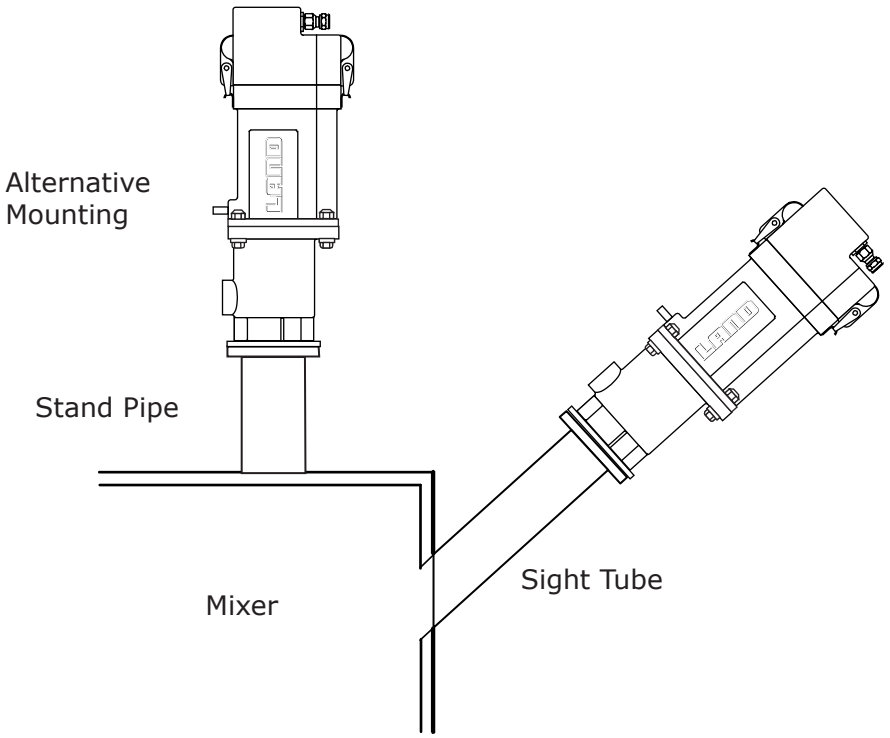


Fig. 4 Temperature Measurement at the Mixer

4.3 Mixer Discharge

Mount the thermometer below the mixer/storage bin discharge doors to view a solid curtain of falling material (See Fig. 5).

Alternatively, position the thermometer such that it views into the skip or lorry and measures the temperature of the collected material.

It is important to ensure that the thermometer's field of view is completely filled by the target.

