

# Model 960



## Features

- Low-Profile - 1.55"
- Thru-Bore or Hollow Bore Styles
- Industrial Grade, Heavy Duty Housing
- State-of-the-Art Opto-ASIC Circuitry

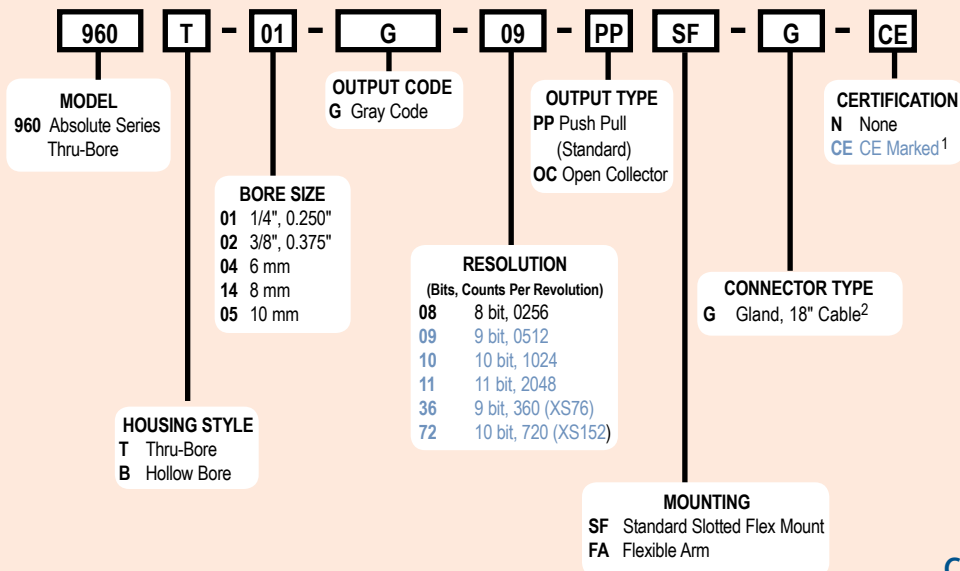
The single-turn Model 960 Absolute Series Accu-Coder™ provides a unique solution to a wide variety of industrial applications requiring absolute position information. By providing a low profile package of just 1.55", a variety of hollow and thru-bore sizes, and an easy to use flexible mounting system, the Model 960 goes where traditional absolute encoders do not fit. In addition, its innovative Opto-ASIC circuitry, coupled with its digital output, make it an excellent choice in those applications plagued by an unusually high level of electrical noise. The Model 960 can easily be mounted directly on a motor shaft, bringing the advantage of absolute positioning in an all metal housing while eliminating the fixtures, couplers and adapters required by other absolute encoder designs.

## Common Applications

Machine Tools, Robotics, Telescopes, Antennas, Rotary & X-Y Positioning Tables, Medical Scanners

## Model 960 Ordering Guide

Blue type indicates price adder options. Not all configuration combinations may be available. Contact Customer Service for details.



For specification assistance call  
Customer Service at  
1-800-366-5412

### NOTES:

- 1 Please refer to Technical Bulletin TB100: *When to Choose the CE Option* at [www.encoder.com](http://www.encoder.com).
- 2 For non-standard cable lengths, add a forward slash (/) plus cable length expressed in feet. Example: G/6 = 6 feet of cable.

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## Model 960 Specifications

### Electrical

Input Voltage ..... 4.75 to 26 VDC max  
 Regulation..... 100 mV peak-to-peak, max ripple at 0 to 10 kHz  
 Input Current..... 100 mA max with no external load  
 Output Format ..... Absolute- Parallel Outputs  
 Output Type ..... Open Collector- 20 mA max per channel  
                           Push-Pull- 20 mA max per channel  
 Code ..... Gray Code, Excess Gray Code  
 Max Frequency..... 25.6 kHz (LSB)  
 Rise Time..... Less than 1 microsecond  
 Resolution..... Up to 11 bit  
 Accuracy.....  $\pm 1/2$  LSB

### Control

Directional Control.... Field selectable for increasing counts (CW or CCW). Standard configuration user selects the applicable MSB wire for direction of count. Direction control option allows user to select count direction by applying 0 VDC to an encoder input. See *Absolute Wiring Tables* below.

