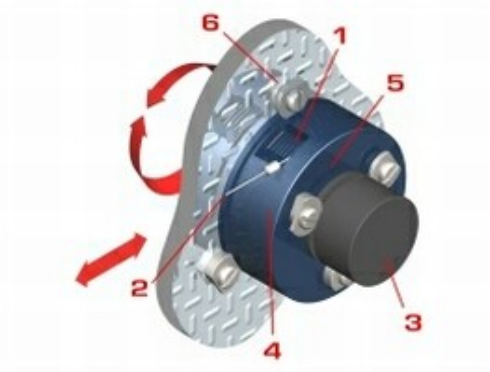
Data Sheet - Series L Ultra-Small Position Transducer

Flexible, Rugged, Affordable Displacement Measurement for OEM and High-Volume Uses

Summary Features

1. AccuTrak™ Threaded Drum For Enhanced Repeatability
2. 21.25-inch (540-mm) Maximum Travel
3. Analog or Digital (Quadrature) Output
4. DirectConnect™ Sensor-To-Drum Technology = Zero Backlash, No Torsion Springs or Clutches
5. Bearing-Mounted Rotating Components
6. EasyMount™ Fasteners Provide 360° Mounting Rotation



Sensor Specifications

ANALOG SENSOR SPECIFICATIONS (voltage divider via hybrid or conductive plastic precision potentiometer)

Item	*Type L00 (1-turn sensor)*	*Type L01 and L02 (3-, and 5-turn sensors)*
Resistance: Value, Tolerance	5K ohms, ±10%	5K ohms, ±10%
Travel: Electrical	340°	1080° (L01), 1800° (L02)
Travel: Mechanical	360° continuous	1080° (L01), 1800° (L02) (+15° -0°)
Mechanical Life	5 million shaft revolutions min	5 million shaft revolutions min
Power Rating	1.0 W at 158° F (70° C); 50 VDC / 12 mA max	2.0 W at 158° F (70° C); 50 VDC / 12 mA max
Independent Linearity Error	±1.0% max per VRCI-P-100A	±0.25% max per VRCI-P-100A
Output Smoothness	0.1% max	0.1% max
Insulation Resistance	1000 Mohms min at 750 Vrms	1000 Mohms min at 750 Vrms
Dielectric Strength	750 Vrms min	1000 Vrms min
Resolution	infinite signal	infinite signal
Operating Temperature	-40° to 185° F (-40° to 85° C)	-40° to 185° F (-40° to 85° C)
Shock / Vibration	100 g for 6 ms / 10 to 500 Hz at 10 g	100 g for 6 ms / 10 to 2000 Hz at 15 g

DIGITAL SENSOR SPECIFICATIONS (incremental optical encoder)

Item	*Type L1 (standard resolution)*	*Type L2 (high resolution)*
Power Requirement	5 ±0.50 VDC	5 to 26 VDC
Supply Current	29 mA max at 5 VDC	35 mA max at 5 VDC
Logic Output	open collector and 3.3 Kohm pull-up resistor (TTL)	open collector with Schmitt trigger and 10 Kohm pull-up resistor (push-pull differential line driver)
Power Consumption	145 mW max, 3.86 mA sink current at 0.40 VDC	150 mW max, 16 mA sink current at 0.40 VDC
Travel: Electrical, Mechanical	360° continuous	360° continuous
Mechanical Life	100 million shaft revolutions min	100 million shaft revolutions min
Resolution	1200 quadrature pulses per revolution	8192 quadrature pulses per revolution
Output	2-bit (quadrature) code, A leads B by 90° w/CW	2-bit (quadrature) code, A leads B by 90° w/CW
Operating Temperature	14° to 185° F (-10° to 85° C)	-4° to 212° F (-20° to 100° C)
Shock / Vibration	100 g for 6 ms / 5 to 2000 Hz, 20 g	50 g for 11 ms / 50 to 500 Hz at 20 g

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
Approximate Weight	3 oz (85 g)
Environmental Sealing	NEMA 12 / IP 53 (standard), NEMA 4X / IP 66 (optional)

Part Numbers

Part Number	Nominal Range	Nominal Resolution#	Nominal Cable Tension	max Cable Accel.	Electrical Connection Code+
(Order Code)	*in (mm)*	*pulses/in (pulses/mm)*	*oz (N)*	*g*	*(see below for details)*

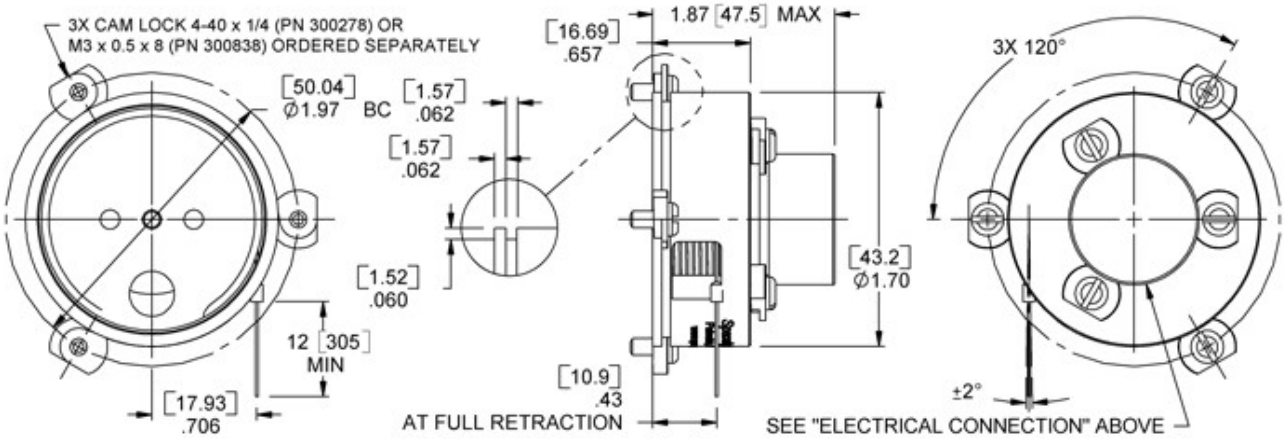
L00*-00	4.00 (102)	infinite analog signal	5 to 25 (1.5 to 7)	20	* = 0, 1, or 2
L01*-00	12.75 (324)	infinite analog signal	5 to 25 (1.5 to 7)	20	* = 0, 1, or 2
L02*-00	21.25 (540)	infinite analog signal	5 to 25 (1.5 to 7)	20	* = 0, 1, or 2
L12*-00	21.25 (540)	270# (10#)	5 to 25 (1.5 to 7)	20	* = 3, 4, or 5
L22*-00	21.25 (540)	1847# (73#)	5 to 25 (1.5 to 7)	20	* = 6 or 7

after quadrature decode by user

+ Electrical Connection

Code	Electrical Connection Type	Pin/Wire Assignment			
0	three solder terminals	*Sensor Pin* CW CCW wiper	*Wire Color* red black white	*Connector Pin* - - -	*Signal* input (V+) ground (common, V-, S-) output (signal, S+)
1	three 24-gauge conductors, shielded, 60 inch (1524 mm) minimum, flying leads (NEMA 4X / IP 66 enclosure)	*Sensor Pin* CW CCW wiper	*Wire Color* red black white	*Connector Pin* - - -	*Signal* input (V+) ground (common, V-, S-) output (signal, S+)
2	three 24-gauge conductors, shielded, 60 inch (1524 mm) minimum, with electrical connector (MS3106A-14S-6P per MIL-C-5015) and 300853 mating electrical connector (MS3106F-14S-6S)	*Sensor Pin* CW CCW wiper	*Connector Pin* - - -	*Connector Pin* A B C	*Signal* input (V+) ground (common, V-, S-) output (signal, S+)
3	Molex 53048-0410 connector; mating connector (not included) consists of housing (Molex 51021-0400) and 4 crimp-on pins (Molex 50079-8100); Molex 50079 crimp tool is required to install crimp-on pins	*Sensor Pin* 1 2 3 4	*Wire Color* - - - -	*Connector Pin* - - - -	*Signal* +5 VDC channel A ground channel B
4	four 26-gauge conductors (twisted pair), 60 inch (1524 mm) minimum, flying leads (NEMA 4X / IP 66 enclosure)	*Sensor Pin* - - - -	*Wire Color* orange white/orange blue white/blue	*Connector Pin* - - - -	*Signal* +5 VDC ground channel A channel B
5	four 26-gauge conductors (twisted pair), 60 inch (1524 mm) minimum, flying leads with electrical connector (MS3106A-14S-6P per MIL-C-5015) and 300853 mating electrical connector (MS3106F-14S-6S)	*Sensor Pin* - - - -	*Wire Color* - - -	*Connector Pin* A B C D	*Signal* +5 VDC ground channel A channel B
6	2 rows of 5 pins on 0.10 inch (2.54 mm) centers	*Sensor Pin* 1 2 3 4 5 6 7 8 9 10	*Wire Color* - - - - - - - - - -	*Wire Number* - - - - - - - - - -	*Signal* common +VDC Z Z' B B' A A' N/C case
7	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	*Sensor Pin* 1 2 3 4 5 6 7 8 9 10	*Wire Color* red gray brown green blue orange yellow white purple black	*Wire Number* - - - - - - - - - -	*Signal* common +VDC Z Z' B B' A A' N/C case

Drawing



Related Products

Part Number	Description
300278*	cam lock: 4-40 X 1/4 (3 required for mounting)
300838*	cam lock: M3 X 0.5 X 8 (3 required for mounting)
300903*	base: mounting, flat / L
160001-01	installation kit

* At least one mounting part number must be ordered separately.

For crimping of hardware to displacement cable, consider the 160001-01 installation kit.

All dimensions are REFERENCE and are in inches [mm]