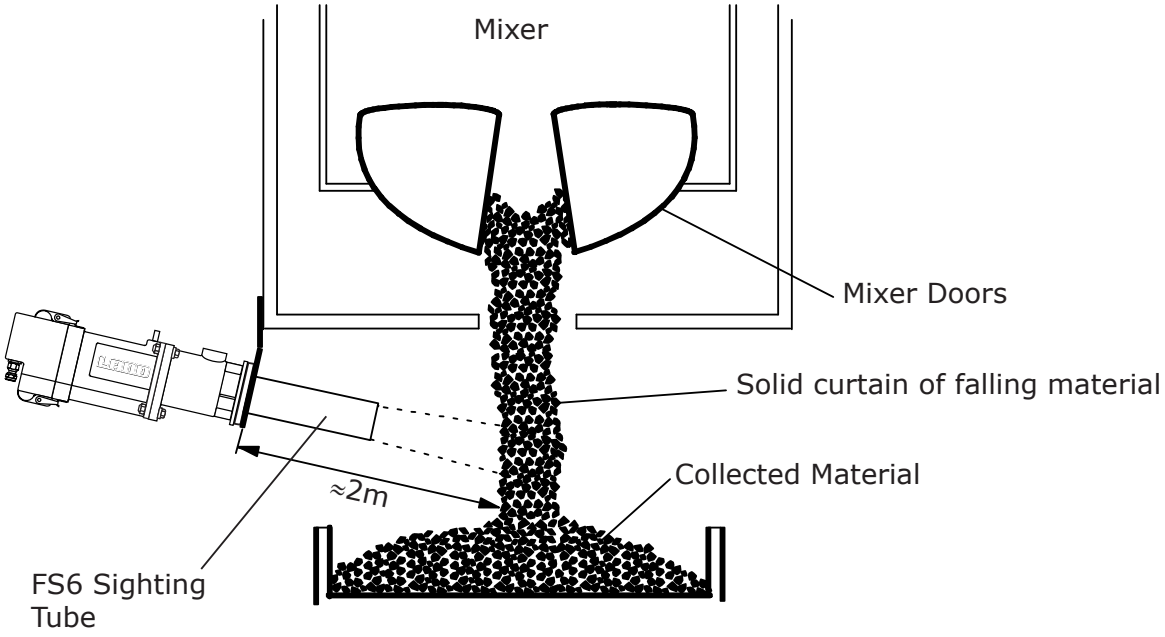


Fig. 5 Temperature Measurement at the Mixer Discharge

5 Using a Sighting Tube

When fabricating the sighting tube be sure that the minimum internal diameter is no less than that shown in Fig. 6 for the length of sighting tube.

Alternatively LAND offer a suitable sighting tube, i.e. Type FS6 150mm (6in) long.

An adjustable sighting tube assembly facilitates efficient temperature measurement in the exit chute where airborne dust would otherwise adversely affect the thermometer readings.

A locking collar welded to the top plate of the chute enables the sight tube to be adjusted to the required height above the stone (See Fig. 3).

A plain, fixed sight tube is sufficient for measurement in the mixer.

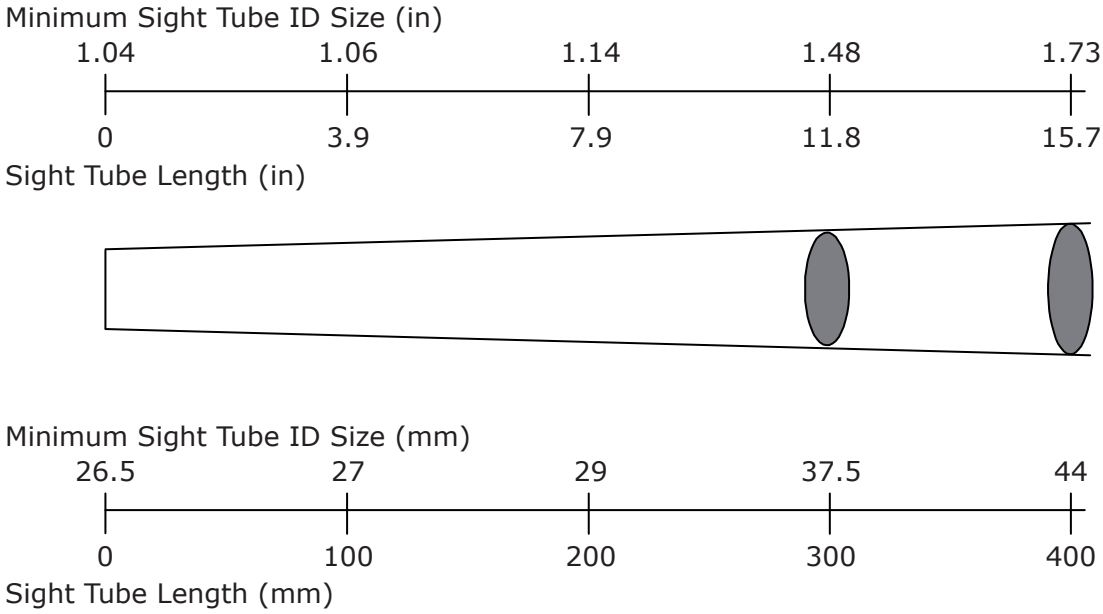
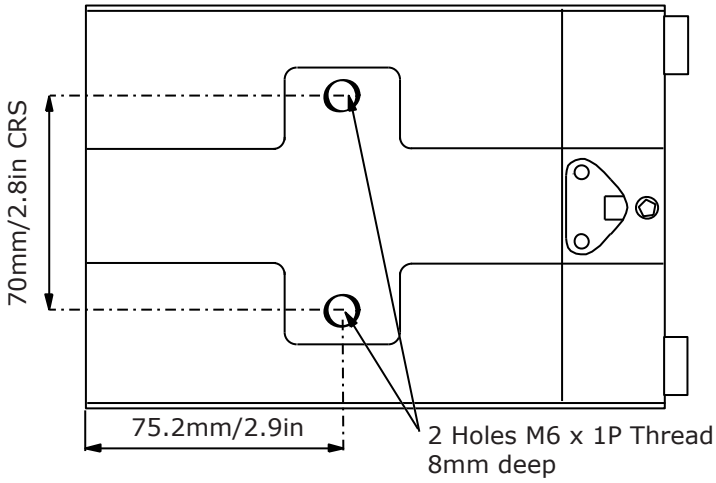


