HEIDENHAIN

Product Information

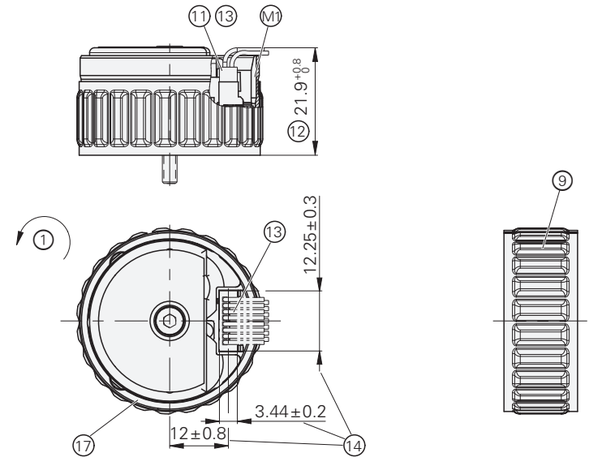
ECI 1119
EQI 1131

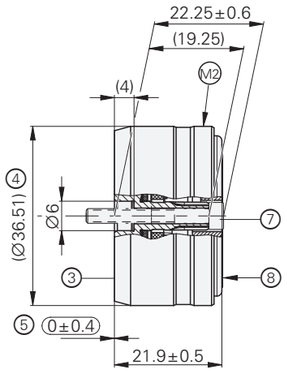
Absolute Rotary Encoders
Without Integral Bearing
EnDat22

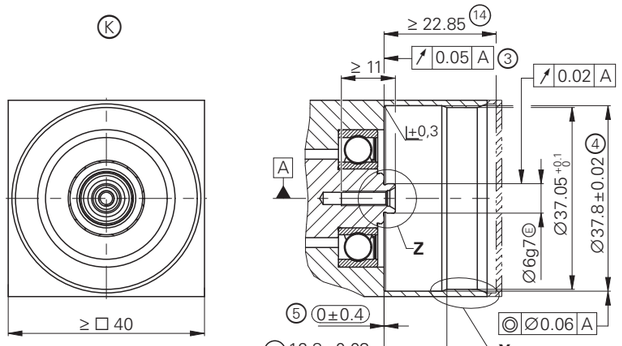
02/2022

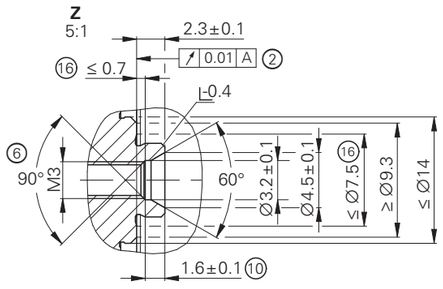
ECI 1119, EQI 1131

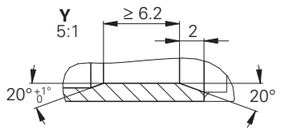
Rotary encoders for absolute position values
- **Robust inductive scanning principle**
- **70G flange for press-fitting with a tolerance sleeve**
- **82A blind hollow shaft (Ø 6 mm) for axial clamping without a positive-locking element**
- **Required mating dimensions with M3×25 central screw**











A = Bearing of mating shaft
K = Required mating dimensions
M1 = Measuring point for operating temperature
M2 = Measuring point for vibration
1 = Direction of shaft rotation for ascending position values
2 = Shaft surface; ensure full-surface contact!
3 = Flange surface; ensure full-surface contact!
4 = Centering diameter
5 = Mounting clearance:
Maximum permissible deviation between shaft surface and flange surface; compensation of mounting tolerances and thermal expansion; dynamic motion permitted over entire range.
6 = Chamfer at start of thread is mandatory for material bonding anti-rotation lock
7 = Screw: DIN EN ISO 4762 – M3x25 – 8.8 with material bonding anti-rotation lock: ID 202264-86; tightening torque: 1.0 Nm ±0.1 Nm
8 = Attention! Not a clamping surface
9 = Flange fastening with tolerance sleeve (for press-fitting parameters, see the mounting instructions)
10 = Possible centering hole
11 = 15-pin PCB connector
12 = Dimension for JH standard cable
13 = Ensure space for cable
14 = Distance to cover; note the opening for PCB connector, header connector, and wires
15 = Min. wall thickness: 1.09 mm; no interruption permitted!
16 = Undercut
17 = Surface for application of force for press-fitting the encoder (ensure full-surface contact)

Workpiece edges as per ISO 13715

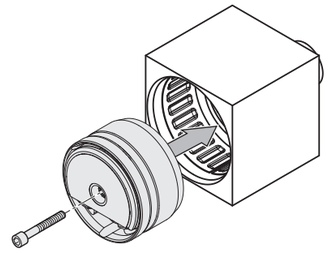
mm
Tolerancing ISO 8015
ISO 2768 - m H
≤ 6 mm: ±0.2 mm

