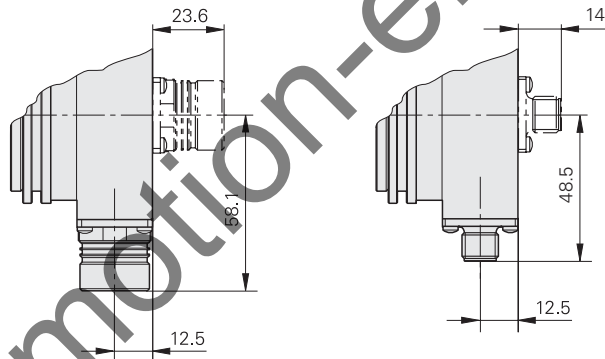
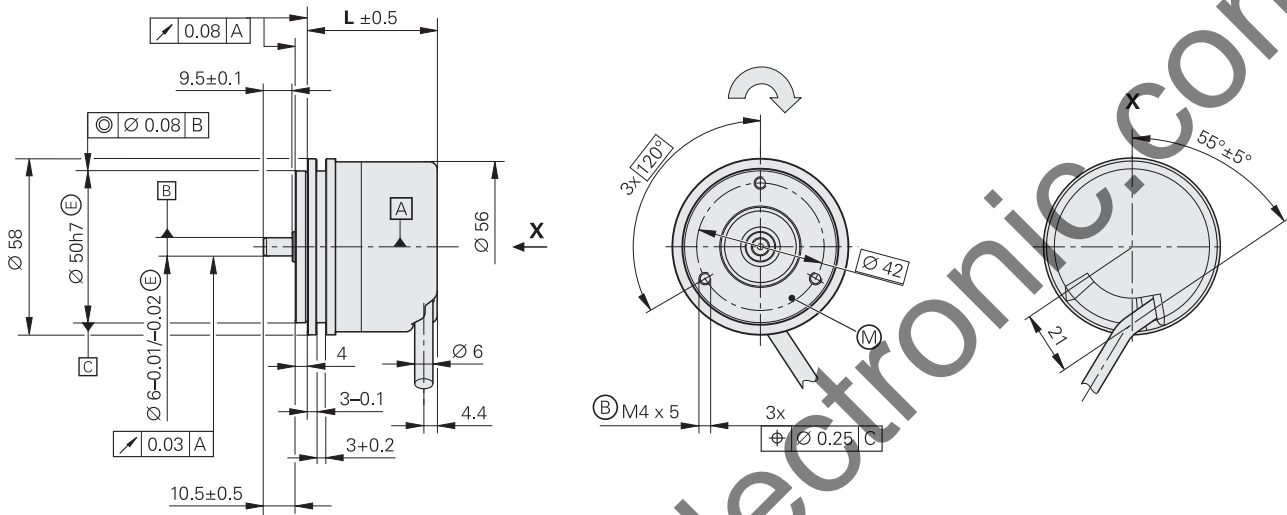


