

Motor Feedback F 21

AC-Synchronous & BLDC Motors Incremental

ORDERING INFORMATION

Type	Number of pulses ¹	Poles commutation ²	Mounting	Electrical ^{3,4,5}	Shaft / bore	Connection
☐	☐	☐	☐	☐	☐	☐
F21	1024 2048	0 Without 6 6 pole 8 8 pole C 10 pole E 12 pole I 16 pole	0 Servo ring size 21	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	3 12.7 mm/ through bore	0 16.5 cm flying leads

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 "3": only incremental, without commutation

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

Available combinations (pulses/poles)

Pulses ppr	Number of poles					
	0	6	8	10 (=C)	12 (=E)	16 (=I)
1024	X	X	X	X	X	X
2048	X	X	X	X	X	X



GENERAL INFORMATION

TECHNICAL DATA mechanical

TECHNICAL DATA electrical

Motor Feedback HC 20

AC-Synchronous & BLDC Motors Incremental

- Compact hollowshaft motor encoder, ideal for BLDC, DC servo and Stepper feedback
- Incremental + commutation
- Phased Array Technology
- Frequency response to 500 kHz
- Operating temperature up to 120 °C
- Outside diameter 50 mm
- Cable plug-in radial/axial

500, 512, 1000, 1024, 2000, 2048, 2500;
optional 4, 6 or 8 pole commutation signals

The type HC20 encoder provides high performance, cost effective feedback for stepper and servo motor controls. A compliant tether allows easy mounting with high tolerance to motor shaft movement and 20 degrees of adjustment to align the signal outputs to the shaft position.

A superior optical configuration allows for generous internal component clearance eliminating potential damage at high ambient operating temperatures. High temperature rated grease is standard for extended bearing life. No special tools are required for installation.

Housing diameter	50 mm
Mounting depth	36°
Shaft diameter	6 mm / 8 mm
Flange	Tether
(Mounting of housing)	
Mounting of shaft	Front clamping ring
Protection class shaft input (EN 60529)	IP50
Protection class housing (EN 60529)	IP50
Axial endplay of mounting shaft (hubshaft)	± 0.8 mm
Radial runout of mating shaft (hubshaft)	± 0.2 mm
Max. speed	max. 12 000 rpm
Operating temperature	0 °C ... +120 °C
Storage temperature	-40 °C ... +120 °C
Material housing	Aluminum
Material flange	Aluminum
Connection	Cable, axial or radial

Supply voltage	DC 5 V ±10 %
Current w/o load typ.	150 mA (incremental), 175 mA (incremental + commutation)
Code	Incremental with commutation, optical
Accuracy	max. 40 arc-sec.
Max. pulse frequency	500 kHz

Motor Feedback HC 20

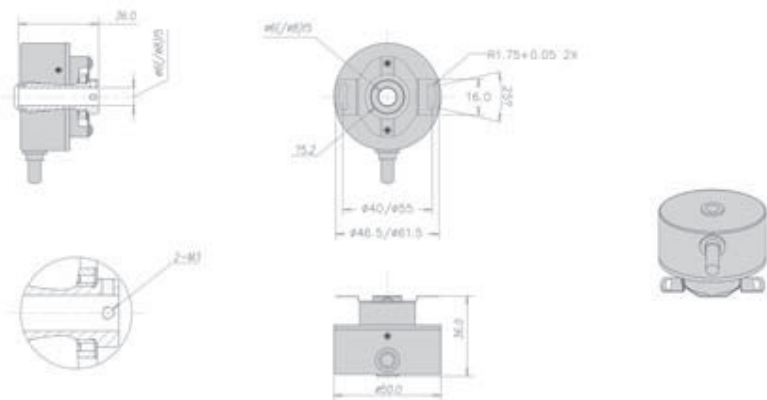
AC-Synchronous & BLDC Motors Incremental

TECHNICAL DATA
electrical (continued)

