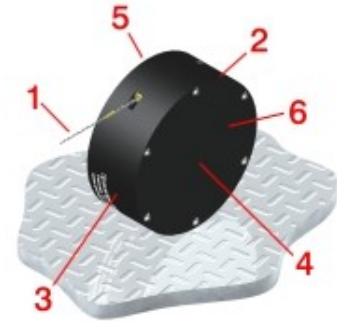


# Data Sheet - Model 174-0321T High-Frequency-Response Position Transducer

For Crash Test, Impact Testing, and High-Acceleration Applications

## Key Features

1. 4-Inch (102-mm) Maximum Travel
2. Analog Signal Using Precision Conductive Plastic Potentiometer
3. AccuTrak™ Grooved Drum for Enhanced Repeatability and Longer Cable Life
4. Bearing-Mounted Rotating Components
5. High-Tension Displacement Cable
6. DirectConnect™ Sensor-To-Drum Technology = Zero Backlash, No Torsion Springs or Clutches



## Potentiometer Specifications

Potentiometer Type	1-turn, precision, conductive plastic
Resistance: Value, Tolerance	5K ohms, ±10%
Travel: Electrical, Mechanical	340°, 340° min
Mechanical Life	100 million shaft revolutions min
Output Signal	analog signal from 0 to supply voltage (voltage divider circuit)
Power Rating	1.0 W at 158° F (70° C)
Supply Current	12 mA max
Supply Voltage	35 VDC max (using voltage divider circuit)
Independent Linearity Error	±0.5% max per VRCI-P-100A
Output Smoothness	0.1% max
Insulation Resistance	1000 Mohms at 500 VDC min
Dielectric Strength	1000 VDC min
Resolution	infinite signal
Operating Temperature	-85° to +257° F (-65° to +125° C)
Shock, Vibration	100 g for 6 ms, 10 to 2000 Hz at 15 g per Mil-R-39023
Temperature Coefficient	±400 ppm/°C max

## Other Specifications

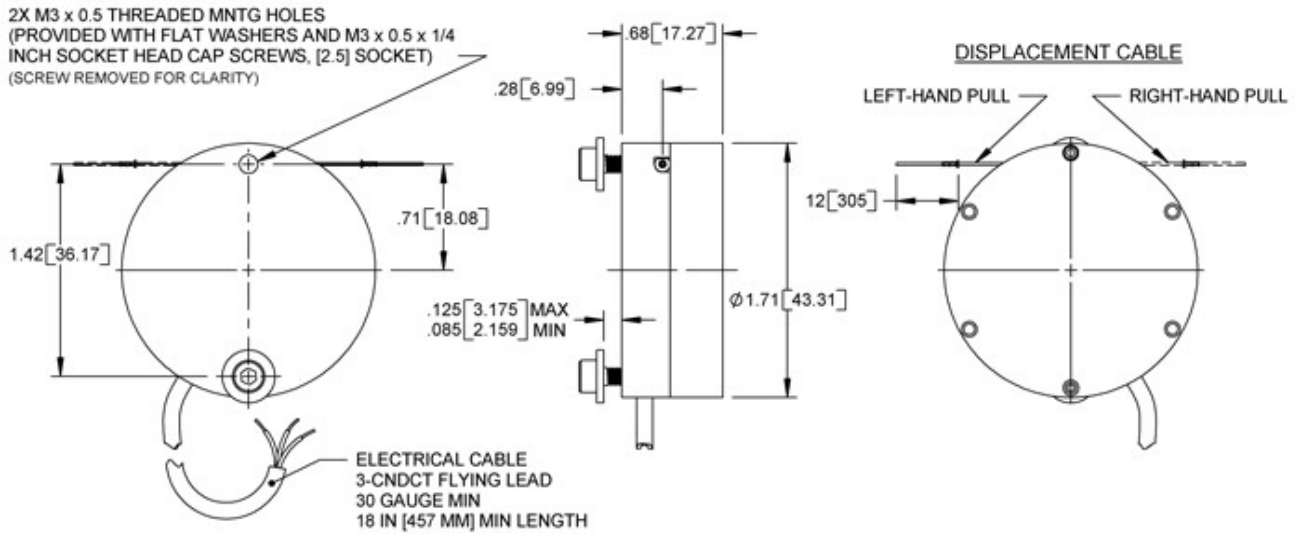
Case Materials	precision-machined anodized 2024 aluminum
Displacement Cable	0.024-inch (0.61-mm) dia., 7-by-7 stranded stainless steel, 70-lb (311-N) min breaking strength
Displacement Cable Hardware	1 each of 300196 loop sleeve, 300292 copper sleeve, 160032 copper sleeve, 300688 ball-end plug, 300495 pull ring, and 301003 nickel swivel; all items provided uncrimped
Nominal Mass	3 oz (85 g)
Displacement Cable Tension (Nominal)	56 oz (15.5 N) min
Cable Acceleration (Nominal)	50 g's max
Environmental Protection	NEMA 3S / IP 54, DO-160D (ED-14D) Env. Cat. E1E1ABSHXFDXSAXXXXXXXXXXX

## Model Numbers and Ordering Codes

174-0321Ta	position transducer (4.00-inch (102-mm) range)
Example: 174-0321T (left-hand displacement cable pull)	

Variable	Value	Description
a	-	left-hand displacement cable pull
	R	right-hand displacement cable pull

## Drawing



Electrical Connection for Increasing Output with Displacement Cable Extraction

<p><i>Left-Hand Pull</i> black white red</p>	<p><i>Right-Hand Pull</i> red white black</p>	<p><i>Signal</i> input, V+ output, signal, S+ ground, common, V-, S-</p>
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For crimping of hardware to displacement cable, consider the 160001-01 installation kit.

