



HEIDENHAIN



Product Information

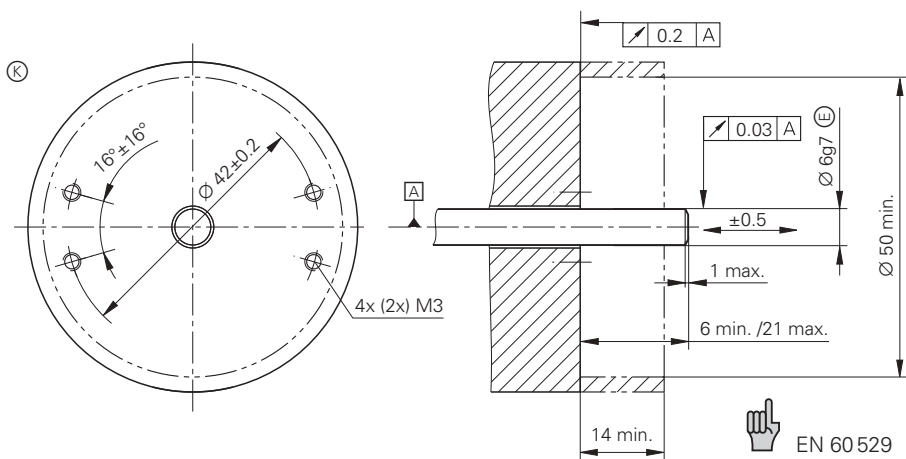
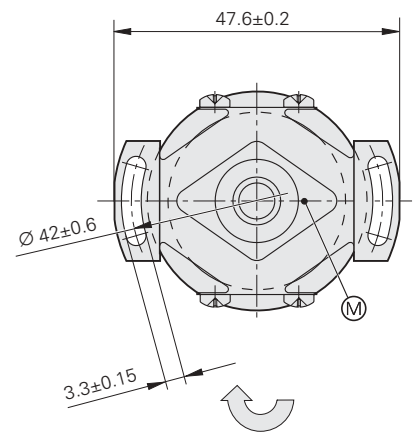
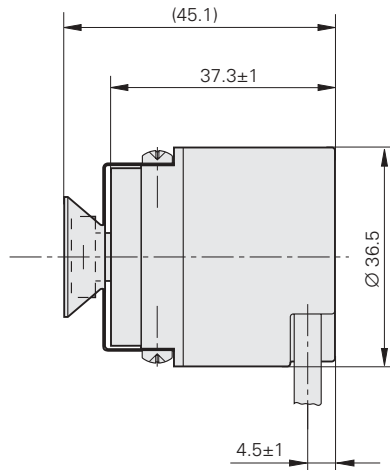
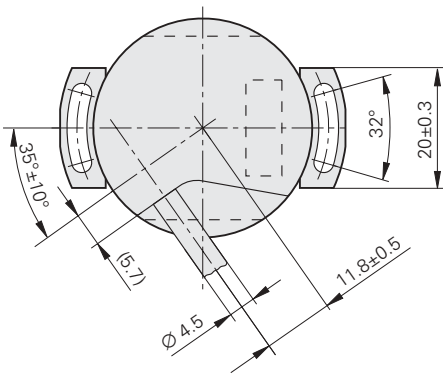
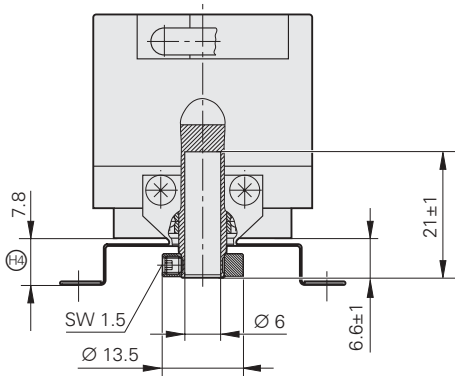
ERN 1085

Incremental Rotary Encoder
with Z1 track

April 2010

ERN 1085

- Rotary encoder with mounted stator coupling
- Compact dimensions
- Blind hollow shaft $\varnothing 6$ mm
- Z1 track for sine commutation



Dimensions in mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm: ± 0.2 mm

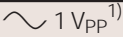
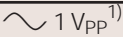
Cable radial, also usable axially

ⓐ = Ball bearing

Ⓚ = Required mating dimensions

Ⓜ = Variable depending on the coupling

↻ Direction of shaft rotation for output signals is described in interface description.

