



# HEIDENHAIN



Product Information

**ROC 2000**

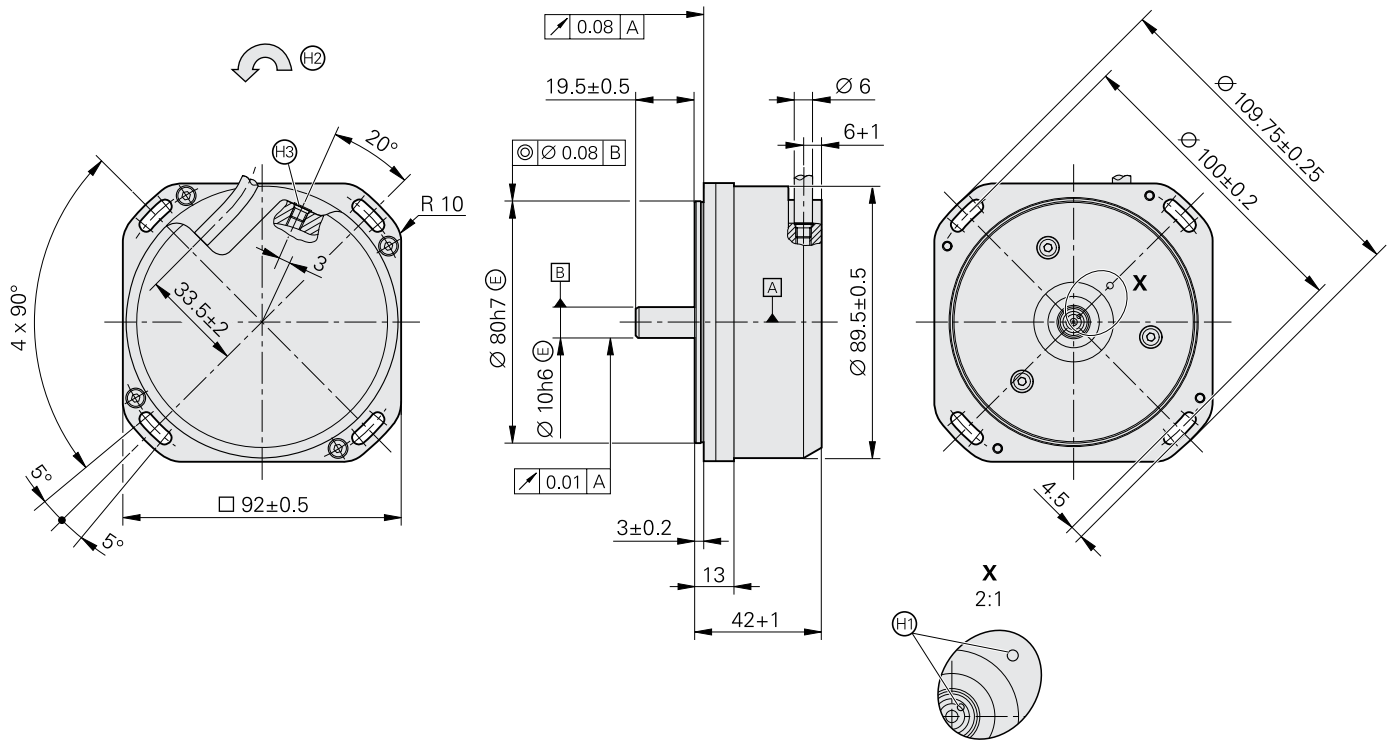
**ROC 7000**


Angle Encoders with  
Integral Bearing for  
Separate Shaft Coupling





November 2015

# ROC 2000 series

- For separate shaft coupling
- System accuracy  $\pm 5''$



mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 < 6 mm:  $\pm 0.2$  mm

-  = Bearing
-  = Position of the reference mark signal  $\pm 5^\circ$
-  = Direction of shaft rotation for output signals as per the interface description
-  = Compressed air inlet M5

