HLR 750 Series — Position Sensors for Hazardous Locations

Features

- UL/ULC Listed
 - Class 1, Division 1 & Class 1, Zone 2 Hazards**
 - -20°F to 212°F (100°C) Operating Temperature
 - Class 1, Division 2 & Class 1, Zone 2 Hazards
 - -20°F to 300°F (150°C) Operating Temperature
- Ranges of ±1 inch to ±10 inches
- All stainless steel construction
- 1/2" conduit leads outlet

Applications

- Gas turbine servo controls
- Fuel valve position feedback
- Petrochemical process plants
- Pulp plants and paper mills

Description

Macro Sensors' HLR 750 Series of 3/4 inch diameter high reliability LVDT position sensors are specifically designed for use in gas turbine environments. These hermetically sealed AC-LVDTs are listed for [Class 1, Division 1, Groups A, B, C, D and Class 1, Zone 2, Group IIC Hazardous Locations] -or- [Class 1, Division 2, Groups A, B, C, D and Class 1, Zone 2, Group IIC Hazardous Locations] by Underwriters Laboratories. Although these ratings share a common LVDT, each set of approvals retains specific operating requirements [Ambient Temperature: -20°F to 212°F (100°C), Maximum Input: 6 V rms @ 2.5 kHz, and ONLY WHEN INSTALLED PER MACROSENSORS 011600000113 Standards] - OR-[Ambient Temperature: -20°F to 300°F (150°C)], respectively. Constructed entirely of stainless steel for environmental robustness, they feature a through-bore design which makes the LVDTs' cores accessible from both ends for better mechanical support and core guidance and facilitates cleanout in dusty or dirty locations. An HLR LVDT's lead wires exit through a radially mounted 1/2-14 NPT male threaded conduit fitting for easy attachment to an explosionproof junction box as well as rigid or flexible conduit.

** ONLY WHEN INSTALLED PER MACROSENSORS 011600000113 Standards Available in measuring ranges from ± 1 inch to ± 10 inches, HLR 750 Series position sensors feature the high resolution, excellent repeatability, and low hysteresis (typically better than 0.01% of full scale output for each) that is associated with time-proven LVDT technology. The maximum linearity error of these sensors is $\pm 0.25\%$ of full range output, using a best-fit straight line derived by the least squares method. A particularly desirable feature of HLR 750 Series LVDTs is that the sum of their secondary voltages is essentially constant and independent of core position, so they can be used equally well with either conventional differential input LVDT signal conditioners or with ratiometric signal conditioning circuits.

HLR 750 Series LVDTs offer reliable contactless position measurement for critical applications in power plants using gas turbines such as fuel valve position feedback, vane pitch servo controls, governor controls, and generator shell expansion measurement. Their temperature rating permits these LVDTs to serve in many applications in steam turbine power plants as well. They also are ideal for throttle position sensing on engine-driven compressors in natural gas pumping stations, height measurement for head boxes and slicers in paper mills, edge detectors and web tension controls in plastic film plants, and real time position sensing for all types of valves in chemical process plants.



