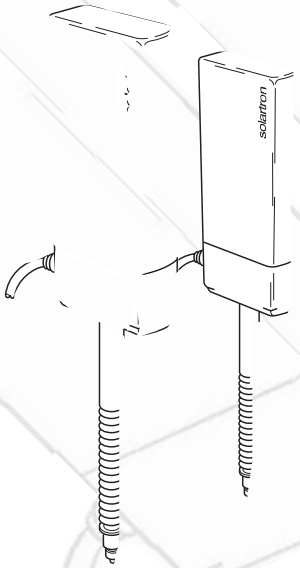
solartron metrology

# linear encoders




model no. LE/12/S
LE/12/P
LE/25/S
LE/25/P

CE

# user manual

# 1.0: Index

# 2.0: Safety Summary

Terms in this Handbook

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.

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

To avoid explosion, do not operate this equipment in an explosive atmosphere.

Air Pressure

On LE/12/P and LE/25/P under no circumstances should the recommended maximum overpressure of 1.0 bar be exceeded.

NOTES:

This equipment contains no user serviceable parts

This equipment must be returned to your Solartron dealer for all servicing and repair (see section 11.0).

Low Voltage

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

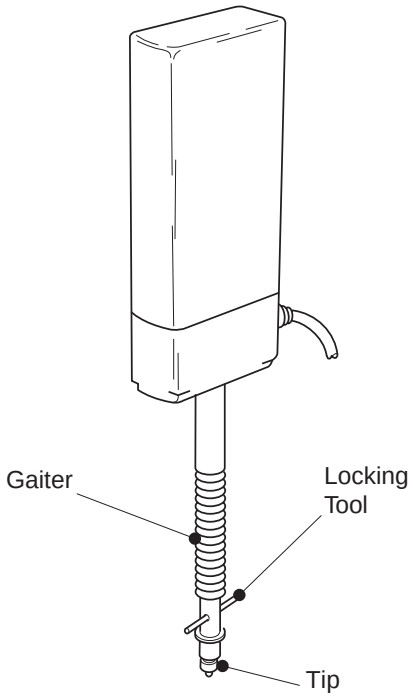
# 3.0: Handling & Maintenance

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. These Linear Encoders are designed to be maintenance free, additional periodic lubrication is unnecessary. Contacts with solvents should be avoided. Any attempt to dismantle the Linear Encoder will invalidate the warranty.