ERN 1085	
Incremental signals	 1 V _{PP} ¹⁾
Line count*/ System accuracy	512/± 60" 2048/± 40"
Reference mark	One
Cutoff frequency -3dB	512 lines: ≥ 100 kHz 2048 lines: ≥ 350 kHz
Absolute position values	 1 V _{PP} ¹⁾
Position values/rev	Z1 track for sine commutation: One sine and one cosine signal per revolution
Power supply	5 V ± 5%
Current consumption (without load)	≤ 150 mA
Electrical connection	Cable 1 m, without connecting element
Cable length	≤ 150 m
Shaft	Blind hollow shaft Ø 6 mm
Mech. permissible speed <i>n</i>	10000 rpm
Starting torque	≤ 0.001 Nm (at 20 °C)
Moment of inertia of rotor	Approx. 0.5 · 10 ⁻⁶ kgm ²
Natural frequency of the stator coupling	≥ 950 Hz ²⁾
Permissible axial motion of measured shaft	± 0.5 mm
Vibration 55 to 2000 Hz Shock 6 ms	≤ 100 m/s ² (IEC 60068-2-6) ≤ 1000 m/s ² (IEC 60068-2-27)
Max. operating temperature	100 °C
Min. operating temperature	<i>Rigid configuration:</i> -30 °C <i>Moving cable:</i> -10 °C
Protection IEC 60529	IP 64
Weight	Approx. 0.1 kg

* Please select when ordering

¹⁾ Restricted tolerances

Signal amplitude 0.75 to 1.2 V_{PP}

²⁾ When coupling is fastened with four screws or two screws with special washers

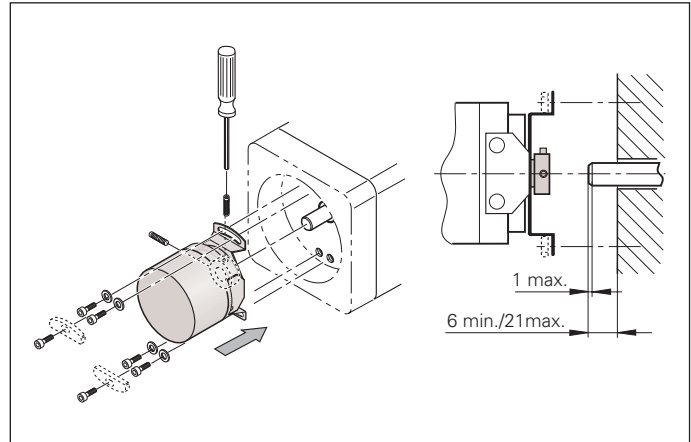
Mounting

The **ERN 1085** rotary encoder features an integral bearing and stator coupling. They compensate radial runout and alignment errors without significantly reducing the accuracy. The encoder shaft is directly connected with the shaft to be measured. During angular acceleration of the shaft, the stator coupling must absorb only that torque caused by friction in the bearing.

Mounting

The rotary encoder is slid by its hollow shaft onto the measured shaft, and the rotor is fastened by two screws or three eccentric clamps.

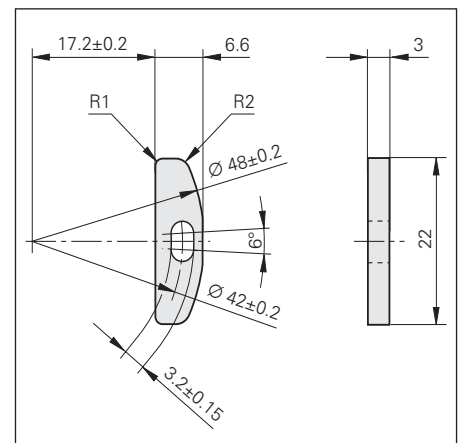
Dynamic applications require the highest possible natural frequencies f_N of the system. This is attained by a coupling with four screws or with washer (see *Mounting Accessories*).



Mounting Accessories

Washer

For increasing the natural frequency f_N and mounting with only two screws
Id. Nr. 334 653-01