ROC/ROQ/ROD 400 Series with Synchro Flange

Rotary encoders for separate shaft coupling

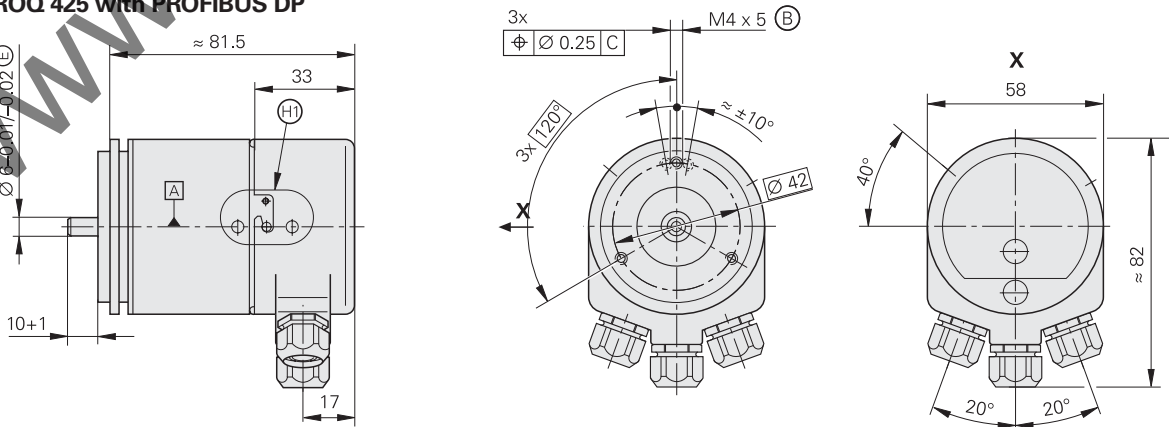


ROC/ROQ/ROD 4xx

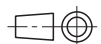


	L
ROD ROC/ROQ 512 lines	42.7
ROC/ROQ 2048 lines ROC 425/ROQ 437	43.2

ROC 413/ROQ 425 with PROFIBUS DP



Dimensions in mm



Tolerancing ISO 8015
ISO 2768 - m H

Cable radial, also usable axially

▣ = Ball bearing

⊕ = Threaded mounting hole

⊕ = Shown rotated by 40°

↻ Direction of shaft rotation for output signals is described in interface description.

	Absolute								Incremental			
	Singletum				Multitum							
	ROC 425 ¹⁾	ROC 413 ¹⁾	ROC 4101) ROC 4121) ROC 413 ¹⁾	ROC 413	ROQ 437 ¹⁾	ROQ 425 ¹⁾	ROQ 4241) ROQ 425 ¹⁾	ROQ 425	ROD 426	ROD 466	ROD 436	ROD 486
Absolute position values*	EnDat 2.2	EnDat 2.2	SSI	PROFIBUS-DP	EnDat 2.2	EnDat 2.2	SSI	PROFIBUS-DP	-			
Ordering information	EnDat 22	EnDat 02			EnDat 22	EnDat 02						
Positions per rev.	33554432 (25 bits)	8192 (13 bits)	1024 (10 bits) 4096 (12 bits) 8192 (13 bits)	8192 (13 bits) ³⁾	33554432 (25 bits)	8192 (13 bits)	4096 (12 bits) 8192 (13 bits)	8192 (13 bits) ³⁾	-			
Revolutions	-				4096				4096 ³⁾			
Code	Pure binary		Gray	Pure binary	Pure binary			Gray	Pure binary			
Elec. permissible speed/Accuracy	≤ 12000 rpm for continuous position values	512 lines: ≤ 5000 rpm/± 1 LSB 2048 lines: ≤ 1500 rpm/± 1 LSB ≤ 12000 rpm/± 50 LSB			≤ 12000 rpm for continuous position values	512 lines: ≤ 5000 rpm/± 1 LSB 2048 lines: ≤ 1500 rpm/± 1 LSB ≤ 10000 rpm/± 50 LSB						
Calculation time t_{cal}	≤ 5 μs	≤ 0.25 μs	≤ 0.5 μs	-	≤ 5 μs	≤ 0.25 μs	≤ 0.5 μs	-	-			
Incremental signals	None	~ 1 V _{PP} ²⁾		-	None	~ 1 V _{PP} ²⁾		-	□ TTL		□ HTL	~ 1 V _{PP} ²⁾
Line counts*	-	512 2048	512	512 (internal only)	-	512 2048	512	512 (internal only)	50 100 150 200 250 360	500 512 720	-	
Cutoff freq. -3 dB Scanning frequency Edge separation a	-	512 lines: ≥ 100 kHz; 2048 lines: ≥ 200 kHz		-	-	512 lines: ≥ 100 kHz; 2048 lines: ≥ 200 kHz		-	1000 1024 1250 1500 1800 2000 2048 2500 3600 4096 5000 6000 ⁵⁾ 8192 ⁵⁾ 9000 ⁵⁾ 10000 ⁵⁾		-	
System accuracy	± 20"	512 lines: ± 60"; 2048 lines: ± 20"		± 60"	± 20"	512 lines: ± 60"; 2048 lines: ± 20"		1/20 of grating period				
Power supply*	3.6 to 5.25 V	5 V ± 5 %	5 V ± 5 % or 10 to 30 V	10 to 30 V	3.6 to 5.25 V	5 V ± 5 %	5 V ± 5 % or 10 to 30 V	10 to 30 V	5 V ± 10 %	10 to 30 V	10 to 30 V	5 V ± 10 %
Current consumption without load	≤ 150 mA	≤ 160 mA	≤ 160 mA	≤ 125 mA at 24 V	≤ 180 mA	≤ 200 mA	≤ 200 mA	≤ 125 mA at 24 V	120 mA	100 mA	150 mA	120 mA
Electrical connection*	• Flange socket M12, radial • Cable 1 m, with coupling M12	• Flange socket M23, axial or radial • Cable 1 m/5 m, with or without coupling M23		Screw terminals; radial cable exit	• Flange socket M12, radial • Cable 1 m, with coupling M12	• Flange socket M23, axial or radial • Cable 1 m/5 m, with or without coupling M23		Screw terminals; radial cable exit	• Flange socket M23, radial and axial • Cable 1 m/5 m, with or without coupling M23			
Shaft	Solid shaft D = 6 mm								Solid shaft D = 6 mm			
Mech. permissible speed	≤ 12000 rpm								≤ 16000 rpm			
Starting torque	≤ 0.01 Nm (at 20 °C)								≤ 0.01 Nm (at 20 °C)			
Moment of inertia of rotor	2.7 · 10 ⁻⁶ kgm ²			3.6 · 10 ⁻⁶ kgm ²	2.7 · 10 ⁻⁶ kgm ²			3.8 · 10 ⁻⁶ kgm ²	2.7 · 10 ⁻⁶ kgm ²			
Shaft load ⁶⁾	Axial 10 N/radial 20 N at shaft end								Axial 10 N/radial 20 N at shaft end			
Vibration 55 to 2000 Hz Shock 6 ms/2 ms	≤ 300 m/s ² (EN 60068-2-6) ≤ 1000 m/s ² /≤ 2000 m/s ² (EN 60068-2-27)								≤ 300 m/s ² (EN 60068-2-6) ≤ 1000 m/s ² /≤ 2000 m/s ² (EN 60068-2-27)			
Max. operat. temperature	$U_P = 5 V$: 100 °C; $U_P = 10$ to 30 V: 85 °C			60 °C	$U_P = 5 V$: 100 °C; $U_P = 10$ to 30 V: 85 °C			60 °C	100 °C	70 °C	100 °C	
Min. operat. temperature	Flange socket or fixed cable: -40 °C; Moving cable: -10 °C			-20 °C	Flange socket or fixed cable: -40 °C; Moving cable: -10 °C			-20 °C	Flange socket or fixed cable: -40 °C; Moving cable: -10 °C			
Protection IEC 60529	IP 67 at housing; IP 64 at shaft end ⁴⁾								IP 67 at housing; IP 64 at shaft end ⁴⁾			
Weight	Approx. 0.35 kg								Approx. 0.3 kg			

