Linear Encoders
Angle Encoders
Rotary Encoders
3-D Touch Probes
Digital Readouts
Numerical Controls

New Versions of ROD 400/ERN 400 Series Incremental Rotary Encoders

For years, rotary encoders of the ROD 400 and ERN 400 series from HEIDENHAIN have served as the industry standard. They are critical components for applications in automation, in machines, production systems and handling devices, in drive technology and many others.

There they reliably measure rotational motion and provide accurate position and rotational speed information over a broad dynamic range.

With its rotary encoders, HEIDENHAIN has proven for many years to be a reliable partner while contributing to high system availability.

The ROD 400 and ERN 400 series have been fundamentally redesigned with the goal of achieving remarkable improvements for the user.

The **acceleration load capacity** has been substantially increased. Now, all ROD 400 are designed for vibration up to 300 m/s^2 and shock up to 5000 m/s^2 (see also *Specifications*). This enables them to function even under extreme operating conditions.

The **flange socket versions** for ROD 400 and ERN 400 have been unified and their overall length significantly reduced. Now the same HEIDENHAIN connectors can be used for both series as are used for other encoders.

The special design of the **cable exit** makes it possible to connect the cable either axially or radially. Both measures reduce the number of variants, simplify the ordering process and increase product availability.

For many models, the **housing lengths** have been reduced. Regardless of whether the rotary encoder has a cable exit or an axial or radial flange socket, the housing length will always be equally small. This enables you to enjoy the advantages of the various connection types even where installation space is limited.

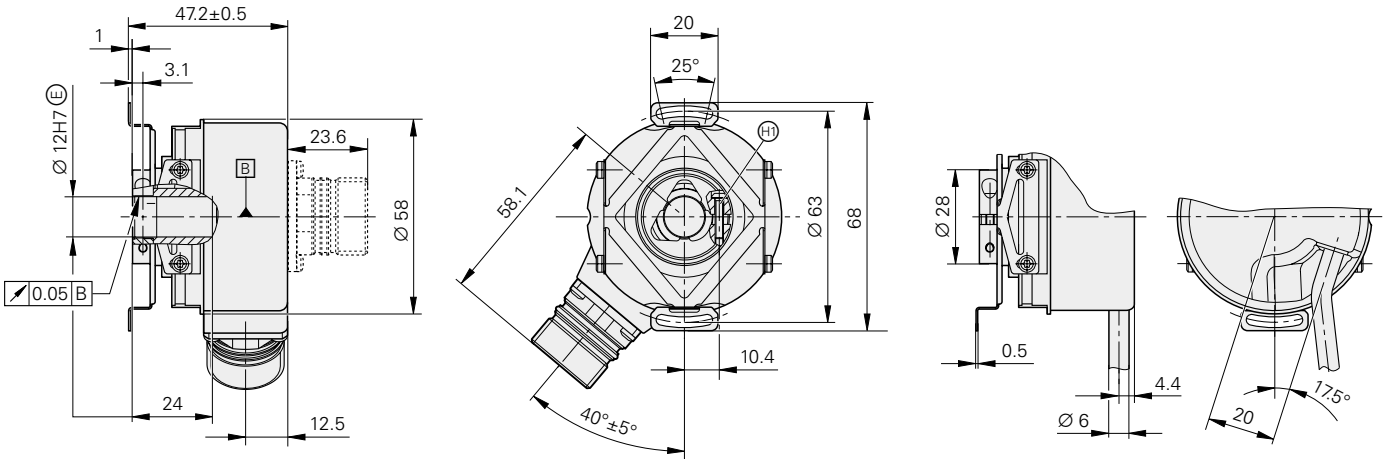
ERN 400 Series

- **Rotary encoders with mounted stator coupling**
- **Blind hollow shaft or hollow through shaft**