Fig. 6 Sighting tube dimensions

6 Mounting the Thermometer

When the sight tube has been fitted to the exit chute, use (3 off) M6 x 20 screws and nuts to attach the thermometer jacket to the mounting flange of the tube.

The thermometer jacket also has a mounting boss on its base which can be used for mounting beneath the mixer/storage hopper.



View on bottom of jacket

Jacket Mounting: The jacket can be mounted using the two threaded holes (M6 x 1P) on the underside

Fig. 7 View on bottom of jacket showing mounting holes

7 Thermometer Cooling & Purging

An air supply is required for cooling and purging the thermometer.

The air keeps the thermometer electrical circuits cool as well as keeping the thermometer lens clean.

Connect the air is supply to the 1in BSP air inlet or use the pipe adaptor, part number 150.786 which will accept a 10mm ID pipe.

IMPORTANT

The air supply to the jacket must be left on whenever the plant is running, and for not less than half an hour after drying/mixing is complete.

8 Air Supply Requirements

A relatively cool, dry, clean air supply of 1.75 to 10.5 Kg/cm^2 (25 to 150 lb/in^2) pressure is required for use with the System A/A air filter system. Connect the air supply to the thermometer jacket and set the flow rate to approximately 7 litres/second (15 cu ft per minute).

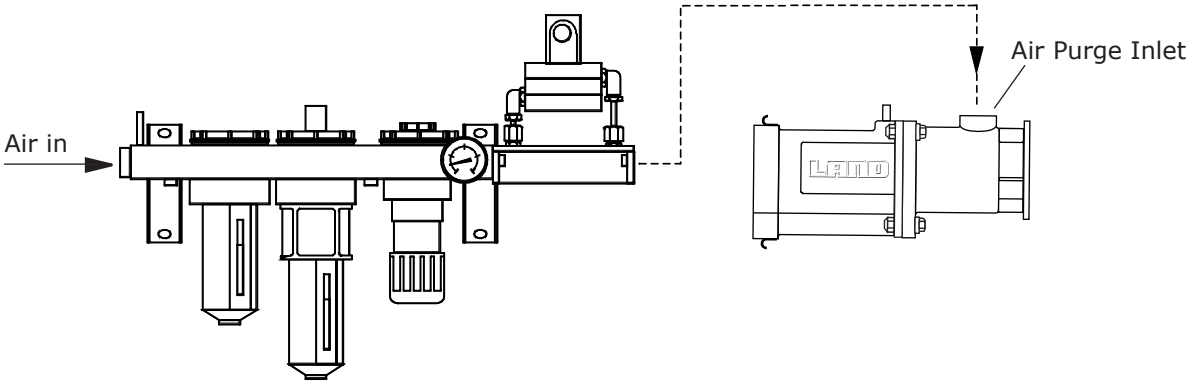


Fig. 8 Air supply system interconnections

9 Power Supply Requirements

The thermometer works on a 4 to 20mA current loop and gives a 4 to 20mA linear output over its temperature range (either 0 to 250°C, 0 to 500°C, 0 to 500°F or 0 to 1000°F depending on the thermometer type).

The thermometer requires a power supply of 11 to 35V d.c. which is normally supplied by the LAND power supply unit or an indicator with loop power option.

The power supply unit and the indicator require an a.c. supply of 110 or 240 volts (specified at time of ordering).

10 Electrical Connections

10.1 General Connections

The electrical connections for the RT8B thermometer power supply and temperature output are made via the 6-way socket on the rear of the thermometer (see Fig. 9).

