	Absolute Singleturn			Incremental		
	ECN 125	**ECN 113**	**ECN 113**	**ERN 120**	**ERN 130**	**ERN 180**
Absolute position values*	**EnDat 2.2**	**EnDat 2.2**	**SSI**	–		
Ordering designation	EnDat 22	EnDat 01	39n1			
Positions per revolution	33554432 (25 bits)	8192 (13 bits)		–		
Code	Pure binary		Gray	–		
Elec. permissible speed Deviations[1]	n_{max} for continuous position value	≤ 600 min^{-1}/n_{max} ± 1 LSB/± 50 LSB		–		
Calculation time t_{cal}	≤ 5 µs	≤ 0.25 µs	≤ 0.5 µs	–		
Incremental signals	None	~ 1 V_{PP}[2]		⊓⊔ TTL	⊓⊔ HTL	~ 1 V_{PP}[2]
Line counts*	–	**2048**		1000 **1024** 2048 2500 3600 **5000**		
Cutoff frequency –3 dB Scanning frequency Edge separation a	– – –	Typically ≥ 200 kHz – –		– ≤ 300 kHz ≥ 0.39 µs		Typ. ≥ 180 kHz – –
System accuracy	± 20"			1/20 of grating period		
Power supply **Current consumption** without load	3.6 to 5.25 V ≤ 200 mA	5 V ± 5 % ≤ 180 mA	5 V ± 5 %[3] ≤ 180 mA	5 V ± 10 % ≤ 120 mA	10 to 30 V ≤ 150 mA	5 V ± 10 % ≤ 120 mA
Electrical connection*	• **Flange socket** M12, radial • Cable 1 m/5m, with M12 coupling	• **Flange socket** M23, radial • **Cable 1 m**/5 m, with or **without coupling** M23		• **Flange socket** M23, radial • **Cable 1 m**/5 m, with or **without coupling** M23		
Shaft*	Hollow through shaft D = 20 mm, **25 mm,** 38 mm, **50 mm**			Hollow through shaft D = 20 mm, **25 mm,** 38 mm, **50 mm**		
Mech. permissible speed n[4]	*D > 30 mm:* ≤ 4000 min^{-1} *D ≤ 30 mm:* ≤ 6000 min^{-1}			*D > 30 mm:* ≤ 4000 min^{-1} *D ≤ 30 mm:* ≤ 6000 min^{-1}		
Starting torque at 20 °C	*D > 30 mm:* ≤ 0.2 Nm *D ≤ 30 mm:* ≤ 0.15 Nm			*D > 30 mm:* ≤ 0.2 Nm *D ≤ 30 mm:* ≤ 0.15 Nm		
Moment of inertia of rotor	*D = 50 mm* 220 · 10^{-6} kgm^2 *D = 38 mm* 350 · 10^{-6} kgm^2 *D = 25 mm* 96 · 10^{-6} kgm^2 *D = 20 mm* 100 · 10^{-6} kgm^2			*D = 50 mm* 220 · 10^{-6} kgm^2 *D = 38 mm* 350 · 10^{-6} kgm^2 *D = 25 mm* 95 · 10^{-6} kgm^2 *D = 20 mm* 100 · 10^{-6} kgm^2		
Permissible axial motion of measured shaft	± 1.5 mm			± 1.5 mm		
Vibration 55 to 2000 Hz **Shock** 6 ms	≤ 200 m/s^2 [5] (EN 60068-2-6) ≤ 1000 m/s^2 (EN 60068-2-27)			≤ 200 m/s^2 [5] (EN 60068-2-6) ≤ 1000 m/s^2 (EN 60068-2-27)		
Max. operating temp.[4]	100 °C			100 °C	85 °C (100 °C at U_P < 15 V)	100 °C
Min. operating temp.	*Flange socket or fixed cable:* –40 °C *For frequent flexing:* –10 °C			*Flange socket or fixed cable:* –40 °C *For frequent flexing:* –10 °C		
Protection[4] EN 60529	IP 64			IP 64		
Weight	0.6 kg to 0.9 kg depending on the hollow shaft version			0.6 kg to 0.9 kg depending on the hollow shaft version		

Bold: These preferred versions are available on short notice

* Please select when ordering

1) Velocity-dependent deviations between the absolute value and incremental signal

2) Restricted tolerances: Signal amplitude 0.8 to 1.2 V_{PP}

3) 10 to 30 V via connecting cable with voltage converter

4) For the correlation between the protection class, shaft speed and operating temperature, see *General Mechanical Information*

5) 100 m/s^2 with flange socket version