Phasing	Incremental signals (A leads B): A leads B by 90° for ccw shaft rotation viewing the shaft clamp end of Commutation signals (U leads V leads W): U leads V leads W by 120° for ccw shaft rotation viewing the shaft clamp end of the encoder
Index pulse width (N)	90° gated A and B high
Tolerance N to U	± 1° mech. index pulse center N to U channel edge
Standard output versions	NPN-O.C.: A, B, N RS422: A, B, N, $\bar{A}$, $\bar{B}$, $\bar{N}$ NPN-O.C.: U, V, W RS422: U, V, W, $\bar{U}$, $\bar{V}$, $\bar{W}$

DIMENSIONED DRAWINGS

Hollow shaft



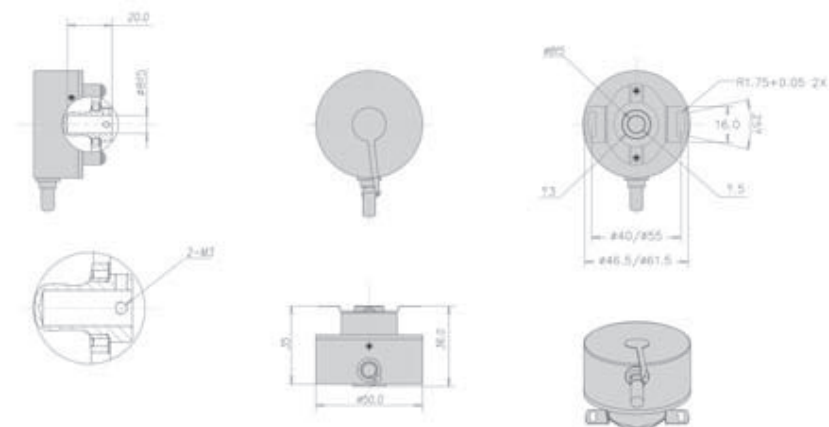
Dimensions in mm

Motor Feedback HC 20

AC-Synchronous & BLDC Motors Incremental

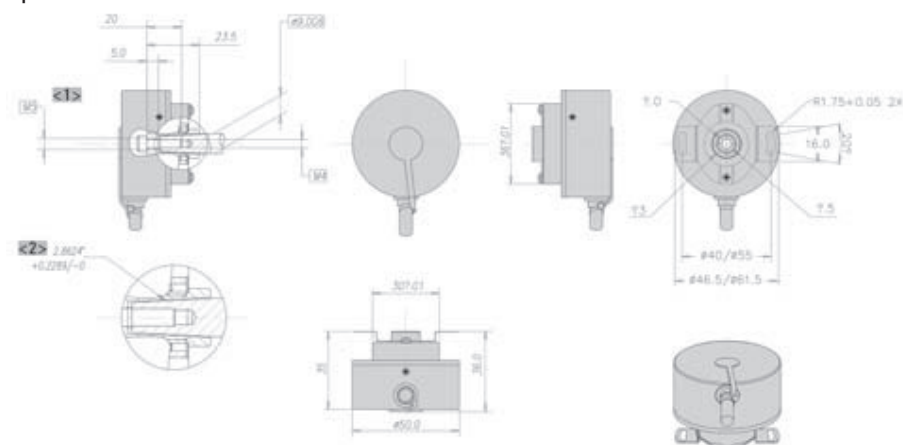
DIMENSIONED DRAWINGS (continued)

Hubshaft



Dimensions in mm

Taper shaft



<1> used for dismounting

<2> Taper

Dimensions in mm

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ORDERING INFORMATION

Type	Number of pulses ¹	Poles commutation	Mounting	Electrical ^{3,4,5,6}	Shaft	Connection
☐	☐	☐	☐	☐	☐	☐
HC20	0500 1000 1024 2000 2048 2500	0 Without 4 4 pole 6 6 pole 8 8 pole	0 No mounting base	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	1 Hub shaft, 6 mm 2 Hub shaft, 8 mm 0 Tapered shaft (9 mm; 1:10) 3 Through hollow shaft, 6 mm 4 Through hollow shaft, 8 mm	A Cable, 25 mm, radial 2 Cable, 50 mm, axial B Cable, 50 mm, radial 3 Cable, 76 mm, axial C Cable, 76 mm, radial 4 Cable, 0.1 m, axial D Cable, 0.1 m, radial

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

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

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

Motor Feedback RF 53

AC-Synchronous & BLDC Motors Incremental

- 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



RF 53 with rear tether

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