



## MHR-T SERIES

### Miniature High-Temperature AC LVDT

#### SPECIFICATIONS

- ◆ Operating temperature 392°F [200°C]
- ◆ Small size and low mass core
- ◆ High output signal
- ◆ Stroke ranges from  $\pm 0.025$  to  $\pm 1$  inch
- ◆ AC operation from 2kHz to 20kHz
- ◆ Stainless steel housing
- ◆ Imperial or metric threaded core

The **MHR-T** Series LVDTs are a variant of the legendary MHR Series. The MHR-T Series provide precision measurements in space restrictive applications at temperatures up to 392°F [200°C] continuous.

With a diameter of just 3/8 inch [9.5mm], and an extremely lightweight core, the MHR-T Series is ideal for applications where excessive core weight could influence the motion; with less inertia, accurate measurements at higher displacement speeds are easier to achieve. The lightweight core also reduces mechanical stresses and helps preserve the structural integrity of the core actuation assembly.

The high output sensitivity resulting from the close electrical coupling between the coil and core provides ample signal for interfacing with practically all signal conditioners and conditioning circuits. The magnetic stainless steel housing provides electromagnetic and electrostatic shielding.

Available in a variety of stroke ranges from  $\pm 0.025$  to  $\pm 1$  inch, the MHR-T is compatible with the full line of Measurement Specialties LVDT signal conditioners.

Like in most of our LVDTs, the MHR-T windings are vacuum impregnated with a specially formulated, high temperature, flexible resin, and the coil assembly is potted inside its housing with a two-component epoxy. This provides excellent protection against hostile environments such as high humidity, vibration and shock.

#### FEATURES

- ◆ Compact size
- ◆ 392°F [200°C] continuous operation
- ◆ Lightweight core
- ◆ Shock and vibration tolerant
- ◆ Calibration certificate supplied with each unit

#### APPLICATIONS

- ◆ High temperature applications
- ◆ Cylinder position feedback
- ◆ Materials testing machines
- ◆ Space restricted installations

**PERFORMANCE SPECIFICATIONS**

| <b>ELECTRICAL SPECIFICATIONS (common)</b>                        |                   |               |               |               |              |             |
|--|-------------------|---------------|---------------|---------------|--------------|-------------|
| Input voltage  | 3 VRMS sine wave  |               |               |               |              |             |
| Input frequency  | 2kHz to 20kHz     |               |               |               |              |             |
| Test frequency   | 2.5kHz (standard) |               |               |               |              |             |
| <b>ELECTRICAL SPECIFICATIONS @ 10kHz (recommended operation)</b> |                   |               |               |               |              |             |
| Parameter  | MHR-T 025         | MHR-T 050     | MHR-T 100     | MHR-T 250     | MHR-T 500    | MHR-T 1000  |
| Stroke range   | ±0.025 [±0.64]    | ±0.05 [±1.27] | ±0.10 [±2.54] | ±0.25 [±6.35] | ±0.5 [±12.7] | ±1 [±25.4]  |
| Sensitivity, V/V/inch [mV/V/mm]                                  | 8.10 [319]        | 3.15 [124]    | 2.80 [110]    | 2.07 [81.5]   | 1.96 [77.2]  | 0.77 [30.3] |
| Output at stroke ends, mV/V (*)                                  | 202.5             | 157.5         | 280           | 517.5         | 980          | 770         |
| Phase shift  | +21°              | +8°           | +5°           | +7°           | +7°          | -1°         |
| Input impedance (PRIMARY)  | 238Ω              | 419Ω          | 400Ω          | 345Ω          | 264Ω         | 155Ω        |
| Output impedance (SECONDARY)                                     | 485Ω              | 154Ω          | 200Ω          | 420Ω          | 810Ω         | 450Ω        |
| Non-linearity  | ±% of FR          |               |               |               |              |             |
| @ 50% stroke   | 0.15              | 0.15          | 0.15          | 0.15          | 0.15         | 0.20        |
| <b>@100% stroke (maximum)</b>                                    | <b>0.25</b>       | <b>0.25</b>   | <b>0.25</b>   | <b>0.25</b>   | <b>0.25</b>  | <b>0.25</b> |
| @125% stroke   | 0.25              | 0.35          | 0.25          | 0.35          | 0.30 (**)    | 0.50        |
| @150% stroke   | 0.30              | 0.50          | 0.30          | 0.50 (**)     | 0.75 (**)    | /           |
| Null voltage (max.)  | 0.5% of FSO       |               |               |               |              |             |

