	**Absolute** **Singleturn** **ROC 425** Functional Safety	**ROC 413**		**RIC 418**
Interface*	EnDat 2.2	EnDat 2.2	SSI	EnDat 2.1
Ordering designation	EnDat22	EnDat01	SSI39r1	EnDat01
Positions per revolution	33554432 (25 bits)	8192 (13 bits)		262144 (18 bits)
Revolutions	–			
Code	Pure binary		Gray	Pure binary
Elec. permissible speed Deviation[1]	≤ 15000 rpm for continuous position value	*512 lines:* ≤ 5000/12000 rpm ± 1 LSB/± 100 LSB *2048 lines:* ≤ 1500/12000 rpm ±1 LSB/±50 LSB	12000 rpm ±12 LSB	≤ 4000/15000 rpm ±400 LSB/±800 LSB
Calculation time t_{cal} Clock frequency	≤ 7 µs ≤ 8 MHz	≤ 9 µs ≤ 2 MHz	≤ 5 µs –	≤ 8 µs ≤ 2 MHz
Incremental signals	Without	~ 1 V_{PP}[2]		~ 1 V_{PP}
Line counts*	–	**512** 2048	512	16
Cutoff frequency –3 dB	–	*512 lines:* ≥ 130 kHz; *2048 lines:* ≥ 400 kHz		≥ 6 kHz
System accuracy	±20″	*512 lines:* ±60″; *2048 lines:* ±20″		±480″
Electrical connection*	• **Flange socket** M12, radial • Cable 1 m, with M12 coupling	• **Flange socket** M23, axial or radial • Cable 1 m/5 m, with or without M23 coupling		• **Flange socket** M23, radial • Cable 1 m, with M23 coupling
Supply voltage	DC 3.6 V to 14 V	DC 3.6 V to 14 V	DC 4.75 V to 30 V	DC 5 V ±0.25 V
Power consumption (max.)	*3.6 V:* ≤ 0.6 W *14 V:* ≤ 0.7 W		*5 V:* ≤ 0.8 W *10 V:* ≤ 0.65 W *30 V:* ≤ 1 W	*5 V:* ≤ 0.95 W
Current consumption (typical, without load)	*5 V:* 85 mA		*5 V:* 90 mA *24 V:* 24 mA	*5 V:* 125 mA
Shaft	Solid shaft Ø 6 mm			
Mech. permiss. speed *n*	≤ 15000 rpm			
Starting torque (typical)	0.01 Nm (at 20 °C)			
Moment of inertia of rotor	≤ 2.7 · 10^{-6} kgm^2			
Shaft load	*Axial:* ≤ 40 N; *radial:* ≤ 60 N at shaft end (see also *Mechanical design types and mounting*)			
Vibration 55 Hz to 2000 Hz **Shock** 6 ms	≤ 300 m/s^2 (EN 60068-2-6) *ROC/ROQ:* ≤ 2000 m/s^2; *RIC/RIQ:* ≤ 1000 m/s^2 (EN 60068-2-27)			
Max. operating temp.[3]	100 °C			
Min. operating temp.	*Flange socket or fixed cable:* –40 °C; *Moving cable:* –10 °C			
Protection EN 60529	IP67 at housing, IP64 at shaft inlet (IP66 upon request)			
Mass	≈ 0.35 kg			
Valid for ID	683639-xx[4]	1109254-xx	1131750-xx	642004-xx

Bold: This preferred version is available on short notice.
***** Please select when ordering
[1] Velocity-dependent deviations between the absolute value and incremental signals

	Multiturn			
	ROQ 437 Functional Safety	**ROQ 425**		**RIQ 430**
	EnDat 2.2	EnDat 2.2	SSI	EnDat 2.1
	EnDat22	EnDat01	SSI41r1	EnDat01
	33554432 (25 bits)	8192 (13 bits)	8192 (13 bits)	262144 (18 bits)
	4096			4096
	Pure binary		Gray	Pure binary
	≤ 15000 rpm for continuous position value	*512 lines:* ≤ 5000/10000 rpm ± 1 LSB/± 100 LSB *2048 lines:* ≤ 1500/10000 rpm ±1 LSB/±50 LSB	12000 rpm ±12 LSB	≤ 4000/15000 rpm ± 400 LSB/± 800 LSB
	≤ 7 µs ≤ 8 MHz	≤ 9 µs ≤ 2 MHz	≤ 5 µs –	≤ 8 µs ≤ 2 MHz
	Without	~ 1 V_{PP} [2]		~ 1 V_{PP}
	–	**512** 2048	512	16
	–	*512 lines:* ≥ 130 kHz; *2048 lines:* ≥ 400 kHz		≥ 6 kHz
	±20"	*512 lines:* ±60"; *2048 lines:* ±20"		±480"
	• **Flange socket** M12, radial • Cable 1 m, with M12 coupling	• **Flange socket** M23, axial or radial • Cable 1 m/5 m, with or without M23 coupling		• **Flange socket** M23, radial • Cable 1 m, with M23 coupling
	DC 3.6 V to 14 V	DC 3.6 V to 14 V	DC 4.75 V to 30 V	DC 5 V ±0.25 V
	3.6 V: ≤ 0.7 W *14 V:* ≤ 0.8 W		*5 V:* ≤ 0.95 W *10 V:* ≤ 0.75 W *30 V:* ≤ 1.1 W	*5 V:* ≤ 1.1 W
	5 V: 105 mA		*5 V:* 120 mA *24 V:* 28 mA	*5 V:* 150 mA
	≤ 12000 rpm			
	683641-xx [4]	1109256-xx	1131752-xx	642000-xx

[2] Restricted tolerances: signal amplitude 0.8 V_{PP} to 1.2 V_{PP}
[3] For the correlation between the operating temperature and the shaft speed or supply voltage, see *General mechanical information*
[4] Also available with functional safety; for dimensions and specifications, see the product information document.