# CS15

## Incremental Optical Encoder

**Size 15, Low Profile**

**100 to 2500 ppi • 5–28 Vdc**

**OEM or Industrial Applications**



| | |
|---|---|
| Resolution Options | 100, 1000, 2000, 2500 ppr |
| Output Driver | push-pull |
| Input Voltage | 5...28 VDC |
| Environmental Suitability | IP50 |
| Operating Temperature | 0˚ to 185˚ F (-20˚ to 85˚ C) |

### ELECTRICAL

| | |
|---|---|
| Input Current | 100 mA, max. |
| Output Format | incremental, quadrature |
| Output Driver | push-pull, 20mA source/sink |
| Index | once per revolution |
| Max Frequency | 200 KHz |
| Electrical Connection | 18-inch, 26 AWG multi-conductor cable |

### MECHANICAL

| | |
|---|---|
| Maximum Shaft Speed | 8000 RPM |
| Flange | Aluminum |
| Shaft | Stainless Steel |
| Shaft Loading, Radial | 5 lbs, max. |
| Shaft Loading, Axial | 5 lbs, max. |
| Starting Torque | .05 oz -in. |
| Bearing Type | Precision Ball Bearings |
| Bearing LIfe, @60% of full rated load | $1.2 \times 10^{10}$ revolutions |
| Moment of Inertia | $6.7 \times 10^{-5}$ oz-in-sec$^2$ (4.8 gm-cm$^2$) |
| Maximum Acceleration | $1 \times 10^5$ rad/sec$^2$ |
| Weight | 3 oz. |

### ENVIRONMENTAL

| | |
|---|---|
| Operating Temperature | 0–185° F (-20–85° C) |
| Storage Temperature | -13°–185° F (-25°–85°C) |
| Humidity | 98% RH non-condensing |
| Vibration | 10 g @ 58 to 500 Hz |
| Shock | 80 g @ 11 ms duration |



1.4" [36 mm]    1.5" [38 mm]
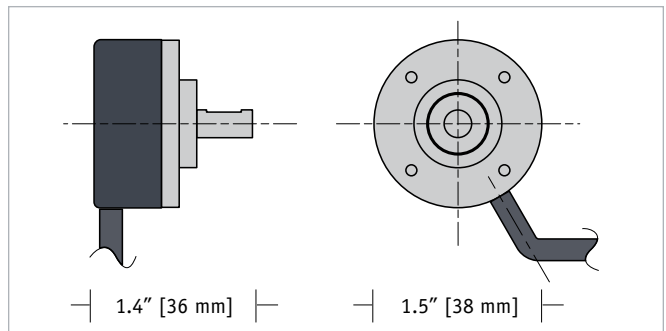
The CS15 is Celesco's compact industry standard size 15, servo-mount incremental encoder. With a low profile of less than an inch in height and a diameter of only 1.5 inches, the economically priced CS15 is perfect for both the OEM and single-piece user alike. Precision ball bearings support a durable stainless steel shaft for reliable, long life operation.

Standard features include 100, 1000, 2000 or 2500 pulses per turn option, a push pull driver and complementary output channels for single-ended or differential output connection. Every encoder ships with state of the art opto-asic circuitry designed to provide a clean, reliable output signal to just about any PLC or electrical interface.
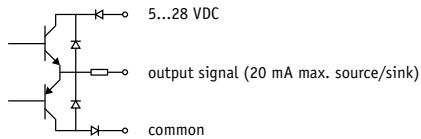
### ORDERING INFORMATION

| Order Number | pulses per turn |
|---|---|
| CS15-100 | 100 |
| CS15-1000 | 1000 |
| CS15-2000 | 2000 |
| CS15-2500 | 2500 |

## Signal Connections

| color | signal | color | signal |
|---|---|---|---|
| red | 5...28 VDC | white | channel B |
| black | common | gray | channel B' |
| green | channel A | yellow | Z |
| blue | channel A' | orange | Z' |