The connection to the thermometer can be made via any of the following:

- Pre-wired 4m cable (Land Part No. 029.673)
- 6-way plug (Land Part No. 206.551)
- 6-way plug housed in protective jacket end cap (Land Part No. 091.562)

Thermometer Pin	Function	Cable Colour	End Cap Pin Nº
1	-	-	-
2	-	-	-
3	V+, 4 to 20mA	Red	5
4	-	-	-
5	-	-	-
6	V-, 4 to 20mA	Black	6

To connect the 6-way plug to the RT8B thermometer (see Fig. 4):

- Align the red marker near the lugs of the plug, with the red marker located above the keyway in the thermometer socket.
- Push the plug into the socket, ensuring that the locking sleeve slides forwards, locking the plug to the socket.

To disconnect the 6-way plug to the RT8B thermometer:

- Grip the locking sleeve portion of the plug.
- Slide the locking sleeve rearwards to release the locking mechanism and disconnect the plug from the thermometer socket.

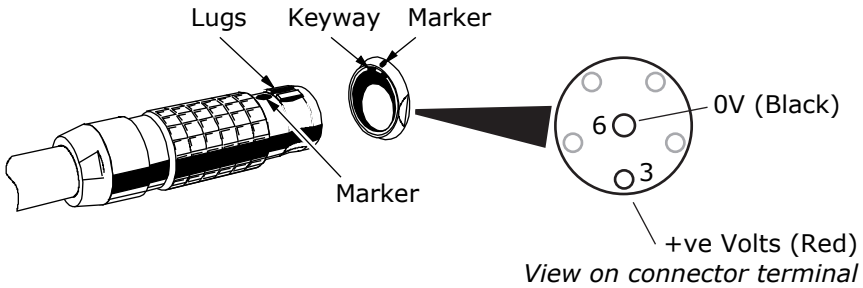


Fig. 9 Connecting the 6-way plug to the RT8B Thermometer

11 Thermometer Installation

1) Insert the thermometer into the thermometer jacket.
2) Unscrew the small circular cap at the rear of the thermometer to reveal the emissivity and time response controls (See Fig. 10).

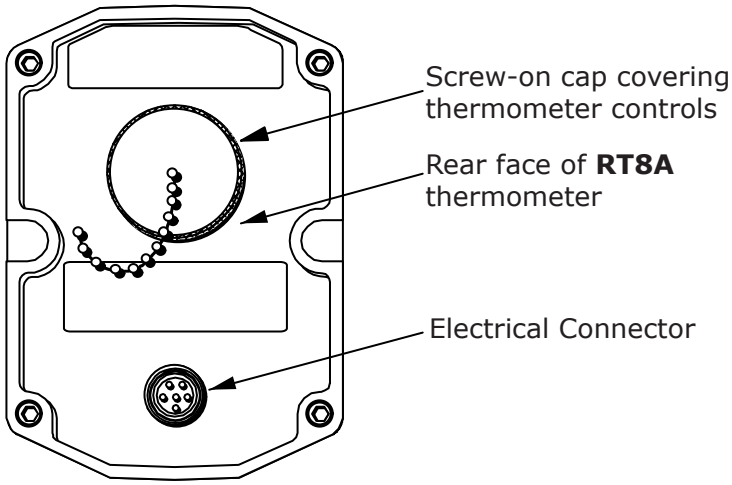
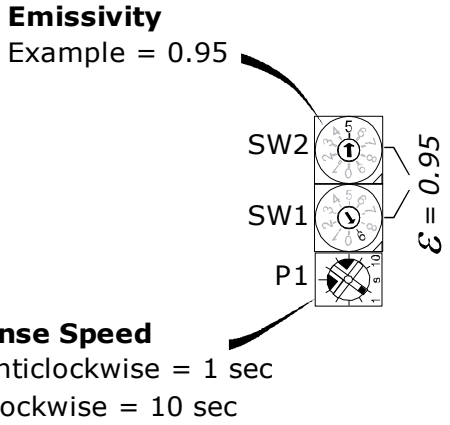


Fig. 10 Location of RT8B thermometer controls screw-on cap

3) Set the emissivity control to 95 using a small screwdriver (see Fig. 11).



Emissivity	SW 1	SW 2
0.10	1	0
0.80	8	0
0.95	9	5
0.92	9	2
1.00	0	0

Example settings

Fig. 11 Emissivity and Response Speed setting

4) For **drier exit** applications, set the time constant control to mid span.

