



# HEIDENHAIN



**Special Product**  
— only on request —

Product Information

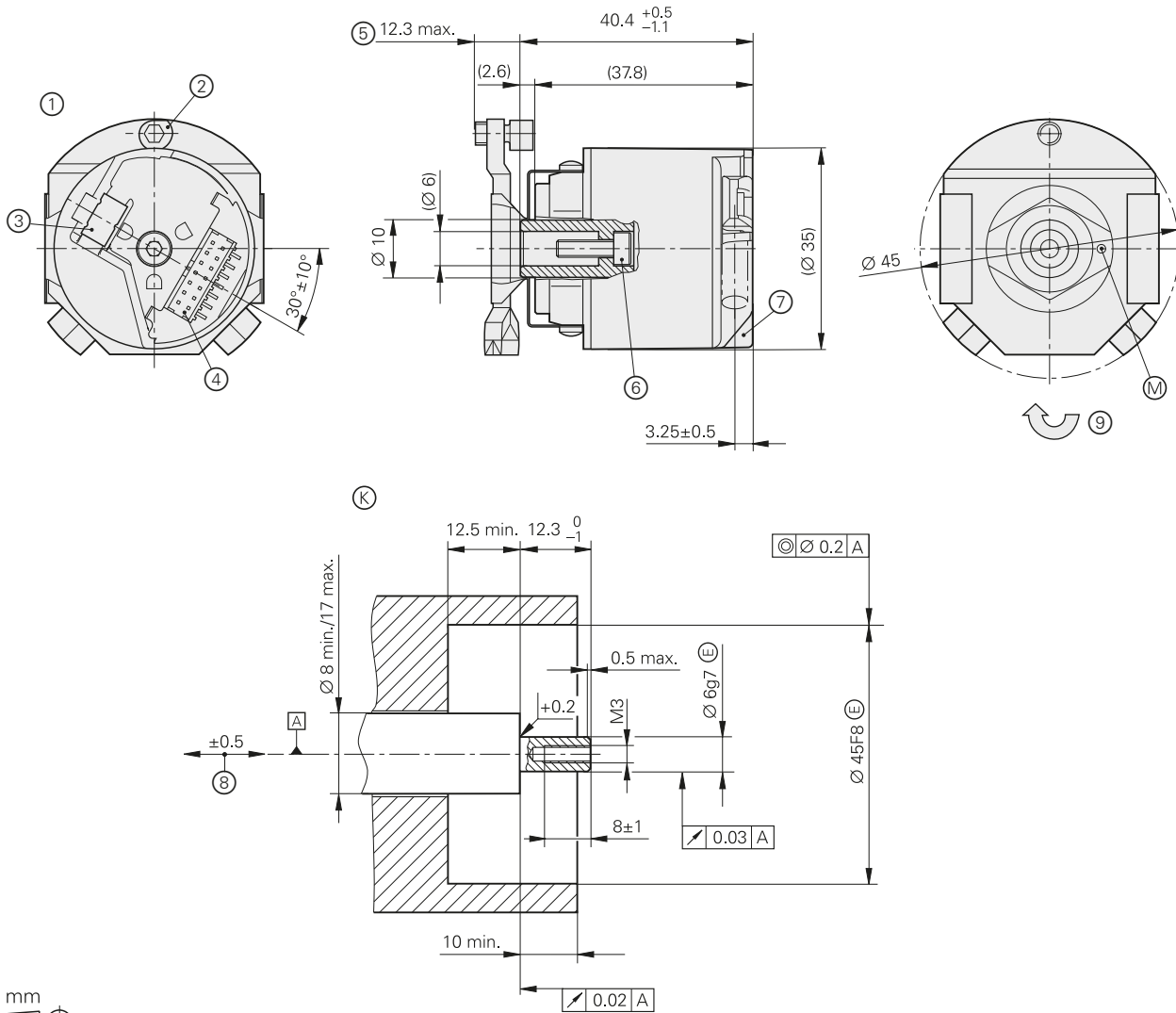
## **ERN 1185**

Incremental Rotary Encoder  
with Z1 Track

# ERN 1185

Rotary encoders with integral bearing for integration in motors

- Mounted stator coupling  $\varnothing 45$  mm
- Compact design
- Blind hollow shaft





mm



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

- ▣ = Bearing of mating shaft
- ⊗ = Required mating dimensions
- ⊙ = Measuring point for operating temperature
- ① = Rotary encoder shown without cover
- ② = To fasten the coupling, turn the eccentric screw (M4) to the right by approx.  $90^\circ$ . Tightening torque  $2 \pm 0.1$  Nm
- ③ = Cable outlet for cables with crimp sleeve  $4.3 \pm 0.1 - 7$  long
- ④ = FCI connector, 14-pin
- ⑤ = Variable depending on the coupling
- ⑥ = Screw M3 x 10 ISO 4762 SW2.5 with patch coating, tightening torque  $1.1 \pm 0.1$  Nm
- ⑦ = Removable cover
- ⑧ = Compensation of mounting tolerances and thermal expansion, no dynamic motion permitted
- ⑨ = Direction of shaft rotation for output signals as per the interface description