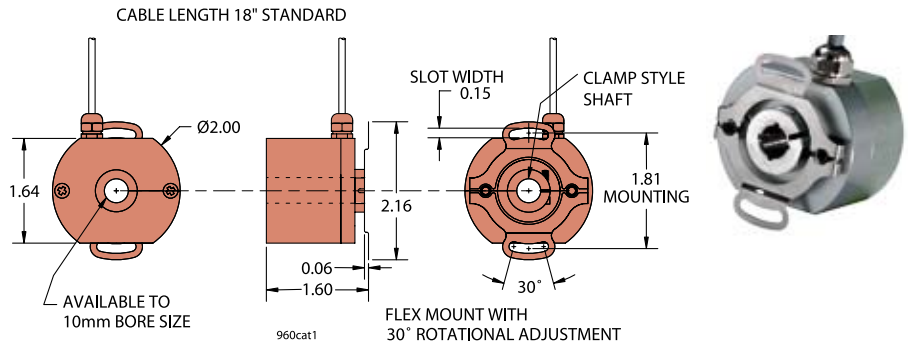
### Mechanical

Max Shaft Speed..... 6000 RPM continuous  
 Bore Size ..... 0.250", 0.3125", 0.375", 6 mm, 8 mm, 10 mm  
 Bore Tolerance ..... -0.0000" / +0.0006"  
 User Shaft Tolerances  
 Radial Runout..... 0.007"  
 Axial Endplay.....  $\pm 0.030$ "  
 Starting Torque ..... 0.3 oz-in typical for thru-bore  
                           0.14 oz-in typical for hollow bore  
 Max Acceleration.....  $1 \times 10^5$  rad/sec<sup>2</sup>  
 Electrical Conn ..... Gland with 18" cable (braid shield, 30 AWG conductors)  
 Housing..... Aluminum with non-corrosive finish  
 Mounting ..... Slotted Flex Mount standard, Flex-Mount Arm optional  
 Weight..... 7 oz typical

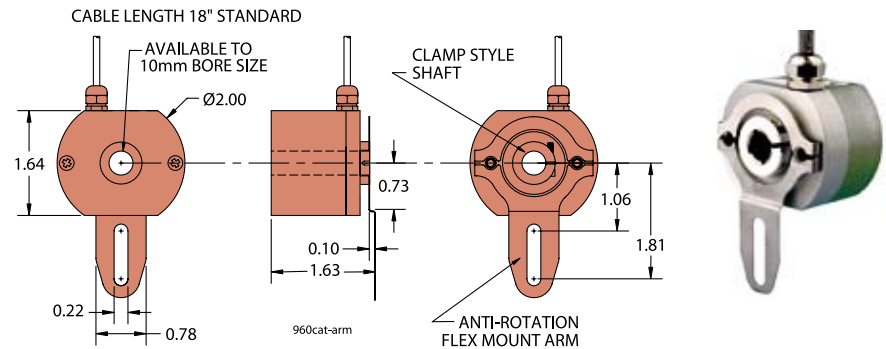
### Environmental

Operating Temp..... 0° to 70° C  
 Storage Temp ..... -20° to +85° C  
 Humidity..... 98% RH non-condensing  
 Vibration..... 10 g @ 58 to 500 Hz  
 Shock..... 20 g @ 11 ms duration

## Model 960 Slotted Flex Mount (SF)



## Model 960 With Flex Arm (FA)



All dimensions are in inches with a tolerance of  $\pm 0.005$ " or  $\pm 0.01$ " unless otherwise specified

### Wiring Table

Function	Wire Color
Common	Black
+VDC	Red
S1 cw MSB	Brown
S1 ccw MSB	Yellow
S2	White
S3	Green
S4	Orange
S5	Blue
S6	Violet
S7	Gray
S8 LSB 8-bit	Pink
S9 LSB 9-bit	Red/Green
S10 LSB 10-bit	Red/Yellow
S11 LSB 11-bit	Turquoise
Direction Control**	Red/Blue
Case Ground*	Shield

\*CE Option Only

\*\*Standard is CW increasing count (when viewed from shaft end, and using brown wire for MSB). Red/Blue is pulled up internally to 5 VDC. To reverse count direction, Red/Blue must be pulled low (0 VDC). If 5 VDC is applied to Red/Blue, unit remains in standard CW increasing count mode. Count direction can also be reversed by using the Yellow MSB wire instead of the Brown. At no time should voltage applied to Red/Blue exceed 5 VDC