   For **mixer/bin exit** applications, set the time constant to 1 second, fully anticlockwise.

5) Replace the circular cap.

Refer to the User Guide for a further explanation of the Emissivity and Time Constant controls.

The thermometer, power supply and indicator are linked together on a current loop. **Note:** the indicator in the **negative** conductor as shown in Fig. 12.

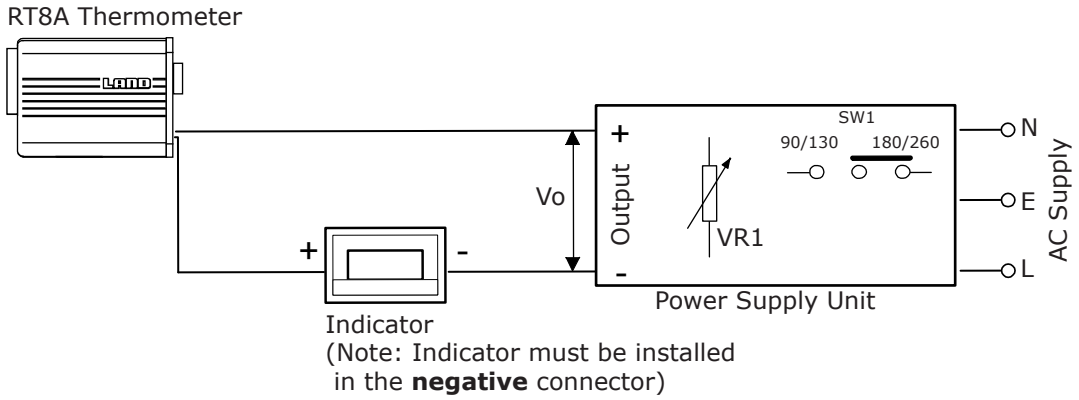


Fig. 12 Thermometer, power supply and indicator current loop

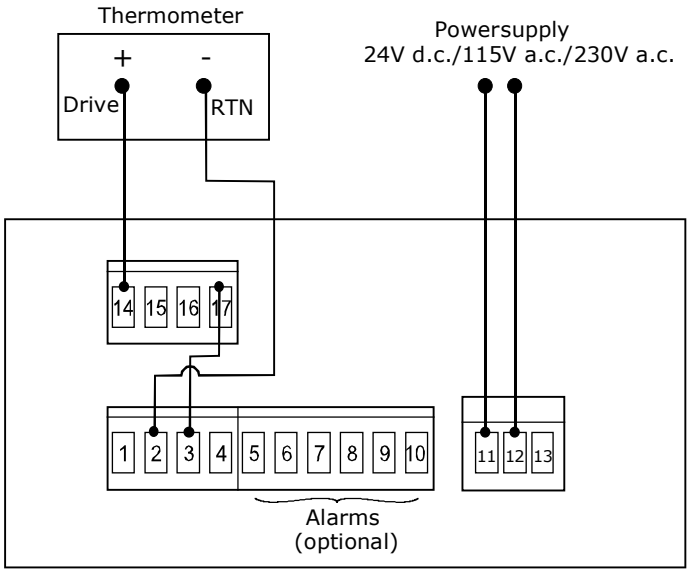


Fig. 13 Thermometer, power supply and indicator electrical connections

12 Checking the System

12.1 Pre-operational checks

Make the following checks before putting the system into operation:

1) Check that there is no obscuration of the sight path between the thermometer and the material to be measured.
2) Check that the thermometer lens is clean. If it is dirty, see Section 12.
3) Check that the air supply is ON and the pressure/flow rates are correct. Refer to Section 8.
4) Check that the thermometer power supply unit and indicator/controller are correctly interconnected. Refer to Section 10.
5) Check that the Emissivity control is set to 95. Refer to Section 10.
6) Check that the speed of response control is set to suit the application (1 to 10 seconds). Refer to Section 11.

12.2 Checks during operation

During the first day of operation make frequent checks of the lens to ensure that it is keeping clean.

The period between the checks can be lengthened progressively depending on site conditions.