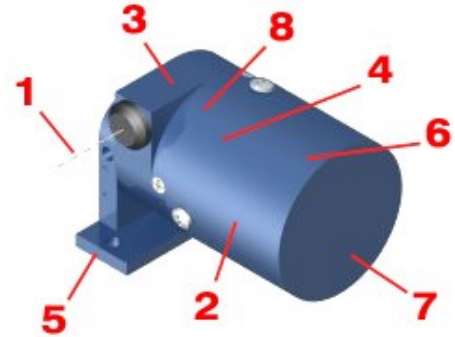
All dimensions are REFERENCE and are in inches [mm]

# Data Sheet - Series D60, D61 and D62 Miniature Position Transducers

## High-Resolution, Digital-Output, Miniature Size

### Summary Features

1. 43-inch (1092-mm) Maximum Travel (Series D62)
2. Digital Signal Using Precision, High-Resolution Incremental Optical Encoder
3. AccuTrak™ Threaded Drum for Enhanced Repeatability
4. Bearing-Mounted Rotating Components
5. Optional Flexible Mounting Bases
6. Predicted Life: 10 Million Full-Stroke Cycles
7. NEMA 4X / IP 66 Environmentally Protected
8. DirectConnect™ Sensor-To-Drum Technology = Zero Backlash, No Torsion Springs or Clutches



### Sensor Specifications

#### SENSOR SPECIFICATIONS (incremental optical encoder)

Power Requirement	5 to 26 VDC
Current	35 mA max at 5 VDC
Logic Output	open collector with Schmitt trigger and 10 Kohm pull-up resistor (push-pull differential line driver)
Power Consumption	150 mW max, 16 mA sink current at 0.40 VDC
Travel: Electrical, Mechanical	360° continuous
Mechanical Life	100 million shaft revolutions min
Resolution	8192 quadrature pulses per revolution
Output	2-bit (quadrature) code, A leads B by 90° w/CW
Operating Temperature	-4° to 212° F (-20° to 100° C)
Shock / Vibration	50 g for 11 ms / 50 to 500 Hz at 20 g
Humidity	98% non-condensing

### Other Specifications

Case/Drum Materials	precision-machined, anodized 2024 aluminum
Displacement Cable	0.027 inch (0.6858 mm) diameter, 7-by-7 stranded stainless steel, 90-lb (400-N) min breaking strength
Displacement Cable Hardware	1 each of 300196 loop sleeve, 300292 copper sleeve, 300688 ball-end plug, 300495 pull ring, 160026 brass swivel, and 301003 nickel swivel; all items provided uncrimped
Nominal Mass	D60: 6 oz (170 g), D61: 8 oz (227 g), D62: 11 oz (312 g)
Environmental Sealing	NEMA 4X / IP 66

### Part Numbers

Part Number (Order Code)	Nominal Range <i>in (mm)</i>	Nominal Resolution# <i>pulses/in (pulses/mm)</i>	Nominal Cable Tension <i>oz (N)</i>	max Cable Accel. <i>g</i>
D60-090	11.25 (286)	3587 (141)	8 to 23 (2 to 6)	40
D60-170	21.25 (540)	1883 (74)	8 to 20 (2 to 6)	40
D61-244	30.50 (775)	1338 (53)	9 to 24 (3 to 7)	71
D62-345	43 (1092)	951 (37)	6 to 19 (2 to 5)	32

# after quadrature decode by user

#### Electrical Connection

Electrical Connection Type	Pin/Wire Assignment														
10-conductor dark gray PVC cable with 24 AWG flying leads, 60-in (1524-mm) min length, 0.250 (6.35) nominal diameter, -20° to +80° C operating temperature range	<table border="1"> <tr> <th>Wire Color</th> <th>Signal</th> </tr> <tr> <td>red</td> <td>common</td> </tr> <tr> <td>gray</td> <td>+VDC</td> </tr> <tr> <td>brown</td> <td>Z</td> </tr> <tr> <td>green</td> <td>Z'</td> </tr> <tr> <td>blue</td> <td>B</td> </tr> <tr> <td>orange</td> <td>B'</td> </tr> </table>	Wire Color	Signal	red	common	gray	+VDC	brown	Z	green	Z'	blue	B	orange	B'
Wire Color	Signal														
red	common														
gray	+VDC														
brown	Z														
green	Z'														
blue	B														
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