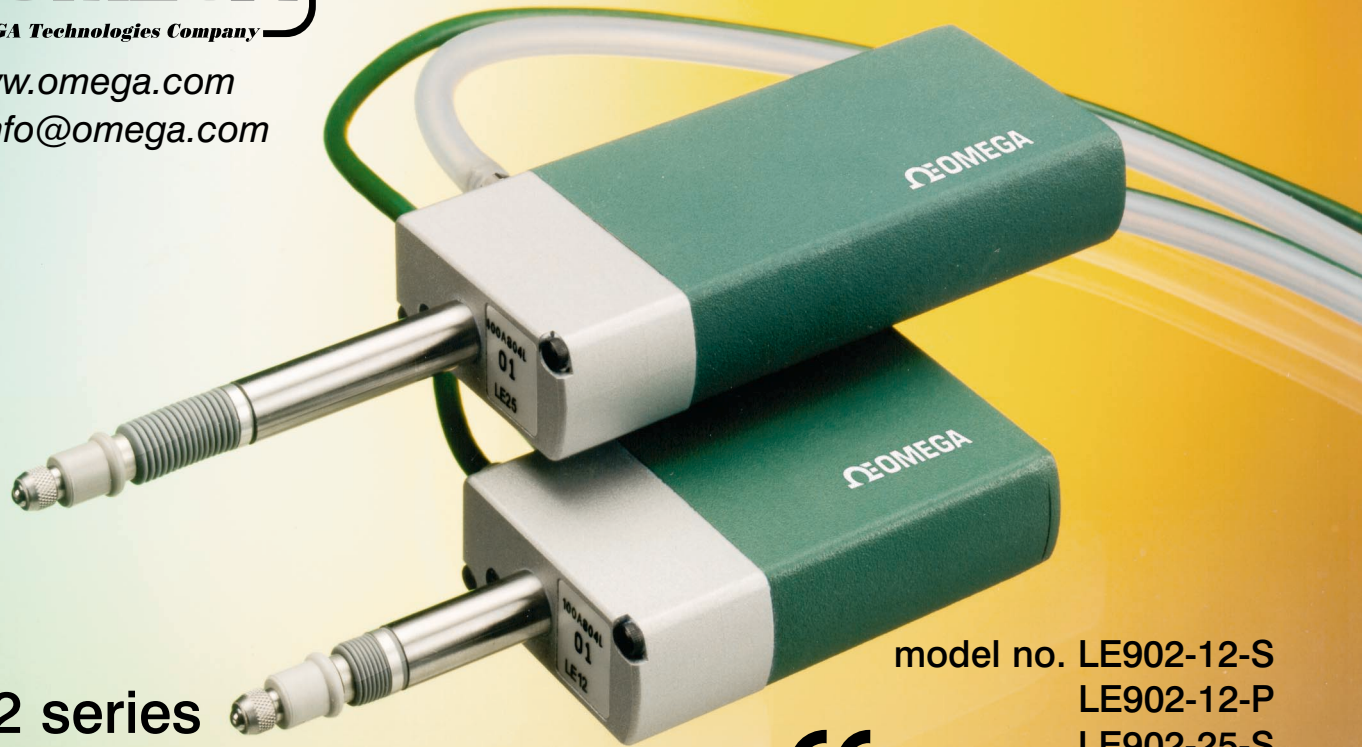




<http://www.omega.com>
e-mail: info@omega.com



**LE902 series
user manual**



model no. LE902-12-S
LE902-12-P
LE902-25-S
LE902-25-P



OMEGAnet® On-Line Service http://www.omega.com	Internet e-mail info@omega.com
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Stamford, CT 06907-0047
Tel: (203) 359-1660 FAX: (203) 359-7700
e-mail: info@omega.com

Canada:
976 Bergar
Laval (Quebec) H7L 5A1
Tel: (514) 856-6928 FAX: (514) 856-6886
e-mail: info@omega.ca

For immediate technical or application assistance:

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Customer Service: 1-800-622-2378 / 1-800-622-BESTSM
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Toll Free: 0800-1-66342
e-mail: czech@omega.com

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Tel: (33) 130-621-400 FAX: (33) 130-699-120
Toll Free in France: 0800-4-06342
e-mail: france@omega.com

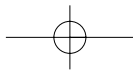
Germany/Austria: Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
Tel: 49 (07056) 3017 FAX: 49 (07056) 8540
Toll Free in Germany: 0130 11 21 66
e-mail: info@omega.de

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One Omega Drive, River Bend Technology Centre
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e-mail: info@omega.co.uk

It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

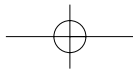
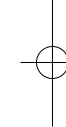
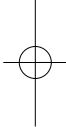
The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

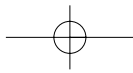
WARNING: These products are not designed for use in, and should not be used for, patient-connected applications.



1.0: Index

Section Title	Page	Section Title	Page
1.0	Index	5.0	Mechanical Installation
2.0	Safety summary	6.0	Operation
3.0	Handling and maintenance	7.0	Specification
4.0	Linear Encoder Connection	8.0	Connections
4.1	Connection to a Digital Readout	9.0	Outline Drawings
4.2	Connection to PC or Digital Readout via Orbit Network		Warranty/Disclaimer





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 LE902-12-P and LE902-25-P under no circumstances should the recommended maximum overpressure of 1.0 bar (14.5 psi) be exceeded.

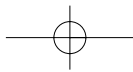
NOTES:

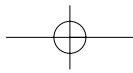
This equipment contains no user serviceable parts

This equipment must be returned to your Omega dealer for all servicing and repair.

Low Voltage

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



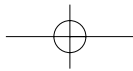
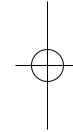
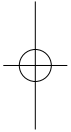


3.0: Handling & Maintenance

The Omega 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.

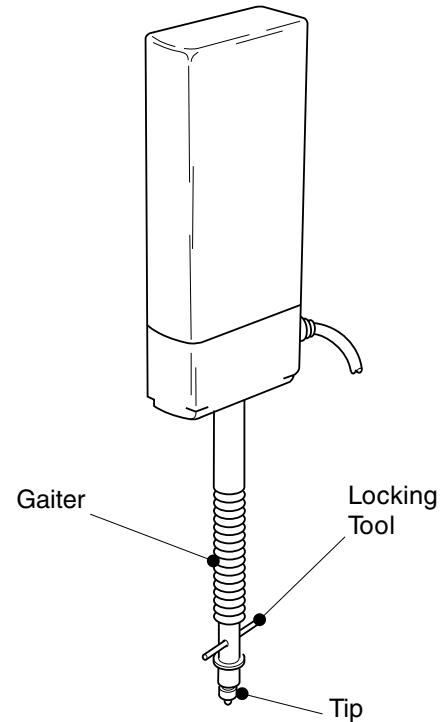
Contacts with solvents should be avoided. Any attempt to dismantle the Linear Encoder will invalidate the warranty.

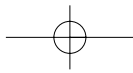


3.0: Handling & Maintenance (continued)