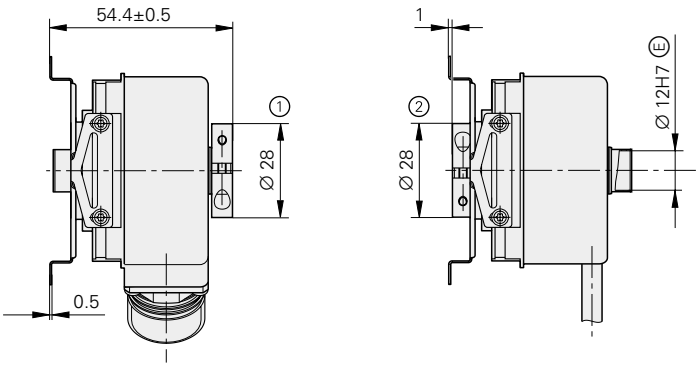
Dimensions in mm

Tolerancing ISO 8015
ISO 2768 - m H

Blind hollow shaft

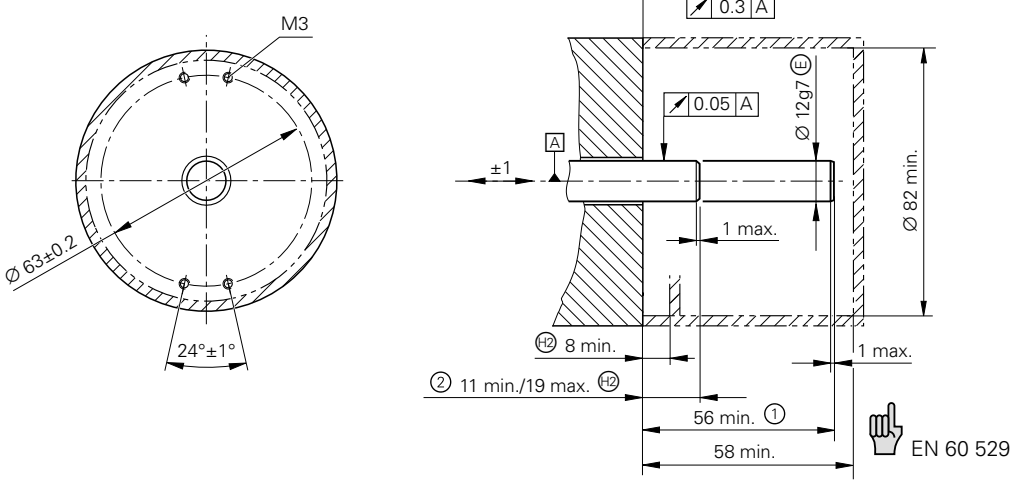


Hollow through shaft



A = Bearing
B = Encoder bearing
H1 = Clamping screw
H2 = Blind hollow shaft
1 = Version with clamping ring on housing side (as delivered)
2 = Version with clamping ring on coupling side (optionally mountable)

Required mating dimensions



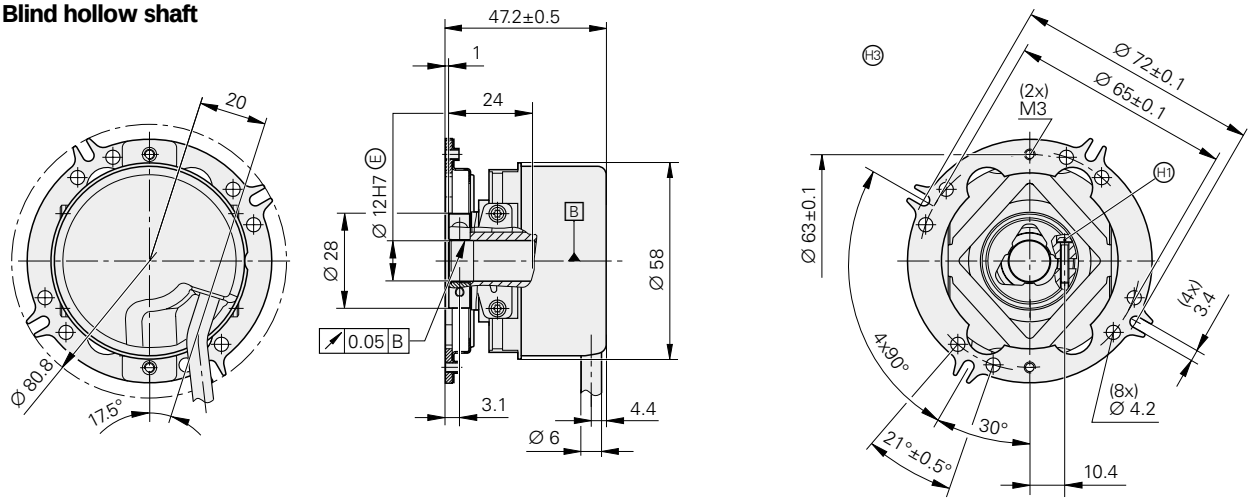
ERN 400 Series

- **Rotary encoders with mounted universal stator coupling**
- **Blind hollow shaft or hollow through shaft**