	<b>Absolute ROC 2310</b>	<b>ROC 2380</b>	<b>ROC 2390F</b>	<b>ROC 2390M</b>
<b>Measuring standard</b>	DIADUR circular scale with absolute and incremental track (16384 lines)			
<b>System accuracy</b>	±5"			
Position error per signal period	±0.4"			
<b>Interface</b>	EnDat 2.2		Fanuc Serial Interface αi interface	Mitsubishi high speed interface
Ordering designation	EnDat22	EnDat02	Fanuc05	Mit03-4
Position values/revolution	67 108864 (26 bits); <i>Fanuc α interface</i> : 8388608 (23 bits)			
Elec. permissible speed	≤ 3000 rpm for continuous position value	≤ 1500 rpm for continuous position value	≤ 3000 rpm for continuous position value	
Clock frequency Calculation time $t_{cal}$	≤ 16 MHz ≤ 5 μs	≤ 2 MHz ≤ 5 μs	–	
Incremental signals Cutoff frequency –3 dB	–	~ 1 V <sub>PP</sub> ≥ 400 kHz	–	
<b>Electrical connection</b>	Cable 1 m, with M12 coupling (male) <i>For EnDat02</i> : Cable 1 m with 17-pin M23 coupling (male)			
Cable length <sup>1)</sup>	≤ 150 m		≤ 50 m	≤ 30 m
Voltage supply	3.6 V to 14 V DC			
Power consumption <sup>2)</sup> (max.)	3.6 V: ≤ 1.1 W; 14 V: ≤ 1.3 W			
Current consumption (typical)	5 V: 140 mA (without load)			
<b>Shaft</b>	Solid shaft D = 10 mm			
Mechanically permissible speed	≤ 3000 rpm			
Starting torque	≤ 0.02 Nm at 20 °C			
Moment of inertia of rotor	50.0 · 10 <sup>-6</sup> kgm <sup>2</sup>			
Permissible shaft load	<i>Axial</i> : 30 N <i>Radial</i> : 30 N at shaft end			
<b>Vibration</b> 55 to 2000 Hz <b>Shock</b> 6 ms	≤ 200 m/s <sup>2</sup> (EN 60068-2-6) ≤ 200 m/s <sup>2</sup> (EN 60068-2-27)			
<b>Operating temperature</b>	<i>Moving cable</i> : –10 °C to 60 °C <i>Fixed cable</i> : –20 °C to 60 °C			
<b>Protection</b> EN 60529	IP64			
<b>Mass</b>	≈ 1.0 kg			