Replacing the probe tip

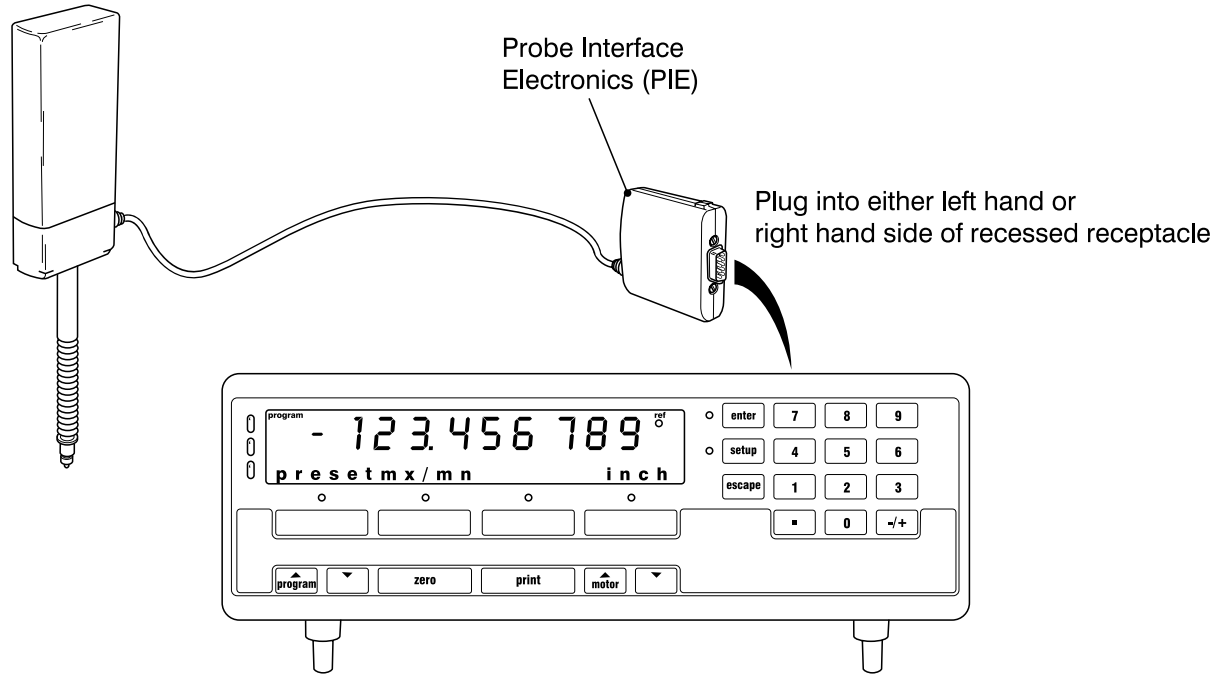
1. Slide back gaiter (fitted to IP65 and pneumatic versions only) to reveal the hole in the shaft.
2. Insert locking tool (supplied) in the hole.
3. Unscrew tip while holding locking tool to prevent any damage to the read head.
4. Install new tip while holding locking tool.
5. Hand tighten tip.
6. Slide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