| <b>ELECTRICAL SPECIFICATIONS @ 2.5kHz (standard calibration)</b> |                |               |               |               |              |             |
|--|----------------|---------------|---------------|---------------|--------------|-------------|
| Parameter  | MHR-T 025      | MHR-T 050     | MHR-T 100     | MHR-T 250     | MHR-T 500    | MHR-T 1000  |
| Stroke range   | ±0.025 [±0.64] | ±0.05 [±1.27] | ±0.10 [±2.54] | ±0.25 [±6.35] | ±0.5 [±12.7] | ±1 [±25.4]  |
| Sensitivity, V/V/in [mV/V/mm]                                    | 4.36 [172]     | 2.55 [100]    | 2.40 [94]     | 1.73 [68]     | 1.60 [63]    | 0.70 [27]   |
| Output at 100% stroke, mV/V (*)                                  | 109            | 127.5         | 240           | 432.5         | 800          | 700         |
| Phase shift  | +58°           | +36°          | +30°          | +33°          | +23°         | +6°         |
| Input impedance (PRIMARY)  | 116Ω           | 141Ω          | 135Ω          | 147Ω          | 145Ω         | 100Ω        |
| Output impedance (SECONDARY)                                     | 286Ω           | 90Ω           | 125Ω          | 268Ω          | 445Ω         | 370Ω        |
| Non-linearity  | ±% of FR       |               |               |               |              |             |
| @ 50% stroke   | 0.15           | 0.15          | 0.15          | 0.15          | 0.15         | 0.20        |
| <b>@100% stroke (maximum)</b>                                    | <b>0.25</b>    | <b>0.25</b>   | <b>0.25</b>   | <b>0.25</b>   | <b>0.25</b>  | <b>0.25</b> |
| @125% stroke   | 0.25           | 0.35          | 0.25          | 0.35          | 0.30 (**)    | 0.50        |
| @150% stroke   | 0.30           | 0.50          | 0.30          | 0.50 (**)     | 0.75 (**)    | /           |
| Null voltage (max)   | 0.5% of FSO    |               |               |               |              |             |

| <b>ENVIRONMENTAL SPECIFICATIONS &amp; MATERIALS</b> |  |
|---|--|
| Operating temperature                               | -4°F to +392°F [-20°C to +200°C]   |
| Shock survival                                      | 1,000 g (11ms half-sine)   |
| Vibration tolerance                                 | 20 g up to 2KHz  |
| Housing material                                    | AISI 400 Series stainless steel  |
| Electrical connection                               | Six lead-wires, 32 AWG stranded plated Copper, PTFE insulated, 3 foot [1 meter] long |
| IEC 60529 rating                                    | IP61   |

**Notes:**

All values are nominal unless otherwise noted

Electrical specifications are for the test frequency indicated in the table

Dimensions are in inch [mm] unless otherwise noted

FR: Full Range is the stroke range, end to end; FR=2xS for ±S stroke range

FSO (Full Scale Output): Largest absolute value of the outputs measured at the ends of the range

(\*) Unit for output at stroke ends is millivolt per volt of excitation (input voltage)

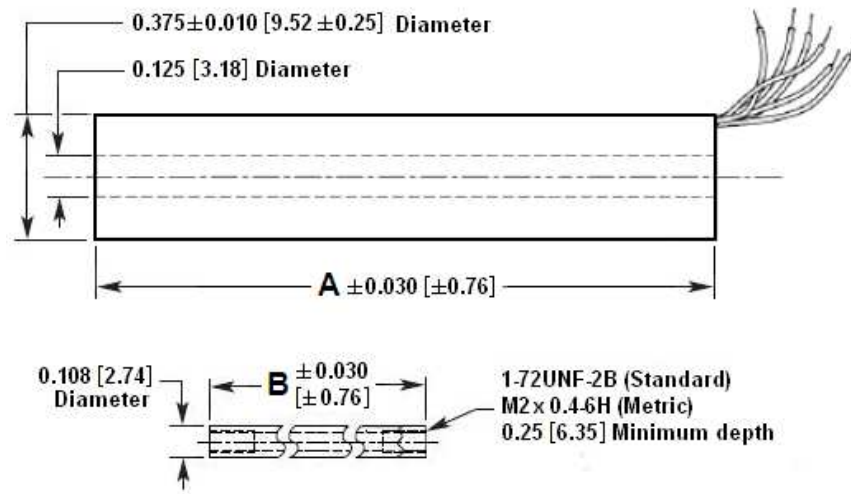
(\*\*) Requires special reduced core length

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Miniature High-Temperature AC LVDT

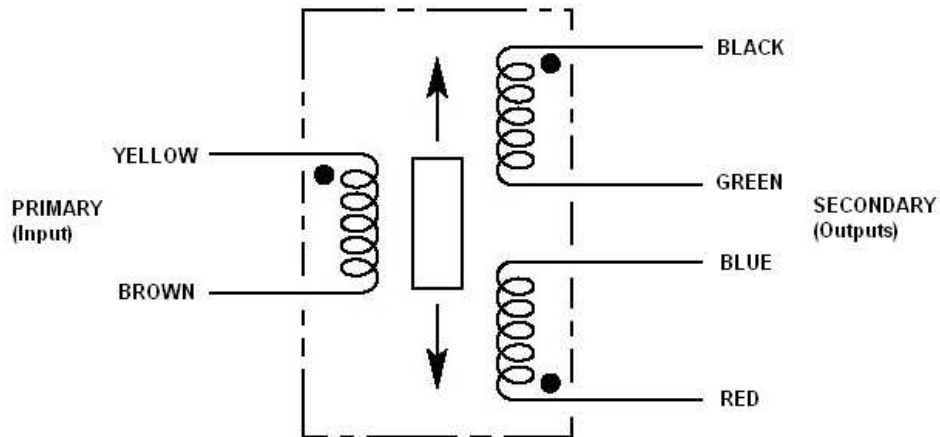
### MECHANICAL SPECIFICATIONS

| Parameter           | MHR-T 025    | MHR-T 050    | MHR-T 100    | MHR-T 250    | MHR-T 500     | MHR-T 1000    |
|---------------------|--------------|--------------|--------------|--------------|---------------|---------------|
| Body length "A"     | 0.660 [16.8] | 0.815 [20.7] | 0.990 [25.1] | 1.850 [47.0] | 3.300 [83.82] | 5.600 [142.2] |
| Core length "B"     | 0.400 [10.2] | 0.500 [12.7] | 0.625 [15.9] | 1.125 [28.6] | 2.000 [50.8]  | 3.000 [76.2]  |
| Body weight, oz [g] | 0.18 [5]     | 0.21 [6]     | 0.21 [6]     | 0.32 [9]     | 0.60 [17]     | 0.92 [26]     |
| Core weight, oz [g] | 0.016 [0.5]  | 0.016 [0.5]  | 0.025 [0.7]  | 0.032 [0.9]  | 0.056 [1.6]   | 0.088 [2.5]   |



Dimensions are in inch [mm]

### WIRING INFORMATION



Connect Blue to Green for differential output

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Miniature High-Temperature AC LVDT

### ORDERING INFORMATION

| Description      | Model     | Part Number  |
|------------------|-----------|--------------|
| ±0.025 inch LVDT | MHR-T 025 | 02562407-000 |
| ±0.05 inch LVDT  | MHR-T 050 | 02562408-000 |
| ±0.10 inch LVDT  | MHR-T 100 | 02562409-000 |

| Description     | Model      | Part Number  |
|-----------------|------------|--------------|
| ±0.25 inch LVDT | MHR-T 250  | 02562410-000 |
| ±0.5 inch LVDT  | MHR-T 500  | 02562411-000 |
| ±1 inch LVDT    | MHR-T 1000 | 02562412-000 |

| OPTIONS AND ACCESSORIES  |              |
|--|--------------|
| Metric threaded core option (use base part numbers from above) | XXXXXXXX-006 |
| Core connecting rod, 6 inches long, 1-72 threads               | 05282945-006 |
| Core connecting rod, 12 inches long, 1-72 threads              | 05282945-012 |
| Core connecting rod, 24 inches long, 1-72 threads              | 05282945-024 |
| Core connecting rod, 36 inches long, 1-72 threads              | 05282945-036 |
| Core connecting rod, 6 inches long, M2x0.4 metric threads      | 05282976-006 |
| Core connecting rod, 12 inches long, M2x0.4 metric threads     | 05282976-012 |

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