HEIDENHAIN

Product Information

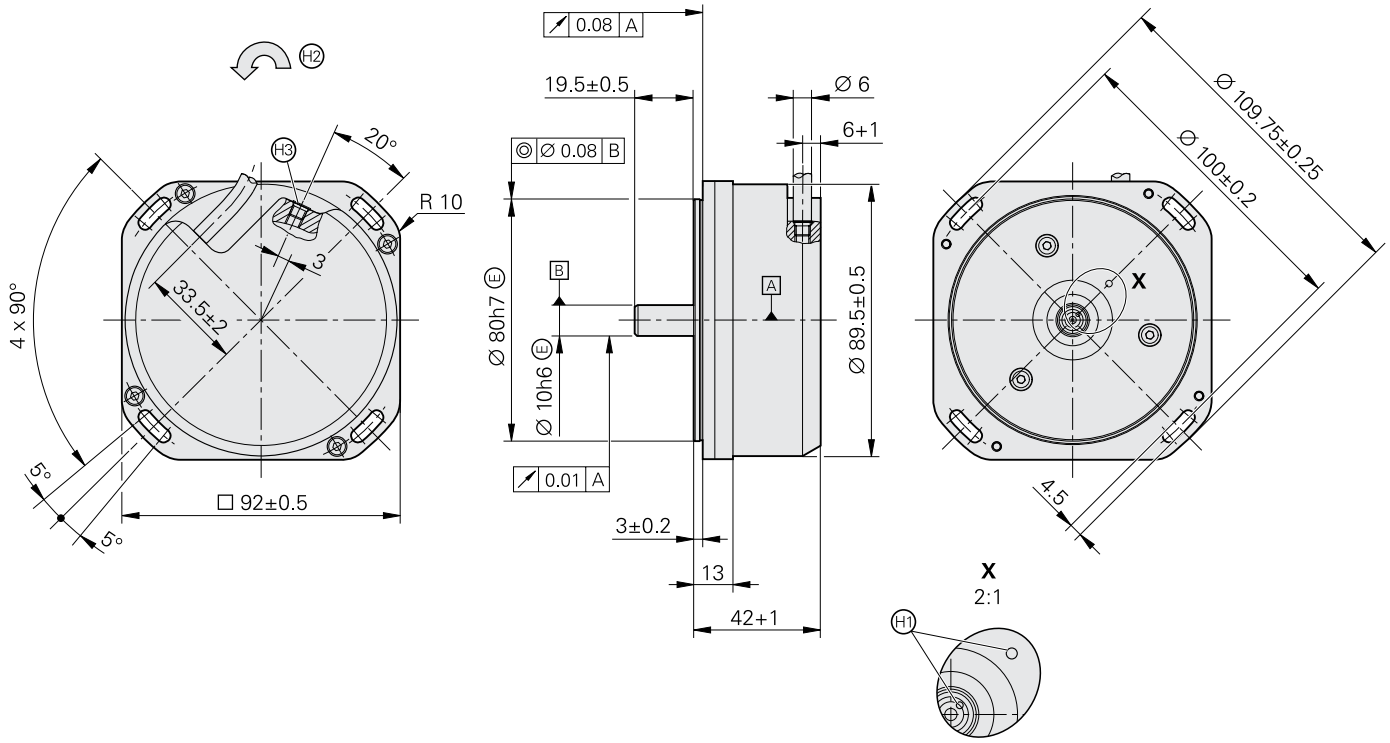
ROC 2000
ROC 7000

Angle Encoders with
Integral Bearing for
Separate Shaft Coupling

November 2015

ROC 2000 series

- **For separate shaft coupling**
- **System accuracy ±5″**



mm

Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ±0.2 mm

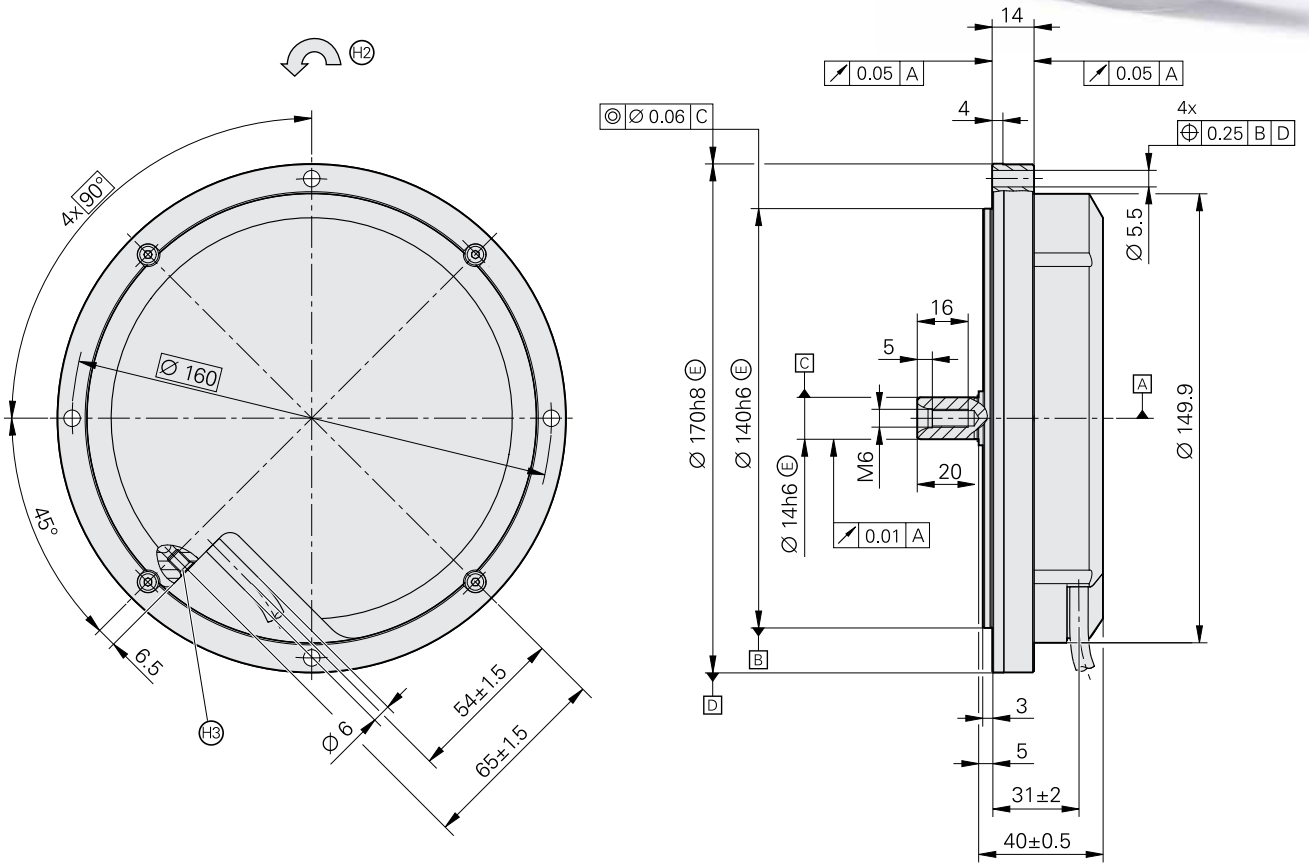
Ⓐ = Bearing
Ⓗ1 = Position of the reference mark signal ± 5°
Ⓗ2 = Direction of shaft rotation for output signals as per the interface description
Ⓗ3 = Compressed air inlet M5

