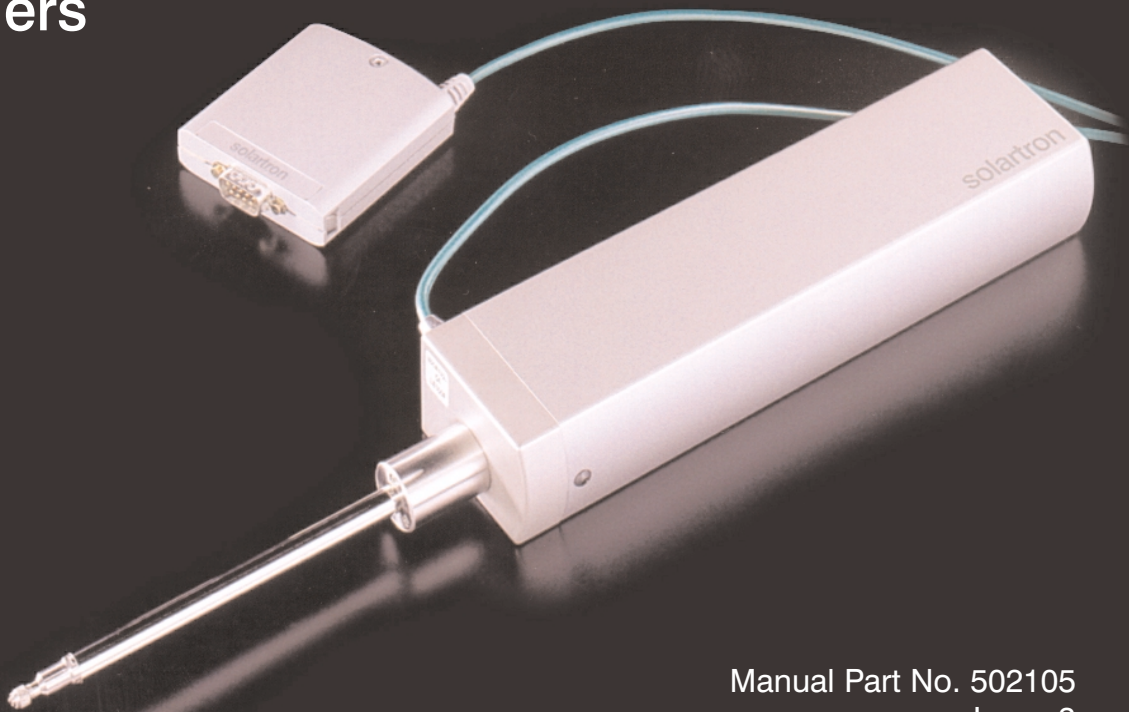


# solartron

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linear encoders  
(free motion)



**CE**  
user manual

Manual Part No. 502105  
Issue 3

# Index

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# 1.0: Introduction

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## 1.1 Introduction

The LE/50 and LE/100 Linear Encoders, have no integral actuation, allowing the free motion, of 50mm and 100mm measuring strokes.

**Model no.** LE/50/F  
LE/100/F

Signals from the probe interface electronics (PIE) can connect to a PC/PLC or the 'plug and go' range of digital readout, via the Solartron Orbit Network.

## 1.2 This Manual

Describes the Linear Encoder types LE/50 and LE/100 free versions with digital Orbit output.

This manual details the handling, installation and operation of the encoder and describes the electrical interfaces.

# 2.0: Safety Summary

---

## 2.1 Terms in this Manual

**WARNING** statements identify conditions or practices that could result in personal injury or loss of life.

**CAUTION** statements identify conditions or practices that could result in damage to the equipment or other property.

## 2.2 Symbols in this manual



This symbol indicates where applicable cautionary or other information is to be found.

## WARNINGS:

### **Do not operate in an explosive atmosphere**

This equipment is not approved for use in an explosive atmosphere.

## NOTES:

### **This equipment contains no user serviceable parts**

This equipment must be returned to Solartron for all servicing and repair (see section 10.0).

## Low Voltage

This equipment operates at below the SELV and is therefore outside the scope of the Low Voltage Directive.

