



HEIDENHAIN



Product Information

ECN/EQN 1100

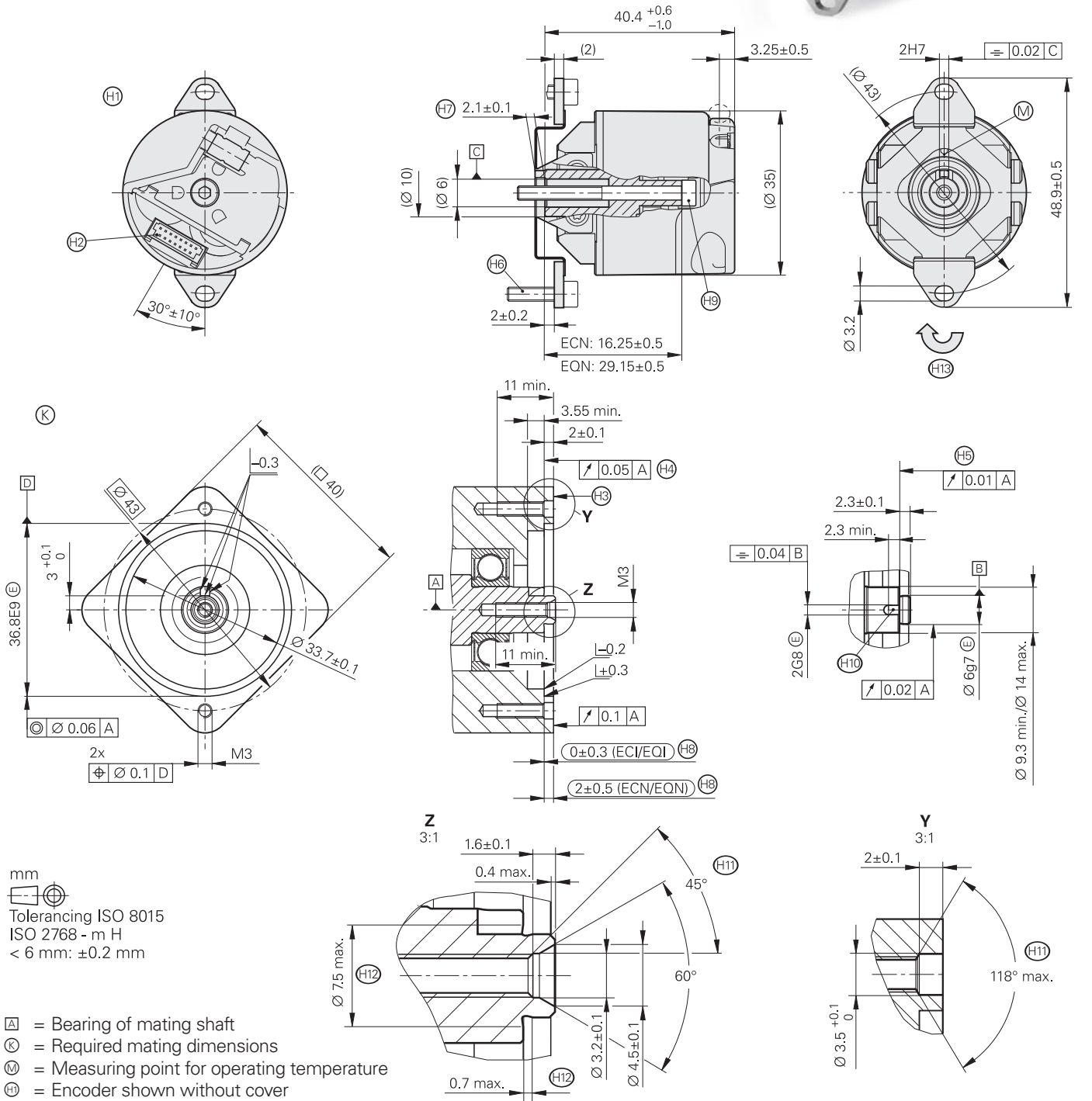
Rotary Encoders with
Interlocking Hollow Shaft

