



HEIDENHAIN



Product Information

ECN 1313

ERN 1326

ERN 1387

Incremental and Absolute
Rotary Encoders with
Integral Bearing

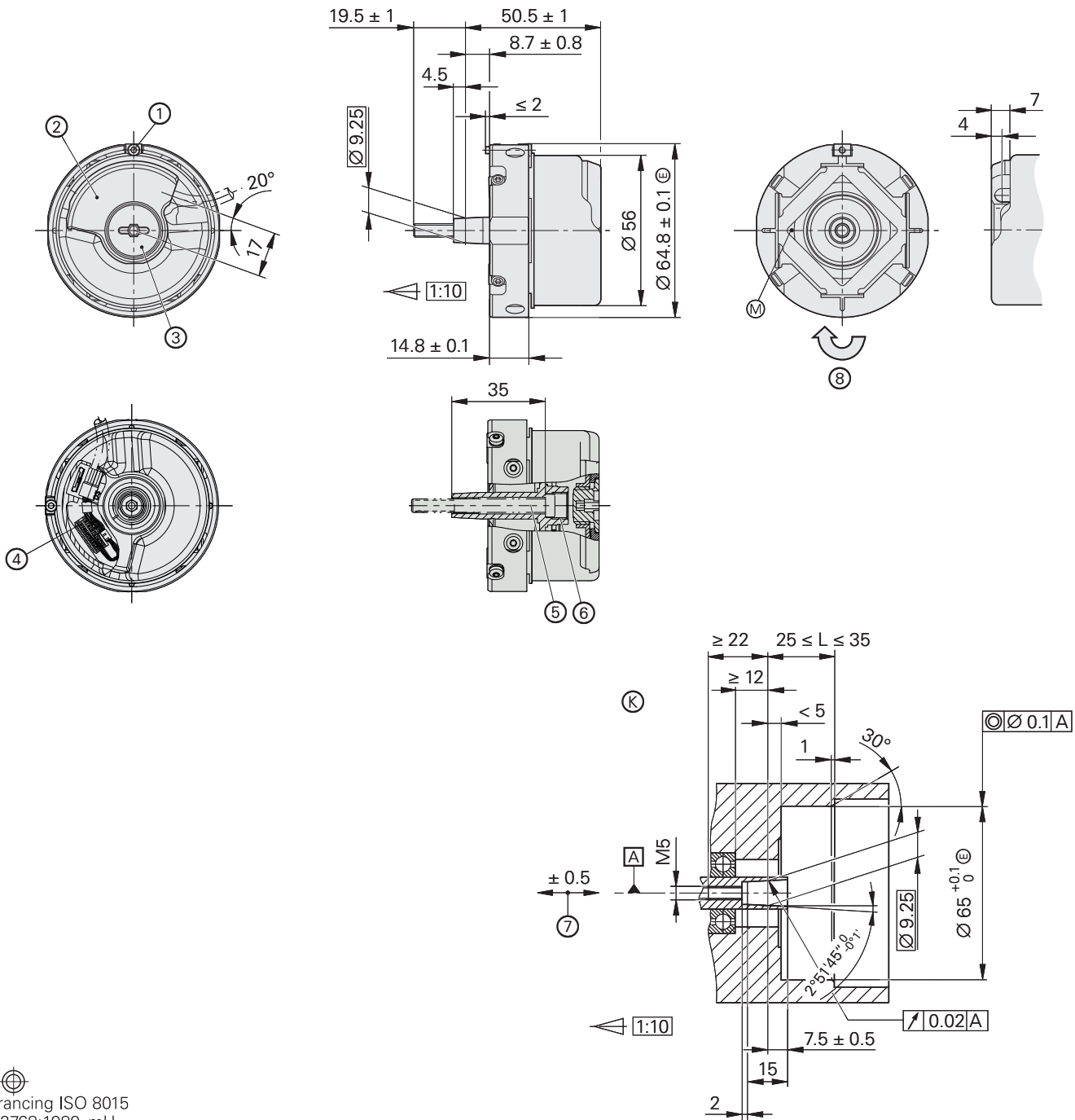
EnDat01 / SSI01r1

TTL, with block
commutation, 1 V_{PP} with
sine commutation

ECN 1300 series

Absolute rotary encoders

- 06 stator coupling for axial mounting
- 65B tapered shaft



mm

 Tolerancing ISO 8015
 ISO 2768:1989-mH
 $\leq 6 \text{ mm: } \pm 0.2 \text{ mm}$

- A = Bearing of mating shaft
- M = Measuring point for operating temperature
- 1 = Clamping screw for coupling ring (width A/F 2)
- 2 = Die-cast cover
- 3 = Screw plug: width A/F 3 and 4
- 4 = 12-pin or 16-pin (12 +4) pin header
- 5 = Screw: DIN 6912 – M5x50 – width A/F 4
- 6 = M10 back-off thread
- 7 = Compensation of mounting tolerances and thermal expansion; no dynamic motion permitted
- 8 = Direction of shaft rotation for ascending position values

