



HEIDENHAIN



Product Information


ECN 200 Series

Absolute Angle Encoders

March 2006

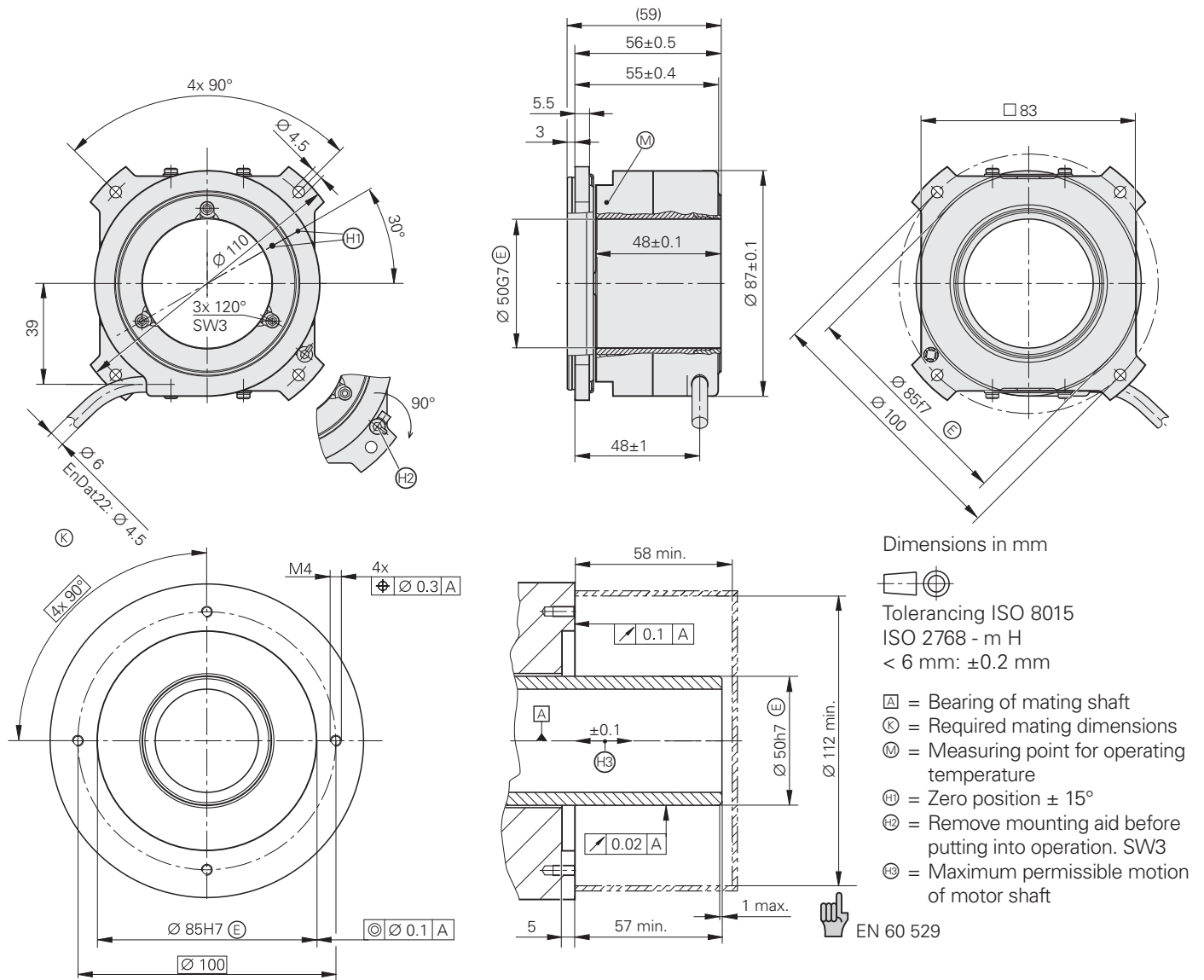
ECN 200 Series

- Absolute angle encoder with mounted stator coupling
- Hollow through shaft with $\varnothing 20$ mm and $\varnothing 50$ mm

