

TECHNICAL DATASHEET

Incremental Encoder RF 53



RF 53 with rear tether

- Solid shaft motor encoder for BLDC and gearless elevator traction machines
- Incremental + commutation
- Up to 10 000 ppr
- Operating temperature up to 120 °C
- IP54
- Outside diameter 53 mm



NUMBER OF PULSES

500 to 10000 ppr;
optional 4, 6, 8, 10, 12, 16, 20, 24 or 32 pole commutation signals

TECHNICAL DATA mechanical

Housing diameter	53 mm
Shaft diameter	Cone solid shaft
Flange (Mounting of housing)	Tether
Mounting of shaft	Center bolt
Protection class shaft input (EN 60529)	IP54
Protection class housing (EN 60529)	IP54
Shaft load axial / radial	20 N / 90 N
Axial endplay of mounting shaft (hubshaft)	± 1.4 mm
Radial runout of mating shaft (hubshaft)	± 0.18 mm
Max. speed	max. 12 000 rpm (continuous), max. 5000 rpm (short term)
Vibration resistance (DIN EN 60068-2-6)	25 m/s ²
Shock resistance (DIN EN 60068-2-27)	1000 m/s ²
Operating temperature	-20 °C ... +120 °C
Storage temperature	-40 °C ... +120 °C
Relative humidity	95 %, non-condensing
Material shaft	Stainless Steel
Material housing	Aluminum
Weight	approx. 200 g

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TECHNICAL DATA mechanical (continued)

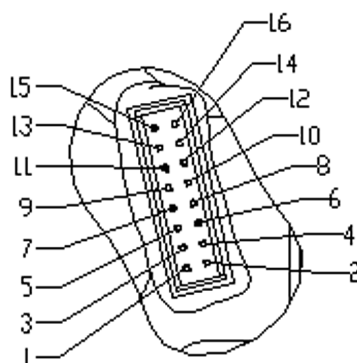
Connection	Cable Cable with Sub-D connector PCB connector
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TECHNICAL DATA electrical

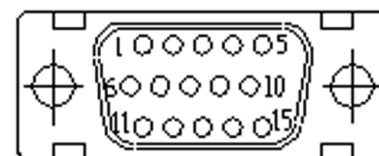
Supply voltage	DC 5 V $\pm 10\%$
Max. current w/o load	100 mA
Code	Incremental with commutation, optical
Accuracy	Incremental signals: ± 2.5 arc-mins. max. (edge to edge) Commutation signals: ± 6 arc-mins. max.
Max. pulse frequency	100 kHz
Phasing	Incremental signals (A leads B): 90° Commutation signals (U leads V leads W): U zu V zu W um 120°
Standard output versions	RS422: A, B, N, \bar{A} , \bar{B} , \bar{N} NPN-O.C.: A, B, N
Number of pulses	500 ... 10 000

ELECTRICAL CONNECTIONS PIN NUMBERING

PCB connector



Sub-D connector



ELECTRICAL CONNECTIONS Cable / Sub-D connector, 15 pole

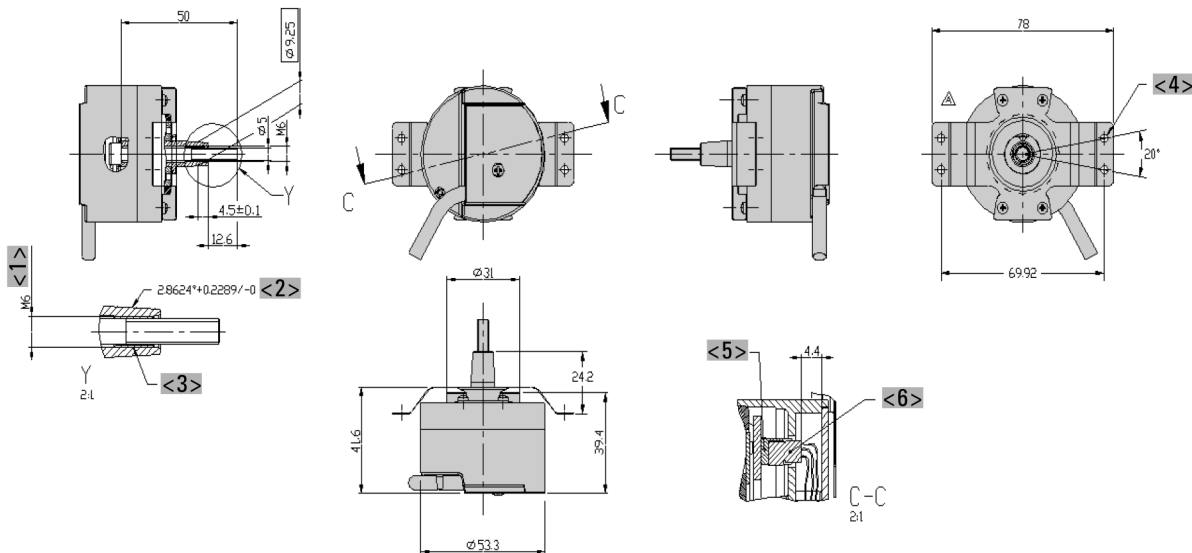
PIN	Signal	Color	SUB-D 15 PIN
1	DC 5 V	red	13
2	U	brown	7
3	0 V	black	14
4	V	grey	9
5	A	blue	1
6	W	white	11
7	\bar{A}	blue/black	2
8	N.C.		
9	B	green	3
10	\bar{U}	brown/black	8
11	\bar{B}	green/black	6
12	\bar{V}	grey/black	10
13	N	violet	N.C.
14	\bar{W}	white/black	12
15	\bar{N}	violet/black	N.C.
16	N.C.		