	ECN 1313	ECN 1313
Interface	EnDat 2.2	SSI
Ordering designation	EnDat01	SSI01r1
Position values per rev.	8192 (13 bits)	
Revolutions	–	
Elec. permiss. shaft speed/ deviations ²⁾	1500 rpm/±1 LSB 12 000 rpm/±50 LSB	15 000 rpm/±15 LSB
Calc. time t_{cal} /clock freq.	≤ 9 µs/≤ 2 MHz	≤ 5 µs/ -
Incremental signals	~ 1 V _{PP} ¹⁾	
Line count	2048	
Cutoff frequency –3 dB	2048 lines: ≥ 400 kHz	
System accuracy	2048 lines :± 20"	
Electrical connection	12-pin	16-pin (12+4)
Supply voltage	DC 3.6 V to 14 V	4.75V to 30 V DC
Power consumption (maximum)	3.6 V: ≤ 0.6 W 14 V: ≤ 0.7 W	5V: ≤ 0.8 W 10 V: ≤ 0.65 W 30V: 1 W
Current consumption (typical)	5 V: 85 mA (without load)	5 V: 90 mA (without load) 24 V: 24 mA (without load)
Shaft	Tapered shaft (Ø 9.25 mm); taper: 1:10	
Mech. permiss. shaft speed n	≤ 15 000 rpm	
Starting torque (typical)	0.01 Nm (at 20 °C)	
Moment of inertia of rotor	$2.6 \cdot 10^{-6} \text{ kgm}^2$	
Natural frequency f_N (typical)	1800 Hz	
Permiss. axial motion of measured shaft	±0.5 mm	
Vibration 55 Hz to 2000 Hz Shock 6 ms	≤ 300 m/s ² ⁴⁾ (EN 60068-2-6) ≤ 2000 m/s ² (EN 60068-2-27)	
Operating temperature	–40 °C to 100 °C	
Protection EN 60529	IP40 when mounted	
Mass	≈ 0.3 kg	
Part number	768295-56	1353128-07

¹⁾ Deviating tolerances

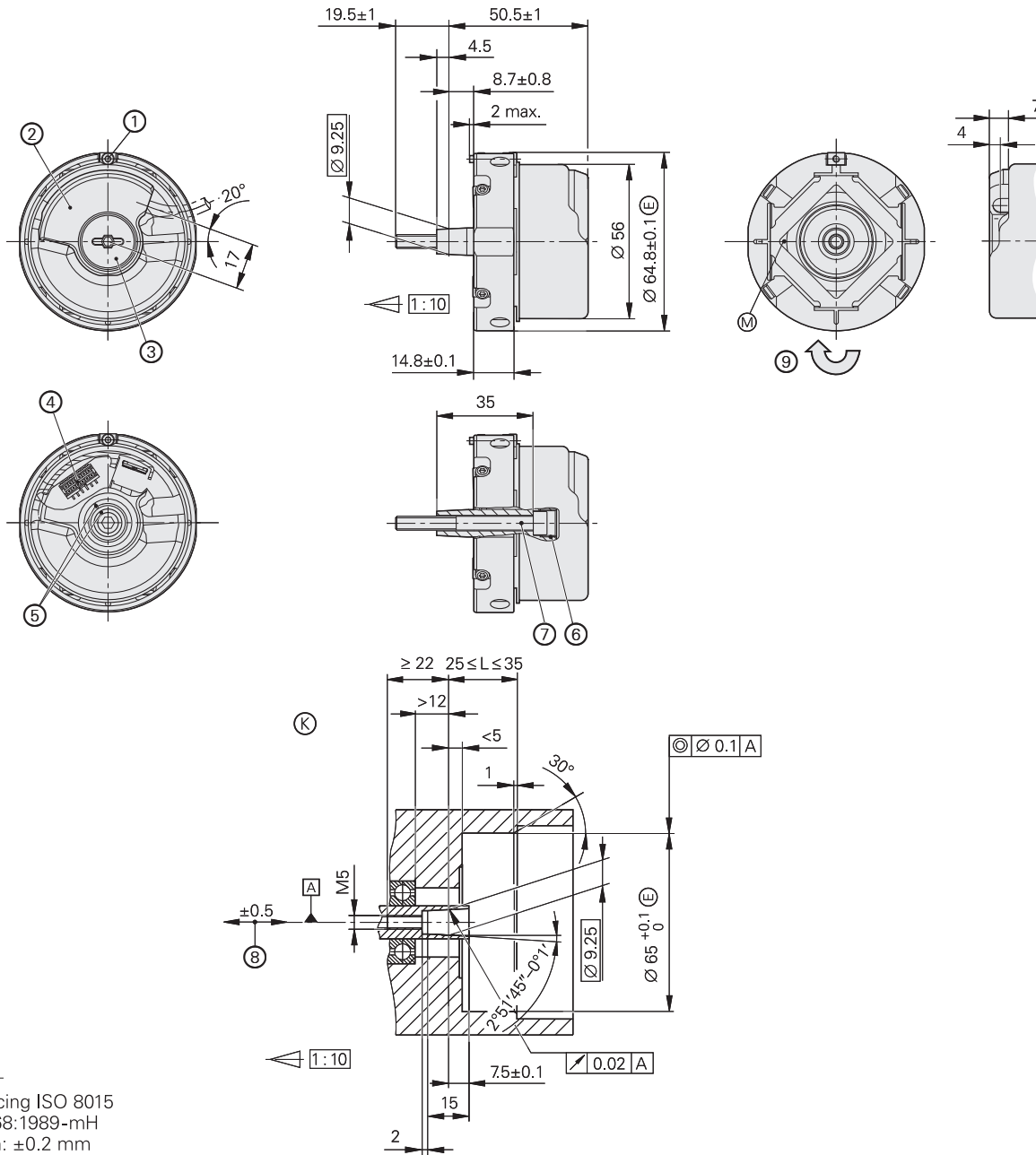
Signal amplitude: 0.8 V_{PP} to 1.2 V_{PP}
 Asymmetry: 0.05
 Amplitude ratio: 0.9 to 1.1
 Phase angle: 90° elec. ±5° elec.
 Signal-to-noise ratio E, F: ≥ 100 mV