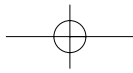


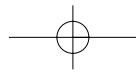
4.0: Linear Encoder Connection

4.1: Connection to Digital Readout



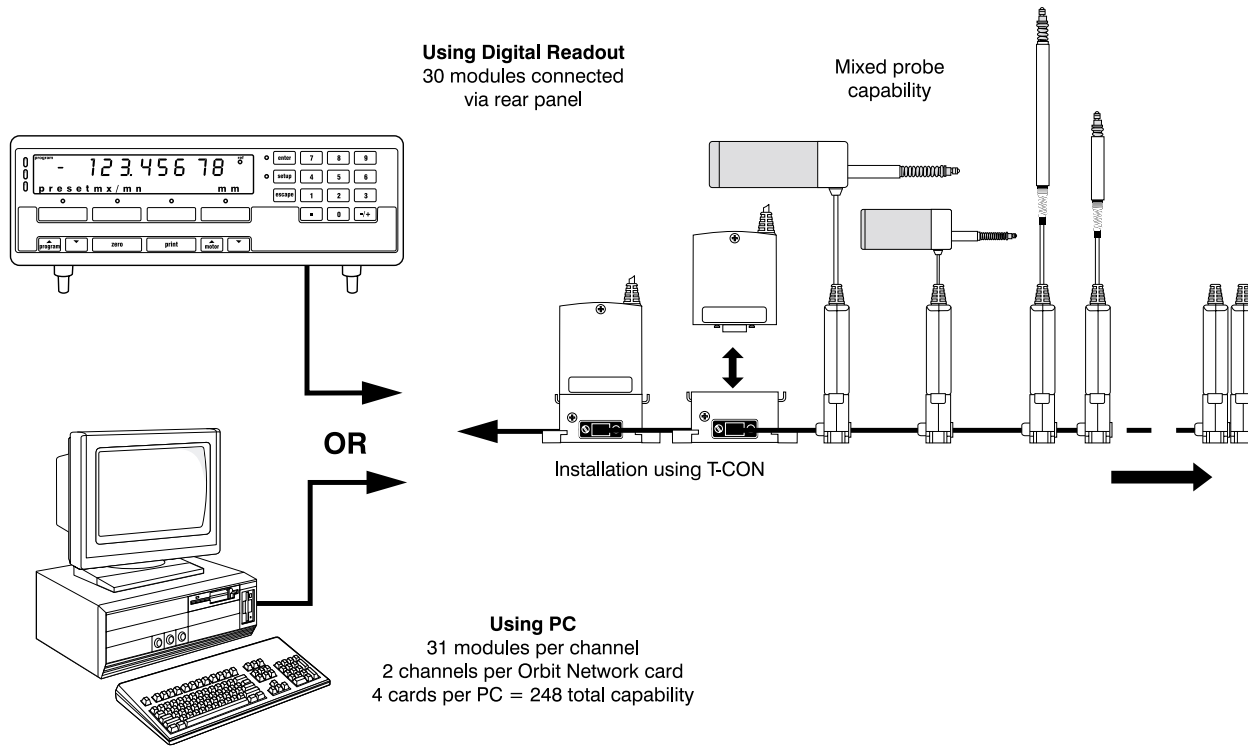
4.0: Linear Encoder Connection





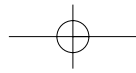
4.0: Linear Encoder Connection (Continued)

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

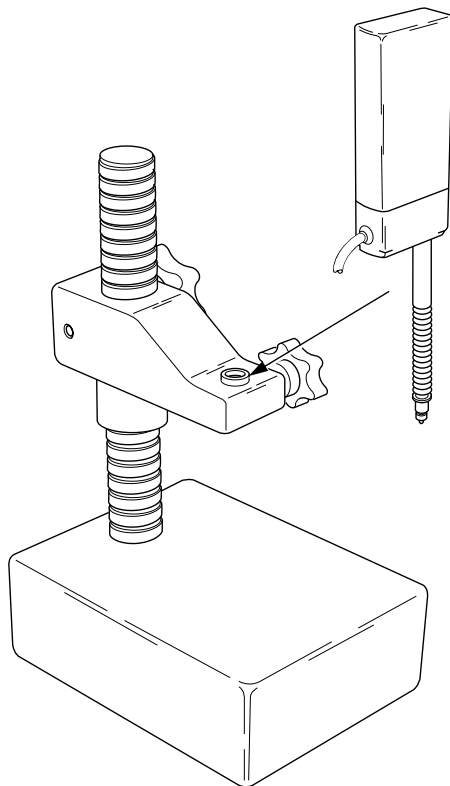


4.0: Linear Encoder Connection

LE902



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 (0.02") lift on a Ø3 (0.118") 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.

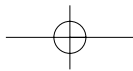
Protect probe against shock loading or impact!

5.0: Mechanical Installation

LE902

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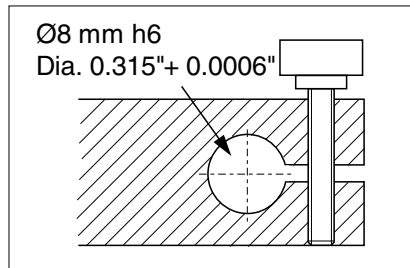
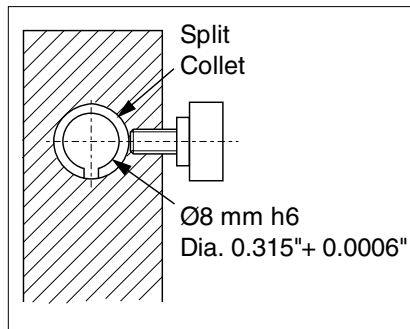
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5.0: Mechanical Installation (continued)

Clamping Configurations

When mounting Linear Encoder do not over tighten clamp screws.



