



ENCODERS

SHAFT-TYPE

DataTorque™ SM23

Performance Benefits

Cleveland Motion Controls is widely recognized for providing high performance shaft and motor-mounted DataTorque™ Encoder solutions. The DataTorque SM23 is no exception.

By combining high performance, proven reliability and low cost, the DataTorque SM23 is ideal as a multi-purpose optical incremental encoder. With a monolithic solar array and stop gap diffusion, it is ideal for applications requiring noise immunity.

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 SM23 Encoder is manufactured with precision surface mount technology. It also includes VMOS and CMOS circuitry, providing the encoder with superior isolation between the output leads and the internal circuitry of the encoder.

The DataTorque SM23 is available with differential line driver output. The differential array tracks evenly under temperature, voltage and light source variations. A variety of options are available to meet each customer's individual needs and requirements.

The DataTorque SM23 is an optical incremental encoder with resolution of 1-2500 CPR (cycles per revolution). It is accurate to ± 6 arc seconds (pulse to adjacent pulse) and ± 3 arc minutes (pulse to any other pulse).

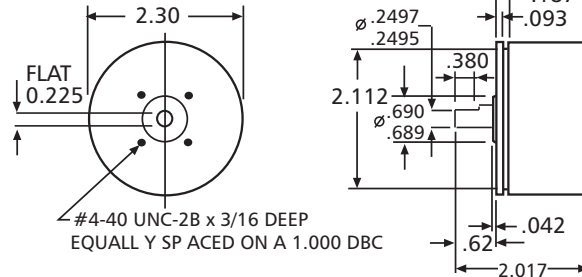
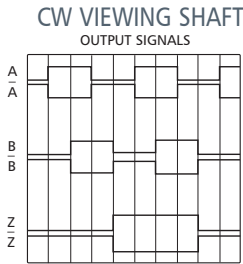


Low Cost Multi-Purpose Optical Incremental Industrial Encoder

- High performance that costs less
- Precision surface mount technology
- VMOS and CMOS circuitry providing superior isolation between the output leads and internal circuitry
- Designed for noise immunity
- Numerous built-in design features and performance benefits enable the SM23 to meet or exceed any other competitive encoder on the market today.

DataTorque™ SM23

PACKAGE DIMENSIONS



TERMINATION

Header: Molex 5 pin single row PC board header
Molex #6372-22-11-2052 or equivalent (is also available with cable or pigtail in place of header)
Mating Connector included

Pin Function: Standard (With connector facing you)

1	2	3	4	5
---	---	---	---	---

1 A out 2 Z out 3 B out 4 +VDC 5 Gnd
Shrouded Header: AMP 10 pin double row PC board #102618-3
Mating Connector: AMP # 87977-3
CRIMP # 1-87523-6

Pin Function: Differential Line Driver (With connector facing you)

Back Row	10	9	8	7	6
Front Row	1	2	3	4	5

1 A out 2 Z out 3 B out 4 ±VDC 5 Gnd
6 B̄ 7 Z̄ 8 Ā 9 N/C 10 N/C

ELECTRICAL SPECIFICATIONS

Encoder Type	Optical Incremental
Resolution	1-2500 CPR (cycles per revolution)
Power Input	+ 5 VDC ±10% 80 ma +12 VDC ±10% 120 ma +15 VDC ±10% 120 ma
Phase Relationship	A leads B by 90 degrees ±18 degrees electrical
Symmetry	180 degrees ±9 degrees
Illumination Source	Single Infrared Emitting Diode (IRLED) Gallium Aluminum Arsenide (GaAlAs)
Frequency Response	200 kHz or 3,000 RPM, whichever occurs first
Drive Capability	CMOS & TTL compatible
Output Mode	TTL-Power MOSFET 5 volt differential line driver-SN75183 12 & 15 volt differential line driver-MM88C30
Accuracy	Pulse to Adjacent Pulse: ±6 arc seconds Pulse to Any Other Pulse: ±3 arc minutes

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

MECHANICAL SPECIFICATIONS

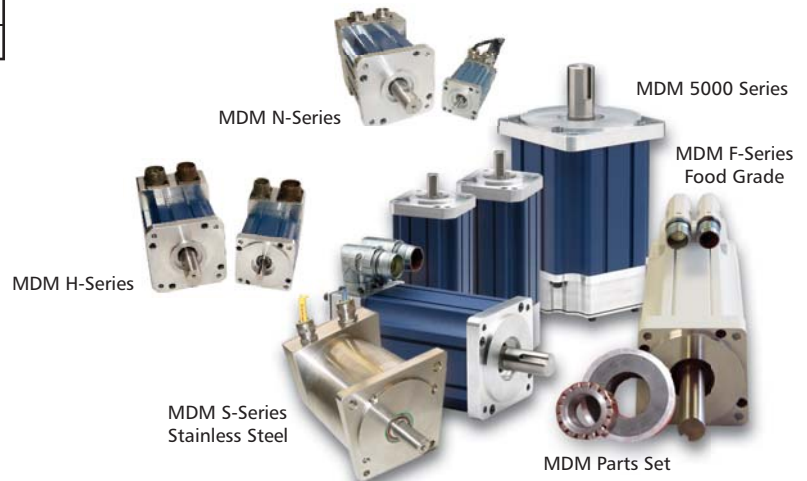
Front End	All metal shaft and bearing housing-- Face and servo and mount standard
Cover	Injection-molded flame retardant 94V-0 VDYNE Nylon
Bearings	Shielded, Instrument Quality
Bearing Life	2.8 X 10 ⁹ revolutions
Operating Speed	Lower of 3,000 RPM or 200 kHz maximum
Slew Speed	6,000 RPM maximum
Shaft Loading Maximum	Axial 10 lbs., (4.54 Kg), Radial 10 lbs. (4.54 Kg)
Shaft Rotation	Bi-directional and continuous
Moment of Inertia	4.0 x 10 ⁻⁵ oz.-in-sec ² (3.0 gm-cm ²)
Starting Torque	0.05 oz.-in. (36 gm cm)
Weight	5 ozs

ORDERING INFORMATION

SM23 - 500 - 5 0 / 5 - 03 - XXX

A B C D E F G

- A. Encoder Series:
- B. Resolution: (Up to 2500 CPR, many standards, please inquire)
- C. Output Configuration:
 - 2 = Single Channel
 - 3 = Single Channel with Index Pulse
 - 4 = Dual Channel
 - 5 = Dual Channel with Index Pulse
- D. Type of Output:
 - 0 = Squarewave Output
 - 2 = Open Collector
- E. Power Input (specify): 5, 12, or 15 VDC
- F. Output Option: 03 = Differential line driver option
- G. Special Deviation:



Cleveland Motion Controls

7550 Hub Parkway • Cleveland, OH 44125
Tel: 216.524.8800 or 800.321.8072
Fax: 216.642.2199
cmcsales@itt.com
www.cmcontrols.com