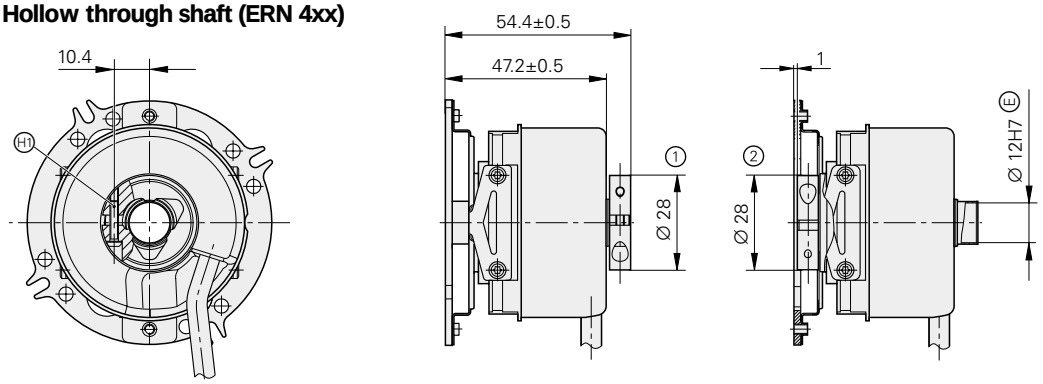
Dimensions in mm

Tolerancing ISO 8015
ISO 2768 - m H

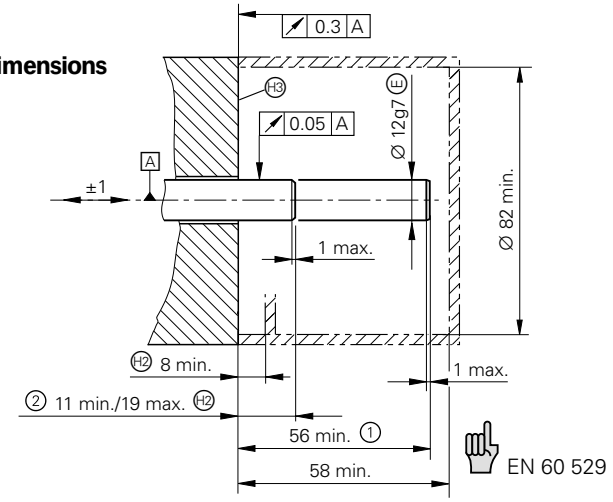
Blind hollow shaft



Hollow through shaft (ERN 4xx)



Required mating dimensions



A = Bearing
B = Encoder bearing
H1 = Clamping screw
H2 = Blind hollow shaft
H3 = Hole circle for fastening, see coupling
1 = Version with clamping ring on housing side (as delivered)
2 = Version with clamping ring on coupling side (optionally mountable)

	ERN 420	ERN 460	ERN 430	ERN 480
Incremental signals	⊓⊔ TTL		⊓⊔ HTL	∿ 1 V_{PP}
Line counts*	250[1] 500[1] **1000 1024 1250 2000 2048 2500 3600 4096 5000**			
Scanning frequency (–3 dB)	–			≥ 180 kHz approx.
(–6 dB)	–			≥ 450 kHz approx.
Max.	Max. 300 kHz			–
Power supply*/Current consumption Max.	5 V ±10% 120 mA	10 to 30 V 100 mA	10 to 30 V 150 mA	5 V ±10% 120 mA
(without load) Approx.	35 mA	20 mA with 15 V	60 mA with 15 V	30 mA
Electrical connection*	**Flange socket** axial (only with blind holllow shaft) or radial **Cable** 1 m, configurable to axial or radial, **without connecting element**			
Max. cable length	100 m (329 ft)		300 m (984 ft)	150 m (492 ft)
Hollow shaft* inside diameter	**Blind hollow shaft** or hollow through shaft **D = 12 mm**			
Mech. permissible speed	Max. 12000 rpm (max. 6000 rpm at max. operating temperature)			
Starting torque at 20 °C (68 °F)	*Blind hollow shaft:* ≤ 0.01 Nm *Hollow through shaft:* ≤ 0.025 Nm			
Moment of inertia of rotor	$3.1 \cdot 10^{-6}$ kgm^2			
Permissible axial motion of measured shaft	± 1 mm			
Vibration (55 to 2000 Hz)	≤ 300 m/s^2 (IEC 60068-2-6)			
Shock (6 ms)	≤ 5000 m/s^2 (IEC 60068-2-27)			
Max. operating temperature	100 °C (212 °F)	70 °C (158 °F)	100 °C (212 °F)	
Min. operating temperature	*Flange socket or fixed cable:* –40 °C *Moving cable:* –10 °C			
Protection (IEC 60529)	*Shaft inlet:* IP 64 *Housing:* IP 67 (blind hollow shaft) IP 66 (hollow through shaft)			
Weight	Approx. 0.25 kg			