# 3.0: Designation of Parts

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## 3.1 Items Supplied

Linear Encoder Probe in packaging case.

Standard tip (measuring contact) fitted.

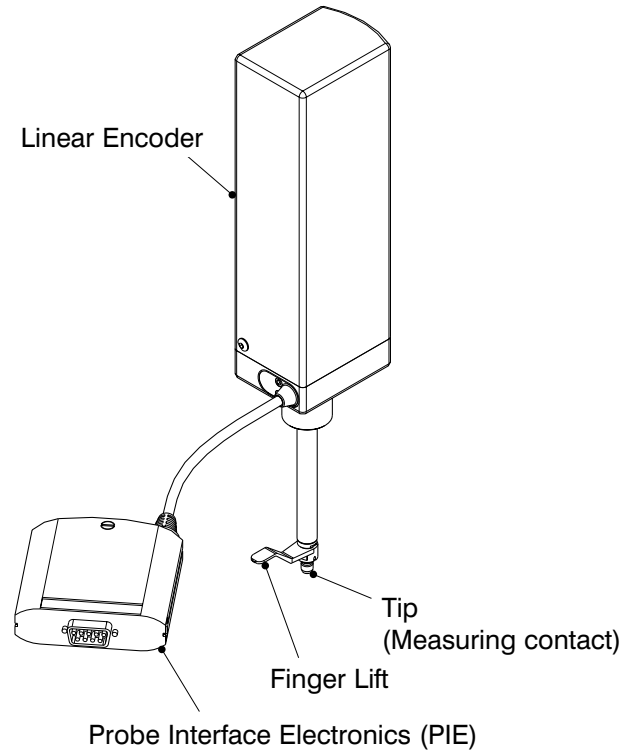
Locking tool.

User Manual.

Calibration chart.

Finger Lift

Plus other accessories as ordered.



# 4.0: Handling & Maintenance

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## 4.1 General Handling

The Solartron range of Linear Encoders are precision instruments and should be handled with care. Where possible the Linear Encoder should be stored in its protective box when not being used.

## 4.2 Maintenance

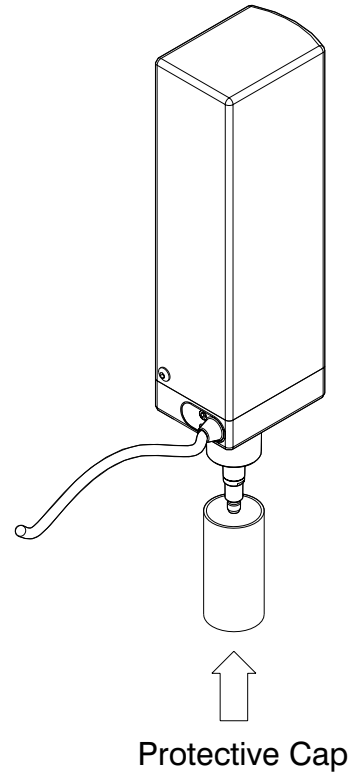
The Linear Encoders are designed to be maintenance free. No oiling of the shaft is necessary. Contacts with solvents should be avoided. Any attempt to dismantle the Linear Encoder will invalidate the warranty.

## 4.0: Handling & Maintenance (continued)

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### 4.3 Care during transportation

To prevent damage caused by extension or retraction of the shaft, it is recommended that the protective flexible cap is fitted over the ball tip and mounting spigot prior to transporting the encoder.



## 4.0: Handling & Maintenance (continued)

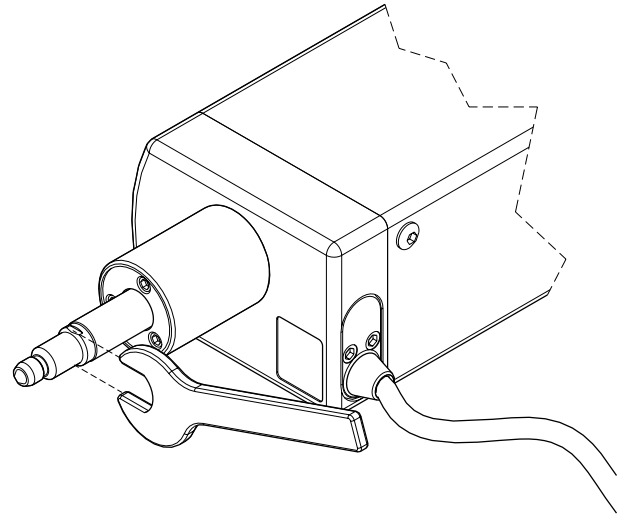
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### 4.4 Replacing the probe tip

N.B. The function of the spanner is to stop the shaft from rotating while removing the tip. Failure to follow the following procedure is likely to result in damage to the encoder.