## Output Waveforms



0°   180°   360°

channels
- A
- $\overline{A}$
- B
- $\overline{B}$

index
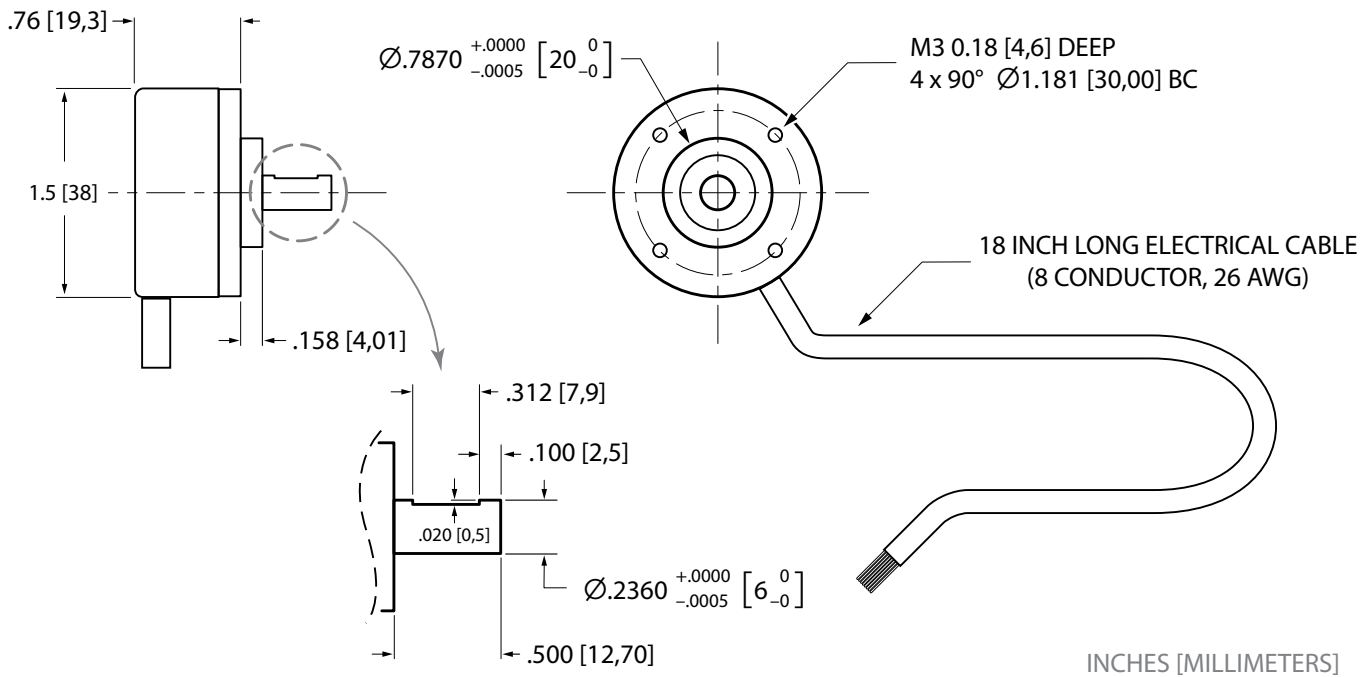- Z
- $\overline{Z}$

gated** un-gated**

*shaft view clockwise rotation*
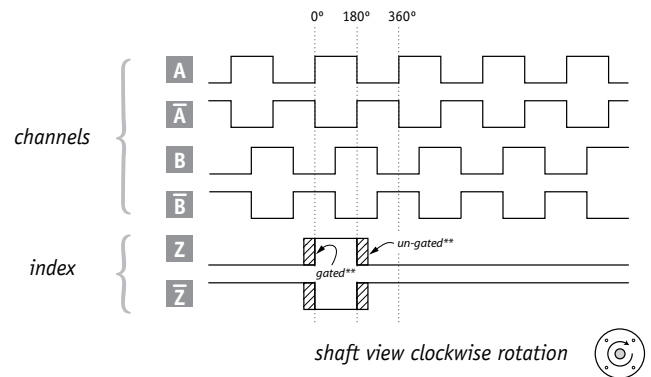
**note:  – 1000, 2000, 2500 pulses-per-turn options — gated to A , index pulse =180°
– 100 pulses-per-turn option — ungated, index pulse = approx 270°

## Output Driver (1 of 4):



5...28 VDC

output signal (20 mA max. source/sink)

common

## Outline Drawing



.76 [19,3]

1.5 [38]

.158 [4,01]

$\varnothing.7870 \begin{smallmatrix}+.0000\\-.0005\end{smallmatrix} \left[20 \begin{smallmatrix}0\\-0\end{smallmatrix}\right]$

.312 [7,9]

.100 [2,5]

.020 [0,5]

$\varnothing.2360 \begin{smallmatrix}+.0000\\-.0005\end{smallmatrix} \left[6 \begin{smallmatrix}0\\-0\end{smallmatrix}\right]$

.500 [12,70]

M3 0.18 [4,6] DEEP
4 x 90°  $\varnothing$1.181 [30,00] BC

18 INCH LONG ELECTRICAL CABLE
(8 CONDUCTOR, 26 AWG)

INCHES [MILLIMETERS]

version: **1.0**  last updated: **February 15, 2011**