Specifications	ECI 1119 singleturn	EQI 1131 multiturn
Interface	EnDat 2.2	
Ordering designation	EnDat22	
Position values per revolution	524 288 (19 bits)	
Revolutions	–	4096 (12 bits)
Calculation time t_{cal} / Clock frequency	≤ 5 µs / ≤ 16 MHz	
Analog delay time t_{AD} (typical)	13.9 µs	
System accuracy	±120"	
Electrical connection	15-pin PCB connector (with connection for external temperature sensor[2])	
Cable length	≤ 100 m (see the EnDat description in the *Interfaces of HEIDENHAIN Encoders* brochure)	
Supply voltage	DC 3.6 V to 14 V	
Power consumption[3] (maximum)	*At 3.6 V:* ≤ 650 mW; *at 14 V:* ≤ 700 mW	*At 3.6 V:* ≤ 750 mW; *at 14 V:* ≤ 850 mW
Current consumption (typical)	*At 5 V:* 95 mA (without load)	*At 5 V:* 115 mA (without load)
Shaft	82A blind hollow shaft (Ø 6 mm) for axial clamping, without positive-locking element	
Speed	≤ 15000 rpm	≤ 12000 rpm
Moment of inertia of rotor	$0.2 \cdot 10^{-6}$ kgm^2	
Angular acceleration of rotor	$\leq 1 \cdot 10^5$ rad/s^2	
Axial motion of measured shaft	≤ ±0.4 mm	
Mounting clearance	2 mm (nominal value for checking the mounting quality in the ATS software, under "Mounting")	
Vibration 55 Hz to 2000 Hz[4] **Shock** 6 ms	*Stator:* ≤ 400 m/s^2; *rotor:* ≤ 600 m/s^2 (EN 60068-2-6) ≤ 2000 m/s^2 (EN 60068-2-27)	
Operating temperature	–40 °C to 110 °C	
Trigger threshold for error message due to temperature exceedance	125 °C (measuring accuracy of internal temperature sensor: ±1 K)	
Relative humidity	≤ 93% (40 °C/21 d as per EN 60068-2-78), without condensation	
Protection rating EN 60529	IP00 (see *Electrical safety* under *General electrical information* in the *Interfaces of HEIDENHAIN Encoders* brochure)	
Mass	≈ 0.04 kg	
ID number	*82A shaft:* ID 1164812-03/-53[1]	*82A shaft:* ID 1164813-03/-53[1]

[1] Rotary encoders in collective package
[2] See *Temperature measurement in motors* in the *Encoders for Servo Drives* brochure
[3] See *General electrical information* in the *Interfaces of HEIDENHAIN Encoders* brochure
[4] At 10 Hz to 55 Hz, constant over 6.5 mm peak to peak (stator), 10 mm peak to peak (rotor)

Mounting

After inserting the tolerance sleeve (see *Mounting accessories*) in the customer's machine, the encoder flange is press-fit until it comes to a stop in the axial direction. Then the blind hollow shaft of the rotary encoder is fastened to the customer-side motor shaft with a central screw (see the mounting instructions).



Further information:

For the customer-side mounting design, aluminum and steel are permissible materials for the customer-side shaft and stator.

In addition, comply with the material specifications and other material characteristics in the *Encoders for Servo Drives* brochure (ID 208922-xx).

Mounting accessories

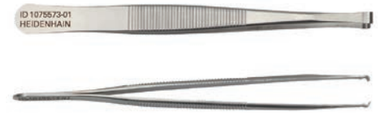
Fastening elements
The central screw and the tolerance sleeve are not included in delivery and can be ordered separately.

ECI 1119 EQI 1131	Fastening elements		Quantity
Central screw[1)] for shaft fastening	ISO 4762-**M3×25**-8.8-**MKL**	ID 202264-86	10 or 100
Tolerance sleeve for clamping the flange	D 37.8 mm x L 15 mm	ID 1264352-10 ID 1264352-11	10 or 100

[1)] With coating for material bonding anti-rotation lock

Please note the information on screws from HEIDENHAIN in the *Encoders for Servo Drives* brochure, under the heading *Rotary encoders with functional safety* in the chapter *General mechanical information*.

Mounting aid
To avoid damage to the cable, use the mounting aid to connect and disconnect the cable assembly. The pulling force must be applied solely to the connector and not to the wires.



ID 1075573-01

For more mounting information and mounting aids, see the Mounting Instructions and the *Encoders for Servo Drives* brochure. The installation can be inspected with the PWM 21 and the ATS software (see Document 1082415).

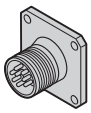
Electrical connection

Pin assignment

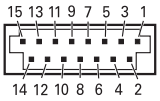
Pin layout

8-pin M12 flange socket

M12



15-pin PCB connector



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Encoder

	Power supply				Serial data transmission				Other signals[1]	
M12	**8**	**2**	**5**	**1**	**3**	**4**	**7**	**6**	**/**	**/**
15	**13**	**11**	**14**	**12**	**7**	**8**	**9**	**10**	**5**	**6**
	U_P	Sensor **U_P**	**0 V**	Sensor **0 V**	**DATA**	**$\overline{\text{DATA}}$**	**CLOCK**	**$\overline{\text{CLOCK}}$**	**T+**[2]	**T–**[2]
	Brown/ Green	Blue	White/ Green	White	Gray	Pink	Violet	Yellow	Brown	Green

1) Only with output cables inside the motor housing

2) Connections for external temperature sensor; evaluation optimized for KTY 84-130 (see *Temperature measurement in motors* in the *Encoders for Servo Drives* brochure)

More information:

For encoder cables, connecting cables, and adapter cables, see the *Cables and Connectors* brochure (ID 1206103-xx).

HEIDENHAIN

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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.

More information:

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

- Brochure: *Encoders for Servo Drives* 208922-xx
- Brochure: *Interfaces of HEIDENHAIN Encoders* 1078628-xx
- Brochure: *Cables and Connectors* 1206103-xx
- Operating Instruction: *ECI 1119, EQI 1131* 1368055-xx
- Mounting Instructions: *ECI 1119, EQI 1131* 1368063-xx