August 2011

ECN/EQN 1100



Rotary encoders for absolute position values

- Mounted stator coupling, 75A
- Blind hollow shaft for axial clamping 1KA
- Fault exclusion for loosening of shaft and stator coupling



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

- Ⓐ = Bearing of mating shaft
- Ⓚ = Required mating dimensions
- Ⓜ = Measuring point for operating temperature
- Ⓢ = Encoder shown without cover
- Ⓣ = PCB connector, 15-pin
- Ⓤ = Coupling surface
- Ⓦ = Flange surface, ECI/EQI 11xx
- Ⓩ = Shaft surface
- Ⓛ = Screw, ISO 4762-M3x12-8.8 with patch coating (not included in delivery). Tightening torque 1.15 ± 0.05 Nm
- Ⓨ = Positive fit element. Ensure correct engagement in slot H10, e.g. by measuring the device overhang
- Ⓩ = Maximum permissible distance between shaft and coupling surface (ECN/EQN) or flange surface (ECI/EQI). Compensation of mounting tolerances and thermal expansion
- Ⓛ = Screw ISO 4762 with patch coating, ECN: M3x22-8.8, EQN: M3x35-8.8 (not included in delivery). Tightening torque 1.15 ± 0.05Nm
- Ⓢ = Slot for positive fit element (ECN/EQN)
- Ⓢ = Chamfer is obligatory at start of thread for materially bonding anti-rotation lock
- Ⓢ = Undercut
- Ⓢ = Direction of shaft rotation for output signals as per the interface description

	Absolute			
	ECN 1113	ECN 1123 	EQN 1125	EQN 1135 
Incremental signals	$\sim 1 V_{PP}^{1)}$	–	$\sim 1 V_{PP}^{1)}$	–
Line count	512	–	512	–
Cutoff frequency –3 dB	≥ 190 kHz	–	≥ 190 kHz	–
Absolute position values	EnDat 2.2			
Ordering designation	EnDat 01	EnDat 22	EnDat 01	EnDat 22
Position values/rev	8 192 (13 bits)	8 388 608 (23 bits)	8 192 (13 bits)	8 388 608 (23 bits)
Revolutions	–		4 096 (12 bits)	
Elec. permissible speed/ Deviation ²⁾	4 000 min ⁻¹ /± 1 LSB 12 000 min ⁻¹ /± 16 LSB	12 000 min ⁻¹ (for continuous position value)	4 000 min ⁻¹ /± 1 LSB 12 000 min ⁻¹ /± 16 LSB	12 000 min ⁻¹ (for continuous position value)
Calculation time t_{cal}	≤ 9 μ s	≤ 7 μ s	≤ 9 μ s	≤ 7 μ s
System accuracy	$\pm 60''$			
Power supply	3.6 V to 14 V DC			
Power consumption (maximum)	3.6 V: ≤ 600 mW 14 V: ≤ 700 mW		3.6 V: ≤ 700 mW 14 V: ≤ 800 mW	
Current consumption (typical)	5 V: 85 mA (without load)		5 V: 105 mA (without load)	
Electrical connection Via PCB connector	15-pin	15-pin ³⁾	15-pin	15-pin ³⁾
Shaft	Blind hollow shaft $\varnothing 6$ mm with positive fit element			
Mech. permissible speed n	12 000 min ⁻¹			
Starting torque	≤ 0.001 Nm (at 20 °C)		≤ 0.002 Nm (at 20 °C)	
Moment of inertia of rotor	Approx. $0.4 \cdot 10^{-6}$ kgm ²			
Permissible axial motion of measured shaft	± 0.5 mm			
Vibration 55 Hz to 2 000 Hz Shock 6 ms	≤ 200 m/s ² (EN 60068-2-6) $\leq 1 000$ m/s ² (EN 60068-2-27)			
Max. operating temp.	115 °C			
Min. operating temp.	–40 °C			
Protection EN 60529	IP 40 when mounted			
Weight	Approx. 0.1 kg			





¹⁾ Restricted tolerances
Signal amplitude: 0.80 to 1.2 V_{PP}
Asymmetry: 0.05
Amplitude ratio: 0.9 to 1.1
Phase angle: 90° ± 5° elec.




