Dynamic Motor Motion
Technology Corporation

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DSN08 SERIES INCREMENTAL ENCODER

The DSN Series Rotary Encoders offers the highest level of performance to cost ratio through its industry leading design. Featuring industry first auto synchronization tuning, this virtually eliminates the strict mounting requirements of conventional rotary encoders. The control processor actively calibrates the algorithm parameters to perfectly compliment the reading of each hall sensor IC induced by the rotor magnetic field. Data from each sensor is interpolated to generate a best-point reading. Each encoder is always guaranteed to have the perfect mount and optimized performance.

The magnetic sensor technology and a full enclosure attributes the DSN08 encoder with unparalleled immunity against environmental conditions. The contact-less sensing technology eliminate damage and reading error caused by shock and vibration.

The hardware filtered supply voltage and ultra low inertia makes the DSN08 encoder a seamless sensor choice for any application.

Features

- Non-Contact Shaft-Sensor Coupling
- 256 ~ 5,000 P/T Resolution [1024 ~ 20,000 C/T]
- Active Sensor Calibration
- Potentiometer Phase Adjustment
- 2,4,6,8,10 Commutation Pole Option
- Hardware Supply Voltage Filter
- Patent Pending Hall Effect Sensor Array Technology
- Differential TTL Line Driver Interface - RS422
- -30 °C ~ +100 °C Operating Temperature
- High Mounting Tolerance - 0.1mm Radial/Axial Play
- High Rigidity Package - Male Pilot Mount Option

Industry Application

- Small to Medium Capacity Servo Motor
- Robotics
- Machine Tools
- Industrial Instrumentation
- Automotive / EV
- Feeders
- Textile / Embroidery Machine
- Measurement Instrumentation

Specification

Encoder Type	Incremental	Frequency Response	300 kHz	
Resolution	256~5000	Output Circuit	Line Driver	
Accuracy *1	0.1 ° MAX. [6 arc-min]	Supply Voltage	+5 VDC ± 10 %	
Max. Permissible Speed *2	30,000 min-1	Supply Current	150 mA MAX.	
Rotor Inertia	0.01 kg·cm^2	Output Voltage	1	+2.4 VDC MIN.
Operating Temperature	-30 °C ~ +100 °C		0	+0.5VDC MAX.
Storage Temperature	-40 °C ~ +100 °C	Output Current	+0.5 mA MAX.	
Relative Humidity	< 95% *3	Pulse Rise/Fall Time	50 ns MAX.	
Weight	0.03 kg	Insulation Voltage *4	800V	
Protection	IP40	Sensor Type	InAs Hall Effect	
Mount Tolerance *5	0.1mm	Magnetic Source	Neodynium [NdFeB]	
Shaft Inclination	± 0.5 ° MAX.			

*1 Accuracy is the maximum error between the measured position and the actual position. Measured as the non-linearity difference between the actual and ideal curves. Fig. 1
*2 Max. 512 P/T resolution scale at 30,000 min-1. Fig. 2 shows the relation between model output resolution and max permissible speed at full scale.
*3 Free from condensation.
*4 From base frame to sensor electronics.
*5 The mounting tolerance applies to eccentricity axial play (X,Y) as well as depth (Z).

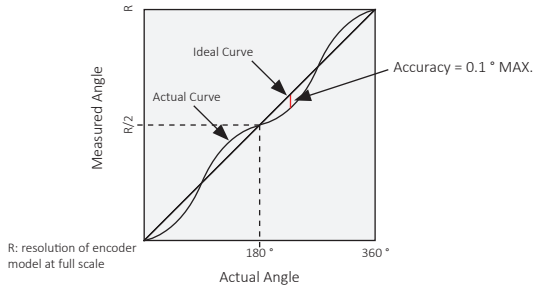
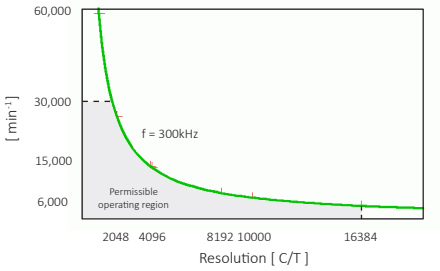


Fig. 1

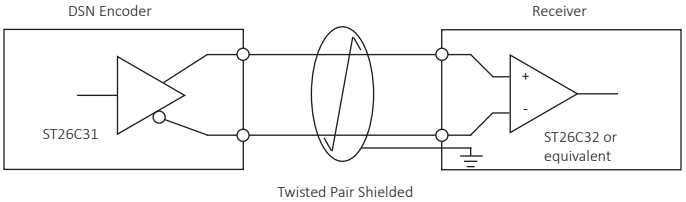


Maximum rotational speed of rotor while at full scale resolution. Response frequency = 300kHz. Resolution calculated as counts per turn.

Fig. 2

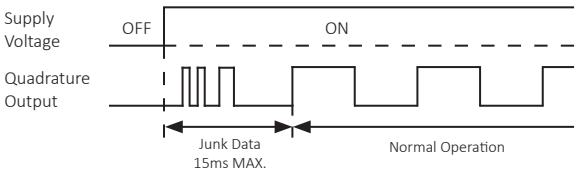
Interface

- □ Line Driver Output
- □ Differential- RS422
- □ Max. Cable Distance = 100m



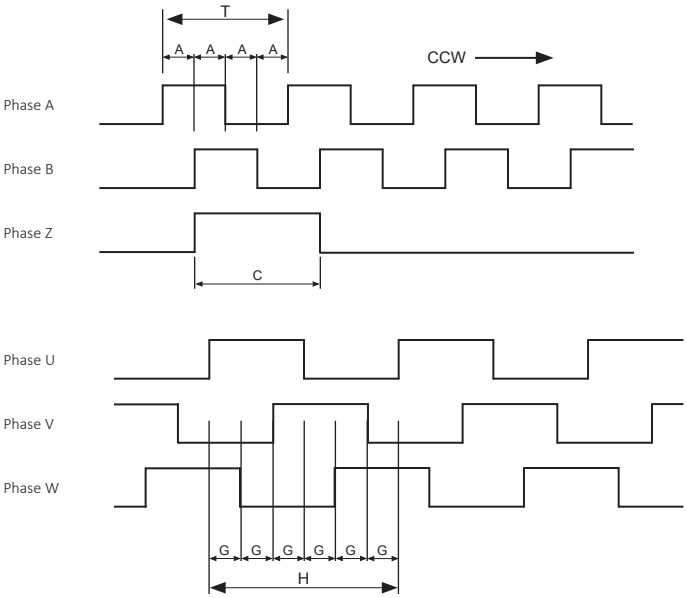
* Shield and Drain wires not connected on Encoder side.

Start-Up Sequence



- Example receiver circuit shown. Contact DMM Technology Corp. for additional design specifications.
- Cable lengths greater than 100m can be achieved - terminal resistor circuit should be connected between complimentary pairs.

□ A leads B for CCW rotation- viewed from encoder shaft/mounting side



T = 360 ° / R
A = T / 4 ± T / 8
C = T ± T / 2
G = 60 / P (mechanical)
H = 360 ° / P (mechanical)

R = model resolution
P = motor pole pair number

Supply voltage input should be as stable as possible.
DSN encoder has integrated voltage regulator, but DC ripple should be minimized to minimize transition noise.

Pole	G	H
2	60 ° ± 1 °	360 °
4	30 ° ± 1 °	180 °
6	20 ° ± 1 °	120 °
8	15 ° ± 1 °	90 °
10	12 ° ± 1 °	72 °

*Mechanical Angle

Note:. The commutation output is not a set reference to the A,B,Z incremental outputs. The on board potentiometer is used to adjust the commutation timing and should be zeroed with the motor phase.

Potentiometer Model: EVND-2A Mfg. Panasonic E.C.

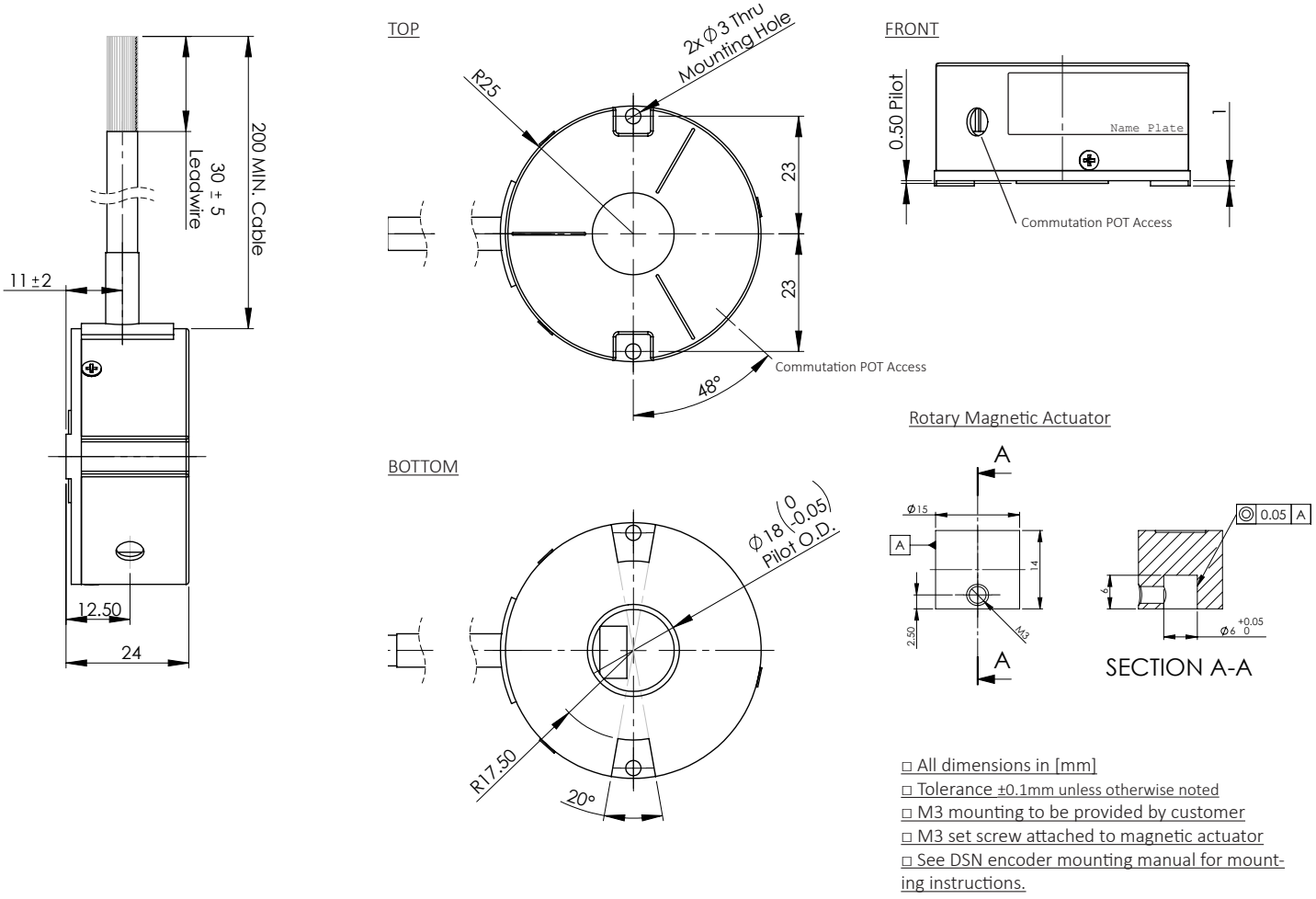
Model Nomenclature

Series	Resolution	Feedback	Commutation Pole	Interface	Special Requirement
DSN08	□	□	□	**D**	**01**
DSN08 Incremental Encoder	04* : 256 P/T 08* : 512 P/T 10 : 1,000 P/T 12 : 1,024 P/T 24 : 2,048 P/T 25 : 2,500 P/T 48 : 4,096 P/T 50 : 5,000 P/T	P : With commutation R : Without commutation	02* : 2 pole 04* : 4 pole 06* : 6 pole 08 : 8 pole 10 : 10 pole	D: +5VDC Differential Line Drive (RS422) Quadrature	01 : Standard Model

* Non Stocked Model. Contact DMM Technology Corp. for availability and lead time.

All models compliant with RoHS directive.

Dimensions



□ All dimensions in [mm]
□ Tolerance ±0.1mm unless otherwise noted
□ M3 mounting to be provided by customer
□ M3 set screw attached to magnetic actuator
□ See DSN encoder mounting manual for mounting instructions.

Interface Cable

□ 6.0mm O.D.
□ Heat-resistant pvc sheath 105 °C 30V
□ 0.4mm O.D. copper conductor (AWG28)
□ 8, 14-position, shield (N.C.), drain (N.C.)

Pair	Color	Data	Pair	Color	Data
1	Red	+5 VDC	5	Brown	U +
	Black	GND		Brown/Black	U-
2	Blue	A +	6	Gray	V +
	Blue/Black	A-		Gray/Black	V-
3	Green	B +	7	White	W +
	Green/Black	B-		White/Black	W-
4	Yellow	Z +	Shield		NC
	Yellow/Black	Z-	Drain Wire		NC

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