		<b>Incremental</b>
		<b>ERN 1185</b>
<b>Incremental signals</b>		 $V_{PP}^{1)}$
Line count*/system accuracy		512/±60" 2048/±40"
Reference mark		One
Cutoff frequency	-3 dB	512 lines: ≥ 100 kHz 2048 lines: ≥ 350 kHz
<b>Absolute position values</b>		 $V_{PP}^{1)}$
Position values/revolution		Z1 track <sup>2)</sup>
<b>Electrical connection</b>		Via PCB connector, 14-pin
Voltage supply		DC 5 V ±0.5 V
Current consumption (without load)		≤ 120 mA
<b>Shaft</b>		Blind hollow shaft Ø 6 mm
Mechanically permissible speed		12000 rpm
Starting torque		≤ 0.001 Nm (at +20 °C)
Moment of inertia of rotor		Approx. $0.3 \cdot 10^{-6} \text{ kgm}^2$
Natural frequency of the stator coupling		≥ 1500 Hz
Permissible axial motion of measured shaft		±0.5 mm
<b>Vibration</b> 55 Hz to 2000 Hz <b>Shock</b> 6 ms		≤ 100 m/s <sup>2</sup> (EN 60068-2-6) ≤ 1000 m/s <sup>2</sup> (EN 60068-2-27)
<b>Max. operating temperature</b>		+115 °C
<b>Min. operating temperature</b>		-30 °C
<b>Protection</b> EN 60529		IP40 when mounted
<b>Mass</b>		≈ 0.1 kg

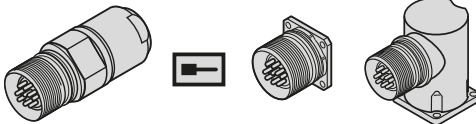
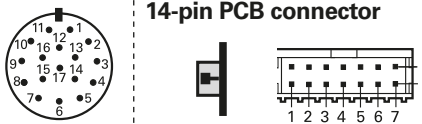



\* Please select when ordering




- <sup>1)</sup> Restricted tolerances    Signal amplitude:    0.75  $V_{PP}$  to 1.2  $V_{PP}$   
    Asymmetry:            0.05  
    Amplitude ratio:    0.9 to 1.1  
    Phase angle:         90° ±5° elec.  
    Signal-to-noise ratio E, F: 100 mV

- <sup>2)</sup> For sine commutation: One sine and one cosine signal per revolution

# Electrical connection



## Pin layout

17-pin HEIDENHAIN coupling or flange socket M23						14-pin PCB connector					
											
Voltage supply						Incremental signals					
	<b>7</b>	<b>1</b>	<b>10</b>	<b>4</b>	<b>11</b>	<b>15</b>	<b>16</b>	<b>12</b>	<b>13</b>	<b>3</b>	<b>2</b>
	<b>1b</b>	<b>7a</b>	<b>5b</b>	<b>3a</b>	/	<b>6b</b>	<b>2a</b>	<b>3b</b>	<b>5a</b>	<b>4b</b>	<b>4a</b>
	Brown/ Green	Blue	White/ Green	White	/	Green/ Black	Yellow/ Black	Blue/ Black	Red/ Black	Red	Black
	<b>U<sub>P</sub></b>	<b>Sensor</b> U <sub>P</sub>	<b>0V</b>	<b>Sensor</b> 0V	<b>Internal shield</b>	<b>A+</b>	<b>A-</b>	<b>B+</b>	<b>B-</b>	<b>R+</b>	<b>R-</b>

Other signals						
	<b>14</b>	<b>17</b>	<b>9</b>	<b>8</b>	<b>5</b>	<b>6</b>
	<b>7b</b>	<b>1a</b>	<b>2b</b>	<b>6a</b>	/	/
	Gray	Pink	Yellow	Violet	Green	Brown
	<b>C+</b>	<b>C-</b>	<b>D+</b>	<b>D-</b>	<b>T+</b> <sup>1)</sup>	<b>T-</b> <sup>1)</sup>

**Cable shield** connected to housing;  
**U<sub>P</sub>** = Voltage supply; **T** = Temperature  
**Sensor:** The sensor line is connected internally with the corresponding power line.  
 Vacant pins or wires must not be used!

<sup>1)</sup> Only for cables inside the motor housing

Cables inside the motor housing		
Cable design	A <sub>P</sub> = 16 x 0.057 mm <sup>2</sup> Cable diameter 4.5 mm with crimp sleeve diameter 4.5 mm	
<b>Complete</b> PCB connector 14-pin/M23 right-angle flange socket, male, 17-pin		316594-xx
<b>With one connector</b> PCB connector 14-pin		317900-xx

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

# HEIDENHAIN

**DR. JOHANNES HEIDENHAIN GmbH**

Dr.-Johannes-Heidenhain-Straße 5

83301 Traunreut, Germany

+49 8669 31-0

+49 8669 32-5061

E-mail: info@heidenhain.de

[www.heidenhain.de](http://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 document edition valid when the order is made.



### For more information:

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

- Brochure *Encoders for Servo Drives* 208922-xx
- Brochure *Interfaces of HEIDENHAIN Encoders* 1078628-xx
- Brochure *Cables and Connectors* 1206103-xx

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