

L25

INCREMENTAL OPTICAL ENCODER



Introduction

The L25 is a lighter duty version of BEI’s H25 optical encoder. Incorporating the same high quality optics and electronics as the H25, the L25 also offers low starting torque. Other features include ABEC 5 bearings, EMI shielding, a 1/4” diameter stainless steel shaft and a drawn aluminum cover. Typical applications include use with light machine tools, test and laboratory instrumentation, the biomedical industry and flow metering.

MECHANICAL SPECIFICATIONS

Shaft Diameter	1/4” nominal
Flat On Shaft	0.80 long x 0.03 deep
Shaft Loading	up to 5 lbs. axial and 8 lbs. radial
Shaft Runout	.0005 T.I.R. maximum
Starting Torque at 25°C	0.07 in-oz typical, 0.12 in-oz maximum without sealed bearings; 0.50 in-oz typical, 1.0 in-oz maximum with sealed bearings
Bearings	Class ABEC 5
Shaft Material	416 stainless steel
Bearing Housing	Die cast aluminum with iridite finish
Cover	Drawn aluminum, 0.060” wall, protective finish standard. Die cast aluminum with protective finish for EM, SM, ECS and SCS terminations
Bearing Life	1 X 10 ⁹ revs (6,700 hrs at 2500 RPM)
Maximum RPM	10,000 RPM
Moment of Inertia	4.1 x 10 ⁻⁴ oz-in-sec ²
Weight	13 oz. typical

ELECTRICAL SPECIFICATIONS

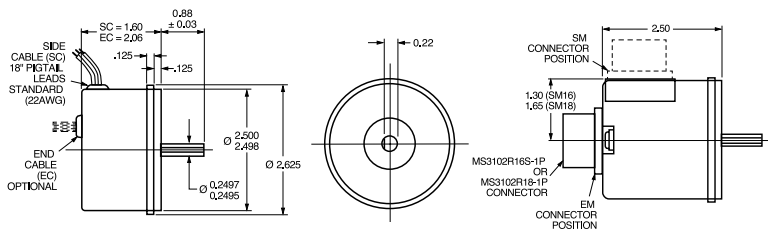
Code	Incremental
Cycles per Shaft Turn	1 to 28,800
Voltage/ Output	(see note 5) 15V/V: Line Driver, 5–15 VDC in, $V_{out} = V_{in}$ 28V/V: Line Driver, 5–28 VDC in, $V_{out} = V_{in}$ 28V/5V: Line Driver, 5–28 VDC in, $V_{out} = 5$ VDC 28V/OC: Open collector, 5–28 VDC in, OC_{out}
Current Requirements	TTL: 175 mA maximum 125 mA typical
Output Format	2 channels in quadrature = 27° electrical typical. Optional index is typically gated 1/2 cycle wide (see figure 1)
Protection Level	Reverse, overvoltage and output short circuit (4469, 7272 only)
Frequency Response	100 KHz (see note 7), up to 800 KHz with interpolation option
Output Terminations	(See Table 1)

ENVIRONMENTAL SPECIFICATIONS

Enclosure Rating	NEMA 2 (IP43)
Temperature	Operating, 0° to 70° C; extended temperature testing available (see note 8); storage; -25° to 90° C
Shock	50 g's for 11 msec duration
Vibration	5 to 2000 Hz @ 20 G's
Humidity	98% RH without condensation

DIMENSIONS

L25G - M16 or M18



Optional Face Mounts

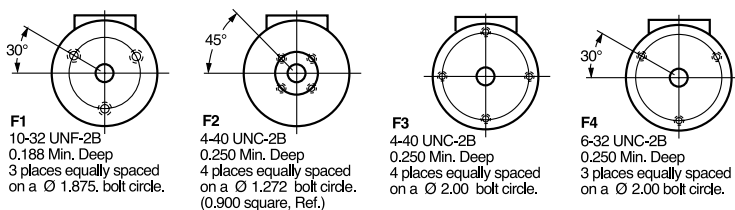


Table 1—Incremental Output Terminations

The connector style will determine pinouts. For example, an encoder with ABC channels and an M18 connector uses the table to the right.

M14 CONNECTOR	M16 CONNECTOR	CHANNELS DESIGNATED IN MODEL NO.	
		ABZ	ABC
E	A	A	A
D	B	B	B
C	C	Z	\overline{A}
B	D	+V (SUPPLY VOLTAGE)	
F	E	-	\overline{B}
A	F	0 V (CIRCUIT COMMON)	
	G	CASE GROUND (CG) (except H20)	

M18 Connector	
PIN	Channel
A	A
B	B
C	Z
D	+V
E	-
F	0V
G	CG
H	\overline{A}
I	\overline{B}
J	\overline{Z}

WIRE COLOR	DA 15P CONNECTOR	CHANNELS DESIGNATED IN MODEL NO.		
		ABZ	ABC	ABZC
YEL	13	A	A	A
BLUE	14	B	B	B
ORN	15	Z	-	Z
W-YEL	10	-	\overline{A}	\overline{A}
W-BLU	11	-	\overline{B}	\overline{B}
W-OM	12	-	-	\overline{Z}
RED	6	+V (SUPPLY VOLTAGE)		
BLK	1	0 V (CIRCUIT COMMON)		
GRN	9	CASE GROUND (CG) (except H20)		
WHITE		SHIELD DRAIN (Shielded Cable Only)		

M12 Connector	
PIN	Channel
A	A
B	B
C	Z
D	+V
E	-
F	0V
G	CG
H	\overline{A}
J	\overline{Z}
K	\overline{Z}

Table 2—Disc Resolutions for Incremental Encoder Model L25

1, 2, 3, 5, 6, 7, 8, 10, 13, 16, 20, 24, 25, 26, 30, 32, 33, 34, 36, 37, 40, 45, 48, 50, 51, 56*, 60, 64, 66, 72, 75, 80, 86, 88, 90, 100, 102, 120, 122,125, 127, 128, 132, 144, 148, 150, 158, 160, 175, 176, 180, 187, 192, 200, 202, 204*, 217, 220, 240, 250, 254, 255, 256, 264*, 274, 280, 283, 288, 292, 300, 312, 320, 321, 325, 360, 366, 372, 375, 377, 380, 381, 384, 385, 393, 400, 430, 432, 450, 462, 480, 490, 500, 502, 508, 512, 522, 530, 550, 560*, 576, 598, 600, 604, 625, 628, 635, 638, 640, 660, 672, 676, 680, 687, 690, 700, 720, 725, 735, 740, 744, 748, 750, 762, 768, 780, 785, 800, 812, 825, 850, 864, 878, 888, 900, 912, 914, 938, 942, 955, 960, 1000, 1016, 1024, 1030, 1035, 1036, 1040, 1054, 1056, 1074, 1076, 1080,1088, 1100, 1101, 1125, 1136, 1200, 1237, 1250, 1257, 1270, 1280, 1300, 1314, 1332, 1333, 1390, 1400, 1414, 1427, 1440, 1484, 1500, 1562, 1570, 1596, 1600, 1650, 1666, 1718, 1745, 1774, 1800, 1840*, 1850, 1855, 1875, 1894, 1920, 1952, 1968, 1979, 1995, 2000, 2048, 2080, 2094, 2100, 2160, 2164, 2199, 2200, 2250, 2356, 2400, 2485, 2500, 2514, 2519, 2540, 3000, 3125, 3600, 4000, 4096, 5000

Output Waveform

Figure 1