	ECN 225		ECN 223F	ECN 223M
Absolute position values	EnDat 2.2	EnDat 2.2	Fanuc 02 serial interface	Mitsubishi High Speed Serial Interface
Ordering designation	EnDat 22	EnDat 02	Fanuc 02	With 02-4
Positions per rev.	33554432 (25 bits)		8388608 (23 bits)	
Elec. permissible speed	3000 min ⁻¹			
Clock frequency	≤ 8 MHz	≤ 2 MHz	–	
Calculation time t_{cal}	5 μ s		–	
Incremental signals	–	 1 V _{pp}	–	
Line count	–	2048	–	
Cutoff frequency –3 dB	–	≥ 200 kHz	–	
Recommd. measuring step	0.00001° (approx. 0.04")		0.00004° (approx. 0.15")	
System accuracy	± 10"			
Power supply	3.6 V to 5.25 V max. 200 mA (without load)			
Electrical connection*	Cable 1 m, with coupling M12	Cable 1 m, with M23 coupling or Binder connector, 14-pin	Cable 1 m, with M 23 coupling	
Cable length with HEIDENHAIN cable	≤ 150 m		≤ 30 m	
Shaft*	Hollow through shaft D = 20 mm, 50 mm			
Mech. perm. speed	≤ 3000 min ⁻¹			
Starting torque at 20 °C	<i>D = 20 mm:</i> ≤ 0.1 Nm <i>D = 50 mm:</i> ≤ 0.15 Nm			
Moment of inertia of rotor	<i>D = 20 mm:</i> 138 · 10 ⁻⁶ kgm ² <i>D = 50 mm:</i> 215 · 10 ⁻⁶ kgm ²			
Natural frequency	≥ 1000 Hz			
Permissible axial motion of measured shaft	± 0.1 mm			
Vibration 55 to 2000 Hz Shock 6 ms	≤ 100 m/s ² (IEC 60068-2-6) ≤ 1000 m/s ² (IEC 60068-2-27)			
Max. operating temperature	70 °C			
Min. operating temperature	<i>For frequent flexing:</i> –10 °C <i>For fixed cable:</i> –20 °C			
Protection IEC 60529	IP 64			
Weight	<i>D = 20 mm:</i> 0.8 kg <i>D = 50 mm:</i> 0.7 kg			