1. Place the linear encoder on a flat surface, with the Solartron logo facing down.
2. Gently move the probe tip fully in.
3. Place the spanner across the "tip changing flats". Refer to the diagram.
4. Use a pair of soft jaw (for example Needle/Snipe Nose) pliers, to grip the knurled area of the linear encoder tip.
5. While holding the spanner, rotate the tip anti-clockwise. (The spanner provides a counteracting force from the turning force of the pliers).

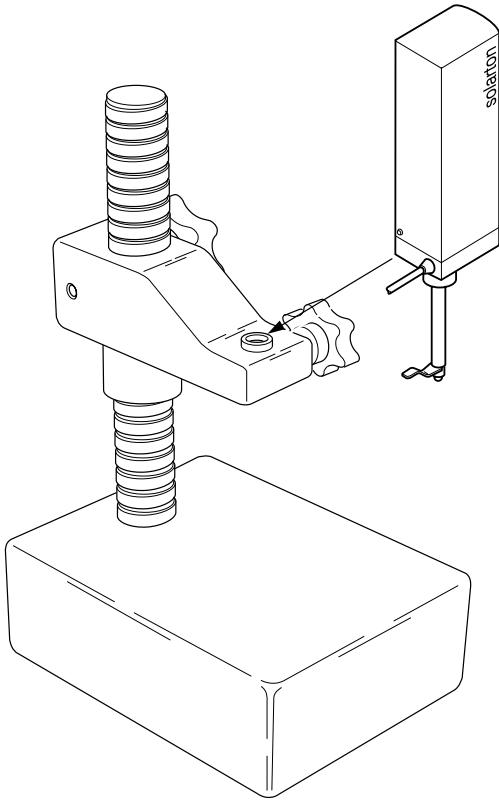
7. While holding the spanner across the "tip changing flats", attach the New tip by screwing, clockwise, into the Linear Encoder. To secure the tip, apply a torque of 18 to 22cNm.





## 5.0: Mechanical Installation

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### CAUTIONS:

Ensure the probe is not subjected to side loading at the tip, or hard driving against the end stops.

### Notes:

Ensure the probe is perpendicular to measuring table to avoid introducing measurement (cosine) errors.

Avoid using excessive torque when tightening gauge stand knobs. (Refer to 5.1.)

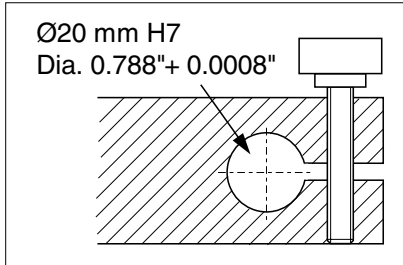
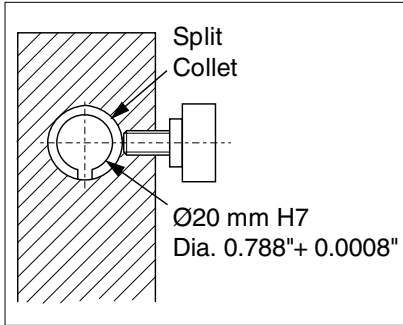
Keep cables away from moving parts.

Protect against shock loading or impact.

# 5.0: Mechanical Installation (continued)

## 5.1 Clamping Configurations

When mounting the Linear Encoder do not over tighten clamp screws.



