

TECHNICAL DATASHEET

Incremental Encoder M 53



- Modular hollow shaft encoder, ideal for BLDC, DC-Servo and Stepper feedback
- Through hollow shaft \varnothing 6 ... 12,7 mm
- Incremental + Commutation
- Incremental signals A, B, N and 4, 6 or 8 pole
- Outside diameter 53 mm
- Mounting depth: only 23 mm
- Maximum speed: 12,000 rpm
- Standard Operating temperature: -40 ... +120°C
- Easy installation and alignment

TECHNICAL DATA mechanical

Housing diameter	53 mm
Mounting depth	22.9 mm
Shaft diameter	6 mm / 6.35 mm / 8 mm / 9.52 mm / 10 mm / 11.11 mm / 12 mm / 12.7 mm (Hub shaft)
Protection class shaft input (EN 60529)	IP50
Protection class housing (EN 60529)	with cover: IP50
Hollow shaft tolerance	+0.026 mm/ -0.000 mm
Mating shaft length	min. 12 mm max. 19 mm
Axial endplay of mounting shaft (hubshaft)	+ 0.3 mm / - 0.21 mm
Radial runout of mating shaft (hubshaft)	Includes shaft perpendicularity to mounting surface: \pm 0.05 mm
Max. speed	max. 12 000 rpm
Acceleration	100 000 rad/s ²
Moment of inertia	approx. 4.7 gcm ²
Vibration resistance (DIN EN 60068-2-6)	25 m/s ² (5 ... 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	500 m/s ² (11 msec)
Operating temperature	-40 °C ... +120 °C
Storage temperature	-40 °C ... +85 °C
Relative humidity	90% noncondensing
Material shaft	Aluminum
Material housing	Glass fiber-reinforced plastic
Weight	max. 85g
Connection	Shielded cable or dual row connector

TECHNICAL DATA electrical

Supply voltage	DC 5 V or DC 12 V \pm 10 %
Max. current w/o load	100 mA (Incremental: DC 5 or 12 V \pm 10 % (excluding output load)), 75 mA (Commutation: DC 5 or 12 V \pm 10 % (excluding output load))
Code	Incremental with commutation, optical
Accuracy	Incremental signals: \pm arc-mins max. edge to edge Commutation signals: \pm arc-mins max.
Max. pulse frequency	200 kHz

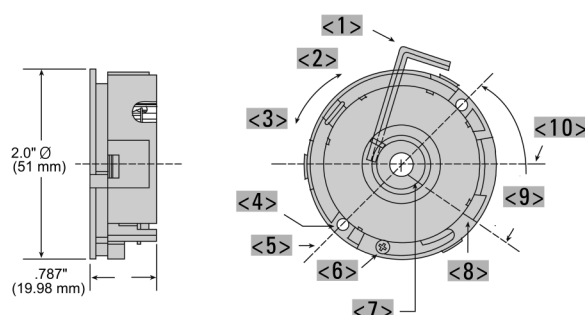
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TECHNICAL DATA electrical (continued)

Phasing	Incremental signals (A leads B): $90^\circ \pm 18^\circ$ electrical Commutation signals (U leads V leads W): 8 Pole: 30° , 6 Pole: 60° , 4 Pole: 90° mechanical
Index pulse width (N)	Incremental signals: $180^\circ \pm 18^\circ$ electrical $180^\circ \pm 36^\circ$ elektrisch
Standard output versions	NPN-O.C.: A, B, N RS422: A, B, N, \bar{A} , \bar{B} , \bar{N} NPN-O.C. (commutation): U, V, W RS422 (commutation): U, V, W, \bar{U} , \bar{V} , \bar{W}

DIMENSIONED DRAWINGS



- <1> 5/64" (2 mm) hex key
- <2> cw (clockwise)
- <3> ccw (counter clockwise)
- <4> 2 x 0.125" \varnothing (3.2 mm) on 1.812" \varnothing B.C.(46 mm)
- <5> Mounting hole axis
- <6> #1 Phillips alignment screw
- <7> Index mark on hub

- <8> for blind hub clamp screw: align index mark on hub with vertical edge on housing to properly orient hub clamp screw to hex key access hole thru side of housing
- <9> 80 offset between mounting hole axis and active index output (centered in adjustment range)
- <10> Index sensor position

Dimensions in inch (mm)

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ORDERING INFORMATION

Type	Number of pulses	Poles commutation ²	Housing	Electrical ^{3,4,5}	Shaft Ø	Connection
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M5 3	0500 0512 1000	0 Without 4 4 pole 6 6 pole 8 8 pole	0 Without cover 2 Axial exit (for shielded cable with pcb connector) 1 Radial exit cover (for shielded cable)	0 U inc = DC 5 V, output inc = NPN-O.C. 1 U inc = DC 12 V, output inc = NPN-O.C. 3 U inc = DC 5 V, output inc = RS422 6 U inc = DC 5 V, output inc = RS422, U com = DC 5 V, output com = NPN-O.C. 9 U inc = DC 5 V, output inc = RS422, U com = DC 5 V, output com = RS422	A 6.35 mm (1/4") B 6.35 mm (1/4") C 11.11 mm (7/16") D 12.7 mm (1/2") E 6 mm F 8 mm G 10 mm H 12 mm	A ... H Screened cable radial (A = 30 cm, B = 60 cm ...) 1 ... 8 Dual row connector with mating ribbon cable (1 = 30 cm, 2 = 60 cm ...)

¹ allowed combinations see available combinations (pulses/poles)

² allowed combinations see available combinations (pulses/poles)

³ U inc: Supply voltage incremental, U com: Supply voltage commutation (only if commutation selected)

⁴ Code Electrical "0", "1", "3": only incremental, without commutation

⁵ Code Electrical "6", "9": inkremental plus commutation signals

⁶ Connection code "A" ... "H": only with output = RS 422