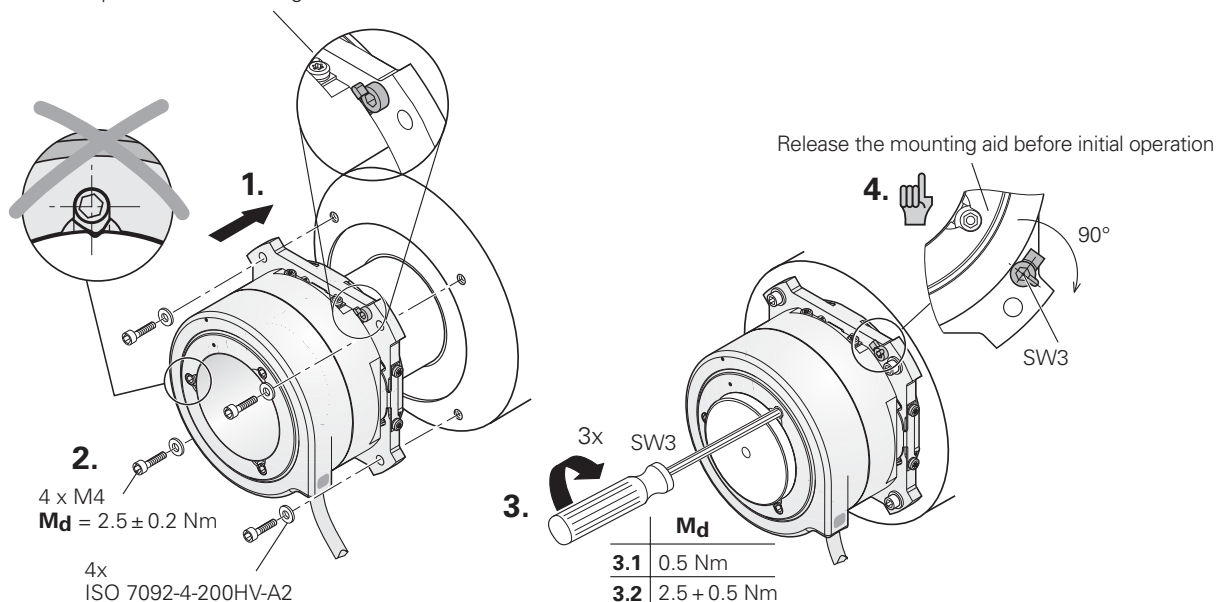
* Please indicate when ordering

Hollow Shaft D = 50 mm



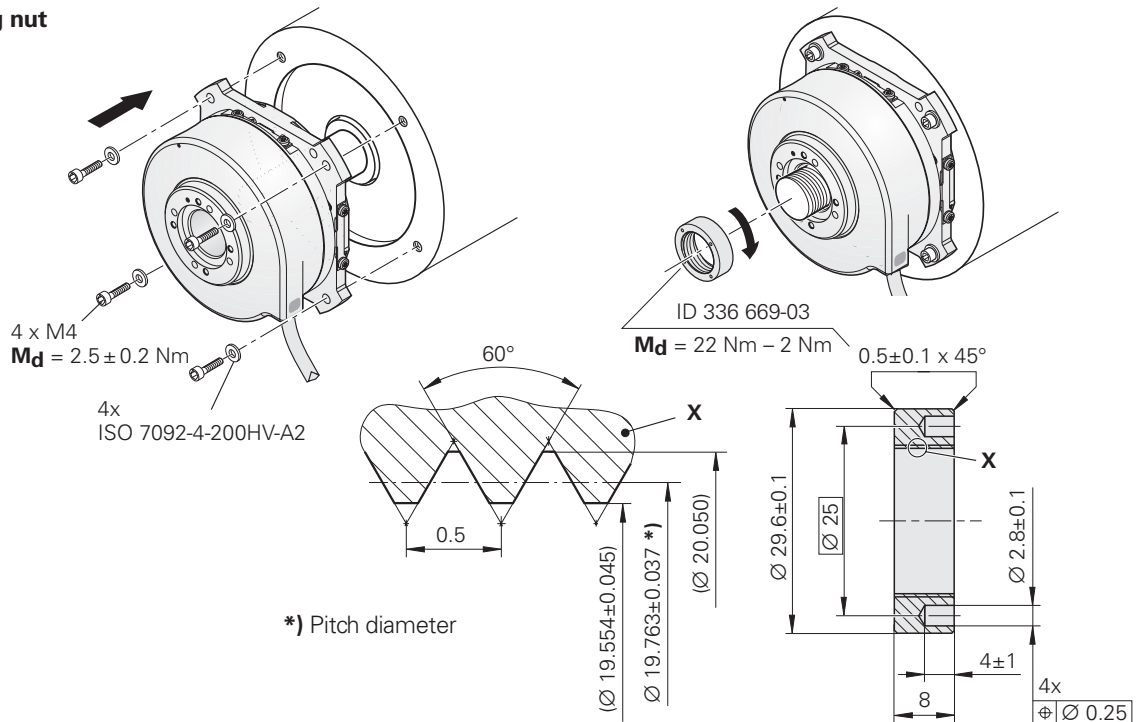
Mounting

Mounting aid ensures compliance with mounting dimension $2.5 \pm 0.3 \text{ mm}$

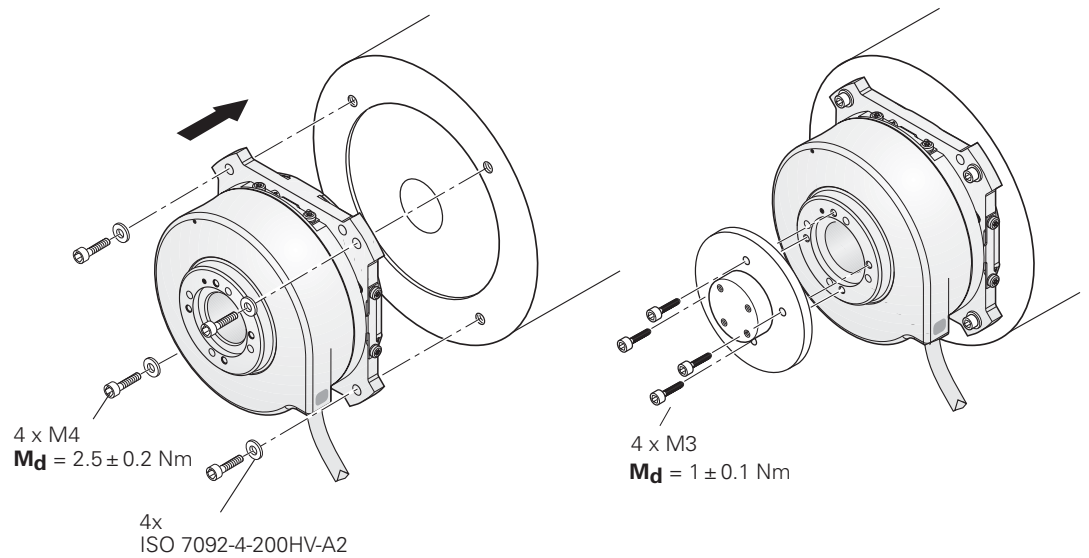


Mounting

Shaft coupling with ring nut








Front end shaft coupling

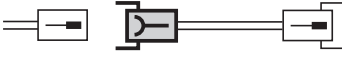
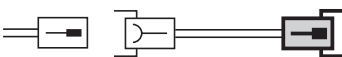
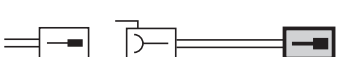

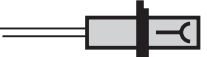
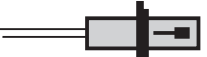



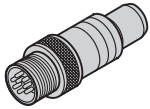



Electrical Connection

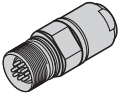



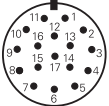
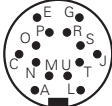



ECN 225

EnDat 22 EnDat 02

			8-pin M12	17-pin M23	14-pin Binder
PUR connecting cable	Ø 6 mm Ø 8 mm Ø 6 mm	8-pin: [(4 × 0.14 mm ²) + (4 × 0.34 mm ²)] 17-pin: [(4 × 0.14 mm ²) + 4(2 × 0.14 mm ²) + (4 × 0.5 mm ²)] 14-pin: [3(4 × 0.32 mm ²) + (4 × 0.32 mm ²)]			
Complete with connector (female) and coupling (male)			368330-xx	323897-xx	348824-xx
Complete with connector (female) and D-sub connector (female) for IK 220			530627-xx	332115-xx	–
Complete with connector (female) and D-sub connector (male) for IK 115/IK 215			524599-xx	324544-xx	–
With one connector (female)			559346-xx	309778-xx	–
Cable only , Ø 8 mm			–	266306-xx	–

