



# ITT

## Cleveland Motion Controls



## ENCODERS SHAFT-TYPE

### DataTorque™ SM15

#### Performance Benefits

Cleveland Motion Controls is widely recognized for providing high performance shaft and motor-mounted DataTorque™ Encoder solutions. The CE compliant DataTorque SM15 is no exception.

By combining high performance, advanced design, proven reliability and low cost, the DataTorque SM15 is an ideal industrial encoder to meet a wide variety of application requirements. It meets all of the requirements of EIA standard RS-422 while retaining low power characteristics of CMOS, enabling the construction of serial and terminal interfaces while maintaining minimal power consumption.

All DataTorque Encoders can be custom configured to meet specific, high volume OEM requirements. We can accommodate many specialized combinations of electrical and mechanical interfaces. Please consult our experienced team of application engineers for details on custom OEM products.

#### Design Features

The DataTorque SM15 Encoder is manufactured with precision surface mount technology. It utilizes high precision, spindle grade ball bearings (shielded), providing a rugged encoder within its design.

The DataTorque SM15 Encoder incorporates the 2631 series quad differential line driver, designed for digital data transmission over balanced lines.

The SM15 utilizes a monolithic solar array with stop gap diffusion, providing further noise immunity. The differential array tracks evenly under temperature, voltage and light source variations.

The DataTorque SM15 is an optical incremental encoder with resolution of 1-2500 CPR (cycles per revolution). It is accurate to  $\pm 6$  arc seconds (pulse to adjacent pulse) and  $\pm 3$  arc minutes (pulse to any other pulse).



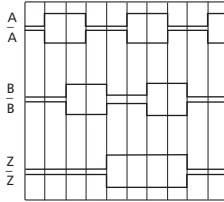
#### Low Cost Advanced Industrial Encoder

- High performance that costs less
- Precision surface mount technology
- Rugged design utilizing high precision spindle grade bearings
- Noise immunity with monolithic solar array
- Incorporates 2631 differential line driver for digital data transmission over balanced lines
- Enables the construction of serial and terminal interfaces while maintaining minimal power consumption
- Numerous built-in design features and performance benefits enable the SM15 to meet or exceed any other competitive encoder on the market today.
- CE compliant

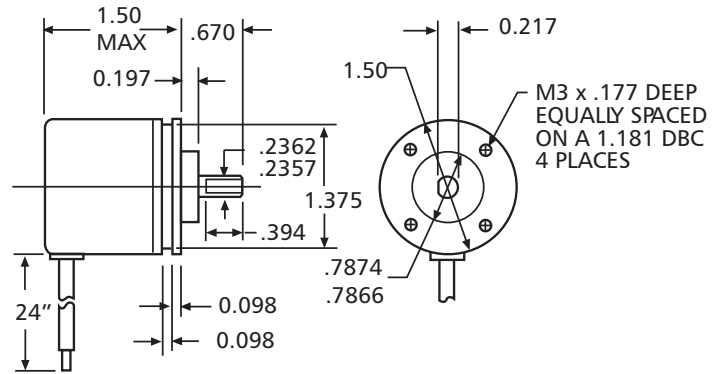


# DataTorque™ SM15

## CW VIEWING SHAFT OUTPUT SIGNALS



## PACKAGE DIMENSIONS



## ELECTRICAL SPECIFICATIONS

Encoder Type	Optical Incremental
Resolution	1-2500 CPR (cycles per revolution)
Power Input	5 VDC ~ 24 VDC (specify when ordering)
Symmetry	180 degrees ±9 degrees
Quadrature	90 degrees ±18 degrees
Illumination Source	Single Infrared Emitting Diode (IRLED) Gallium Aluminum Arsenide (GaAlAs)
Frequency Response	200 kHz
Drive Capability	RS-422 compatible
Output Mode	2631 series
Accuracy	Pulse to Adjacent Pulse: ±6 arc seconds Pulse to Any Other Pulse: ±3 arc minutes

## MECHANICAL SPECIFICATIONS

Angular Acceleration	1 X 10 <sup>5</sup> rad/sec <sup>2</sup>
Bearing Life	11 X 10 <sup>9</sup> revolutions
Bearings	ABEC 5+ spindle grade, shielded
Operating Speed	3,000 RPM
Slew Speed	6,000 RPM maximum
Shaft Loading	Radial 4.4 lbs., (2 Kg), Axial 2.2 lbs. (1Kg)
Starting Torque	5g - cm or less
Net Weight	80 grams maximum
Inertia	10g - cm <sup>2</sup>

## ENVIRONMENTAL SPECIFICATIONS

Operating Ambient	-10 to +70 degrees C
Storage Ambient	-30 to +80 degrees C
Vibration	50 Hz - 10 G - 1 Hr
Shock	30 G 11 ms
Humidity	35 to 85% RH, no condensation

## TERMINATIONS

Cable  
Color Code: Standard  
Green A output  
Yellow Z output  
White B output  
Red +VDC  
Black Ground

Cable  
Color Code:  
Differential Line Driver  
Green A output  
Yellow Z output  
White B output  
Red +5 VDC  
Black Ground  
Blue  $\bar{A}$  output  
Brown  $\bar{B}$  output  
Orange Z output

9 PIN "D" Type  
Pin Function:  
Standard  
1  $\bar{B}$  6 Z or N/C  
2 B 7  $\bar{Z}$  or N/  
3 A 8 D.C. Ground  
4  $\bar{A}$  9 N/C  
5 +VDC

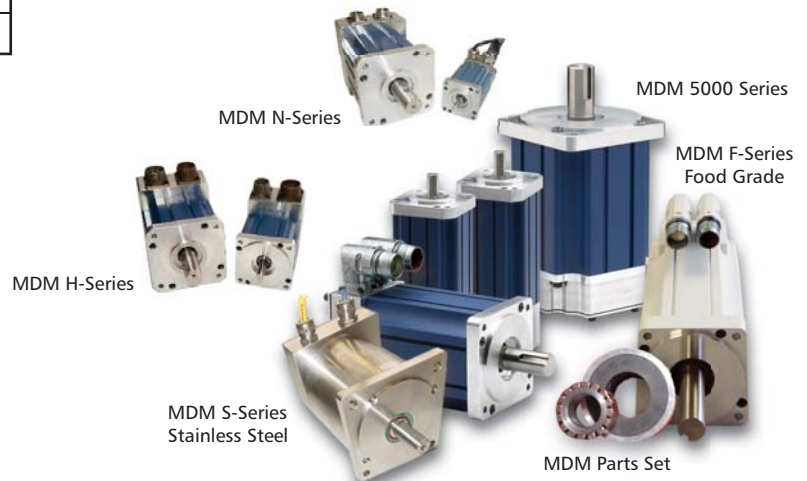
Mating Connector: AMP# 747905-2  
or equivalent

## ORDERING INFORMATION

**SM15 - 256 - 50 / 5 - 03 - X - XXX**

**A B C D E F G**

- A. Encoder Series:
- B. Resolution: (Up to 2500 CPR, many standards, please inquire)
- C. Output Configuration: 20 = Single Channel  
30 = Single Channel with Index Pulse  
40 = Dual Channel  
50 = Dual Channel with Index Pulse
- D. Power Input: 5 VDC ~ 24 VDC, specify when ordering
- E. Output Options: Blank = single ended  
03 = Differential line driver option
- F. Termination: Blank = Cable  
D = 9 Pin "D" Connector
- G. Special Deviation:



## Cleveland Motion Controls

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