Recommended maximum tightening torque

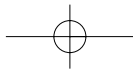
$$= \frac{0.28d \left(\frac{P}{\pi d} + 0.15 \right)}{1 - \left(0.15 \frac{P}{\pi d} \right)}$$

Where d = screw dia mm

P = screw pitch mm

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

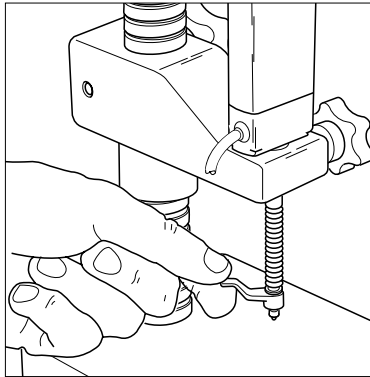
Note: A clearance hole in the fixturing of Ø9.5mm (0.374") is advisable around the gaiter for satisfactory operation.



6.0: Operation

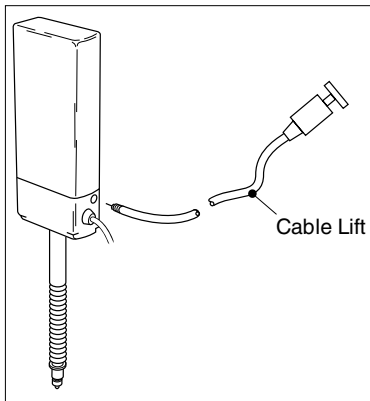
Finger Lift

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



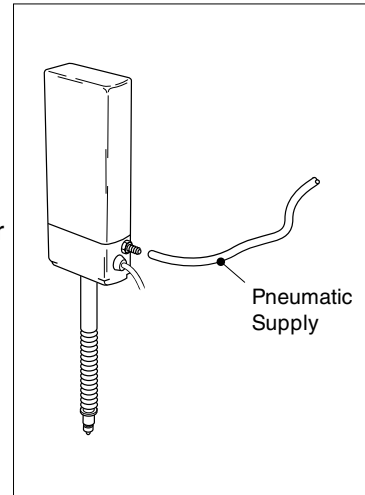
Cable Lift

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-902-12-P & LE902-25-P. By applying air between 0.5 & 0.8 bar (7.25 & 11.6 psi) measuring tip will extend to meet component under test. On no account should a pressure exceeding 1.0 bar (14.5 psi) 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.

6.0: Operation

LE902

7.0: Specification

Model	LE902-12	LE902-25
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 / 6.5 ft	
Temp range		
- Operating	0° to 50°C (32° to 122°F)	
- Storage	-20° to +70°C (-4° to 158°F)	

IP Rating	
Probe:	IP50 (IP65 optional)
Interface Electronics:	IP53
Mounting	8mm / 0.315 in h6 h7
Tip thread size	M2.5x6 deep
Supply Voltage	5V ± 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 & EN50082-1

7.0: Specification

LE902

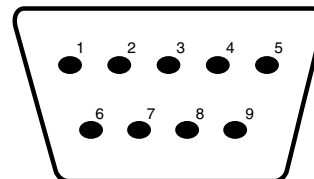
10

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8.0: Connections

PIE Pin assignment

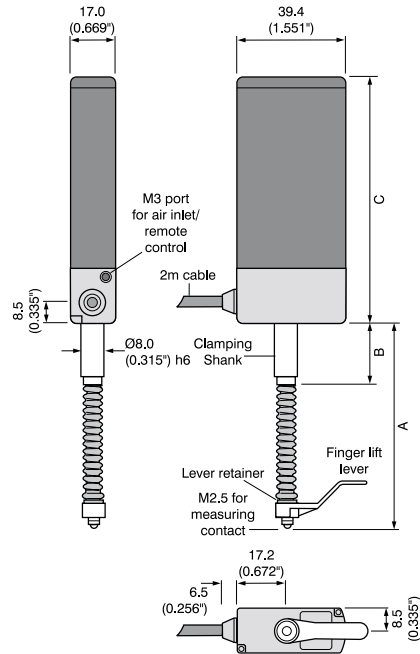
Pin	Function
1	(none)
2	RS485(A)
3	RS485(B)
4	0V
5	0V
6	+5V
7	+5V
8	+5V
9	0V