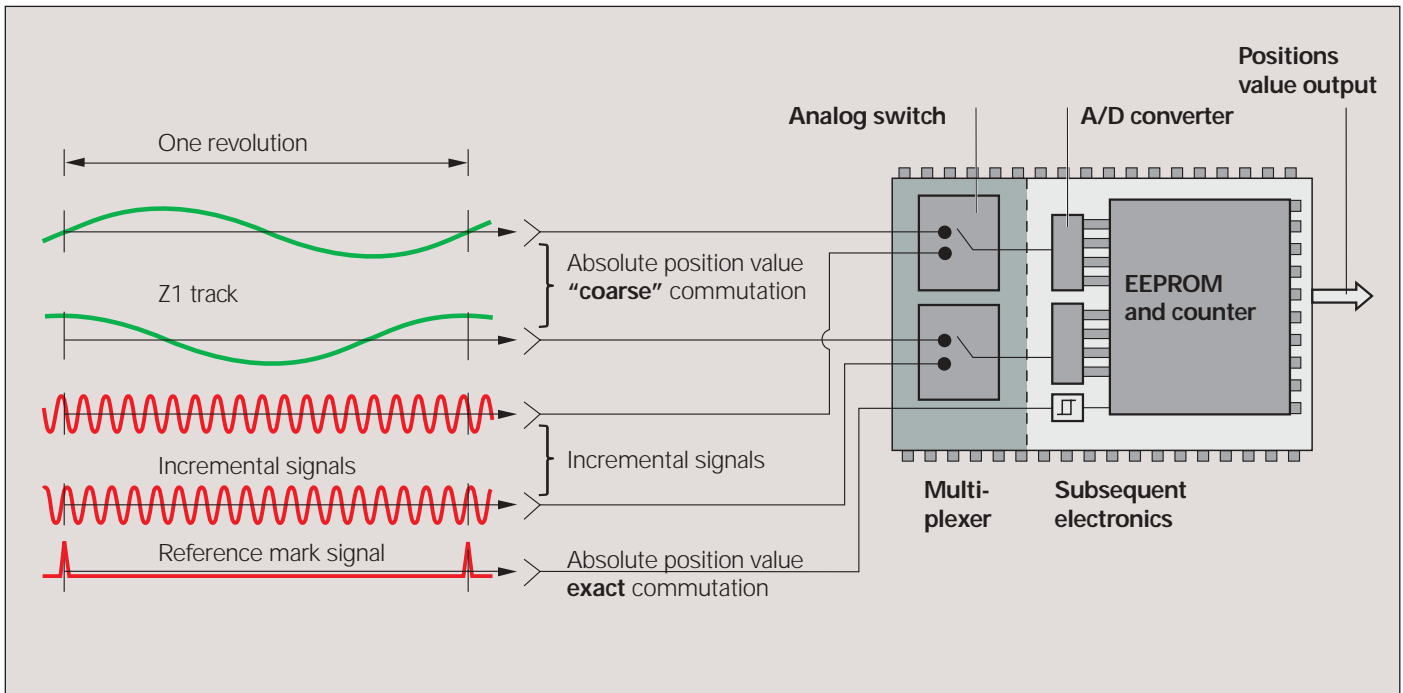
Interfaces

Commutation Signals for Sinusoidal Commutation

The **commutation signals C and D** are taken from the so-called Z1 track and form one sine or cosine period per revolution. They have a signal amplitude of typically 1 V_{PP} at 1 kΩ. The input circuitry of the subsequent electronics is the same as for the ~ 1 V_{PP} interface. The required terminating resistor of Z₀, however, is 1 kΩ instead of 120 Ω.

Interface	Sinusoidal voltage signals ~ 1 V _{PP}
Commutation signals	Two nearly sinusoidal signals C and D For signal levels see <i>Incremental Signals</i> ~ 1 V _{PP}
Incremental signals	See <i>Incremental Signals</i> ~ 1 V _{PP}
Connecting cable	HEIDENHAIN cable with shielding PUR [4(2 x 0.14 mm ²) + 4(2 x 0.14 mm ²) + (4 x 0.5 mm ²)] Max. 150 m 6 ns/m
Cable length	
Propagation time	

Electronic commutation with Z1 track








Pin layout

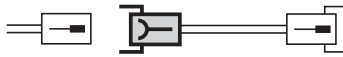
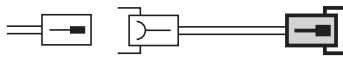
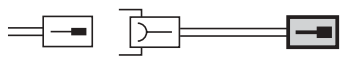
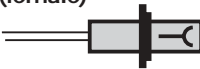

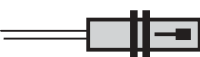
17-pin coupling M23			17-pin connector M23								
	Power supply				Incremental signals						
	7	1	10	4	11	15	16	12	13	3	2
	U _P	Sensor U _P	0V	Sensor 0V	Inside shield	A+	A-	B+	B-	R+	R-
	Brown/Green	Blue	White/Green	White	/	Green/Black	Yellow/Black	Blue/Black	Red/Black	Red	Black

	Other signals			
	14	17	9	8
	C+	C-	D+	D-
	Gray	Pink	Yellow	Violet

Shield on housing
U_P = power supply voltage
Sensor: The sensor line is connected internally with the corresponding power line.
 Vacant pins or wires must not be used!

Connecting Elements and Cables

		17-pin M23
PUR connecting cable Ø 8 mm 17-pin: [(4 x 0.14 mm ²) + 4(2 x 0.14 mm ²) + (4 x 0.5 mm ²)]		
Complete with M23 connector (female) and M23 coupling (male)		323 897-xx
Complete with M23 connector (female) and D-sub connector (female) for IK 220		332 115-xx
Complete with M23 connector (female) and D-sub connector (male) for IK 115/IK 215		324 544-xx
With one connector M23 (female)		309 778-xx
Cable only , Ø 8 mm		266 306-01

Mating element on connecting cable for connecting element on encoder	M23 connector (female) for cable Ø 8 mm 	291 697-26
Connector on cable for connection to subsequent electronics	M23 connector (male) for cable Ø 8 mm Ø 6 mm 	291 697-27
Coupling on connecting cable	M23 coupling (male) for cable Ø 4.5 mm Ø 6 mm Ø 8 mm 	291 698-25 291 698-26 291 698-27
M23 mounted couplings	With flange (female) Ø 6 mm Ø 8 mm 	291 698-35
	With flange (male) Ø 6 mm Ø 8 mm 	291 698-41 291 698-29
	With central fastening (male) Ø 6 mm 	291 698-37

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For more information

- Brochure: *Encoders for Servo Drives RotaryEncoders*