



# HEIDENHAIN



Product Information

## **ERN 1185**

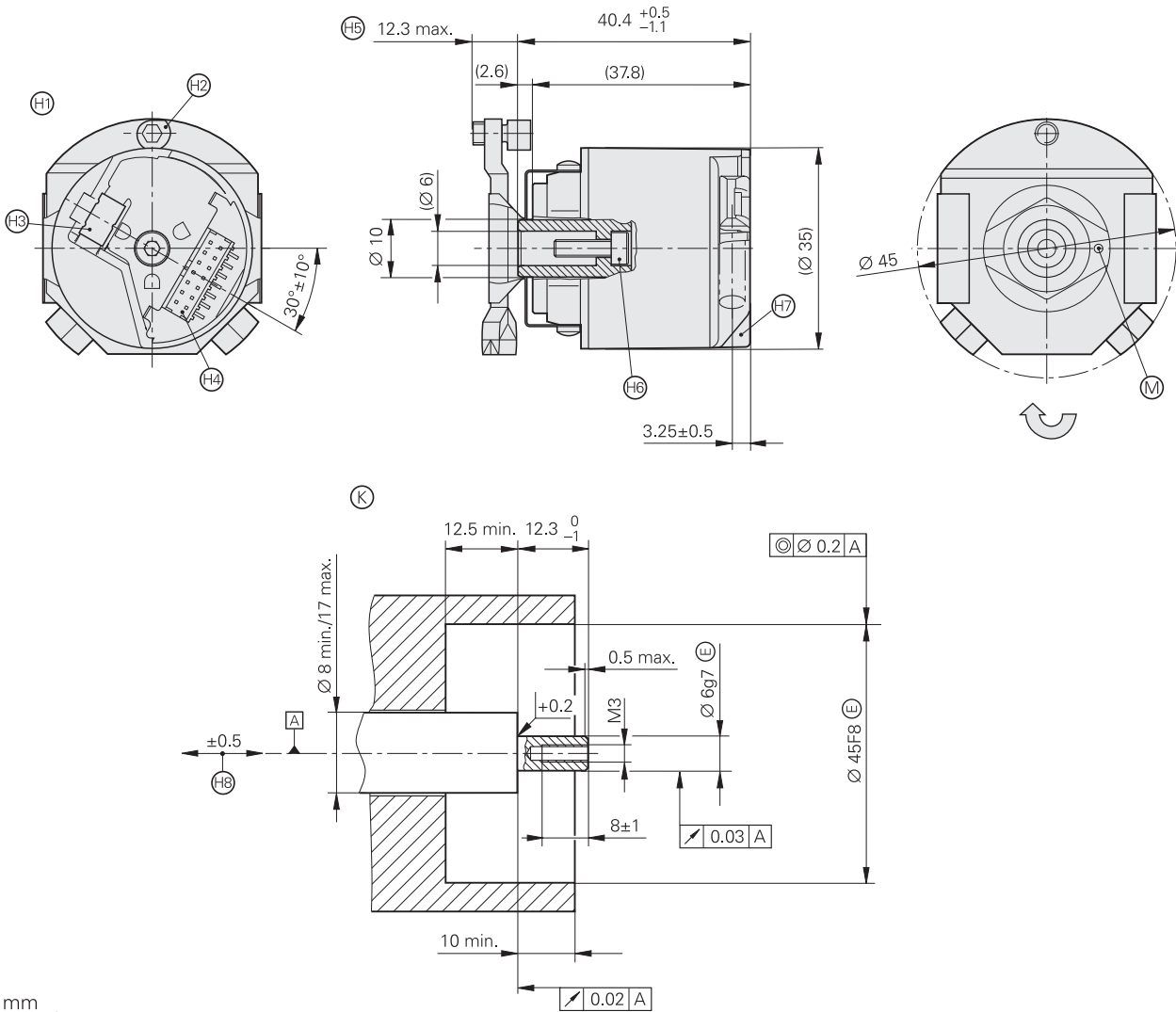
Incremental Rotary Encoder  
with Z1 Track

September 2014

# 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  
 < 6 mm:  $\pm 0.2$  mm

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

		Incremental ERN 1185
<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>Voltage supply</b>		5 V ± 10 %
<b>Current consumption</b> without load		≤ 120 mA
<b>Electrical connection</b>		Via PCB connector, 14-pin
<b>Shaft</b>		Blind hollow shaft Ø 6 mm
<b>Mechanically permissible speed n</b>		12000 min <sup>-1</sup>
<b>Starting torque</b>		≤ 0.001 Nm (at 20 °C)
<b>Moment of inertia</b> of rotor		Approx. $0.3 \cdot 10^{-6}$ kgm <sup>2</sup>
<b>Natural frequency of the stator coupling</b>		≥ 1500 Hz
<b>Permissible axial motion of measured shaft</b>		± 0.5 mm
<b>Vibration</b> 55 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 temp.</b>		-30 °C
<b>Protection</b> EN 60529		IP 40 when mounted
<b>Weight</b>		≈ 0.1 kg

\* Please select when ordering

<sup>1)</sup> Restricted tolerances    Signal amplitude:    0.75 to 1.2  $V_{SS}$   
    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>/</b>	<b>6b</b>	<b>2a</b>	<b>3b</b>	<b>5a</b>	<b>4b</b>	<b>4a</b>
	<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>
	Brown/ Green	Blue	White/ Green	White	/	Green/ Black	Yellow/ Black	Blue/ Black	Red/ Black	Red	Black

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>	<b>/</b>	<b>/</b>
	<b>C+</b>	<b>C-</b>	<b>D+</b>	<b>D-</b>	<b>T+</b> <sup>1)</sup>	<b>T-</b> <sup>1)</sup>
	Gray	Pink	Yellow	Violet	Green	Brown

**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 diameter 4.5 mm  
 16xAWG30/7 for

	PCB connector	Crimp sleeve	Complete With PCB connector and right-angle socket M23, 17-pin	With one connector With PCB connector
	14-pin	Ø 4.5 mm		
<b>ERN 1185</b>	14-pin	Ø 4.5 mm	316594-xx	317900-xx

## PUR connecting cables

	17-pin: [(4 × 0.14 mm <sup>2</sup> ) + 4(2 × 0.14 mm <sup>2</sup> ) + (4 × 0.5 mm <sup>2</sup> )] Ø 8 mm
<b>Complete</b> with connector (female) and coupling (male)	323897-xx
<b>Complete</b> with connector (female) and D-sub connector (female) for IK 220	332115-xx
<b>Complete</b> with connector (female) and D-sub connector (male) for IK 215	324544-xx
<b>With one</b> connector (female)	309778-xx

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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: *Position Encoders for Servo Drives*
- Catalog: *Interfaces of HEIDENHAIN Encoders*