



# HEIDENHAIN



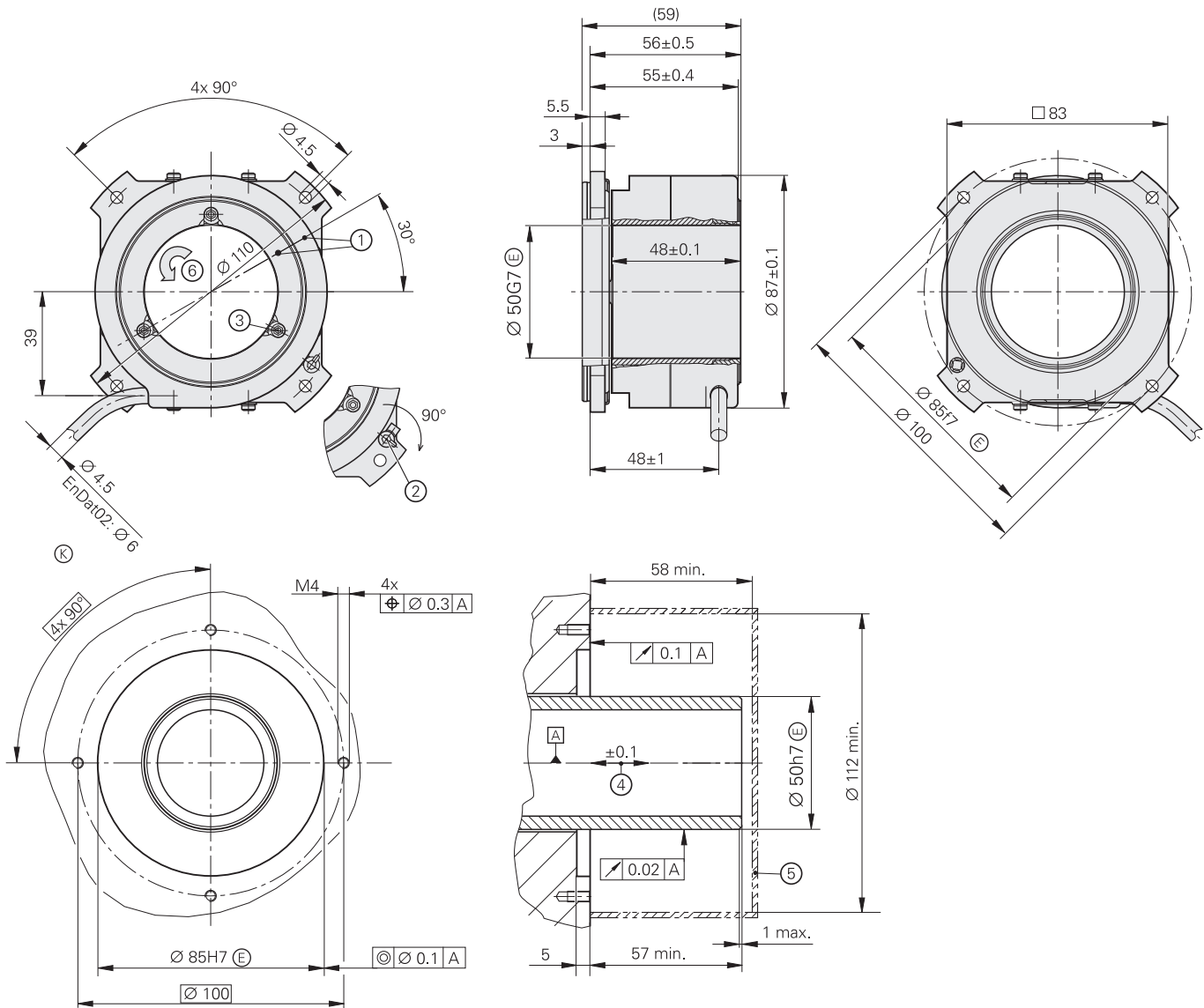
Product Information


## **ECN 2000**

Absolute Angle Encoders  
with Integral Bearing

# ECN 2000

- Mounted stator coupling
- Hollow through shaft  $\varnothing 50$  mm
- System accuracy  $\pm 10''$



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

- ▣ = Bearing of mating shaft
- ⊙ = Required mating dimensions
- ① = Mark for  $0^\circ$  position  $\pm 15^\circ$
- ② = Rotate to loosen mounting aid before putting into service. Width A/F 3
- ③ = SW3 (3 x  $120^\circ$ ), tightening torque 2.5 Nm + 0.5 Nm
- ④ = Tolerance specification includes mounting tolerances and thermal expansion. No dynamic movement permitted.
- ⑤ = Comply with protection against contact (EN 60529)
- ⑥ = Direction of shaft rotation for output signals according to interface description

