

# LP 750 Series

## Hermetically Sealed Frictionless Position Sensors

*Potentiometer Replacement...  
...Unlimited Cycle Life!*



### Description

Macro Sensors' LP 750 Series of 19 mm (3/4 inch) diameter potentiometer replacement position sensors have been designed for a wide range of position measurement applications. The compact design is made possible by its unique coil-winding configuration and digitally enhanced analog output. It is particularly suited for use where installation space is limited. These rugged, hermetically sealed sensors are constructed entirely of stainless steel, and are sealed against hostile environments to IEC standard IP-68.

Electrical termination is through a sealed radial connector and mating connector is supplied with the unit. The radial connection offers three important benefits. First, it permits access to either or both ends for better mechanical support and core guidance. Second, it is easier to cleanout the bore in dusty or dirty locations. Third, is a shorter installed length compared to units of the same range with an axial connection.

### Features

- Standard ranges of 95 mm to 600 mm (3.75 inches to 24.0 inches)
- 24 V DC input, 0 to 10 V DC output (LPER units) or 4 to 20 mA input/output (LPIR units)
- Non-linearity less than or equal to  $\pm 0.25\%$  of FSO ( $\leq \pm 0.10\%$  optional)
- Excellent stroke-to-length ratio
- Frictionless operation; unlimited cycle life
- Through-bore operation
- Radial connector, mating plug included
- Environmentally sealed to IEC IP-68

### Applications

- Machine tool positioners
- Materials testing extensometers
- Hydraulic cylinder position
- Valve position sensing
- Automatic assembly equipment
- Corrosive environments

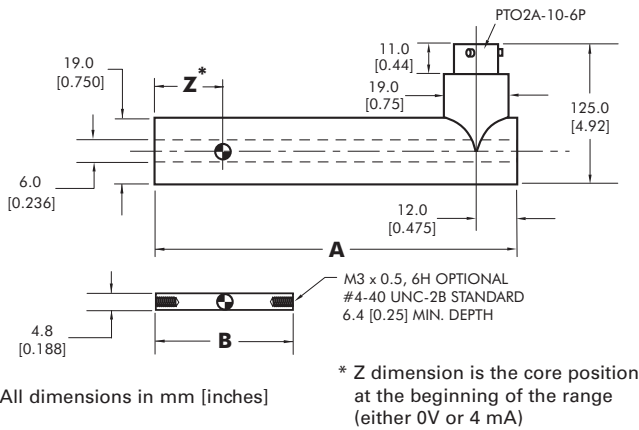
LP 750 Series sensors are available in standard ranges of 95 mm (3.75 inches) to 600 mm (24.0 inches) and are offered in either a loop-powered 4-20 mA input/output (LPIR units) or a nominal 24 V DC input with a 0 to 10 V DC output (LPER units). The standard maximum linearity error for any of these sensors is  $\pm 0.25\%$  of full-scale output (FSO). Optionally linearity error of less than or equal to  $\pm 0.10\%$  FSO is available.

LP 750 Series sensors offer frictionless operation, enhanced stroke to length ratio, high resolution, excellent repeatability, and low hysteresis. Their exceptional reliability is the result of manufacturing processes and assembly techniques developed and optimized by Macro Sensors over decades of sensor manufacturing experience.

### LP 750 Series General Specifications

- Frequency Response (-3dB):** 50 Hz (nominal) \*higher bandwidths available
- Linearity Error:**  $\leq \pm 0.25\%$  of FSO  
( $\leq \pm 0.10\%$  of FSO optional)
- Repeatability Error:**  $< 0.025\%$  of FSO
- Hysteresis Error:**  $< 0.025\%$  of FSO
- Operating Temperature:**  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$   
( $-40^{\circ}\text{F}$  to  $+185^{\circ}\text{F}$ )
- Thermal Coefficient of Scale Factor:**  $-0.027\%/^{\circ}\text{C}$  (nominal)  
( $-0.015\%/^{\circ}\text{F}$  nominal)
- Vibration Tolerance:** 10 g to 2 kHz
- Shock Survival:** 100 g, 11 ms

