Модульный инкрементальный энкодер M53
Технические характеристики

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эл.почта: drx@nt-rt.ru || сайт: https://dynapar.nt-rt.ru/

SERIES M53

Dynapar™ brand

For Stepper & Small Servo Motors

Key Features

- **2.0” Diameter Modular Encoder with Easy Installation Requiring No Special Gapping Tools or Parts**
- **Phased Array Sensor Technology Allowing .020” Axial Shaft Play**
- **Up to 2048 PPR with Commutation Tracks**

SSM Servo Small Motor

RoHS

SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental, Optical
Resolution: (pulses/revolution)
Incremental: 500 to 2048 PPR
Commutation: 4, 6 or 8 pole
Accuracy:
Incremental: ±5 arc-mins. max. edge to edge;
Sense: (viewing encoder mounting surface)
Incremental: A leads B by 90° for CCW rotation of motor shaft;
Commutation: U leads V, V leads W by 120° for CW rotation of motor shaft
Phasing:
Incremental: 90° ±18° electrical
Commutation: 8 Pole: 30°; 6 Pole: 40°; 4 Pole: 60° mechanical
Index to U Channel: ±1° mechanical - Index center to U channel edge
Symmetry:
Incremental: 180° ±18° electrical
Commutation: 8 Pole: 45°;
6 Pole: 60°; 4 Pole: 90° mechanical
Index Pulse Width: 90° ±36° electrical (Gated with A high and B low)

ELECTRICAL

Input Power Requirements:
Incremental: 5 VDC or 12 VDC ±10% at 100 mA max. (excluding output load);
Commutation: 5 VDC or 12 VDC ±10% at 75 mA max. (excluding output load)

ELECTRICAL (CONT.)

Output Signals:
7272 Push-Pull: 40mA, sink or source
7272 Differential Line Driver: 40 mA, sink or source
Frequency Response: 200 kHz min.
Termination:
Connector: PCB mounted dual row head with 0.1” x 0.1” pin spacing, 10 pins (incremental only), 16 pins (w/commutation);
Cable: conductors - 28 AWG, stranded (7/36), insulation - black, PVC; Shield: aluminum/polyester foil plus tinned, copper drain wire (28 AWG, 7/36)

MECHANICAL

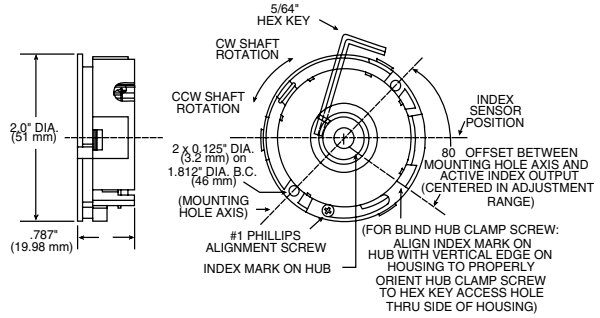
Dimensions:
Outside Diameter: 2.1” (53 mm) max. w/cover, 2.0” (51 mm) max. without cover; Height: 0.8” (20.3 mm) (w/cover, excluding connector);
Emitter to Detector Gap: 0.070” (1.8 mm) min.
Hub Diameters: 1/4”, 3/8”, 7/16”, 1/2”, 6 mm, 8 mm, 10 mm, 12 mm nominal
Mounting Configuration:
Base: (2) #4-40 (M2.5) #1 Phillips fillister head cap screw on 1.812” (46 mm) B.C., 0.01” (0.254 mm) true position to shaft; Shaft: split hub w/collar clamp, #2-56 hex socket cap screw (5/64” hex wrench included)
Hub Dia. Tolerance: +0.001”/-0.000” (+0.026 mm/-0.000 mm)
Mating Shaft Length: 0.45” (12 mm) min. blind hub clamp screw, 0.65” (16.5 mm) exposed hub clamp screw; 0.75” (19 mm) max. inside cover
Mating Shaft Runout: 0.002” (0.05 mm) max. (Includes shaft perpendicularity to mounting surface)
Mating Shaft Endplay: +0.011”/-0.008” (+0.30 mm/-0.21 mm) nominal (“+” indicates away from mounting face)
Electrical/Mechanical Alignment Range: ±15° mechanical
Acceleration: 100,000 rad/sec.^{2} max.
Velocity: 12,000 RPM max.
Moment of Inertia: 6.64 x 10^{-5} in-oz sec.^{2} (4.7 gm-cm^2)
Material:
Base, Housing, & Cover: high temperature, glass filled polymer;
Hub: Aluminum; Disk: 0.030” thick glass
Finish:
Base & Housing: black;
Cover: RAL 7010 (dark grey)
Weight:
Connector: 1 oz. (28 gm) typ.
Connector w/cover: 1.5 oz. (43 gm) typ.
Cable: 2.5 oz (71 gm) typ.
Cable w/cover: 3 oz. (85 gm) typ.