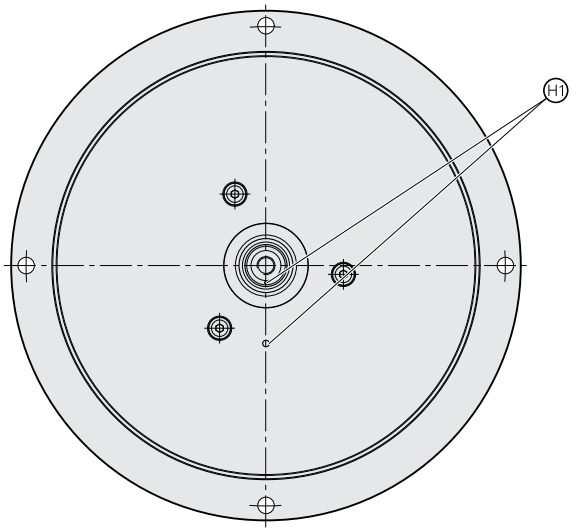
	Absolute **ROC 2310**	**ROC 2380**	**ROC 2390F**	**ROC 2390M**
Measuring standard	DIADUR circular scale with absolute and incremental track (16384 lines)			
System accuracy	±5″			
Position error per signal period	±0.4″			
Interface	EnDat 2.2		Fanuc Serial Interface αi interface	Mitsubishi high speed interface
Ordering designation	EnDat22	EnDat02	Fanuc05	Mit03-4
Position values/revolution	67108864 (26 bits); *Fanuc α interface:* 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_{PP} ≥ 400 kHz	–	
Electrical connection	Cable 1 m, with M12 coupling (male) *For EnDat02:* Cable 1 m with 17-pin M23 coupling (male)			
Cable length[1]	≤ 150 m		≤ 50 m	≤ 30 m
Voltage supply	3.6 V to 14 V DC			
Power consumption[2] (max.)	*3.6 V:* ≤ 1.1 W; *14 V:* ≤ 1.3 W			
Current consumption (typical)	*5 V:* 140 mA (without load)			
Shaft	Solid shaft D = 10 mm			
Mechanically permissible speed	≤ 3000 rpm			
Starting torque	≤ 0.02 Nm at 20 °C			
Moment of inertia of rotor	$50.0 \cdot 10^{-6}$ kgm^2			
Permissible shaft load	*Axial:* 30 N *Radial:* 30 N at shaft end			
Vibration 55 to 2000 Hz **Shock** 6 ms	≤ 200 m/s^2 (EN 60068-2-6) ≤ 200 m/s^2 (EN 60068-2-27)			
Operating temperature	*Moving cable:* –10 °C to 60 °C *Fixed cable:* –20 °C to 60 °C			
Protection EN 60529	IP64			
Mass	≈ 1.0 kg			

***** Please select when ordering
[1] With HEIDENHAIN cable; ≤ 8 MHz
[2] See *General electrical information* in the *Interfaces for HEIDENHAIN Encoders* catalog

ROC 7000

- **For separate shaft coupling**
- **System accuracy ±2″**





mm

Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ±0.2 mm

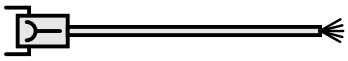
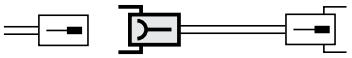
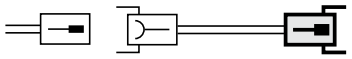
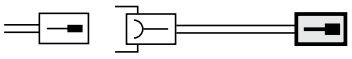
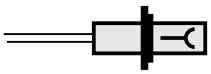
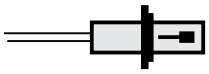
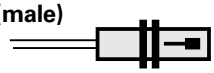
A = Bearing
H1 = Position of the reference-mark signal ±5°
H2 = Direction of shaft rotation for output signals as per the interface description
H3 = Compressed air inlet M5

	Absolute **ROC 7310**	**ROC 7380**	**ROC 7390F**	**ROC 7390M**
Measuring standard	DIADUR circular scale with absolute and incremental track (16384 lines)			
System accuracy	±2″			
Position error per signal period	±0.4″			
Interface	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); *Fanuc α interface:* 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_{PP} ≥ 400 kHz	–	
Electrical connection	Cable 1 m, with M12 coupling (male) *For EnDat02:* Cable 1 m with 17-pin M23 coupling (male)			
Cable length[1]	≤ 150 m		≤ 50 m	≤ 30 m
Voltage supply	3.6 V to 14 V DC			
Power consumption[2] (max.)	*3.6 V:* ≤ 1.1 W; *14 V:* ≤ 1.3 W			
Current consumption (typical)	*5 V:* 140 mA (without load)			
Shaft	Solid shaft D = 14 mm			
Mechanically permissible speed	≤ 3000 rpm			
Starting torque	≤ 0.025 Nm at 20 °C			
Moment of inertia of rotor	$65.0 \cdot 10^{-6}$ kgm^2			
Permissible shaft load	*Axial:* 30 N *Radial:* 30 N at shaft end			
Vibration 55 to 2000 Hz **Shock** 6 ms	≤ 200 m/s^2 (EN 60068-2-6) ≤ 200 m/s^2 (EN 60068-2-27)			
Operating temperature	0 °C to 50 °C			
Protection EN 60529	IP64			
Mass	≈ 1.6 kg			