# 3.0: Handling & Maintenance (continued)

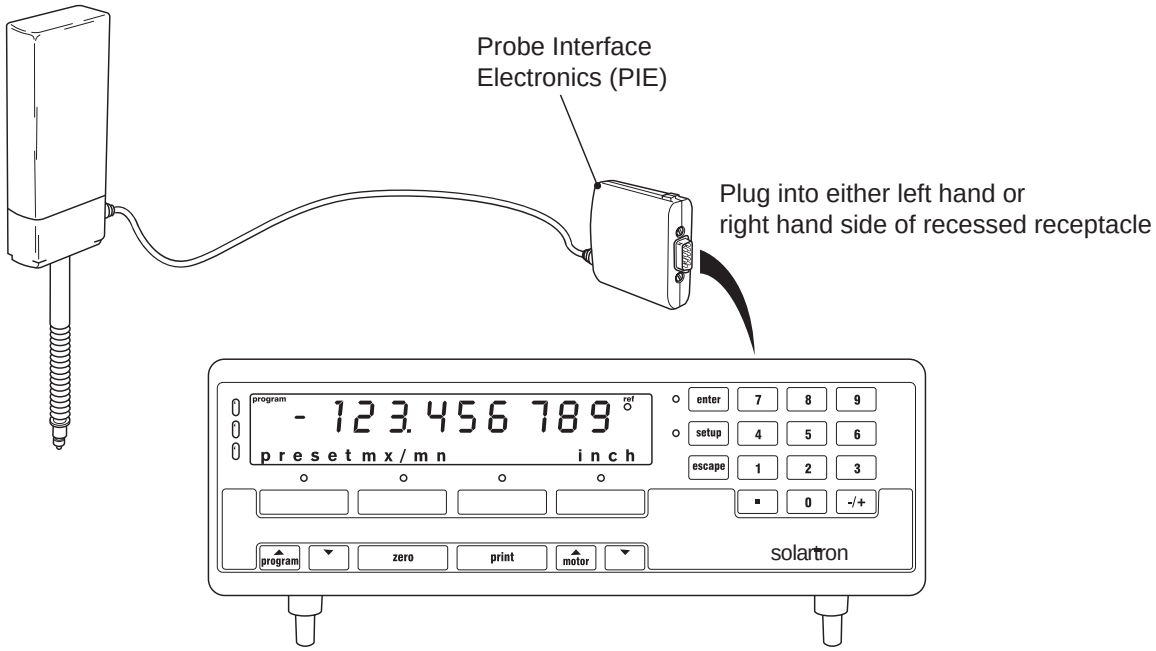
Replacing the probe tip

1. Slide back gaiter (fitted to IP65 and pneumatic versions only) to reveal the hole in the shaft.
2. Insert locking tool (supplied) in the hole.
3. Unscrew tip while holding locking tool to prevent any damage to the read head.
4. Install new tip while holding locking tool.
5. Hand tighten tip.
6. Slide down gaiter, (IP65 and pneumatic versions only).