Recommended maximum tightening torque:-

Bolt (ISO)	Torque (cNm)
M4 x 0.70	75
M5 x 0.08	90
M6 x 1.00	110
M8 x 1.25	145

Mounting collet available as an accessory:

Part No. 207251

or

Mounting bracket kit available as an accessory:

Part No. 960030

# 5.0: Mechanical Installation (continued)

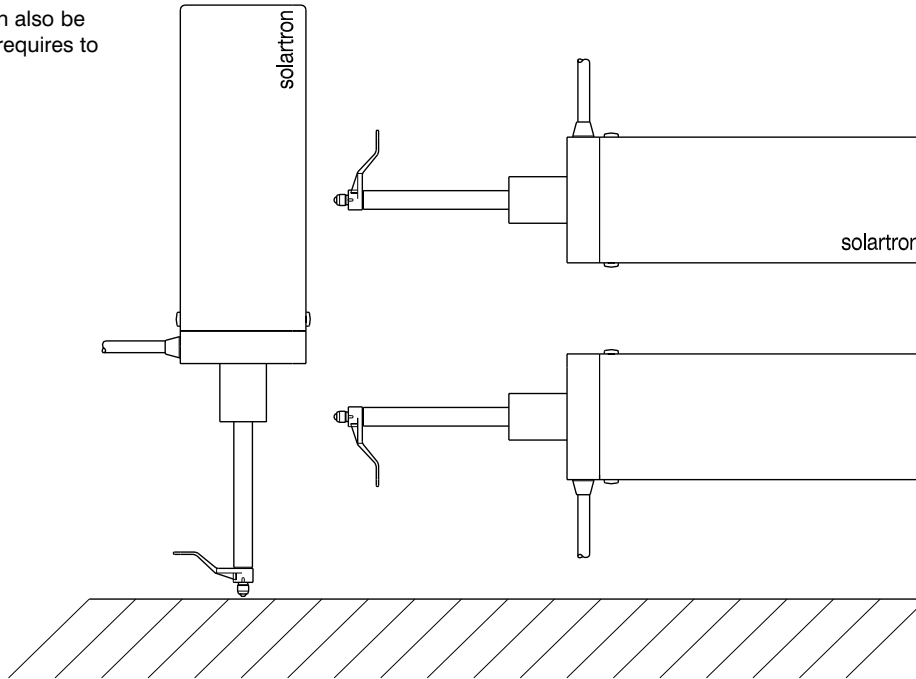
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## 5.2 Probe Orientation

Recommended orientations for mounting linear encoder.

Note:

The Linear Encoder can also be used vertically up, but requires to be directly coupled.