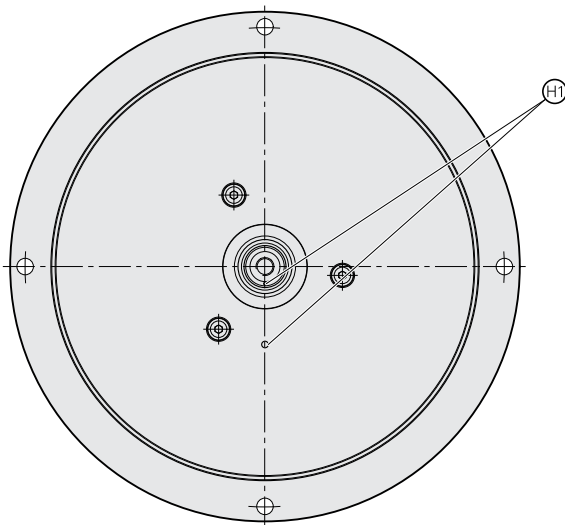
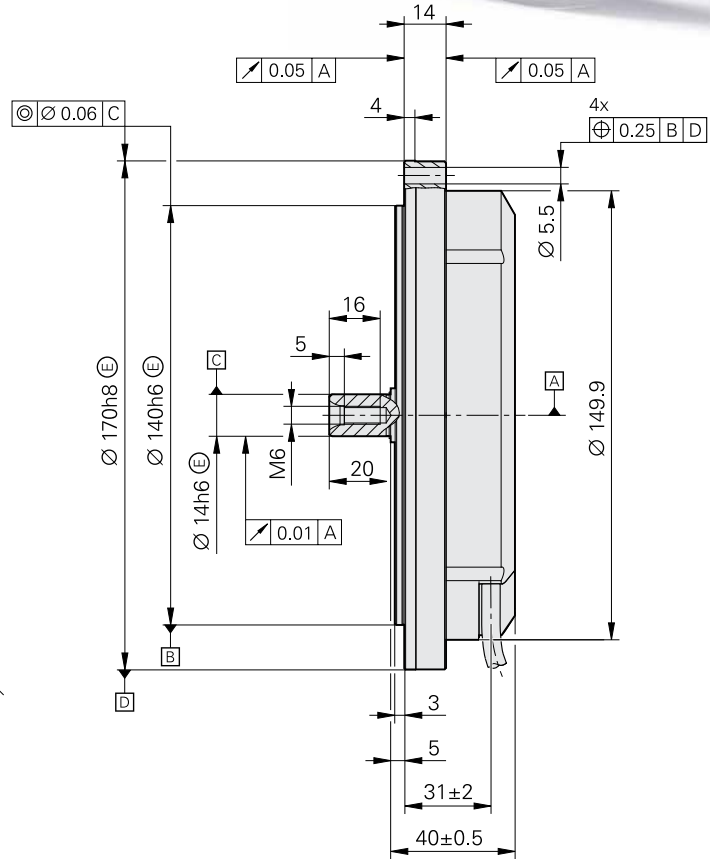
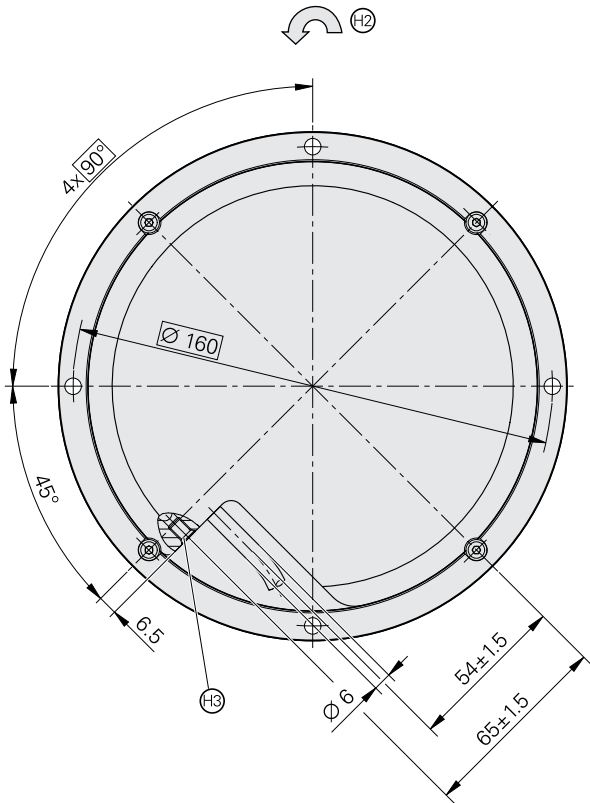
\* Please select when ordering

<sup>1)</sup> With HEIDENHAIN cable; ≤ 8 MHz

<sup>2)</sup> See *General electrical information* in the *Interfaces for HEIDENHAIN Encoders* catalog

# ROC 7000

- For separate shaft coupling
- System accuracy  $\pm 2''$



mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 < 6 mm:  $\pm 0.2$  mm

- ▣ = Bearing
- ⊕ = Position of the reference-mark signal  $\pm 5^\circ$
- ⊙ = Direction of shaft rotation for output signals as per the interface description
- ⊗ = Compressed air inlet M5