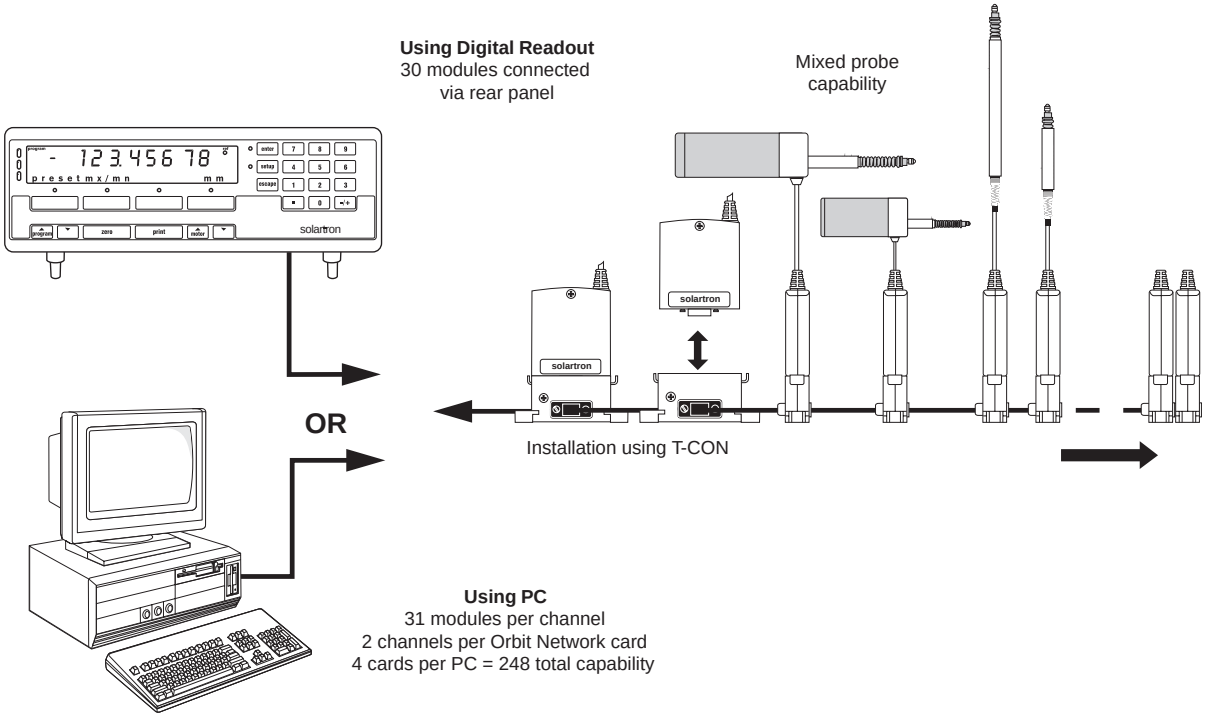
# 4.0: Linear Encoder Connection

## 4.1: Connection to Digital Readout

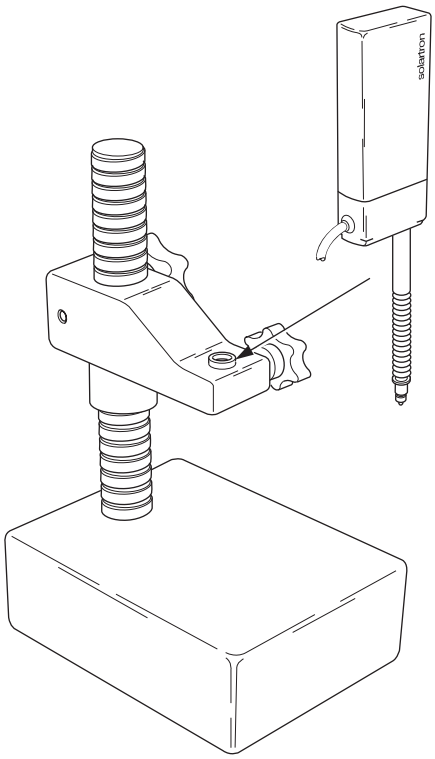


# 4.0: Linear Encoder Connection (Continued)

## 4.2: Connection to a PC or Digital Readout via Orbit Network



# 5.0: Mechanical Installation




CAUTIONS:

Ensure that the probe is not subjected to excessive over-travel, or side loading at the tip greater than that corresponding to a 0.5mm lift on a Ø3 ball

When mounting the Linear Encoder avoid the risk of distortion of the bearing assembly by over-tightening of the mounting screws.

Notes:

It is important to ensure that the probe is perpendicular to measuring table to avoid introducing cosine errors.

Do not use excessive torque when tightening gauge stand clamp screws.

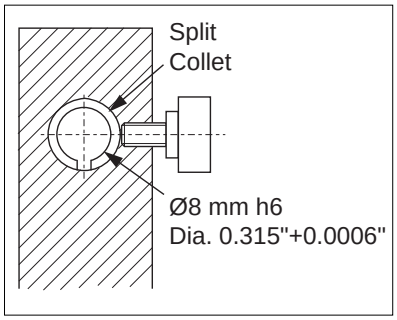
Keep cable away from moving parts to avoid potential damage.

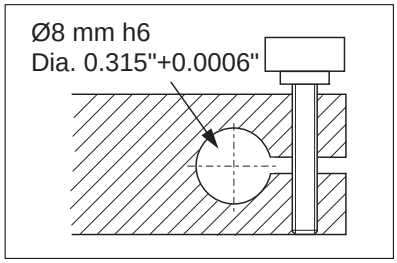
Protect probe against shock loading or impact!

# 5.0: Mechanical Installation (continued)

Clamping Configurations

When mounting Linear Encoder do not over tighten clamp screws.




Recommended maximum tightening torque

$$= \frac{0.28d\ ((P/\Pi d) + 0.15)}{(1-(0.15\,P/\Pi d))}$$

Where d = screw dia mm

P = screw pitch mm

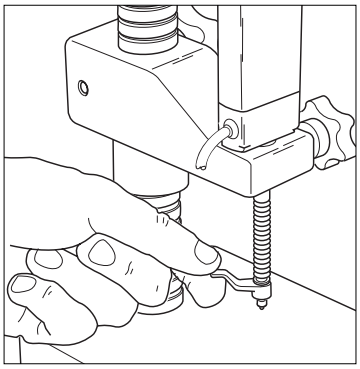
assuming a 'V' form thread and 0.15 coefficient of friction.