ENVIRONMENTAL

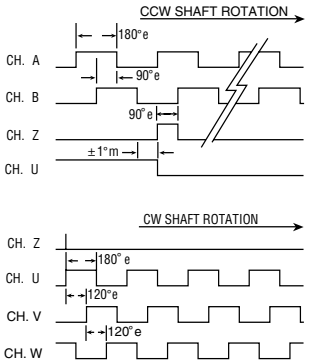
Operating Temperature: 0° to 120°C
Storage Temperature: -40° to 85°C
Shock: 50 G’s for 11 msec duration
Vibration: 2.5 G’s at 5 to 2000 Hz
Relative Humidity: Up to 90% (non-condensing)
Enclosure Rating: NEMA 1 / IP50 dirt-tight (for models with cover)

Dynapar™ brand SERIES M53

Dimensions/Installation



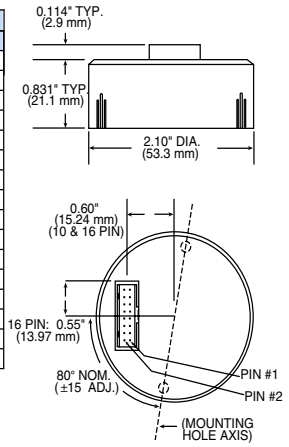
Output Waveforms (For clarity, compliments are not shown.)



Code 6: Terminations (Not all signals present on all models)

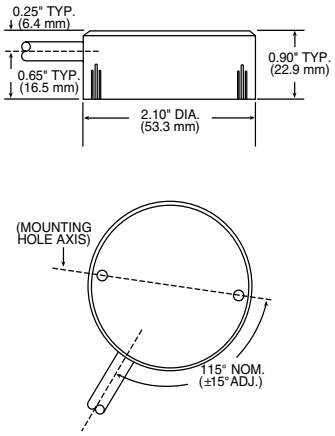
0: 16 Pin JST connector 1-8: Shielded Cable with JST connector

Pin	16 Pin
1	Vcc
2	U
3	GND
4	V
5	A
6	W
7	A'
8	NC
9	B
10	U'
11	B'
12	V'
13	Z
14	W'
15	Z'
16	NC



A-H: Shielded Cable

Function	Wire Color: Incr. Only	Wire Color: Incr. & Comm.
Vcc	RED	RED
GND	BLK	BLK
A	GRN	BLU
A'	RED/BLK	BLU/BLK
B	ORN	GRN
B'	WHT/BLK	GRN/BLK
Z	WHT	VIO
Z'	BLU	VIO/BLK
U	–	BRN
U'	–	BRN/BLK
V	–	GRY
V'	–	GRY/BLK
W	–	WHT
W'	–	WHT/BLK



Ordering Information

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: PPR, Poles	Code 3: Cover	Code 4: Electrical	Code 5: Hub Bore	Code 6: Termination
M53	□□□□/□	□	□	□	□
Ordering Information					
M53 Size 20 Commutating Modular	Incremental channels only **0500/0** **1024/0** **1000/0** **2000/0** **2048/0** Incremental plus Commutation channels **0500/4** **2000/4** **0500/6** **2000/8** **0500/8** **1000/4** **2048/4** **1000/6** **2048/6** **1000/8** **2048/8** **1024/4** **1024/6** **1024/8**	**0** No Cover **1** Radial Exit Cover (for Shielded Cable) **2** Axial Exit (for Shielded Cable with JST Connector)	**0** 5V in, open collector out incremental only **1** 12V in, open collector out incremental only **3** 5V in, line driver out incremental only **A** 12V in, 5V line driver out incremental only **B** 12V in,12V line driver out incremental only Available when Code 2 is XXXX/4, XXXX/6, or XXXX/8 **6** 5V in,line driver out incremental open collector out Comm **9** 5V in,line driver out incremental line driver out Comm **C** 12V in,5Vline driver out incremental,open collector **D** 12V in,12Vline driver out incremental,open collector **E** 12V in,5V line driver out incremental,5Vline driver out Comm out Comm out Comm **F** 12V in,12Vline driver out incremental,12Vline driver out Comm	Exposed hub clamp screw: **A** 1/4 in. **B** 3/8 in. **C** 7/16 in. **D** 1/2 in. **E** 6 mm **F** 8 mm **G** 10 mm **H** 12 mm	Available when Code 3 is 0 or 2: **0** JST connector **1-8** Shielded cable with connector; 1=1 ft., 2=2 ft., etc. Available when Code 3 is 0 or 1: **A-H** Shielded cable; A=1 ft., B=2 ft., etc.

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