	<b>Absolute ROC 7310</b>	<b>ROC 7380</b>	<b>ROC 7390F</b>	<b>ROC 7390M</b>
<b>Measuring standard</b>	DIADUR circular scale with absolute and incremental track (16384 lines)			
<b>System accuracy</b>	±2"			
Position error per signal period	±0.4"			
<b>Interface</b>	EnDat 2.2		Fanuc Serial Interface αi interface	Mitsubishi high speed interface
Ordering designation	EnDat22	EnDat02	Fanuc05	Mit03-4
Position values/revolution	268435456 (28 bits); <i>Fanuc α interface</i> : 134217728 (27 bits)			
Elec. permissible speed	≤ 3000 rpm for continuous position value	≤ 1500 rpm for continuous position value	≤ 3000 rpm for continuous position value	
Clock frequency Calculation time $t_{cal}$	≤ 16 MHz ≤ 5 μs	≤ 2 MHz ≤ 5 μs	–	
Incremental signals Cutoff frequency –3 dB	–	~ 1 V <sub>PP</sub> ≥ 400 kHz	–	
<b>Electrical connection</b>	Cable 1 m, with M12 coupling (male) <i>For EnDat02</i> : Cable 1 m with 17-pin M23 coupling (male)			
Cable length <sup>1)</sup>	≤ 150 m		≤ 50 m	≤ 30 m
Voltage supply	3.6 V to 14 V DC			
Power consumption <sup>2)</sup> (max.)	3.6 V: ≤ 1.1 W; 14 V: ≤ 1.3 W			
Current consumption (typical)	5 V: 140 mA (without load)			
<b>Shaft</b>	Solid shaft D = 14 mm			
Mechanically permissible speed	≤ 3000 rpm			
Starting torque	≤ 0.025 Nm at 20 °C			
Moment of inertia of rotor	65.0 · 10 <sup>-6</sup> kgm <sup>2</sup>			
Permissible shaft load	<i>Axial</i> : 30 N <i>Radial</i> : 30 N at shaft end			
<b>Vibration</b> 55 to 2000 Hz <b>Shock</b> 6 ms	≤ 200 m/s <sup>2</sup> (EN 60068-2-6) ≤ 200 m/s <sup>2</sup> (EN 60068-2-27)			
<b>Operating temperature</b>	0 °C to 50 °C			
<b>Protection</b> EN 60529	IP64			
<b>Mass</b>	≈ 1.6 kg			

\* Please select when ordering

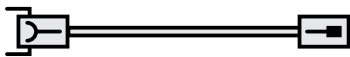
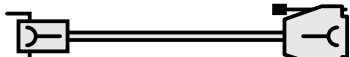

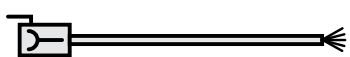
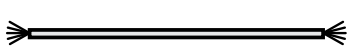
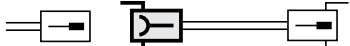
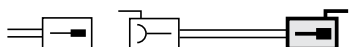
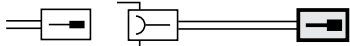

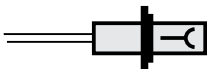
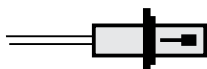
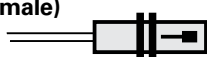
<sup>1)</sup> With HEIDENHAIN cable; ≤ 8 MHz

<sup>2)</sup> See *General electrical information* in the *Interfaces for HEIDENHAIN Encoders* catalog

# Connecting cables EnDat

8-pin  
M12

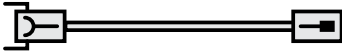
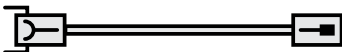
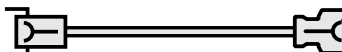
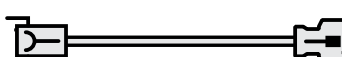