Mating element on connecting cable for connecting element on encoder	Connector (female) for cable Ø 8 mm 	–	291697-26	292275-08
Connector on cable for connection to subsequent electronics	Connector (male) for cable Ø 8 mm Ø 6 mm 	–	291697-27	–
Coupling on connecting cable	Coupling (male) for cable Ø 4.5 mm Ø 6 mm Ø 8 mm 	–	291698-25 291698-26 291698-27	–
Flange socket for mounting on the subsequent electronics	Flange socket (female) 	–	315892-10	–
Mounted couplings	With flange (female) Ø 6 mm Ø 8 mm 	–	291698-35	–
	With flange (male) Ø 6 mm Ø 8 mm 	–	291698-41 291698-29	–
	With central fastening (male) Ø 6 mm 	–	291698-37	–

ECN 225 – EnDat 22									
8-pin coupling M12			M12						
	Power supply				Absolute position values				
 M12	2	8	1	5	3	4	7	6	
	$U_P^{1)}$	U_P	$0V^{1)}$	$0V$	DATA	$\overline{\text{DATA}}$	CLOCK	$\overline{\text{CLOCK}}$	
	Blue	Brown/Green	White	White/Green	Gray	Pink	Violet	Yellow	

ECN 225 – EnDat 02												
17-pin coupling M23					14-pin Binder coupling							
												
												
												
	Power supply				Incremental signals				Absolute position values			
	7	1	10	4	15	16	12	13	14	17	8	9
 B	O	C	S	N	U	L	T	J	P	E	G	R
	U_P	Sensor U_P	$0V$	Sensor $0V$	A+	A-	B+	B-	DATA	$\overline{\text{DATA}}$	CLOCK	$\overline{\text{CLOCK}}$
	Brown/ Green	Blue	White/ Green	White	Green/ Black	Yellow/ Black	Blue/ Black	Red/ Black	Gray	Pink	Violet	Yellow

Shield on housing; U_P = power supply voltage

Sensor: The sensor line is connected internally with the corresponding power line

Vacant pins or wires must not be used.

¹⁾ For parallel supply lines

ECN 223F, ECN 223M

PUR connecting cable Ø 8 mm	For M23 connecting element, 17-pin [[4 x 0.14 mm ²] + 4(2 x 0.14 mm ²) + (4 x 0.5 mm ²)]	ECN 223F	ECN 223M
Complete with connector (female) and coupling (male)		349314-xx	349314-xx
With one connector (female)		309778-xx	309778-xx
Complete with M23 connector (female), 17-pin, and Fanuc connector [[2 x 2 x 0.14 mm ²] + (4 x 1 mm ²)]		534855-xx	–
Complete with M23 connector (female), 17-pin, and Mitsubishi connector [[2 x 2 x 0.14 mm ²] + (4 x 0.5 mm ²)]		–	10-pin: 573661-xx 20-pin: 367958-xx

ECN 223F					20-pin Fanuc connector			
17-pin coupling M23					Only on connecting cable			
	Power supply				Absolute position values			
	7	1	10	4	14	17	8	9
	9	18/20	12	14/16	1	2	5	6
	<u>U_P</u>	<u>Sensor U_P</u>	<u>0V</u>	<u>Sensor 0V</u>	<u>Serial Data</u>	<u>Serial Data</u>	<u>Request</u>	<u>Request</u>
	Brown/Green	Blue	White/Green	White	Gray	Pink	Violet	Yellow

ECN 223M					10-pin or 20-pin Mitsubishi connector			
17-pin coupling M23					Only on connecting cable			
	Power supply				Absolute position values			
	7	1	10	4	14	17	8	9
	10-pin	–	2	–	7	8	3	4
	20-pin	19	1	11	6	16	7	17
	<u>U_P</u>	<u>Sensor U_P</u>	<u>0V</u>	<u>Sensor 0V</u>	<u>Serial Data</u>	<u>Serial Data</u>	<u>Request Frame</u>	<u>Request Frame</u>
	Brown/Green	Blue	White/Green	White	Gray	Pink	Violet	Yellow

Shield on housing; **U_P** = power supply voltage
Vacant pins or wires must not be used.

Sensor: The sensor line is connected internally with the corresponding power line.

HEIDENHAIN

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