Note: A clearance hole in the fixturing of Ø9.5mm is advisable around the gaiter for satisfactory operation.

# 6.0: Operation

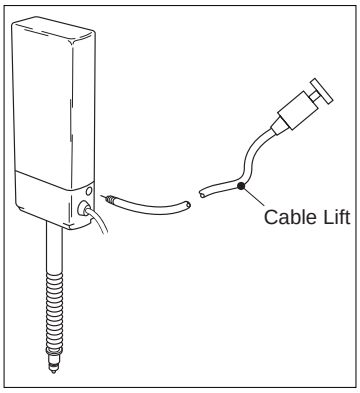
### Finger Lift

Snaps over probe tip enabling tip to be lifted without transferring heat to shaft.



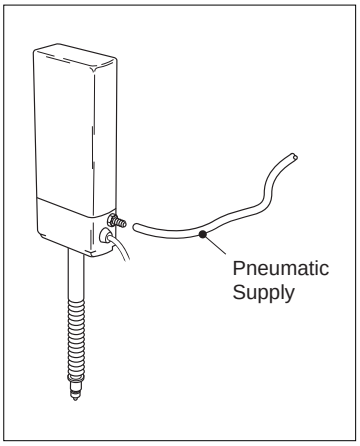
### Cable Lift

Allows tip to be retracted without touching Linear Encoder. Cable retract screws into probe body after removal of blanking screw.




### Pneumatic Operation

A Pneumatic nozzle is fitted as standard to LE/12/P & LE/25/P. By applying air between 0.5 & 0.8 bar measuring tip will extend to meet component under test. On no account should a pressure exceeding 1.0 bar be applied.




WARNING: Damage/injury could be caused if the maximum recommended air pressure is exceeded.

CAUTION

Ensure that air supply for pneumatic operation is clean, dry and oil free.

# 7.0: Specification

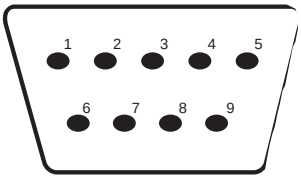
| Model | LE12 | LE25 |
|---|---|---|
| Stroke | 12mm (0.5”) | 25mm(1.0”) |
| Resolution | 0.05µm (2 millionths inch) | |
| Accuracy | ± 0.5µm (20 millionths inch) | |
| Reference temp | 20°C (68°F) | |
| Slew rate | 0.5 m/sec (1.5 ft/sec) | |
| Operating attitude | ANY | |
| Gauging forces: (typical at mid stroke) | | |
| Downwards | 60gm (2.1 oz) | |
| Upwards | 10gm (0.3 oz) | |
| Horizontal | 50gm (1.7 oz) | |
| Max side load | 100gm (3.5 oz) | |
| Shock | 100g (6ms) | |
| Vibration | 10g (50-2000 Hz) | |
| Cable length | 2m | |
| Temp range | | |
| - Operating | 0° to 50°C (32° to 122°F) | |
| - Storage | -20° to +70°C (-4° to 158°F) | |

| | |
|---|---|
| IP Rating<br>Probe:<br>Interface Electronics: | <br>IP50 (IP65 optional)<br>IP63 |
| Mounting | 8mm<br>h6 |
| Tip thread size | M2.5x6 deep |
| Supply Voltage | 5V ± 0.25VDC |
| Supply Current (max) | 60mA |
| Serial Communications Baud Rate | 9600 Baud or<br>187.5K Baud |
| Serial Communications Protocol | Orbit Network Protocol |
| Maximum Reading Rate | 1000 readings/sec |
| EMC | EN50081-1 &<br>EN50082-1 |