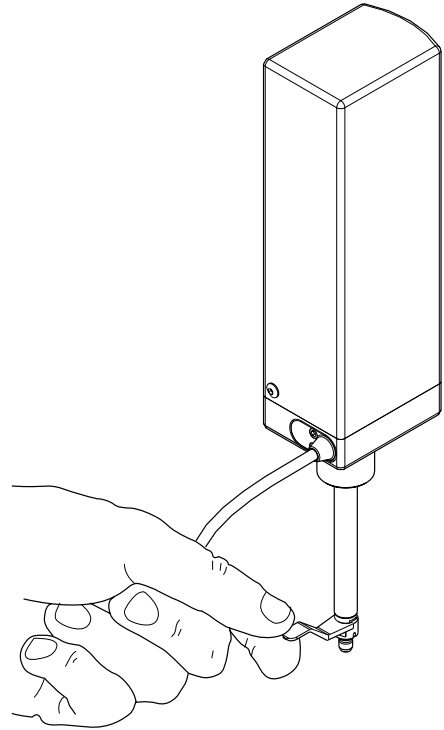


## 6.0: Operation

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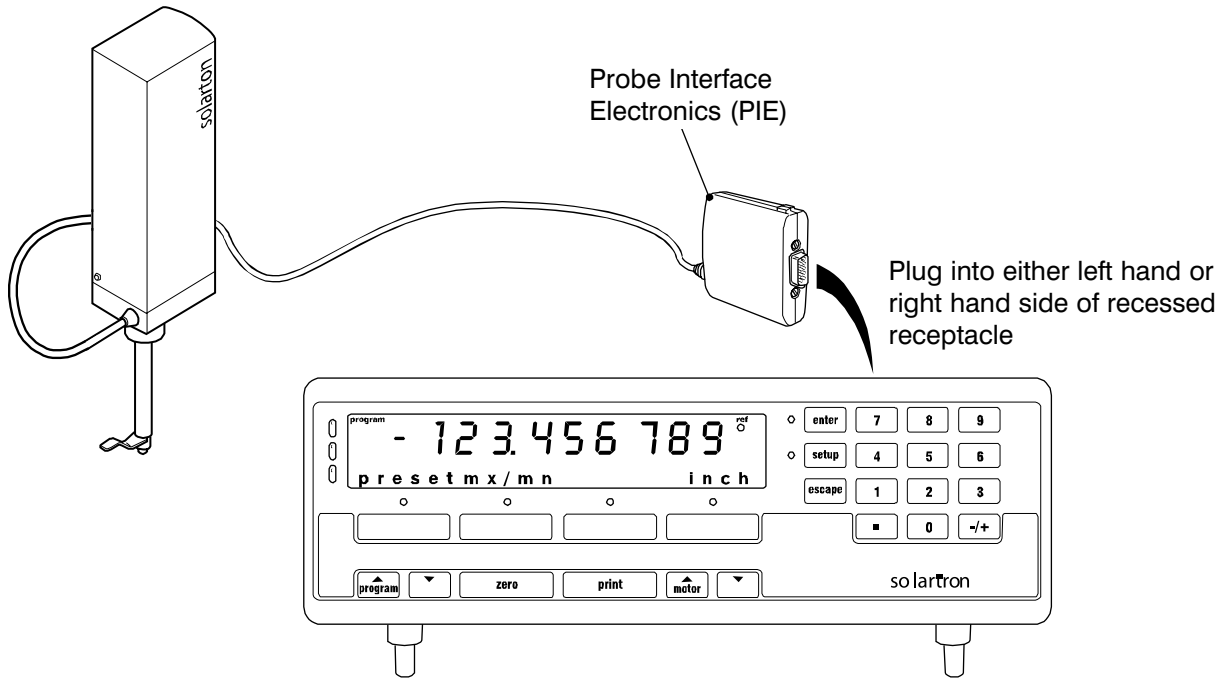
### 6.1 Finger Lift Operation

The finger lift adaptor, snaps over the probe tip, enabling it to be lifted without transferring heat to the shaft.