Bold: These preferred versions are available on short notice

* Please indicate when ordering

¹⁾ Available in 3rd quarter of 2005; for the previous version, see the *Rotary Encoders, January 2004* brochure

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

³⁾ These functions are programmable

⁴⁾ IP 66 upon request

⁵⁾ Only on ROD 426, ROD 466 through integrated signal doubling

⁶⁾ Also see *Mechanical Design and Installation*

		Absolute	
		Singleturn	
		ROC 415	ROC 417
Absolute position values	EnDat 2.1		
Positions per rev.	32 768 (15 bits)	131 072 (17 bits)	
Code	Pure binary		
Elec. permissible speed at accuracy	60 rpm/± 2 LSB 200 rpm/± 50 LSB		
Calculation time t_{cal}	≤ 0.25 μs		
Incremental signals	~ 1 V _{PP} ¹⁾		
Line counts	8192		
Cutoff freq. -3 dB	≥ 100 kHz		
Power supply Current consumption without load	5 V ± 5% ≤ 250 mA		
Electrical connection*	<ul style="list-style-type: none"> • Flange socket M23, axial or radial • Cable 1 m/5 m, with or without coupling M23 		
Shaft	Solid shaft D = 10 mm		
Mechanically permissible speed	≤ 10 000 rpm		
Starting torque	≤ 0.025 Nm (at 20 °C)		
Moment of inertia of rotor	3.6 · 10 ⁻⁶ kgm ²		
Shaft load	Axial 10 N Radial 20 N at shaft end		
Vibration 55 to 2000 Hz Shock 6 ms	≤ 100 m/s ² (EN 60068-2-6) ≤ 1000 m/s ² (EN 60068-2-27)		
Max. operating temperature	80 °C		
Min. operating temperature	<i>Flange socket or fixed cable: -40 °C</i> <i>Moving cable: -10 °C</i>		
Protection EN 60529	IP 67 at housing IP 66 at shaft inlet		
Weight	Approx. 0.4 kg		

Bold: These preferred versions are available on short notice

* Please indicate when ordering

¹⁾ Restricted tolerances: Signal amplitude 0.8 to 1.2 V_{PP}

Mounting Accessories

Fixing clamps

(3 per encoder)
Id. Nr. 200032-01

Shaft coupling

See *Shaft Couplings*

