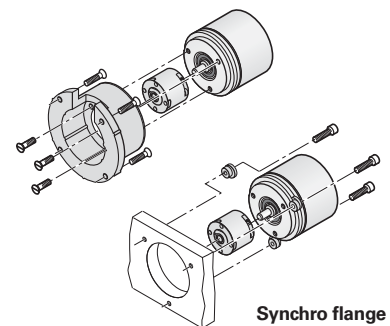# ROC, ROQ, ROD and RIC, RIQ rotary encoders
## With integral bearing, for separate shaft coupling

The optical encoders **ROC**, **ROQ** and **ROD**, as well as the inductive **RIC** and **RIQ** from HEIDENHAIN have integrated bearings and are sealed. They provide IP 64 to IP 67 protection, depending on the version. They are robust and compact.

These encoders are coupled by the rotor to the measured shaft through a separate coupling that compensates axial motion and misalignment between the encoder shaft and measured shaft.

Some rotary encoders are suitable in a special version for potentially explosive atmospheres in accordance with Directive 94/9/EG, **(ATEX)**. They comply with Equipment Group II, meet the requirements of Category 2 and can be used for Zones 1 and 21 as well as 2 and 22.
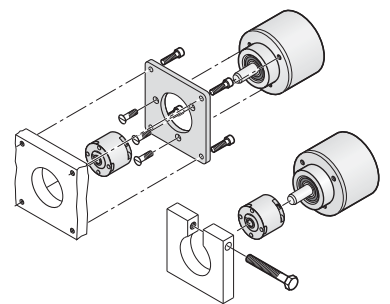
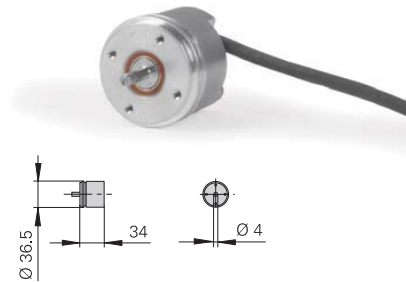### ROC, ROQ, ROD 1000 series
- **Miniaturized dimensions** for installation in small devices or in limited installation space
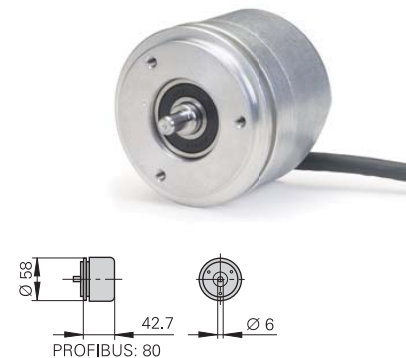- Mounting by synchro flange
- Shaft diameter 4 mm

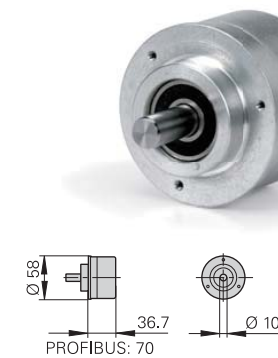**Series 1000**

Ø 36.5   34   Ø 4

ROC/ROQ/ROD 400 series
- **Industrial standard** for dimensions and output signals
- Degree of protection IP 67 at housing IP 64 at shaft inlet (IP 66 available on request)
- Mounting by synchro flange or clamping flange
- Shaft diameters 6 mm with synchro flange 10 mm with clamping flange
- Preferred types with fast delivery (see *Rotary Encoders* brochure or ask HEIDENHAIN)

ROD 400 series with synchro flange

Ø 58   42.7   Ø 6
PROFIBUS: 80

RIC/RIQ 400 series
- Inductive scanning principle
- For reduced accuracy requirements up to ± 480"
- Mechanical design same as ROC/ROQ 400

Synchro flange

Clamping flange

	Absolute				Incremental			
	ROC 1013	ROQ 1025	ROC 1023	ROQ 1035	ROD 1020	ROD 1030	ROD 1070	ROD 1080
Interface	EnDat 2.2[1] with $\sim$ 1 V$_{PP}$		EnDat 2.2[1]		⨅ TTL	⨅ HTL	⨅ TTL[2]	$\sim$ 1 V$_{PP}$
Position values/revolution	8192 (13 bits)		8388608 (23 bits)		–			
Distinguishable revolutions	–	4096 (12 bits)	–	4096 (12 bits)	–			
Line count/signal periods	512		–		100 to 3600		1000/2500/ 3600	100 to 3600
Voltage supply	3.6 to 14 V		3.6 to 14 V		5 V	10 V to 30 V	5 V	

[1] Includes EnDat 2.1 command set; PROFIBUS-DP via gateway
[2] Integrated 5/10-fold interpolation

ROD 400 series with clamping flange

Ø 58   36.7   Ø 10
PROFIBUS: 70

PROFIBUS-DP/PROFINET

Synchro flange	Absolute RIC 418	RIQ 430	ROC 413	ROQ 425	ROC 413
Clamping flange					
Interface	EnDat 2.1 with $\sim$ 1 V$_{PP}$		EnDat 2.2[4] with $\sim$ 1 V$_{PP}$; SSI		PROFIBUS-DP; PROFINET
Position values/ rev	262144 (18 bits)		8192 (13 bits)		
Distinguishable revolutions	–	4096 (12 bits)	–	4096 (12 bits)	–
Line count/signal periods	16		512		–
Voltage supply	5 V		3.6 V to 14 V; 5 V or 10 V to 30 V		9 V to 36 V; 10 V to 30 V

[1] ATEX version available (*ROC/ROQ* with 5 V voltage supply and EnDat 2.1)
[2] **Functional Safety** upon request

	ROQ 425	ROC 424S	ROQ 436S	ROC 425[2] ROC 425F	ROQ 437[2] ROQ 437F	Incremental ROD 426[1] ROD 420[1]	ROD 466[1] –	ROD 436[1] ROD 430[1]	ROD 486[1] ROD 480[1]
Interface		Siemens DRIVE-CLiQ		EnDat 2.2[4]; Fanuc αi		⨅ TTL	⨅ TTL[1]	⨅ HTL	$\sim$ 1 V$_{PP}$
Position values/ rev		16777216 (24 bits)		33554432 (25 bits)		–			
Distinguishable revolutions	4096 (12 bits)	–	4096 (12 bits)	–	4096 (12 bits)	–			
Line count/signal periods						50 to 5000 *ROD 426/466:* Up to 10000[3]			1000 to 5000
Voltage supply		10 V to 28.8 V		3.6 to 14 V		5 V	10 V to 30 V		5 V

[3] Signal periods over 5000 are generated through signal doubling in the encoder
[4] Includes EnDat 2.1 command set; PROFIBUS-DP via gateway