# 8.0: Connections

PIE Pin assignment

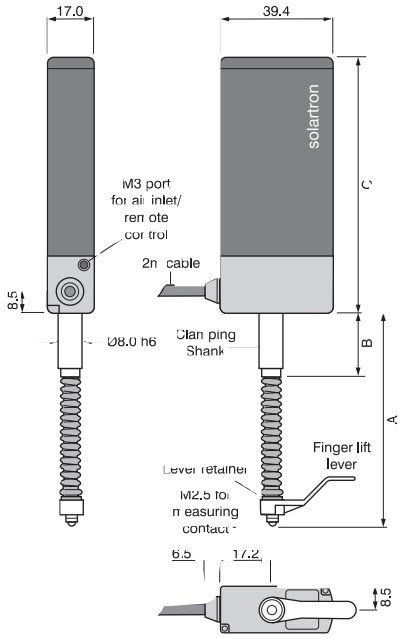
| Pin | Function |
|---|---|
| 1 | (none) |
| 2 | RS485(A) |
| 3 | RS485(B) |
| 4 | 0V |
| 5 | 0V |
| 6 | +5V |
| 7 | +5V |
| 8 | +5V |
| 9 | 0V |




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

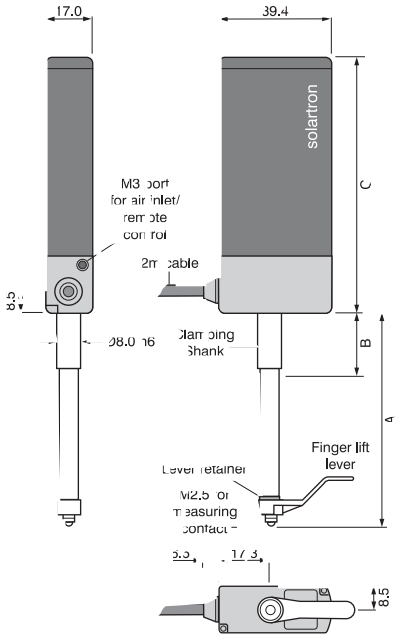
# 9.0: Outline Drawings

IP65 Version




| | LE/12/S | LE/12/P | LE/25/S | LE/25/P |
|---|---|---|---|---|
| A | 56.0<br>43.0 | 43.0<br>56.0 | 92.0<br>66.0 | 66.0<br>92.0 |
| B | 20.5 | 20.5 | 33.0 | 33.0 |
| C | 66.0 | 66.0 | 92.0 | 92.0 |

IP50 Version

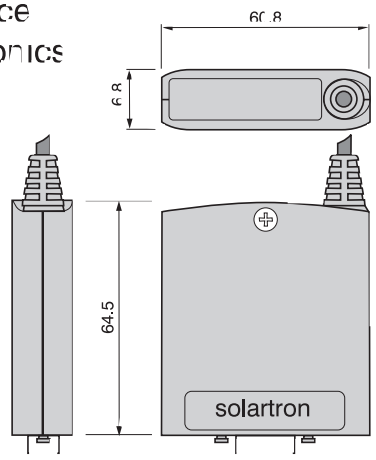



| | LE/12/S | LE/25/S |
|---|---|---|
| A | 56.0<br>43.0 | 76.0<br>56.0 |
| B | 20.5 | 33.0 |
| C | 66.0 | 92.0 |

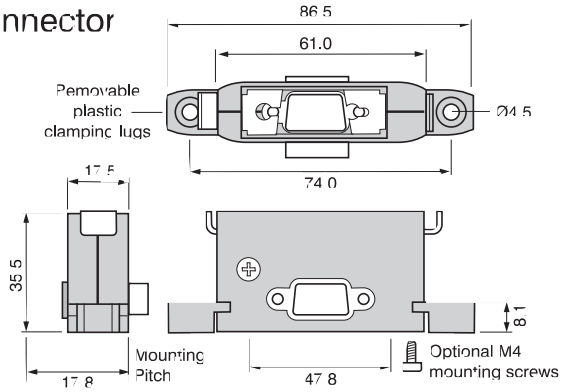
Note:
All dimensions in mm
All dimensions stated are nominal

# 9.0: Outline Drawings

nterface
Electronics




'T CON
Connector




Note:
All dimensions in mm
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