***** Please select when ordering
1) With HEIDENHAIN cable; ≤ 8 MHz
2) See *General electrical information* in the *Interfaces for HEIDENHAIN Encoders* catalog

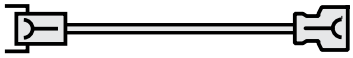
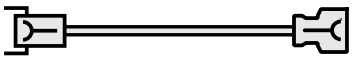
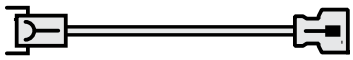
Connecting cables EnDat

8-pin M12 | 17-pin M23

			EnDat without incremental signals	**EnDat** with incremental signals
PUR connecting cable 17-pin:	[(4 × 0.14 mm²) + 4(2 × 0.14 mm²) + (4 × 0.5 mm²)]; A_P = 0.5 mm²			
PUR connecting cable 8-pin:	[(4 × 0.14 mm²) + 4 × 0.34 mm²]; A_P = 0.34 mm²		Ø 6 mm	Ø 8 mm
Complete with connector (female) and coupling (male)			368330-xx	323897-xx
Complete with connector (female) and D-sub connector (female), 15-pin			533627-xx	332115-xx
Complete with connector (female) and D-sub connector (male), 15-pin			524599-xx	324544-xx
With one connector (female)			634265-xx	309778-xx
Cable without connectors, Ø 8 mm			816329-xx	816322-xx
Mating element on connecting cable to connector on encoder cable	**Connector (female)** Ø 8 mm		–	291697-26
Connector on cable for connection to subsequent electronics	**Connector (male)** Ø 8 mm		–	291697-27
Coupling on connecting cable	**Coupling (male)** Ø 4.5 mm Ø 6 mm Ø 8 mm		–	291698-25 291698-26 291698-27
Flange socket for mounting on subsequent electronics	**Flange socket (female)**		–	315892-10
Mounted couplings	**With flange (female)** Ø 6 mm		–	291698-35
	With flange (male) Ø 6 mm Ø 8 mm		–	291698-41 291698-29
	With central fastening (male) 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 mm² + 4 × 0.34 mm²] A_P = 0.34 mm² ② **Ø 8 mm;** [2 × 2 x 0.14 mm² + 4 × 1 mm²] A_P = 1 mm² ③ **Ø 6 mm;** [2 × 2 x 0.14 mm² + 4 × 0.5 mm²] A_P = 0.5 mm²	**Cable**	**Fanuc**	**Mitsubishi**
Complete with M12 connector (female), 8-pin, and M12 coupling (male), 8-pin		①	368330-xx	
Complete with M12 connector (female), 8-pin, and M23 coupling (male), 17-pin		①	582333-xx	
Complete with M12 connector (female), 8-pin, and • Fanuc connector (female) or • Mitsubishi connector (female), 10-pin		①	646807-xx	647314-xx
Complete with M12 connector (female), 8-pin, and Mitsubishi connector (male), 20-pin		①	–	646806-xx
Complete with M23 connector (female), 17-pin, and • Fanuc connector (female) or • Mitsubishi connector (female), 10-pin		②	534855-xx	573661-xx
Complete with M23 connector (female), 17-pin, and Mitsubishi connector (male), 20-pin		③	–	367958-xx
Cable only		②	816327-xx	

A_P: Cross section of power supply lines
Ø: Cable diameter (for bend radii, see *Interfaces of HEIDENHAIN Encoders* catalog)

HEIDENHAIN

DR. JOHANNES HEIDENHAIN GmbH
Dr.-Johannes-Heidenhain-Straße 5
83301 Traunreut, Germany
☎ +49 8669 31-0
FAX +49 8669 32-5061
E-mail: info@heidenhain.de

www.heidenhain.de

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*

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