

# 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

<b>Shaft Diameter</b>	1/4” nominal
<b>Flat On Shaft</b>	0.80 long x 0.03 deep
<b>Shaft Loading</b>	up to 5 lbs. axial and 8 lbs. radial
<b>Shaft Runout</b>	.0005 T.I.R. maximum
<b>Starting Torque at 25°C</b>	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
<b>Bearings</b>	Class ABEC 5
<b>Shaft Material</b>	416 stainless steel
<b>Bearing Housing</b>	Die cast aluminum with iridite finish
<b>Cover</b>	Drawn aluminum, 0.060” wall, protective finish standard. Die cast aluminum with protective finish for EM, SM, ECS and SCS terminations
<b>Bearing Life</b>	1 X 10 <sup>9</sup> revs (6,700 hrs at 2500 RPM)
<b>Maximum RPM</b>	10,000 RPM
<b>Moment of Inertia</b>	4.1 x 10 <sup>-4</sup> oz-in-sec <sup>2</sup>
<b>Weight</b>	13 oz. typical

## ELECTRICAL SPECIFICATIONS

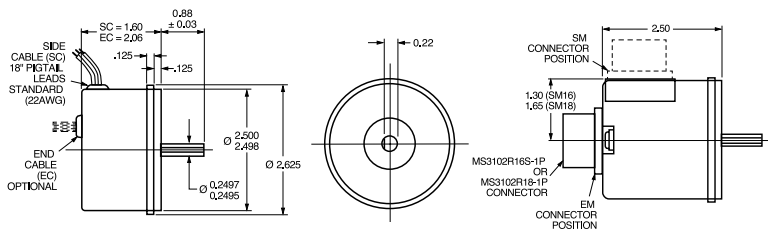
<b>Code</b>	Incremental
<b>Cycles per Shaft Turn</b>	1 to 28,800
<b>Voltage/ Output</b>	(see note 5) 15V/V: Line Driver, 5–15 VDC in, $V_{out} = V_{in}$ 28V/V: Line Driver, 5–28 VDC in, $V_{out} = V_{in}$ 28V/5V: Line Driver, 5–28 VDC in, $V_{out} = 5$ VDC 28V/OC: Open collector, 5–28 VDC in, $OC_{out}$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

## ENVIRONMENTAL SPECIFICATIONS

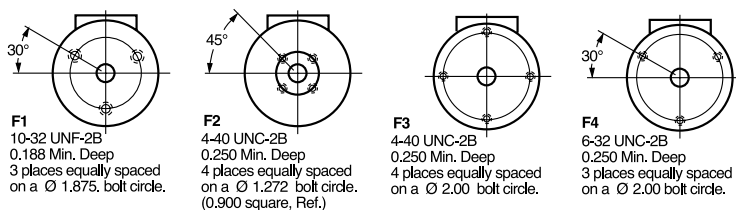
<b>Enclosure Rating</b>	NEMA 2 (IP43)
<b>Temperature</b>	Operating, 0° to 70° C; extended temperature testing available (see note 8); storage; -25° to 90° C
<b>Shock</b>	50 g's for 11 msec duration
<b>Vibration</b>	5 to 2000 Hz @ 20 G's
<b>Humidity</b>	98% RH without condensation

## 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.	
PIN	PIN	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)		

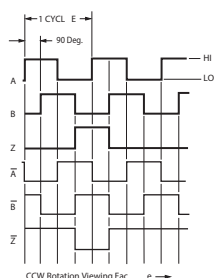
M12 Connector	
PIN	Channel
A	A
B	B
C	Z
D	+V
E	-
F	0V
G	CG
H	$\overline{A}$
J	$\overline{Z}$
K	$\overline{Z}$

**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**





Use this diagram, working from left to right to construct your model number