²⁾ Velocity-dependent deviations between the absolute and incremental signals

³⁾ With connection for temperature sensor, evaluation optimized for KTY 84-130
Functional Safety for ECN 1123 and EQN 1135 upon request

Electrical Connection

Cables

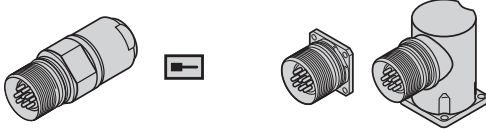
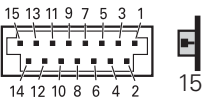



PUR connecting cable	Ø 6 mm 8-pin: $[(4 \times 0.14 \text{ mm}^2) + (4 \times 0.34 \text{ mm}^2)]$ Ø 8 mm 17-pin: $[(4 \times 0.14 \text{ mm}^2) + 4(2 \times 0.14 \text{ mm}^2) + (4 \times 0.5 \text{ mm}^2)]$	M12 connector, 8-pin	M23 connector, 17-pin
Complete with connector (female) and coupling (male)		368330-xx	323897-xx
Complete with connector (female) and D-sub connector (female) for IK 220		533627-xx	332115-xx
Complete with connector (female) and D-sub connector (male) for IK 215/PWM 20		524599-xx	324544-xx
With one connector (female)		559346-xx	309778-xx




Cables inside the motor housing 4.5 mm cable diameter for			Complete With PCB connector and right-angle socket M23, 17-pin	Complete With PCB connector and flange socket, straight, M12, 8-pin for pure serial data transmission	With one connector With PCB connector
	PCB connector	Crimp sleeve			
ECN 1113 EQN 1125	15-pin	Ø 4.5 mm	606079-xx EPG 16xAWG30/7	–	605090-xx EPG 16xAWG30/7
ECN 1123 EQN 1135	15-pin	Ø 4.5 mm	–	746795-xx ¹⁾ TPE 10xAWG26/19 746790-xx ^{1) 2)} TPE 8xAWG26/19	681161-xx EPG $[6 \times (2 \times 0.09 \text{ mm}^2)]$

¹⁾ Single wires with heat-shrink tubing; shield must be connected to the motor

²⁾ Without separate connections for temperature sensor


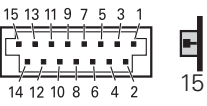



Pin Layout

17-pin coupling or flange socket M23						15-pin PCB connector								
														
Power supply					Incremental signals ¹⁾					Absolute position values				
	7	1	10	4	11	15	16	12	13	14	17	8	9	
	13	11	14	12	/	1	2	3	4	7	8	9	10	
	U _P	Sensor U _P	0V	Sensor 0V	Internal shield	A+	A-	B+	B-	DATA	DATA	CLOCK	CLOCK	
	Brown/ Green	Blue	White/ Green	White	/	Green/ Black	Yellow/ Black	Blue/ Black	Red/ Black	Gray	Pink	Violet	Yellow	

Other signals	
	5 6
	/ /
	T+ T-
	Brown ²⁾ White ²⁾

Cable shield connected to housing; **U_P** = power supply voltage; **T** = temperature
Sensor: The sensor line is connected in the encoder with the corresponding power line.
 Vacant pins or wires must not be used!

- ¹⁾ Only with ordering designations EnDat 01 and EnDat 02
²⁾ Only for motor-internal adapter cables

8-pin coupling or flange socket M12					15-pin PCB connector					
										
Power supply				Absolute position values				Other signals ²⁾		
	8	2	5	1	3	4	7	6	/	/
	13	11	14	12	7	8	9	10	5	6
	U _P	Sensor U _P	0V	Sensor 0V	DATA	DATA	CLOCK	CLOCK	T+	T-
	Brown/ Green	Blue	White/ Green	White	Gray	Pink	Violet	Yellow	Brown	Green

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Related documents

- Catalog: *Position Encoders for Servo Drives 208922-xx*