

## SERIES 25L

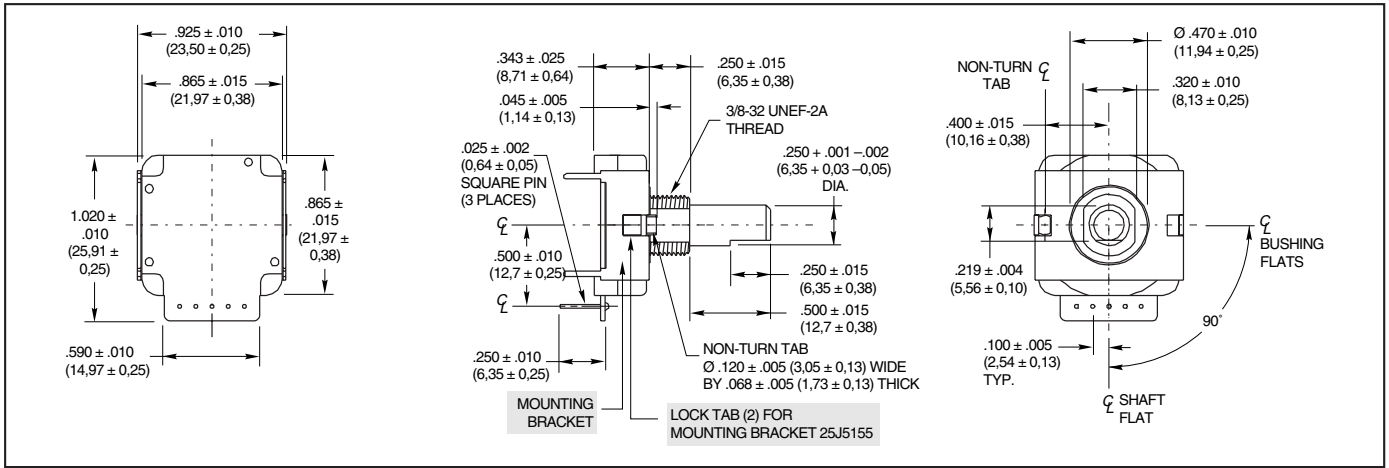
Hex, Gray and Quadrature Code

### FEATURES

- Price Competitive to Similar Designs
- Quality Construction and Contact Materials
- Multiple Code and Indexing Choices
- 100,000 Life Cycles
- Less than 1.0" Square
- Manufactured to ISO 9001 Standards



### DIMENSIONS In inches (and millimeters)



### TRUTH TABLES

| Clockwise Rotation          |               |        |   |   |   |
|-----------------------------|---------------|--------|---|---|---|
| 4-Bit Gray Code-16 Position |               |        |   |   |   |
| Switch Position             | Code Position | Output |   |   |   |
|                             |               | 1      | 2 | 4 | 8 |
| 1                           | 0             |        |   |   |   |
| 2                           | 1             | •      |   |   |   |
| 3                           | 2             | •      | • |   |   |
| 4                           | 3             |        | • |   |   |
| 5                           | 4             |        | • | • |   |
| 6                           | 5             | •      | • | • |   |
| 7                           | 6             | •      |   | • |   |
| 8                           | 7             |        | • | • |   |
| 9                           | 8             |        | • | • | • |
| 10                          | 9             | •      |   | • | • |
| 11                          | 10            | •      | • | • | • |
| 12                          | 11            |        | • | • | • |
| 13                          | 12            |        | • |   | • |
| 14                          | 13            | •      | • |   | • |
| 15                          | 14            | •      |   |   | • |
| 16                          | 15            |        |   |   | • |

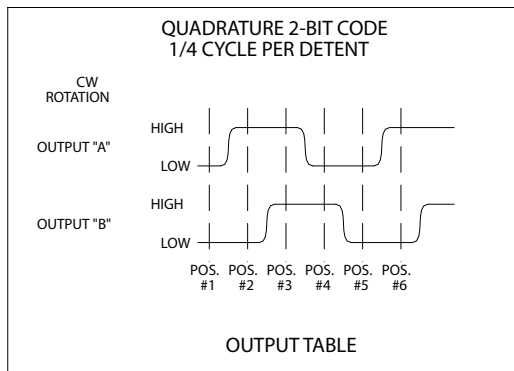
• Indicates closed circuit; blank indicates open circuit.