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

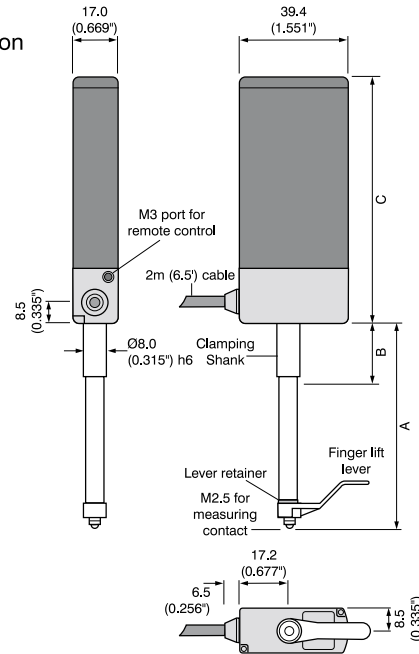
9.0: Outline Drawings

IP65 Version



	LE902-12-P	LE902-25-P
A	43.0/56.0 (1.693/2.205")	66.0/92.0 (2.598/3.622")
B	20.5 (0.807")	33.0 (1.299")
C	66.0 (2.598")	92.0 (3.622")

IP50 Version



	LE902-12-S	LE902-25-S
A	50.5/37.5 (1.988/1.476")	76.0/50.0 (2.992/1.969")
B	20.5 (0.807")	33.0 (1.299")
C	66.0 (2.598")	92.0 (3.622")

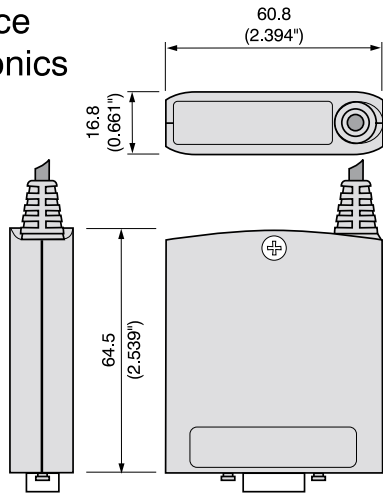
Note:
All dimensions in mm
and inches
All dimensions stated
are nominal

9.0: Outline Drawings

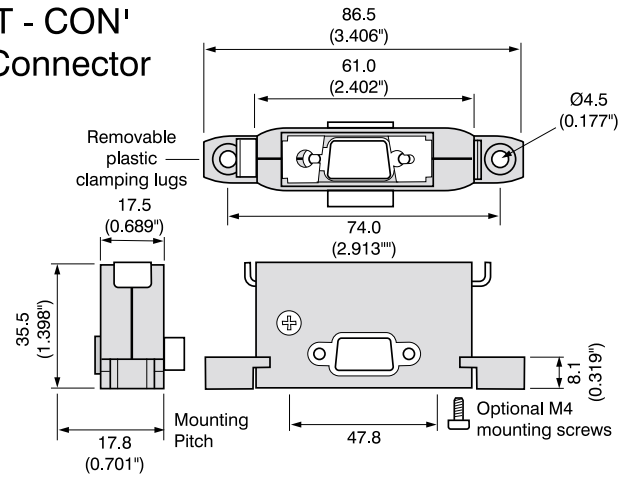
LE902

9.0: Outline Drawings

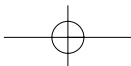
Interface Electronics



'T - CON' Connector



Note:
All dimensions in mm
and inches
All dimensions stated
are nominal



WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

LE902

RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

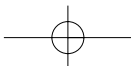
1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!

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- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- Transducers & Strain Gauges
- Load Cells & Pressure Gauges
- Displacement Transducers
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- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments