

Series 200

Short Stroke DC LVDTs

The Series 200 DC-DC LVDTs are precision Linear Variable Differential Transformers packaged with a solid state oscillator and a phase sensitive demodulator. The transducer is designed to work with DC voltages, and has excellent linearity, infinite resolution, and high sensitivity. Input and output circuits are electrically isolated from each other and from the coil assembly housing, making them usable directly in floating or ground return systems. DC indicators, recorders, and control systems can usually be driven directly by the large DC output. The core, when displaced axially within the coil assembly, produces a voltage change in the output directly proportional to the displacement.



KEY FEATURES

Ranges from $\pm 0.05"$ to $0.20"$

Stainless Steel Construction

Non-linearity < 0.5%, 0.3%

High Sensitivity

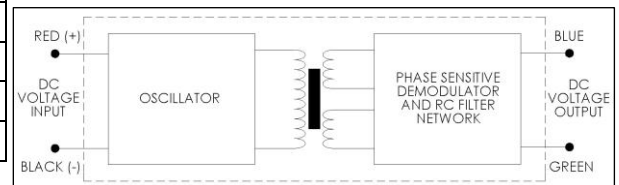
SPECIFICATIONS – ELECTRICAL

MODEL NUMBER	0200-0000Q	0200-0001Q	0201-0000Q	0201-0001Q
RANGE, \pm INCHES (\pm MM)	0.050 (1.27)	0.050 (1.27)	0.100 (2.54)	0.100 (2.54)
INPUT, VDC	7 Max., 5 Min.			
INPUT, mA	20	20	35	35
OUTPUT, FULL SCALE OPEN CIRCUIT, \pm VDC	1.5	1.5	2.8	2.8
LINEARITY, \pm FULL SCALE, %	0.5	0.3	0.5	0.3
INTERNAL CARRIER FREQUENCY	9 KHz			
MAX RIPPLE, RMS/VDC OUTPUT RANGE	0.7%			
OUTPUT IMPEDANCE, KOHms	2.2	2.2	3.0	3.0
FREQUENCY RESPONSE (3dB DOWN), Hz	350	350	170	170
TEMPERATURE RANGE	-65°F to +140°F (-54°C to +60°C)			
RESOLUTION	Infinite			

NOTES:

1. Polarity of excitation must be observed for proper function. Reversal will not damage the unit.
2. Load impedance of 50 KOHms minimum required for proper operation.
3. Output polarity will be positive on one side of null, negative on the other side of null.
4. Blue lead is more positive with respect to the Green lead when the core is moved toward the lead end.

BLOCK DIAGRAM



DIMENSIONAL DIAGRAM

FIGURE 1

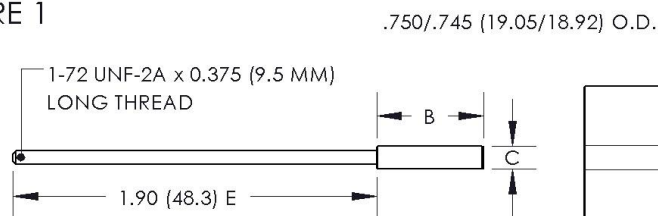
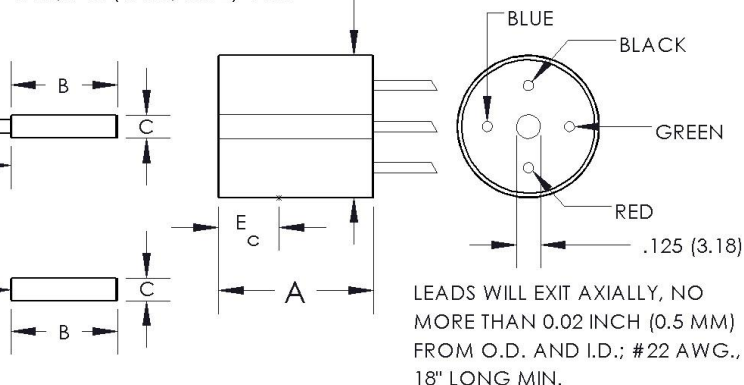


FIGURE 2

1-72 UNF-2B, .18 (4.6 MM) MIN. DEEP
THREAD BOTH ENDS; THRU THREAD
WHEN B < .6 INCH (15.2 MM)



LEADS WILL EXIT AXIALLY, NO
MORE THAN 0.02 INCH (0.5 MM)
FROM O.D. AND I.D.; #22 AWG.,
18" LONG MIN.

ALL DIMENSIONS IN INCHES (MM)

SPECIFICATIONS – MECHANICAL

MODEL*	LINEAR RANGE, ±INCHES (MM)	BODY LENGTH, A, INCHES (MM)	ELECTRICAL CENTER, E _c , INCHES (MM)	BODY MASS, GRAMS	CORE LENGTH, B, INCHES (MM)	EXTENSION LENGTH, E, INCHES (MM)
0200-0000_	0.05 (1.27)	0.81 (20.6)	0.32 (8.13)	21	0.56 (14.2)	1.9 (48.3)
0200-0001_	0.05 (1.27)	0.81 (20.6)	0.32 (8.13)	21	0.56 (14.2)	1.9 (48.3)
0201-0000_	0.10 (2.54)	1.06 (26.9)	0.44 (11.2)	26	0.81 (20.6)	1.9 (48.3)
0201-0001_	0.10 (2.54)	1.06 (26.9)	0.44 (11.2)	26	0.81 (20.6)	1.9 (48.3)

CORE OPTIONS

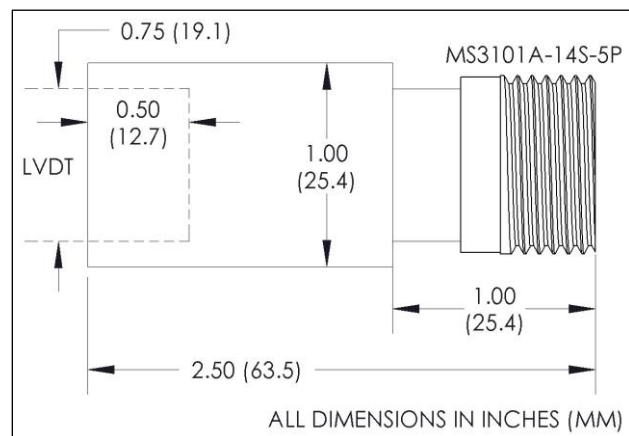
MODEL	CORE ASSEMBLY REF. FIG. 1		THREADED CORE REF. FIG. 2	
	OPTION 0	OPTION 1	OPTION 2	OPTION 3
	C = 0.120" (3.05mm)	C = 0.099" (2.51mm)	C = 0.120" (3.05mm)	C = 0.099" (2.51mm)
0200-0000_	C004-0000	C004-0001	C005-0002	C005-0003
0200-0001_	C004-0000	C004-0001	C005-0002	C005-0003
0201-0000_	C004-0002	C004-0003	C005-0006	C005-0007
0201-0001_	C004-0002	C004-0003	C005-0006	C005-0007

* Model numbers ending with a "_" have multiple core options. All standard units will end with a 0 indicating a core assembly. This core assembly consists of a core brazed to an extension rod that terminates in 1-72 UNF-2A threads. If an option is not selected, option 0 will be provided. Option 1 indicates a core assembly with a smaller core. Core options 2 and 3 provide a threaded core only. A separate extension rod can be used to connect the core to the moving object.

SALES OPTIONS

OPTION #	DESCRIPTION
X0002	Splashproof – protects the unit from washdown environments or outdoor applications
X0004	Modify length of the extension rod from 1.9" to user specified length; specify as Dimension E
X0010	Option cable termination; eight feet of 4 conductor, 22 AWG, PVC cable
X0011	Provide an offset and scaled output voltage; special connector and mating connector included; used only with load impedances of 1 Megaohm or greater; input voltage and scaling parameters must be specified
X0017	Modify unit for use in any noncorrosive, nonconductive medium, such as hydraulic fluid, for pressure < 5000 PSI; housing is vented
X0023	Install second brazed extension rod to user specified length; specify as Dimension E
X0025	Optional MS-style connector termination. Increases O.D. to 1.00"; mating connector supplied
X0040	Optional cable termination; eight feet of 4 conductor, 22 AWG, Teflon cable; temperature range increased to -65°F to +250°F (-55°C to +121°C)

OPTION X0025



For more detailed information about these options, please contact the factory.

Series 240

General Purpose DC LVDTs

The Series 240 DC-DC LVDTs are an integrated package consisting of a precision linear variable differential transformer, a solid state oscillator, and a phase-sensitive demodulator. The transducer is designed for excellent linearity, infinite resolution, and high sensitivity. Input and output circuits are electrically isolated from each other and from the coil assembly housing, making them usable directly in floating or ground return systems. DC indicators, recorders, and control systems can usually be driven directly by the large DC output. The core, when displaced axially within the coil assembly, produces a voltage change in the output directly proportional to the displacement.



KEY FEATURES

Ranges from $\pm 0.05"$ to $\pm 4.0"$

Non-linearity $< 0.5\%$

Stainless Steel Construction

6 to 30 VDC Excitation

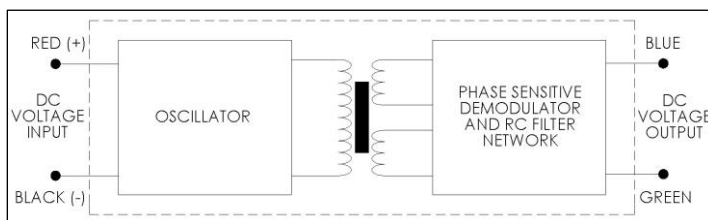
SPECIFICATIONS – ELECTRICAL

MODEL NUMBER	0240-00000	0241-00000	0242-00000	0243-00000	0244-00000	0245-00000	0246-00000	0246-00005
WORKING RANGE, \pm INCHES (MM)	0.050 (1.27)	0.100 (2.54)	0.250 (6.35)	0.500 (12.7)	1.00 (25.4)	2.00 (50.8)	3.00 (76.2)	3.00 (76.2)
MAX. USABLE RANGE, \pm INCHES (MM)	0.075 (1.78)	0.150 (3.75)	0.375 (9.53)	0.750 (19.1)	1.50 (38.1)	2.75 (69.8)	3.25 (82.5)	4.00 (101)
INPUT VOLTAGE, VDC	6.0 Min. to 30 Max.							9.0 Min. to 30 Max.
NOMINAL F.S. OUTPUT, \pm VDC with UNLOADED OUTPUT								
@ 6V INPUT	1.3	2.4	1.8	3.1	4.6	3.9	3.3	N/A
@ 15V INPUT	3.4	6.4	4.8	8.3	12.1	10.2	8.7	10
@ 24V INPUT	5.5	10.4	7.8	13.5	18.7	16.5	14.1	16.3
@ 30V INPUT	7.0	13.0	9.7	17.0	24.8	20.7	17.7	30.5
INPUT CURRENT	8.3 mA @ 6V Input to 52 mA @ 30V Input							
² NON-LINEARITY	$\pm 0.5\%$ Full Scale Over Total Working Range; $\pm 1.0\%$ Full Scale Over Maximum Usable Range							
INTERNAL CARRIER FREQUENCY, Hz	13000	12000	3600	3400	3200	1500	1400	1400
% RIPPLE, RMS (NOMINAL)	0.7	0.7	0.8	0.8	0.8	1	1	1
OUTPUT IMPEDANCE, Ohms	2500	3500	5200	5500	5600	5500	5600	5600
FREQUENCY RESPONSE (3 dB down), Hz	300	140	115	110	100	110	75	75
TEMPERATURE RANGE	-65°F to $+250^{\circ}\text{F}$ (-54°C to $+121^{\circ}\text{C}$)							
RESOLUTION	Infinite							

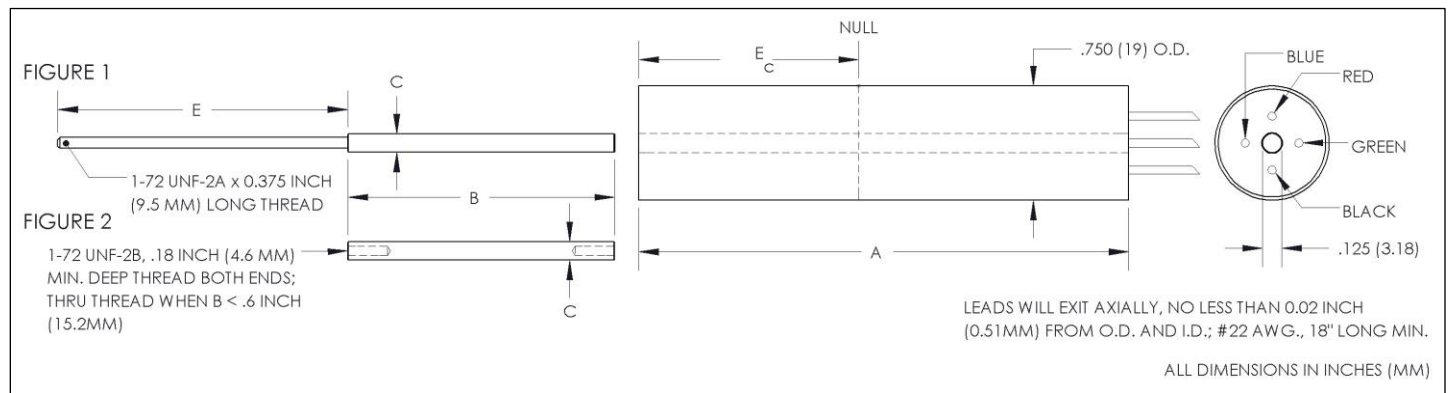
NOTES:

1. Polarity of excitation must be observed for proper function. Reversal will not damage the unit.
2. Load impedance of 50 KOhms minimum required for proper operation.
3. Output polarity will be positive on one side of null, negative on the other side of null.
4. Transducers are calibrated at 24 VDC.
5. Blue lead is more positive with respect to the Green lead when the core is moved toward the lead end.

BLOCK DIAGRAM



DIMENSIONAL DIAGRAM



SPECIFICATIONS – MECHANICAL

MODEL*	LINEAR RANGE, ±INCHES (MM)	BODY LENGTH, A, INCHES (MM)	ELECTRICAL CENTER, E_C , INCHES (MM)	BODY MASS, GRAMS	CORE LENGTH, B, INCHES (MM)	EXTENSION LENGTH, E, INCHES (MM)
0240-0000_	0.05 (1.27)	0.87 (22.1)	0.34 (8.64)	55.8	0.56 (14.2)	1.9 (48.3)
0241-0000_	0.10 (2.54)	1.12 (28.5)	0.56 (14.2)	59.2	0.60 (15.2)	2.18 (55.4)
0242-0000_	0.25 (6.35)	3.21 (81.5)	1.44 (36.6)	121.4	1.75 (44.5)	1.9 (48.3)
0243-0000_	0.50 (12.7)	3.71 (120)	1.69 (42.9)	132.2	1.87 (47.5)	2.4 (60.9)
0244-0000_	1.00 (25.4)	4.71 (120)	2.19 (55.6)	156.2	2.00 (50.8)	3.2 (81.2)
0245-0000_	2.00 (50.8)	8.21 (209)	3.94 (100)	235.4	3.50 (88.9)	5.2 (132)
0246-0000_	3.00 (76.2)	10.52 (267)	5.09 (129)	293	3.50 (88.9)	8.4 (213)
0246-00005	4.00 (101.6)	10.52 (267)	5.09 (129)	293	2.00 (50.8)	9.1 (231)

* Model numbers ending with a "_" have multiple core options. All standard units will end with a Q indicating a core assembly. This core assembly consists of a core brazed to an extension rod that terminates in 1-72 UNF-2A threads. If an option is not selected, option Q will be provided.

CORE OPTIONS

The core is constructed from a soft, high permeability iron-nickel alloy. Nonmagnetic stainless steel is used as extension rod material. Core assemblies are sized for use over the maximum working range of the LVDT. The difference between option Q and 1 is the core outer diameter. Smaller O.D. cores should be considered for applications with some radial movement to prevent contacting the inner diameter of the coils. The smaller core diameter will decrease sensitivity slightly (< 5%).

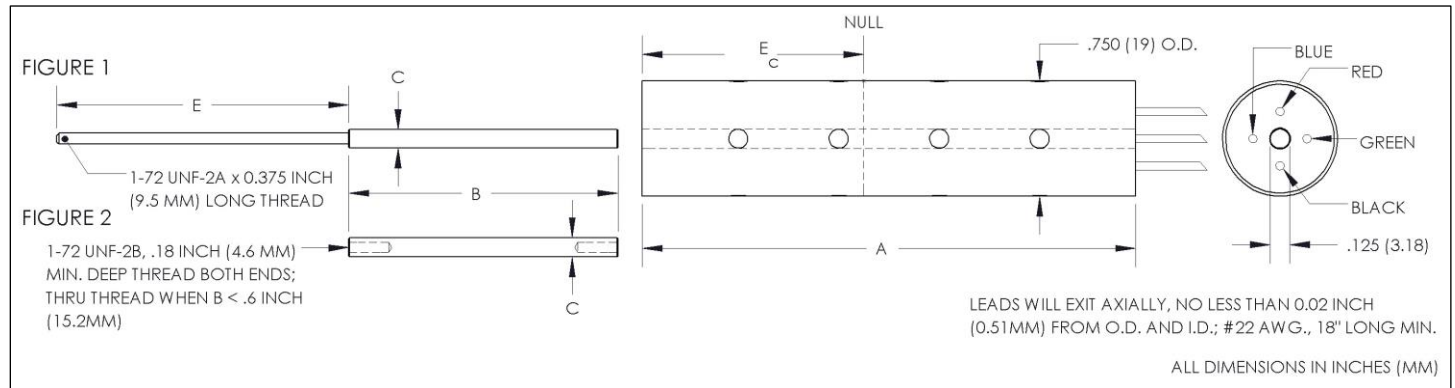
Options 2 and 3 are cores only, tapped at both ends with 1-72 UNF-2B threads, as shown in Figure 2 of the Dimensional Drawing. These should be used in applications when a separate extension rod is desirable. The difference between option 2 and 3 is the outer diameter.

The model 0246-00005 has only one core assembly available. This unit is designed to operate over the maximum usable stroke of ±4.0 inches (±102mm).

MODEL	CORE ASSEMBLY REF. FIG. 1		THREADED CORE REF. FIG. 2	
	OPTION Q	OPTION 1	OPTION 2	OPTION 3
	$C = 0.120"$ (3.05mm)	$C = 0.099"$ (2.51mm)	$C = 0.120"$ (3.05mm)	$C = 0.099"$ (2.51mm)
0240-0000_	C004-0000	C004-0001	C005-0002	C005-0003
0241-0000_	C004-0198	C004-0199	C005-0153	C005-0154
0242-0000_	C004-0010	C004-0006	C005-0054	C005-0051
0243-0000_	C004-0011	C004-0007	C005-0035	C005-0023
0244-0000_	C004-0012	C004-0008	C005-0048	C005-0052
0245-0000_	C004-0013	C004-0009	C005-0053	C005-0033
0246-0000_	C004-0014	C004-0015	C005-0053	C005-0033
0246-00005	C004-0057	N/A	N/A	N/A

SERIES 240 MODIFIED FOR USE IN HIGH PRESSURE ENVIRONMENTS

The high pressure version of the Series 240 is suitable for operation in nonconductive and noncorrosive fluids or gasses at pressures up to 5000 P.S.I. The vented housing eliminates pressure differentials between the environment and the transducer's interior, allowing rapid and extreme pressure changes without damage or degradation in performance.



Note: All electrical and physical specifications are the same as the standard Series 240 LVDTs

MODEL*	STROKE, ±INCHES (MM)
0240-0008_	0.05 (1.27)
0241-0007_	0.10 (2.54)
0242-0006_	0.25 (6.35)
0243-0009_	0.50 (12.7)
0244-0014_	1.00 (25.4)
0245-0007_	2.00 (50.8)
0246-0008_	3.00 (76.2)

* Model numbers ending with a "_" have multiple core options. All standard units will end with a Q indicating a core assembly. This core assembly consists of a core brazed to an extension rod that terminates in 1-72 UNF-2A threads. If an option is not selected, option Q will be provided.

SALES OPTIONS

OPTION #	DESCRIPTION
X0001	Splashproof – protects the unit from washdown environments or outdoor applications by means of an additional washer on the non-lead end. Applies to Models 0242-0000_ through 0246-0000_
X0004	Modify length of the extension rod to user specified length; specify as Dimension E
X0007	Provide maximum non-linearity of ±0.25% full scale
X0010	Cable termination; eight feet of 4 conductor, #22 AWG., PVC cable; temperature range changes to 0°F to 175°F (-17°C to +79°C)
X0011	Provide an offset and scaled output voltage; special connector and mating connector included; used only with load impedances of 1 Megohm or greater; input voltage and scaling parameters must be specified
X0023	Install second brazed extension rod
X0025	Terminate in an integral connector type MS3101A-14S-5P; adaptor for connector has 1.00" O.D.; includes mating connector
X0036	Welded non-lead end for enhanced splashproofing; applies to Models 0242-0000_ through 0246-0000_
X0040	Cable termination – extended temperature range; eight feet of 4 conductor, #22 AWG., Teflon cable; temperature range increased to -65°F to +250°F (-55°C to +121°C)

For more detailed information about these options, please contact the factory.

OPTION X0025