| Clockwise Rotation                        |               |        |   |   |   |
|---|---------------|--------|---|---|---|
| 4-Bit Binary Code Hexadecimal-16 Position |               |        |   |   |   |
| Switch Position                           | Code Position | Output |   |   |   |
|   |               | 1      | 2 | 4 | 8 |
| 1   | 0             |        |   |   |   |
| 2   | 1             | •      |   |   |   |
| 3   | 2             |        | • |   |   |
| 4   | 3             | •      | • |   |   |
| 5   | 4             |        |   | • |   |
| 6   | 5             | •      |   | • |   |
| 7   | 6             |        | • | • |   |
| 8   | 7             | •      | • | • |   |
| 9   | 8             |        |   |   | • |
| 10  | 9             | •      |   |   | • |
| 11  | 10            |        | • |   | • |
| 12  | 11            | •      | • |   | • |
| 13  | 12            |        |   | • | • |
| 14  | 13            | •      |   | • | • |
| 15  | 14            |        | • | • | • |
| 16  | 15            | •      | • | • | • |

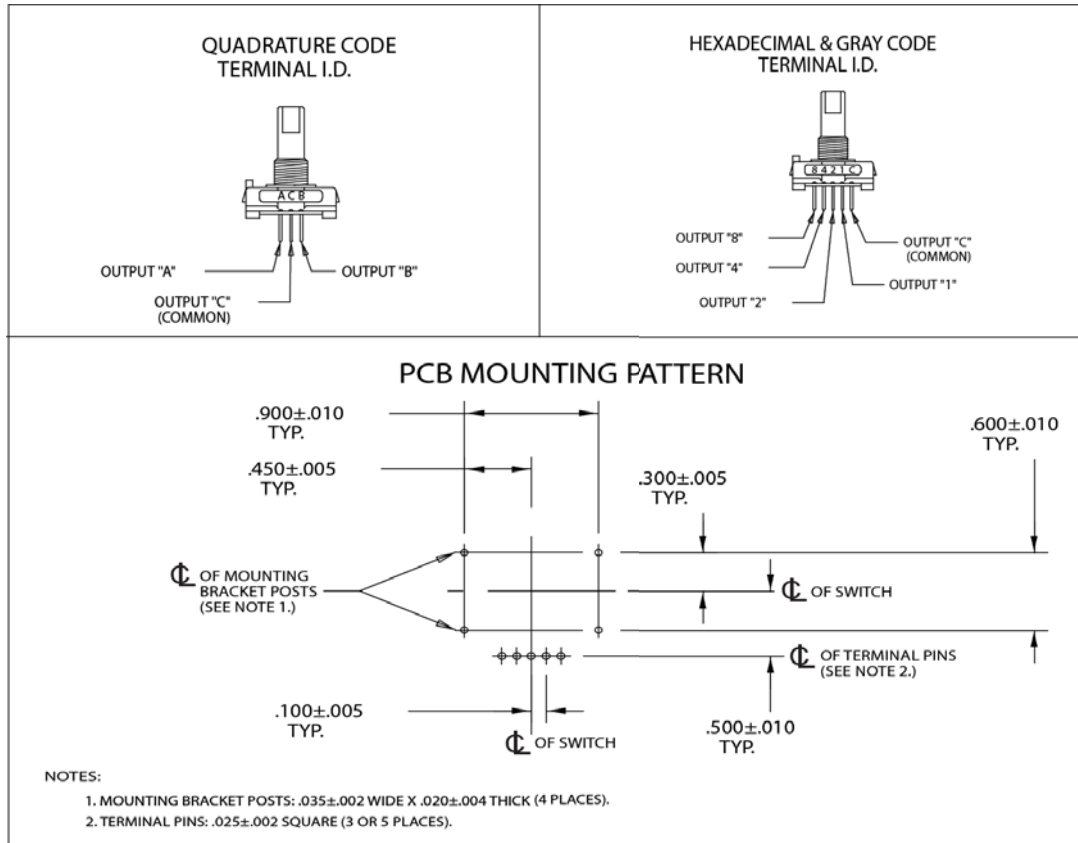
• Indicates closed circuit; blank indicates open circuit.

| Clockwise Rotation                         |     |            |
|--|-----|------------|
| Quadrature 2-Bit Code 1/4 Cycle per Detent |     |            |
| Switch Position                            | "A" | Output "B" |
| 1  |     |            |
| 2  | •   |            |
| 3  | •   | •          |
| 4  |     | •          |
| 5  |     |            |
| 6  | •   |            |
| 7  | •   | •          |
| 8  |     | •          |
| 9  |     |            |
| 10   | •   |            |
| 11   | •   | •          |
| 12   |     | •          |
| 13   |     |            |
| 14   | •   |            |
| 15   | •   | •          |
| 16   |     | •          |
| 17   |     |            |
| 18   | •   |            |
| 19   | •   | •          |
| 20   |     | •          |
| 21   |     |            |
| 22   | •   |            |
| 23   | •   | •          |
| 24   |     | •          |
| 25   |     |            |
| 26   | •   |            |
| 27   | •   | •          |
| 28   |     | •          |
| 29   |     |            |
| 30   | •   |            |
| 31   | •   | •          |
| 32   |     | •          |
| 33   |     |            |
| 34   | •   |            |
| 35   | •   | •          |
| 36   |     | •          |

• Indicates closed circuit; blank indicates open circuit. Code repeats every 4 positions.



Optical and Mechanical Encoders



**SPECIFICATIONS**

**Electrical Ratings**

Switching Loads: 1.5 mA at 115 Vac, resistive; 150 mA at 14 Vdc, resistive  
 Current Carrying Capacity: 250 mA maximum at 28 Vdc, resistive load  
 Contact Resistance: 75 mΩ, typical  
 Insulation Resistance: 1000 mΩ minimum between terminals  
 Voltage Breakdown: 1000 Vac minimum between terminals  
 Life Expectancy: 100,000 cycles of operation at rated loads. One cycle of operation is a rotation through all of the active positions and a return to the starting position.

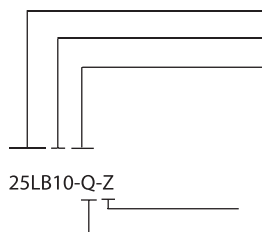
**Mechanical Ratings**

Rotational Torque: 2 to 6 in-oz  
 Operating Temperature Range: -40 C° to +85 C°  
 Storage Temperature Range: -65 C° to +85 C°  
 Continuous Rotation: All standard switches are continuous rotation. Desired stop locations supplied upon request.  
 Anti-Rotation Device: Integral non-turn tab, flattened bushing, .375" diameter, .320 double "D" across flats.  
 Termination: Standard is PC style, parallel to shaft, facing rear. Options include PC, parallel to shaft, facing front.  
 Panel Mounting Torque: 10 in-lbs maximum

**Materials and Finishes**

Bushing/Housing and Shaft/Rotor: Reinforced thermoplastic  
 Detent Ball: Stainless steel, nickel-plated  
 Detent Spring: Tinned music wire  
 Contacts: Beryllium copper, gold plate over nickel  
 Terminals: Copper alloy, #725, 100% tin plate over nickel plate  
 Output Board: FR-4, copper/nickel-plated  
 Mounting Nut: Brass, tin/zinc-plated hex nut  
 Mounting Bracket: Stainless Steel, tin-plated

**ORDERING INFORMATION**



Series: 25L = Economical, single deck encoder  
 Housing Color: B = Black housing; R = Red housing  
 Angle of Throw: 10 = 10°, 36 positions; 11 = 11.25°, 32 positions;  
 15 = 15°, 24 positions; 18 = 18°, 20 positions;  
 22 = 22.5°, 16 positions; 30 = 30°, 12 positions;  
 45 = 45°, 8 positions

Mounting Bracket: Z = with bracket, Blank = no bracket  
 Code Output: H = Hexadecimal available only in 22.5°  
 G = Gray available only in 22.5°  
 Q = Quadrature (2-bit)

Custom materials, styles, color and markings are available. Custom knobs available.

Available from your local Grayhill Distributor. For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill. For custom codes, termination, rotational torque, angles of throw, call Grayhill for more information.

Optical and Mechanical Encoders