



**Technical Manual**

**LIN SERIES TRANSDUCERS**

**Doc. Ref CD1019J**



Affirmed by Declaration  
of Conformity

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## 1. INTRODUCTION

This series of displacement transducers is available in three different measuring ranges and these ranges are available in two different operating temperature ranges.

These transducers are available in the free armature or spring return types (suffix A).

Model	Measuring Range (mm)	Operating Temperature Range
LIN52	±5	-220°C to +220°C
LIN152	±15	
LIN252	±25	
LIN56	±5	-220°C to +600°C
LIN156	±15	
LIN256	±25	

Model	Measuring Range (mm)	Operating Temperature Range
LIN52A	±5	-220°C to +220°C
LIN152A	±15	
LIN252A	±25	
LIN56A	±5	-220°C to +350°C
LIN156A	±15	
LIN256A	±25	

NB: The LINxxx6A (spring return) version units have a continuous working rating of 350°C due to the limiting factor of the spring. However, the units are designed to allow easy changing of an external spring. Temperatures above 350°C will increase stresses within the spring.

For dimensional and other details, refer to the drawings:

D9354 for free armature  
D9364 for spring return armature.

## 2. DETAILS OF MI CABLE

2.1 The MI cable is insulated with magnesium oxide ( $MgO$ ) which is hygroscopic. To function correctly the cable should remain sealed at all times. Any ingress of moisture will lower the insulation resistance. The standard cold seal provides a sealed connection from the MI cable cores to the flexible PVC insulated conductors.

The temperature rating of the cold seal is  $105^{\circ}C$ .

A 2 metre length of cable is fitted as standard. Lengths of up to 50 metres may be specified when ordering.

### 2.2 Specification of MI Cable used on High Temperature ( $600^{\circ}C$ ) PYxxx6 Transducers

Sheath Material	AISI 316L Chromium Nickel Titanium Stabilised Steel
Sheath Thickness	0.33mm
Sheath Diameter	$3.00mm \pm 0.03mm$
Number of Conductors	4
Conductor Material	Nickel
Nominal resistance per conductor per metre	$0.99 \text{ ohms} \pm 15\%$
Nominal capacitance per conductor per metre	$135pF \pm 20\%$
Insulation	Magnesium Oxide
Maximum Cable Operating Temperature	$800^{\circ}C$
Maximum External Pressure	In excess of 45000 psig

### 2.3 Specification of MI Cable used on High Temperature ( $220^{\circ}C$ ) PYxxx2 Transducers

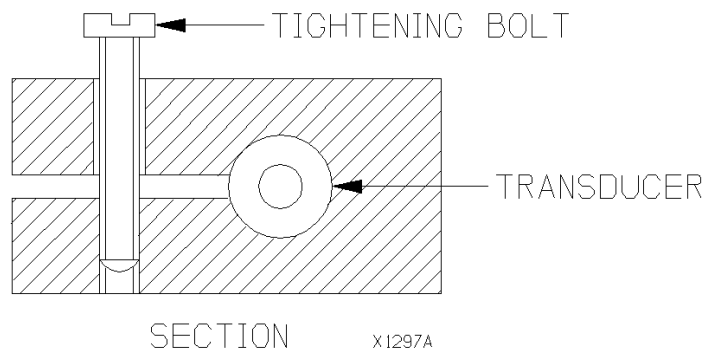
Sheath Material	AISI 321 Chromium Nickel Titanium Stabilised Steel
Sheath Thickness	0.33mm
Sheath Diameter	$3.00mm \pm 0.03mm$
Number of Conductors	4
Conductor Material	Oxygen free copper
Nominal resistance per conductor per metre	$0.19 \text{ ohms} \pm 15\%$
Nominal capacitance per conductor per metre	$135pF \pm 20\%$
Insulation	Magnesium Oxide
Maximum Cable Operating Temperature	$600^{\circ}C$
Maximum External Pressure	In excess of 45000 psig

### 3 HANDLING PRECAUTIONS

- 3.1 Do not bend the cable excessively. Especially avoid bending the cable near the end termination.
- 3.2 Ensure the cold seal junction and connecting wires are not heated above 105°C.
- 3.3 Ensure the bore is kept free of dirt.