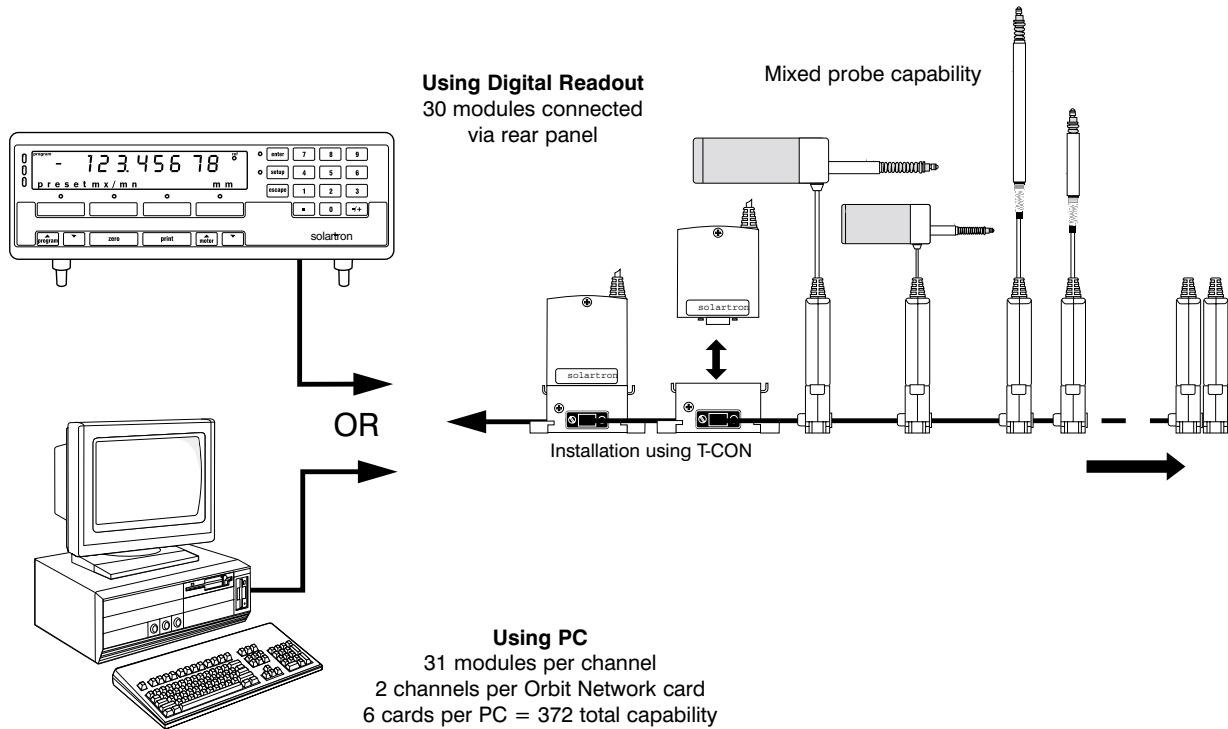
# 7.0: Linear Encoder Interface

## 7.1: Connection to Digital Readout



# 7.0: Linear Encoder Interface (continued)

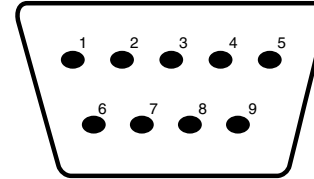
## 7.2: Connection to PC or Digital Readout via Orbit Network



# 7.0: Linear Encoder Interface (continued)

## 7.3 Probe Interface Electronics (PIE) Pin assignment

Pin	Function
1	(none)
2	RS485(A)
3	RS485(B)
4	0V
5	0V
6	+5V
7	+5V
8	+5V
9	0V



View from Pin Side

PIE can be fitted directly into the back of the Digital Readout or linked into the 'Orbit' Network using the stackable T-CON connectors.

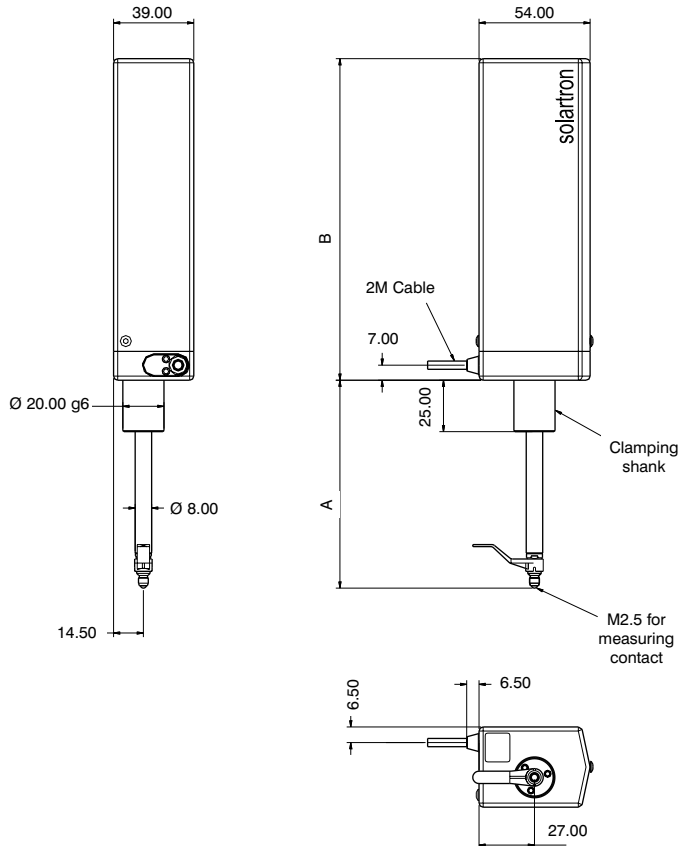
## 8.0: Specification

Model	LE50	LE100
Stroke (min.)	50.8mm (2.0")	101.6mm(4.0")
Resolution	0.05 $\mu$ m (2 millionths inch)	
Accuracy	$\pm$ 1 $\mu$ m (40 millionths inch)	
Reference temp.	20°C (68°F)	
Slew rate	0.5 m/sec (1.5 ft/sec)	
Operating attitude	Tip vertically down or Coupled	
Nominal weight (Excluding PIE)	0.75Kg	0.85Kg
Gauging forces: (typical at mid stroke) Downwards	0.6 N (typ) 0.8 N (max)	0.9 N (typ) 1.2 N (max)
Max side load	100g (3.5oz)	

Cable lengths	2m	
Temp range	0° to 50°C (32° to 122°F)	
- Operating	0° to 50°C (32° to 122°F)	
- Storage	-20° to +70°C (-4° to 158°F)	
IP Rating	Probe	IP40
	Interface Electronics	IP53
Mounting	20mm g6/H7	
Tip thread size	M2.5x6 deep	
Supply Voltage	5V $\pm$ 0.25VDC	
Supply Current (max)	60mA	
Serial Communications Baud Rate	9600 Baud or 187.5K Baud	
Serial Communications Protocol	Orbit Network Protocol	
Maximum Reading Rate	1000 readings/sec	
EMC	EN50081-1 & EN61000-6-2	



# 9.0: Outline Drawings



		LE/50/M (IP40)	LE/100/M (IP40)
A	Fully Out	104.5	151.0
	Fully In	52.5	48.0
B		156.5	213.5

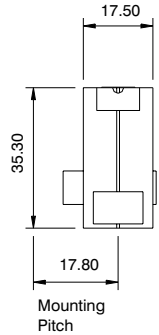
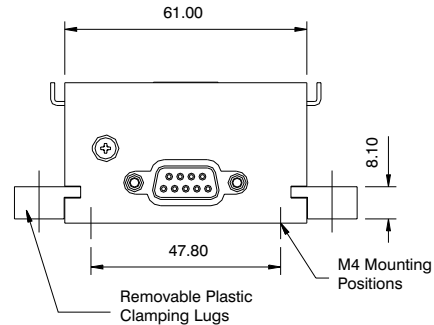
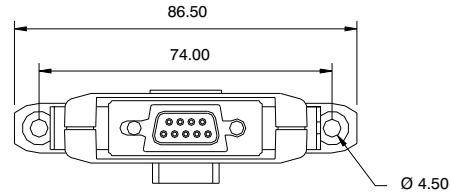
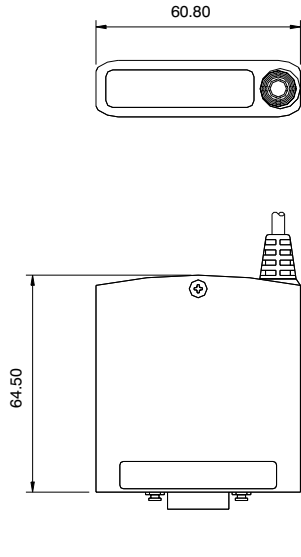
**Note:**

All dimensions in mm  
All dimensions stated are nominal

# 9.0: Outline Drawings (continued)

Interface  
Electronics

'T-CON'  
Connector



Note:  
All dimensions in mm  
All dimensions stated are nominal

# 10.0: Return of Goods

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Devices returned for repair should be shipped prepaid to Solartron. The shipping container should be marked: “Return for Repair” Model..... Type.....

The following information should accompany the device:

1. A purchase order, unless the device is being returned under warranty.
2. Application, type of environment and length of time in service of the device.
3. Description of the faulty operation of the device and the circumstances of the failure.
4. Name and telephone number of the person to contact if there are questions about the returned device.
5. Statement as to whether warranty or non-warranty service is required.

6. Complete shipping instructions for the return of the device.
7. Original purchase order number and date of purchase.

Adherence to these procedures will expedite handling of the returned device and will prevent unnecessary additional charges for inspection and testing to determine the condition of the device.

Solartron reserve the right to repair or replace goods returned under warranty.

# SOLARTRON METROLOGY OFFICES

## OFFICES WORLDWIDE - Addresses for Repairs

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Fax: +33 (1) 69 64 47 49

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Web: [www.solartronmetrology.com](http://www.solartronmetrology.com)

The logo for Solartron Metrology, featuring the word "solartron" in a bold, lowercase, green sans-serif font.