### LP 750 Series Dimensional Specifications



Model	LPxR 750 -1875	LPxR 750 -3750	LPxR 750 -7000	LPxR 750 -9000	LPxR 750 -12000
Nominal Range (mm)	95	190	350	450	600
Nominal Range (inches)	3.75	7.50	14.0	18.0	24.0
Dimension "A" (mm)	140	265	465	595	790
Dimension "A" (inches)	5.51	10.43	18.31	23.43	31.10
Dimension "B" (mm)	20.3	41.9	87.6	114.3	134.6
Dimension "B" (inches)	0.80	1.65	3.45	4.50	5.30
Dimension "Z" (mm)	13.7	24.6	49.3	63.2	71.9
Dimension "Z" (inches)	0.54	0.97	1.94	2.49	2.83
Weight, Body (grams)	124	153	207	263	374
Weight, Body (ounces)	4.4	5.4	7.3	9.3	13.2
Weight, Core (grams)	11.6	11.6	18.4	22.1	22.1
Weight, Core (ounces)	0.40	0.40	0.65	0.78	0.78

### Ordering Information

For standard LPER 750 or LPIR 750, order by model number with range.  
 For metric option, add -006 after model number with range.  
 For Teflon<sup>®</sup> bore liner option, add -010 after model number with range.  
 For  $\leq \pm 0.10\%$  of FSO linearity error option, add -200 after model number with range.  
 For combinations of options, add option numbers together (eg. -216, -210, -206, -200, -016, -010, -006).  
**For accessories, please visit our website at [www.macrosensors.com](http://www.macrosensors.com).**

### LPER 750 Specifications

- Input Power:** 24 V DC (nominal)  
13.5 - 26.5 V DC  
30 mA (nominal)
- Full Scale Output:** 0 to 10 V DC
- Output Noise & Ripple:**  $< 5 \text{ mV}_{\text{rms}}$

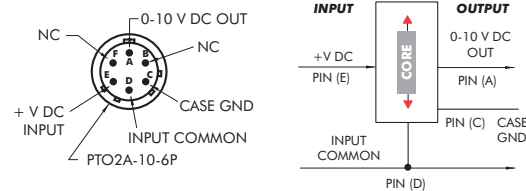


#### Displacement

Model	LPER 750 -1875	LPER 750 -3750	LPER 750 -7000	LPER 750 -9000	LPER 750 -12000
Scale Factor (V/mm)	0.105	0.052	0.029	0.022	0.017
Scale Factor (V/inch)	2.67	1.33	0.71	0.56	0.42

#### Wiring Diagram

CAUTION: DO NOT CONNECT TO PIN "B"



### LPIR 750 Specifications

- Loop Supply Voltage:** 10 V to 28 V DC
- Loop Resistance (Min.):** 50 Ohms
- Output:** 4- 20 mA
- Output Noise & Ripple:**  $< .008 \text{ mA}_{\text{rms}}$

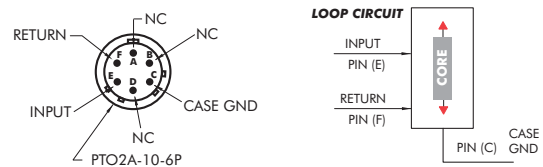


#### Displacement

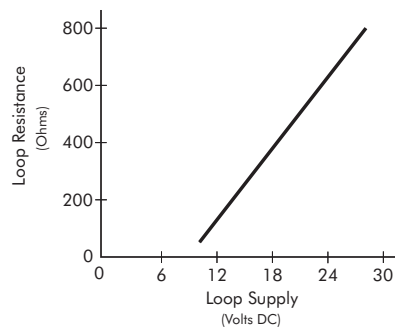
Model	LPIR 750 -1875	LPIR 750 -3750	LPIR 750 -7000	LPIR 750 -9000	LPIR 750 -12000
Scale Factor (mA/mm)	0.168	0.084	0.046	0.036	0.027
Scale Factor (mA/inch)	4.27	2.13	1.14	0.89	0.67

#### Wiring Diagram

CAUTION: DO NOT CONNECT TO PIN "B"



#### Loop Resistance vs. Minimum Loop Supply Voltage



7300 US Route 130 North, Bldg. 22  
 Pennsauken, NJ 08110-1541 USA  
 tel: 856-662-8000 fax: 856-317-1005  
 lvdts@macrosensors.com www.macrosensors.com



Innovators in Position Sensing

All specifications subject to change without notice.  
 © 2008 Macro Sensors 09/23/08