HLR 750 Series

General Specifications Class 1, Div. 2 Groups A, B, C and D T3C Class 1, Zone 2, AEx nC IIC T3 Input Voltage: 3.0 V_{rms} (nominal) Ex nC IIC T3 6.0 V_{rms} (max.) Ambient Temp: -20 to 300 Deg. F (150 Deg. C) OR 2.5 kHz (max.) Input Frequency: Class 1, Div. 1 Groups A, B, C and D T3C Class 1, Zone 2, AEx nC IIC T3 Linearity Error: $\leq \pm 0.25\%$ of FRO 6 #22 AWG TEFLON INSULATED LEADS Ex nC IIC T3 **Repeatability Error:** < 0.01% of FSO 6.5 FEET [2M] MIN. LENGTH Ambient Temp: -20 to 212 Deg. F (100 Deg. C) Max. Input: 6V rms @ 2.5 kHz Hysteresis Error: <0.01% of FSO ONLY WHEN INSTALLED PER 1/2" NPT CONDUIT THREAD 7/8 [22] HEX MACROSENSORS 011600000113 Operating Temperature: See drawing 0.750 0 7 5 0 -0.01%/°F (nominal) **Thermal Coefficient** Ν [19.0] [19.0] 0.235 of Sensitivity: (-0.02%/°C nominal) CONNECT BLUE AND GREEN FOR DIFFERENTIAL OUTPUT [6.0] Vibration Tolerance: 20 g to 2 kHz RED • ____ SEC 1 YELLOW Shock Survival: 100 g, 11 ms 6 BLUE GREEN SEC 2 PRIMARY 0.475 (BROWN [12.0] BLACK Δ #4-40 UNF-2B STANDARD WIRING DIAGRAM M3 x 0.5, 6H METRIC 0.38 [9.6] MIN. DEPTH 0.188 [4.8] B All dimensions in inches [mm]

Specifications

| Model | HLR 750 -1000 | HLR 750 -2000 | HLR 750 -3000 | HLR 750 -4000 | HLR 750 -5000 | HLR 750 -6000 | HLR 750 -7500 | HLR 750 -10000 |
|----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|
| Parameter | | | | | | | | |
| Nominal Range (inches) | ±1.00 | ±2.00 | ±3.00 | ±4.00 | ±5.00 | ±6.00 | ±7.50 | ±10.00 |
| Nominal Range (mm) | ±25 | ±50 | ±75 | ±100 | ±125 | ±150 | ±190 | ±250 |
| Sensitivity (mV/V/.001 in) | 0.34 | 0.20 | 0.21 | 0.17 | 0.11 | 0.10 | 0.11 | 0.075 |
| Sensitivity (mV/V/mm) | 13.4 | 7.9 | 8.3 | 6.7 | 4.3 | 3.9 | 4.3 | 3.0 |
| Primary Impedance (Ω) | 785 | 575 | 170 | 420 | 540 | 450 | 775 | 620 |
| Dimension "A" (inches) | 7.34 | 10.91 | 13.65 | 16.17 | 18.65 | 18.65 | 23.85 | 31.65 |
| Dimension "A" (mm) | 186.4 | 277.1 | 346.7 | 410.7 | 473.7 | 473.7 | 605.8 | 803.9 |
| Dimension "B" (inches) | 4.00 | 5.30 | 6.20 | 6.20 | 6.20 | 5.30 | 7.00 | 9.50 |
| Dimension "B" (mm) | 101.6 | 134.6 | 157.5 | 157.5 | 157.5 | 134.6 | 177.8 | 241.3 |
| Dimension "N" (inches) | 3.32 | 5.07 | 6.29 | 7.65 | 8.94 | 8.94 | 11.52 | 15.42 |
| Dimension "N" (mm) | 84.3 | 128.8 | 159.8 | 194.3 | 227.1 | 227.1 | 292.6 | 391.7 |
| Weight - Body (ounces) | 10.3 | 12.2 | 14.2 | 15.1 | 16.0 | 16.0 | 22.6 | 24.3 |
| Weight - Body (g) | 292 | 346 | 400 | 428 | 454 | 454 | 640 | 690 |
| Weight - Core (ounces) | 0.50 | 0.65 | 0.78 | 0.78 | 0.78 | 0.65 | 0.88 | 1.20 |
| Weight - Core (ounces) | 14.2 | 18.4 | 22.1 | 22.1 | 22.1 | 18.4 | 25.0 | 34.0 |

Ordering Information

For standard HLR 750, order by model number with range

- For metric threaded core option, add -006 after model number with range
- For Teflon® bore liner option, add -010 after model number with range
- For both options, add -016 after model number with range
- For accessories and compatible support electronics, please visit our website at www.macrosensors.com.



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Innovators in Position Sensing

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