Bold: These preferred versions are available on short notice
***** Please indicate when ordering
[1] Not with ERN 480

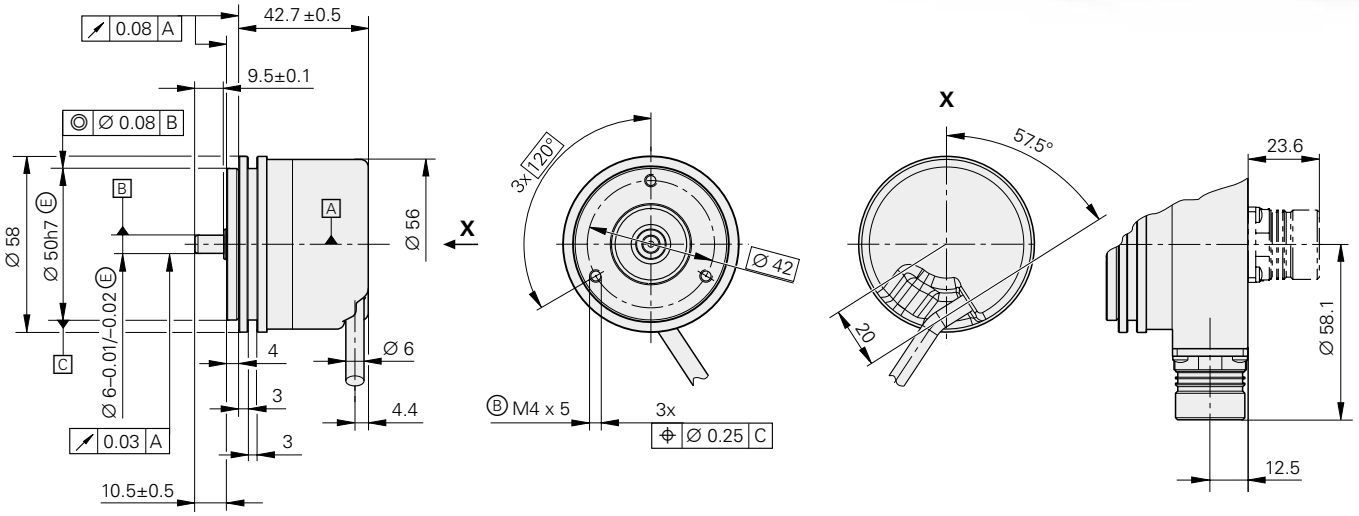
ROD 400 Series with Synchro Flange

Rotary encoder for separate shaft coupling

Dimensions in mm

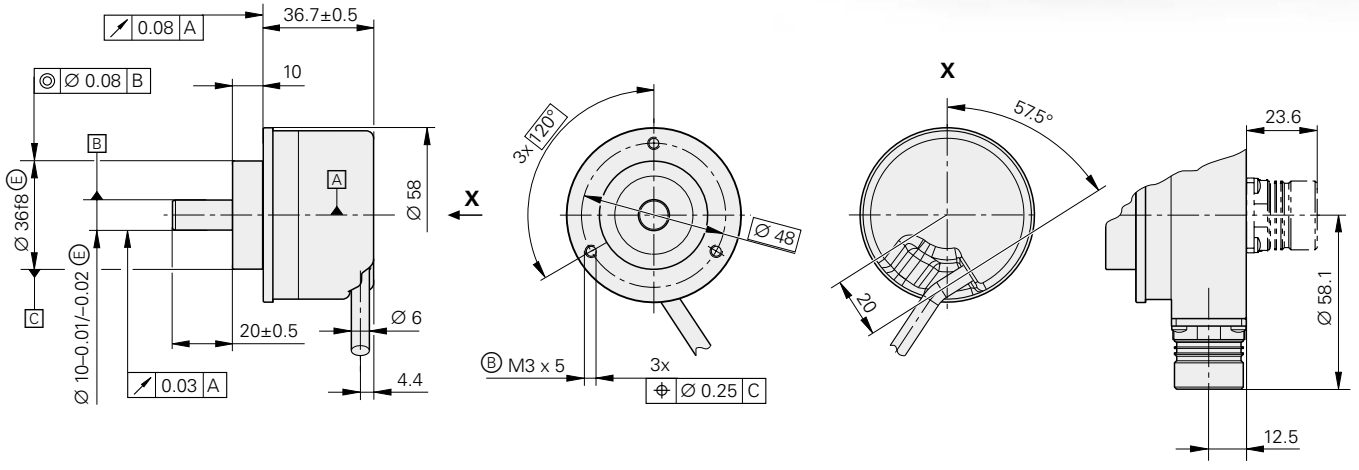
Tolerancing ISO 8015
ISO 2768 - m H

A = Bearing
B = Threaded mounting hole



ROD 400 Series with Clamping Flange

Rotary encoder for separate shaft coupling



Rotary Encoders	**Incremental**			
With synchro flange	**ROD 426**	**ROD 466**	**ROD 436**	**ROD 486**
With clamping flange	**ROD 420**	**–**	**ROD 430**	**ROD 480**
Incremental signals	⊓⊔ TTL		⊓⊔ HTL	∿ 1 V_{PP}
Line counts/ Signal periods*	50 100 150 200 250 360 **500** 512 720			–
	1000 1024 1250 1500 1800 **2000 2048 2500 3600 4096 5000**			
Signal periods[1]*	6000 8192 9000 10000		–	
Scanning frequency (–3 dB) (–6 dB) **Scanning frequency**	– – Max. 300 kHz			≥ 180 kHz approx. ≥ 450 kHz approx. –
Power supply*/Current consumption Max. (without load) Approx.	5 V ±10%/ 120 mA 35 mA	10 to 30 V/ 100 mA 20 mA with 15 V	10 to 30 V/ 150 mA 60 mA with 15 V	5 V ±10%/ 120 mA 30 mA
Electrical connection*	**Flange socket** axial or radial **Cable 1 m**/5 m, configurable to axial or radial, with or **without coupling**			