If the lens becomes dirty, make the following checks:

1) Check the air supply.
2) Ensure that the air pressure and flow rates are being maintained (Refer to Section 8).
3) Clean the air filter and drain it if necessary.
4) Clean the lens (see Section 12) and check again after short periods of operation.

12.3 Cleaning the Air Filter

Periodically, drain the air filters and (if necessary) change the filter elements.

Full instructions will be found with the leaflet supplied with the air system.

After cleaning, check that the flow and pressure are as listed in Section 8.

13 Cleaning the Lens

The RT8B thermometer has a scratch-resistant coated lens. However, reasonable care is still needed to avoid lens damage.

To clean the lens:

1) Remove the jacket backcap and disconnect the electrical connector.
2) Remove the thermometer from the jacket.
3) Blow off any loose dust on the lens and wipe the lens with a soft cloth or brush.
4) Clean the lens face with soap and water or alcohol.
5) Prior to replacing the thermometer in the jacket ensure that the inside of the jacket is free of debris.
6) Replace the thermometer in the jacket.
7) Reconnect the electrical connector.
8) Replace the jacket backcap.

PRODUCT WARRANTY

Thank you for purchasing your new product from Land Instruments International. This Land manufacturer's 'back-to-base' warranty covers product malfunctions arising from defects in design or manufacture. The warranty period commences on the instrument despatch date from the Land Instruments International Ltd. factory in Dronfield, UK.

36 MONTHS WARRANTY

Building upon the reputation for reliability and longevity that System 4 and UNO thermometers have earned, Land are delighted to be able to provide our customers with an industry-leading 36 month warranty for the following products:-

- SPOT thermometers, accessories* and mountings* and special instruments based on SPOT.
  **Note: SPOT Actuators are provided with an 12 months Warranty.*
- System 4 thermometers, processors, accessories and mountings and special instruments based on System 4.
- UNO thermometers, accessories and mountings and special instruments based on UNO.
- Application-dedicated processors based on LANDMARK® Graphic.
- ABTS/S and ABTS/U
- FTS
- VDT/S and VDT/U
- DTT
- FLT5/B
- 4500 MkIII (Transmissometer and AFU-APS-I/O only)
- LWIR Thermal Imaging Cameras
- NIR-B / MWIR-B Thermal Imaging Cameras

This 36 month warranty is provided as standard for all orders for the products listed above received from 1st May 2002.

We believe that our customers expect us to set the standard in terms of performance, quality, reliability and value for money. This 36 months warranty, as a part of an on-going program of continuous improvement, is just one way in which Land strive to maintain our position as the temperature measurement partner of choice.

24 MONTHS WARRANTY

The following Land Instruments International products are provided with a 24 months warranty:

- LSP-HD Linescanners
- NIR
- SDS-640

12 MONTHS WARRANTY

All other AMETEK Land products including NIR-B Camera Retraction and Mounting Systems, VIRALERT Human Body Temperature Screening Systems, Water Cooled Housings & Accessories, SPOT Actuator, and Air PurgeEquipment

PRODUCT WARRANTY

EXCLUSIONS FROM WARRANTY

It should be noted that costs associated with calibration checks which may be requested during the warranty period are not covered within the warranty.

AMETEK Land reserve the right to charge for service/calibration checks undertaken during the warranty period if the cause is deemed to fall outside the terms of the warranty

This Land manufacturer's warranty does not cover product malfunction arising from:-

- improper installation
- misuse
- unauthorised alteration
- inappropriate routing, support, physical shock & strain protection, etc. of the fibre-optic lightguide (where fitted)
- environmental conditions exceeding the IP / NEMA rating of the product
- inappropriate recalibration which results in product calibration being taken outside specification
- improper resealing of thermometer following parameter adjustment (UNO, FLT5/A, etc.)
- damage caused by an unauthorised repair
- consumables including filters, electrochemical cells, batteries and sorbents

Land Instruments International Ltd • Dronfield S18 1DJ • England • Tel: +44 (0) 1246 417691 • Fax: +44 (0) 1246 410585
Email: land.enquiry@ametek.com • **www.ametek-land.com**

AMETEK Land, Inc. • 150 Freeport Rd. • Pittsburgh, PA 15238 • U.S.A. • Tel: +1 (412) 826 4444
Email: land.enquiry@ametek.com • **www.ametek-land.com**

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