	ECN 2110	ECN 2180	ECN 2190F	ECN 2190M
<b>Measuring standard</b>	DIADUR circular scale with one absolute and one incremental track (2048 lines)			
<b>System accuracy</b>	±10"			
Position error per signal period	≤ ±1.5"			
<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	33554432 (25 bits); with Fanuc α interface 8388608 (23 bits)			
Elec. permissible speed	≤ 3000 rpm for continuous position value			
Clock frequency	≤ 16 MHz	≤ 2 MHz	–	
Calculation time $t_{cal}$	≤ 6 μs	≤ 9 μs	–	
Incremental signals	–	~ 1 V <sub>PP</sub>	–	
Cutoff frequency –3 dB	–	≥ 400 kHz	–	
<b>Electrical connection*</b>	Cable, 1 m, with 8-pin M12 coupling (male)	Cable, 1 m, with 17-pin M23 coupling (male)	Cable, 1 m, with or without 8-pin M12 coupling (male)	
Cable length <sup>1)</sup>	≤ 150 m		≤ 50 m	≤ 30 m
Voltage supply	DC 3.6 V to 14 V			
Power consumption <sup>2)</sup> (maximum)	3.6 V: ≤ 0.7 W 14 V: ≤ 0.8 W			
Current consumption (typical)	5 V: 100 mA (without load)			
<b>Shaft</b>	Hollow through shaft, 50 mm			
Mechanically permissible speed	≤ 3000 rpm			
Starting torque (at 20 °C)	≤ 0.2 Nm			
Moment of inertia of rotor	220 · 10 <sup>-6</sup> kgm <sup>2</sup>			
Permissible axial motion of measured shaft	±0.1 mm			
<b>Natural frequency</b>	≥ 1000 Hz			
<b>Vibration</b> 55 Hz to 2000 Hz <b>Shock</b> 6 ms	≤ 100 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>Stationary cable:</i> –20 °C to 60 °C			
<b>Protection</b> EN 60529	IP 64			
<b>Mass</b>	≈ 0.7 kg			




\* Please select when ordering

<sup>1)</sup> With HEIDENHAIN cable




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

# Electrical connection


## EnDat connecting cable without incremental signals

PUR connecting cable $\varnothing 6 \text{ mm}; 2(2 \times 0.09 \text{ mm}^2) + 2(2 \times 0.16 \text{ mm}^2)$		$A_p = 2 \times 0.16 \text{ mm}^2$
<b>Complete</b> with 8-pin M12 connector (female) and 8-pin M12 coupling (male)		1036372-xx
<b>Complete</b> with 8-pin M12 connector (female) and 15-pin D-sub connector (female)		1036521-xx
<b>Complete</b> with 15-pin connector (female) and 15-pin D-sub connector (male)		1036526-xx

## EnDat adapter cable with incremental signals

PUR connecting cable $\varnothing 8 \text{ mm}; 4(2 \times 0.16 \text{ mm}^2) + 4 \times 0.5 \text{ mm}^2 + 4 \times 0.16 \text{ mm}^2$		$A_p = 0.5 \text{ mm}^2$
<b>With one connector</b> 17-pin M23 (female)		309778-xx
<b>Complete</b> with 17-pin M23 connector (female) and 15-pin D-sub connector (female)		332115-xx
<b>Complete</b> with 17-pin M23 connector (female) and 15-pin D-sub connector (male)		324544-xx

## Fanuc/Mitsubishi connecting cable

PUR connecting cable $\varnothing 6 \text{ mm}; 2(2 \times 0.09 \text{ mm}^2) + 2(2 \times 0.16 \text{ mm}^2)$		$A_p = 2 \times 0.16 \text{ mm}^2$	Fanuc	Mitsubishi
<b>Complete</b> with 8-pin M12 connector (female) and 8-pin M12 coupling (male)			1036372-xx	

$A_p$ : Cross section of power supply lines

$\varnothing$ : Cable diameter (for bend radii see the brochure *Interfaces of HEIDENHAIN Encoders*)

For more cables, see the brochure *Angle Encoders with Integral Bearing*.

# 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 document edition valid when the order is made.



### For more information:

Comply with the requirements described in the following documents to ensure correct operation:

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

591109-xx  
1078628-xx

For brochures and product information sheets, visit [www.heidenhain.de](http://www.heidenhain.de).