Max. cable length	100 m (329 ft)		300 m (984 ft)	150 m (492 ft)
Mech. permissible speed	Max. 16000 rpm			
Starting torque	≤ 0.01 Nm (at 20 °C)			
Moment of inertia of rotor	$2.3 \cdot 10^{-6}$ kgm^2			
Shaft load	*n* ≤ *6000 rpm:* axial 40 N/radial 60 N at shaft end *n* > *6000 rpm:* axial 10 N/radial 20 N at shaft end			
Vibration (55 to 2000 Hz) **Shock** (6 ms)	≤ 300 m/s^2 (IEC 60068-2-6) ≤ 5000 m/s^2 (IEC 60068-2-27)			
Max. operating temperature	100 °C (212 °F)	70 °C (158 °F)	100 °C (212 °F)	
Min. operating temperature	*Flange socket or fixed cable:* –40 °C *Moving cable:* –10 °C			
Protection (IEC 60529)	IP 67 at housing; IP 64 at shaft end[2]			
Weight	Approx. 0.25 kg			

Bold: These preferred versions are available on short notice
***** Please indicate when ordering
[1] Only with ROD 426/ROD 466 through integrated signal doubling
[2] IP 66 on request

HEIDENHAIN

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Standards (ISO, EN, etc.) apply only where explicitly stated in the catalog.

For more information:
• Brochure: *Rotary Encoders*

389 588-21 · 20 · 4/2003 · F&W · Printed in Germany · Subject to change without notice