# ECN, EQN, ERN rotary encoders

With integral bearing and mounted stator coupling
IP 64 degree of protection

HEIDENHAIN **ECN**, **EQN** and **ERN** rotary encoders with integral bearings and stator-mounted couplings operate by photoelectric scanning. They are characterized by their simple mounting and short overall length. Possible applications range from simple measuring tasks to position and speed control on servo drives. The hollow shaft of these encoders is slid directly onto and fastened to 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. Rotary encoders with stator coupling therefore provide excellent dynamic performance and a high natural frequency.

Some rotary encoders are suitable in a special version for potentially explosive atmospheres in accordance with Directive 94/9/EG, **(ATEX)**. They comply with Equipment Group II, meet the requirements of Category 2 and can be used for Zones 1 and 21 as well as 2 and 22.
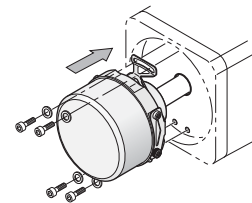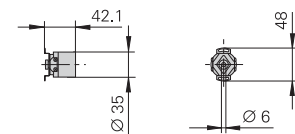
ECN/EQN/ERN 1000
ECN/EQN/ERN 400
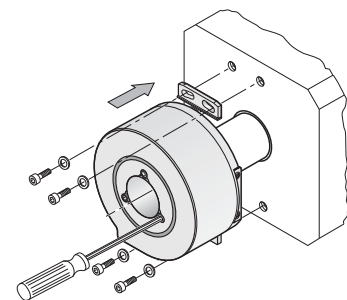
ECN/ERN 100

ECN/EQN/ERN 1000 series
• **Miniaturized version**
• Blind hollow shaft with 6 mm inside diameter
• Housing outside diameter 35 mm
• Natural frequency of the encoder stator coupling: ≥ 1 500 Hz
• Mechanically permissible speed: ≤ 12 000 min⁻¹

42.1 · Ø 35 · 48 · Ø 6

ECN/EQN/ERN 400 series
• **Compact design**
• Blind hollow shaft or hollow through shaft with 8 mm or 12 mm inside diameter
• Housing outside diameter: 58 mm
• Degree of protection:
  IP 67 at housing (IP 66 with hollow through shaft)
  IP 64 at shaft inlet (IP 66 upon request)
• Natural frequency of the encoder stator coupling: ≥ 1 400 Hz (cable version)
• Mechanically permissible speed: ≤ 12 000 min⁻¹
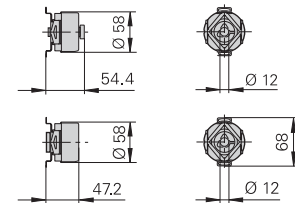
54.4 · Ø 58 · Ø 12
47.2 · Ø 58 · Ø 12 · 68

ECN/ERN 100 series
• **For large shaft diameters**
• Hollow through shaft with inside diameters D: D: 20 mm, 25 mm, 38 mm, 50 mm
• Housing outside diameter: 87 mm
• Natural frequency of the encoder stator coupling: ≥ 1 000 Hz
• Mechanically permissible speed:
  D ≤ 30 mm: ≤ 6 000 min⁻¹
  D > 30 mm: ≤ 4 000 min⁻¹

55 max. · Ø 87 · 104 · Ø D
D: 50 mm max.
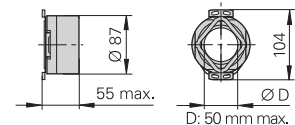
	Absolute ECN 1013	EQN 1025	ECN 1023	EQN 1035	Incremental ERN 1020	ERN 1030	ERN 1070	ERN 1080
Interface	EnDat 2.2[1] with ∿ 1 V$_{PP}$		EnDat 2.2[1]		⊓⊔TTL	⊓⊔HTL	⊓⊔TTL[2]	∿ 1 V$_{PP}$
Position values/rev	8 192 (13 bits)		8 388 608 (23 bits)		–			
Distinguishable revolutions	–	4 096 (12 bits)	–	4 096 (12 bits)	–			
Line count	512		–		100 to 3 600		1000/2500/3600	100 to 3 600
Voltage supply	3.6 to 14 V				5 V	10 V to 30 V	5 V	

	Absolute ECN 413[3]		EQN 425[3]		ECN 425 ECN 425F ECN 424S	EQN 437 EQN 437F EQN 436S	Incremental ERN 420[3] ERN 460	ERN 430[3]	ERN 480[3]
Interface	EnDat 2.2[1] With ∿ 1 V$_{PP}$; SSI	PROFIBUS-DP; PROFINET	EnDat 2.2[1] With ∿ 1 V$_{PP}$; SSI	PROFIBUS-DP; PROFINET	EnDat 2.2[1]; Fanuc αi Siemens DRIVE-CLiQ		⊓⊔TTL; ⊓⊔TTL	⊓⊔HTL	∿ 1 V$_{PP}$
Position values/rev	8 192 (13 bits)		8 192 (13 bits)		*ECN 425:* 33 554 432 (25 bits) *ECN 424:* 16 777 216 (24 bits)		–		
Distinguishable revolutions	–		4 096 (12 bits)		–	4 096 (12 bits)	–		
Line count	512 or 2 048	–	512 or 2 048	–	–		250 to 5 000		1 000 to 5 000
Voltage supply	3.6 to 14 V 5 V or 10 V to 30 V	9 V to 36 V; 10 V to 30 V	3.6 to 14 V 5 V or 10 V to 30 V	9 V to 36 V; 10 V to 30 V	3.6 V to 14 V; 3.6 V to 14 V; 10 V to 28.8 V		5 V; 10 V to 30 V	10 V to 30 V	5 V

PROFIBUS-DP/PROFINET

80 · Ø 12 · 68
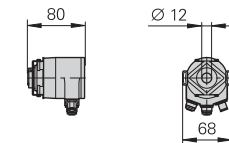
	Absolute ECN 113	ECN 125	Incremental ERN 120	ERN 130	ERN 180
Interface	EnDat 2.2[1] with ∿ 1 V$_{PP}$	EnDat 2.2[1]	⊓⊔TTL	⊓⊔HTL	∿ 1 V$_{PP}$
Position values per revolution	8 192 (13 bits)	33 554 432 (25 bits)	–		
Line count	2 048	–	1 000 to 5 000		
Power supply	5 V	3.6 V to 5.25 V	5 V	10 V to 30 V	5 V

[1] Includes EnDat 2.1 command set; PROFIBUS-DP via gateway
[2] Integrated 5/10-fold interpolation
[3] ATEX version available (*ECN 413/EQN 425* with 5 V power supply and EnDat 2.1)