### 4 INSTALLATION

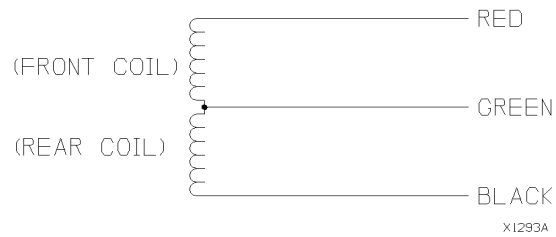
- 4.1 Mount the transducer by clamping the body. A suitable method of doing this is with a split block type of clamp as shown below.



- 4.2 On the free armature version (standard), the armature (probe) should be mounted on the moving part to be measured so that the armature moves centrally in the bore of the transducer body.
- 4.3 On the spring return version (suffix A), the end of the armature (probe) can be attached to the moving part to be measured.
- 4.4 The MI cable can be bent, typically to a bending radius of 36mm which can be reduced to 12mm provided bending is effected over a mandrel in one set and without re-straightening.

## 5. ELECTRICAL CONNECTIONS

### 5.1



The signal from the red-green is in phase with the excitation (red-black) for an inward movement of the armature.

5.2 The transducer can be energised by constant voltage or constant current (10mA) at a frequency of 2.4 to 5.0 kHz.

When used with the S7AC, S7M, DR7AC, 621 or E309 instruments, bridge completion resistors are to be fitted in the instrument.

When used with the E725 AC instrument, bridge completion resistors are to be fitted in the instrument or inside the transducer connector.

When used with the 615 instrument, the bridge is completed by the circuitry of the instrument.

## **6. CALIBRATION**

Full calibration details of the LIN transducer with an RDP instrument are contained in the Technical Manual for the particular instrument.

A transducer can be supplied by us pre-calibrated with its instrument. This calibration can be carried out at a specific elevated temperature.

In the case of the 615 which has graduated ZERO and SPAN dials, the calibration can be carried out at various different temperatures and the appropriate dial settings for those given.

## **7. MAINTENANCE AND INSPECTION**

- 7.1 The transducer is a fully welded, sealed construction and should not require maintenance.
- 7.2 Ensure the cable is correctly installed with no sharp bends. (See Section 4.4)
- 7.3 If the transducer becomes suspect, insulation resistance and continuity (loop) resistance checks can be made. Figures for these are on the Calibration Sheet supplied with each transducer.

Note that the insulation resistance will fall to a low value when the temperature is high, e.g. 50k ohm at 600°C.

## Notes

## **WARRANTY AND SERVICE**

### WARRANTY.

R.D.P. Electronics products are warranted against defects in materials or workmanship. This warranty applies for one year from the date of delivery. We will repair or replace products that prove to be defective during the warranty period provided they are returned to R.D.P. Electronics.

This warranty is in lieu of all other warranties, expressed or implied, including the implied warranty of fitness for a particular purpose to the original purchaser or to any other person. R.D.P. Electronics shall not be liable for consequential damages of any kind.

If the instrument is to be returned to R.D.P. Electronics for repair under warranty, it is essential that the type and serial number be quoted, together with full details of any fault.

### SERVICE.

We maintain comprehensive after-sales facilities and the instrument can, if necessary be returned to our factory for servicing.

Equipment returned to us for servicing, other than under warranty, must be accompanied by an official order as all repairs and investigations are subject to at least the minimum charge prevailing at the date of return.

The type and serial number of the instrument should always be quoted, together with full details of any fault and services required.

### IMPORTANT NOTES.

1. No service work should be undertaken by the customer while the unit is under warranty except with the authorisation of RDP Electronics.
2. If the instrument is to be returned to R.D.P. Electronics for repair, (including repair under warranty) it is essential that it is suitably packed and that carriage is insured and prepaid. R.D.P. Electronics can accept no liability whatsoever for damage sustained during transit.
3. It is regretted that the above warranty only covers repairs carried out at our factory. Should the instrument have been incorporated into other equipment that requires our engineers to perform the repair on site, a charge will be made for the engineer's time to and from the site, plus any expenses incurred.

The aforementioned provisions do not extend the original warranty period of any product that has been either repaired or replaced by R.D.P. Electronics.

**THIS WARRANTY MAY BE NULL AND VOID SHOULD  
THE CUSTOMER FAIL TO MEET OUR TERMS OF PAYMENT.**