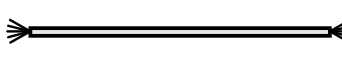
17-pin  
M23

		EnDat without incremental signals	EnDat with incremental signals
<b>PUR connecting cable 17-pin:</b> $[(4 \times 0.14 \text{ mm}^2) + 4(2 \times 0.14 \text{ mm}^2) + (4 \times 0.5 \text{ mm}^2)]; A_P = 0.5 \text{ mm}^2$			
<b>PUR connecting cable 8-pin:</b> $[(4 \times 0.14 \text{ mm}^2) + 4 \times 0.34 \text{ mm}^2]; A_P = 0.34 \text{ mm}^2$		Ø 6 mm	Ø 8 mm
<b>Complete</b> with connector (female) and coupling (male)		368330-xx	323897-xx
<b>Complete</b> with connector (female) and D-sub connector (female), 15-pin		533627-xx	332115-xx
<b>Complete</b> with connector (female) and D-sub connector (male), 15-pin		524599-xx	324544-xx
<b>With one connector</b> (female)		634265-xx	309778-xx
<b>Cable without connectors</b> , Ø 8 mm		816329-xx	816322-xx
<b>Mating element on connecting cable to connector on encoder cable</b>	<b>Connector (female)</b> Ø 8 mm 	–	291697-26
<b>Connector on cable</b> for connection to subsequent electronics	<b>Connector (male)</b> Ø 8 mm 	–	291697-27
<b>Coupling on connecting cable</b>	<b>Coupling (male)</b> Ø 4.5 mm Ø 6 mm Ø 8 mm 	–	291698-25 291698-26 291698-27
<b>Flange socket</b> for mounting on subsequent electronics	<b>Flange socket (female)</b> 	–	315892-10
<b>Mounted couplings</b>	<b>With flange (female)</b> Ø 6 mm 	–	291698-35
	<b>With flange (male)</b> Ø 6 mm Ø 8 mm 	–	291698-41 291698-29
	<b>With central fastening (male)</b> Ø 6 mm to 10 mm 	–	741045-02

$A_P$ : Cross section of power supply lines

Ø: Cable diameter

# Connecting cables Fanuc Mitsubishi

PUR connecting cable	① Ø 6 mm; [4 × 0.14 mm <sup>2</sup> + 4 × 0.34 mm <sup>2</sup> ] ② Ø 8 mm; [2 × 2 × 0.14 mm <sup>2</sup> + 4 × 1 mm <sup>2</sup> ] ③ Ø 6 mm; [2 × 2 × 0.14 mm <sup>2</sup> + 4 × 0.5 mm <sup>2</sup> ]	Cable	Fanuc	Mitsubishi
<b>Complete</b> with M12 connector (female), 8-pin, and M12 coupling (male), 8-pin		①	368330-xx	
<b>Complete</b> with M12 connector (female), 8-pin, and M23 coupling (male), 17-pin		①	582333-xx	
<b>Complete</b> with M12 connector (female), 8-pin, and <ul style="list-style-type: none"> <li>• Fanuc connector (female) or</li> <li>• Mitsubishi connector (female), 10-pin</li> </ul>		①	646807-xx	647314-xx
<b>Complete</b> with M12 connector (female), 8-pin, and Mitsubishi connector (male), 20-pin		①	-	646806-xx
<b>Complete</b> with M23 connector (female), 17-pin, and <ul style="list-style-type: none"> <li>• Fanuc connector (female) or</li> <li>• Mitsubishi connector (female), 10-pin</li> </ul>		②	534855-xx	573661-xx
<b>Complete</b> with M23 connector (female), 17-pin, and Mitsubishi connector (male), 20-pin		③	-	367958-xx
<b>Cable only</b>		②	816327-xx	

A<sub>P</sub>: Cross section of power supply lines

Ø: Cable diameter (for bend radii, see *Interfaces of HEIDENHAIN Encoders catalog*)

## HEIDENHAIN

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This Product Information supersedes all previous editions, which thereby become invalid. The basis for ordering from HEIDENHAIN is always the Product Information valid when the contract is made.

### Further Information

- Catalog: *Angle Encoders with Integral Bearing*
- Catalog: *Interfaces of HEIDENHAIN Encoders*