²⁾ Speed-dependent deviations between absolute and incremental signals

ERN 1300 series

Incremental rotary encoders

- 06 stator coupling for axial mounting
- 65B tapered shaft



mm
 Tolerancing ISO 8015
 ISO 2768:1989-mH
 ≤ 6 mm: ±0.2 mm

- ▣ = Bearing of mating shaft
- ⊙ = Required mating dimensions
- M = Measuring point for operating temperature
- 1 = Clamping screw for coupling ring (width A/F 2)
- 2 = Die-cast cover
- 3 = Screw plug: width A/F 3 and 4
- 4 = 14-pin or 16-pin PCB connector
- 5 = Reference mark position on shaft and cap
- 6 = M10 back-off thread
- 7 = Self-locking screw: DIN 6912 – M5 x 50 – width A/F 4
- 8 = Compensation of mounting tolerances and thermal expansion; no dynamic movement permitted
- 9 = Direction of shaft rotation for output signals according to interface description

	ERN 1387	ERN 1326	
Interface	 1 V _{PP} ¹⁾	 TTL	
Line count*/ System accuracy	2048/±20"	4096/±16"	8192/±16" ⁵⁾
Reference mark	One		
Output frequency	–	≤ 300 kHz	≤ 600 kHz
Edge separation <i>a</i>	–	≥ 0.35 μs	≥ 0.12 μs
Cutoff frequency –3 dB	≥ 210 kHz	–	–
Commutation signals	 1 V _{PP} ¹⁾	 TTL	
Width	Z1 track ²⁾	10 · 36° ³⁾	
Electrical connection	14-pin	16-pin	
Supply voltage	DC 5 V ±0.25 V	DC 5 V ±0.5 V	
Current consumption (without load)	≤ 130 mA	≤ 150 mA	
Shaft	Tapered shaft (Ø 9.25 mm); taper: 1:10		
Mech. permiss. shaft speed <i>n</i>	≤ 15000 rpm		
Starting torque (typical)	0.01 Nm (at 20 °C)		
Moment of inertia of rotor	2.6 · 10 ^{–6} kgm ²		
Natural frequency <i>f</i> _N (typical)	1800 Hz		
Permiss. axial motion of measured shaft	±0.5 mm		
Vibration 55 Hz to 2000 Hz Shock 6 ms	≤ 300 m/s ² ⁴⁾ (EN 60068-2-6) ≤ 2000 m/s ² (EN 60068-2-27)		
Max. operating temp.	100 °C	120 °C	100 °C
Min. operating temp.	–40 °C		
Protection EN 60529	IP40 when mounted		
Mass	≈ 0.3 kg		
Part number	749144-58	574485-21	574485-22

* Please select when ordering

- ¹⁾ Deviating 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° elec. ±5° elec. |
| Signal-to-noise ratio E, F: | 100 mV |

²⁾ One sine and one cosine signal per revolution; see the *Interfaces of HEIDENHAIN Encoders* brochure

³⁾ Three square-wave signals with signal periods of 36° mechanical phase shift

⁴⁾ Valid as per standard at room temperature; at operating temperatures up to 100 °C: ≤ 300 m/s²;
up to 120 °C: ≤ 150 m/s²

⁵⁾ Via integrated signal doubling

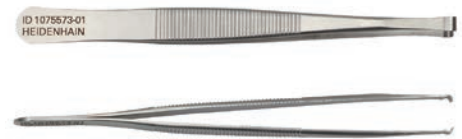
Mounting accessories

Mounting aid

The mounting aid is used for insertion and removal of the PCB connector. It prevents damage to the cable by allowing force to be applied solely to the connector. Do not pull the wires themselves.

ID 1075573-01

For further mounting information and mounting aids, please refer to the relevant mounting instructions and the *Encoders for Servo Drives* brochure.



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This Product Information document 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 placed.



Further information:

Comply with the requirements described in the following documents to ensure correct and intended operation:

- Operating Instructions

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