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DIMENSIONED DRAWINGS

Front tether



<1> M6 (used for dismounting)

<2> Taper

<3> Internal thread M6x1 x 12 mm deep

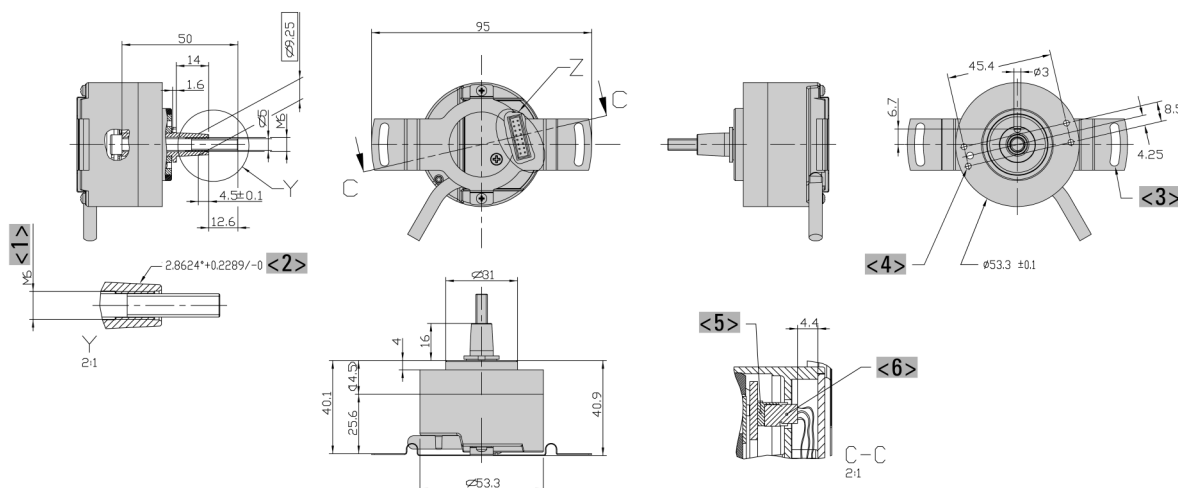
<4> \emptyset 3.2 4x on a 71 mm bolt circle (B.C.)

<5> Cable connector 1

<6> Cable connector 2

Dimensions in mm

Rear tether



<1> M6 (used for dismounting)

<2> Taper

<3> 3.8 wide slot on a \emptyset 85 bolt circle (B.C.)

<4> M2.5 x 6 mm DP. (4x)

<5> Cable connector 1

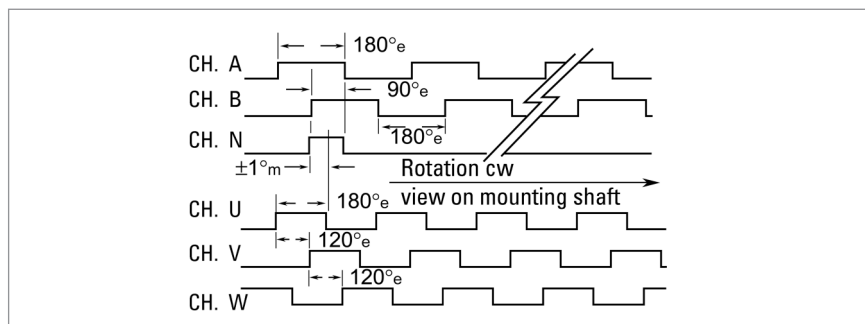
<6> Cable connector 2

Dimensions in mm

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OUTPUT WAVEFORMS



ORDERING INFORMATION

Type	Number of pulses ^{1,2}	Poles commutation	Spring tether	Electrical ^{3,4,5,6}	Connection
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RF53	0500 0512 1000 1024 2000 2048 2500 4096 5000 8129 10E3 = 10000	0 Without 4 4 pole 6 6 pole 8 8 pole A 10 pole C 12 pole G 16 pole K 20 pole O 24 pole W 32 pole	1 Spring tether rear 2 Spring tether front	0 U inc = DC 5 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	E Cable, 7 m K Cable, 10 m P Cable, 15 m 1 Sub-D connector at 3 m cable 2 Sub-D connector at 5 m cable 3 Sub-D connector at 10 m cable 0 PCB connector, 16 pole

¹ Option redundant on request

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": only incremental, <= 2 048/0 (ppr/poles)

⁵ Code Electrical "3": only incremental, without commutation

⁶ Code Electrical "6", "9": incremental plus commutation signals

Available combinations (pulses/poles)

Pulses ppr	Number of poles									
	0	4	6	8	10 (=A)	12 (=C)	16 (=G)	20 (=K)	24 (=O)	32 (=W)
0500	X	X	X	X	X	X				
0512	X	X	X	X						
1000	X	X	X	X	X	X				
1024	X	X	X	X		X				
2000	X	X	X	X	X	X				
2048	X	X	X	X	X	X	X	X	X	X
2500	X	X	X	X	X	X				
4096	X	X	X	X	X	X	X	X	X	X
5000	X	X	X	X	X	X				
8192	X	X	X	X	X	X	X	X	X	X
10E3 =10000	X	X	X	X	X	X				