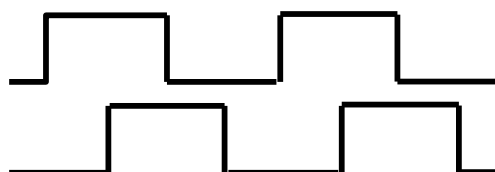
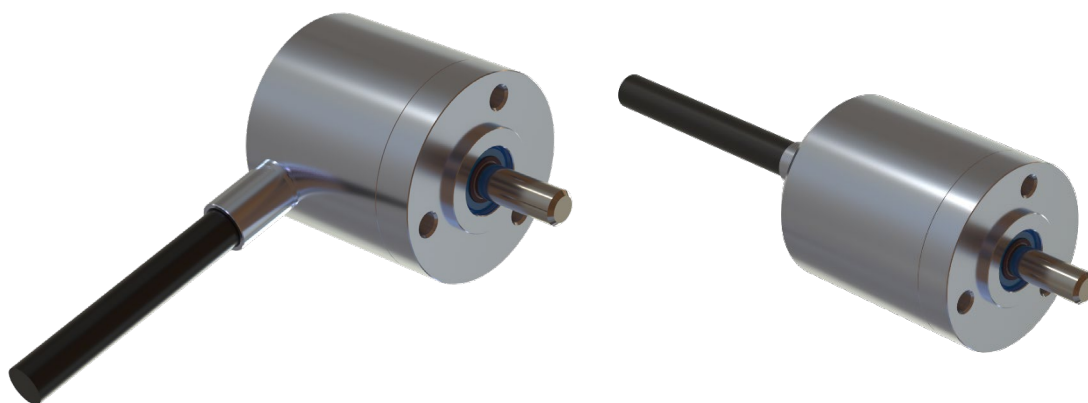


# Mini Encoder High Resolution



**PWB encoders GmbH**  
**Am Goldberg 2**  
**D-99817 Eisenach**  
**Germany**  
**Phone: +49 3691 72580-0**

**[info@pwb-encoders.com](mailto:info@pwb-encoders.com)**  
**[www.pwb-encoders.com](http://www.pwb-encoders.com)**

## **Description**

The GEO24 is a reliable, cost-effective optical shaft encoder with bearings that can be quickly and easily integrated into an application. The encoder has a line driver (HTL) and provides two square-wave signals A and B. for counting and direction information. The amplitude of the signals depends on the selected power supply. The resolution of the encoder is determined by the number of pulses per revolution (PPR). Contact is made via a 4-pole shielded sensor cable; the cable output can be radial or axial.

## **Features**

- optical scanning principle
- small design: 24 mm diameter
- mini encoder with shaft  $\varnothing$ 4 mm
- 360 pulses per revolution
- supply voltage: 8-24 VDC (reverse polarity protection)
- output current per channel: max. 20 mA
- two-channel line driver output, channel A and B
- cable output radial or axial
- operating temperature: -20 °C to +85 °C
- compliant with EU Directive 2011/65/EU (RoHS)

## Recommended operating conditions

### Electrical Notes

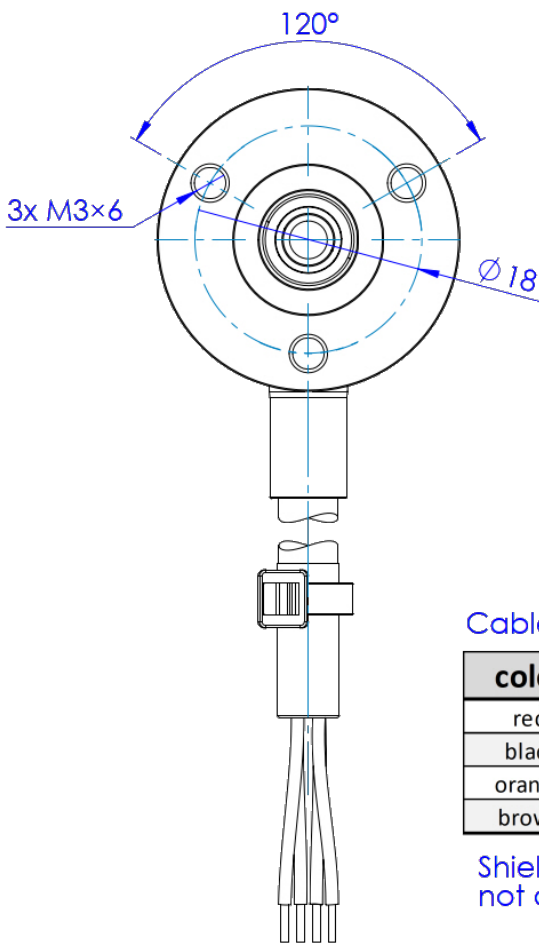
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply voltage	$V_{CC}$	8	12	24	$V_{DC}$	
Supply current	$I_{CC}$	8	30	50	mA	no load
Count frequency	f			30	kHz	
Operating temperature	$T_A$	-20	25	85	°C	
Humidity exposure				90	% RH	not condensing
<b>A, A, B, B, I, I Channel</b>						
High level output voltage	$V_{OH}$	UB-3V		$V_{CC}$	$V_{DC}$	
High level output current	$I_{OH}$			20	mA	
Low level output voltage	$V_{OL}$			1.5	$V_{DC}$	
Low level output current	$I_{OL}$			20	mA	
Propagation time				110	ns	
Rise time	$t_r$			350	ns	
Fall time	$t_f$			350	ns	

### Mechanical Notes

Parameter	Value	Tolerance	Unit
Max. allowable axial shaft play of motor	0.1	-	mm
Max. allowable radial shaft play of motor	0.02	-	mm
Mounting screw size	3 x M3x6mm	-	-
Pitch circle diameter	18.0	±0.1	mm
Shielded cable, tinned ends	4 x 0,14	-	mm
Total weight	~ 27	-	g
Moment of inertia of the hub with the code wheel	13.0	±1.0	gcm <sup>2</sup>
Protection grade according to DIN 40500	IP54	-	-
max. speed (mechanical)	5,000	-	rpm

**ESD Warning: Normal handling precautions should be taken to avoid static discharge damage to the sensor.**

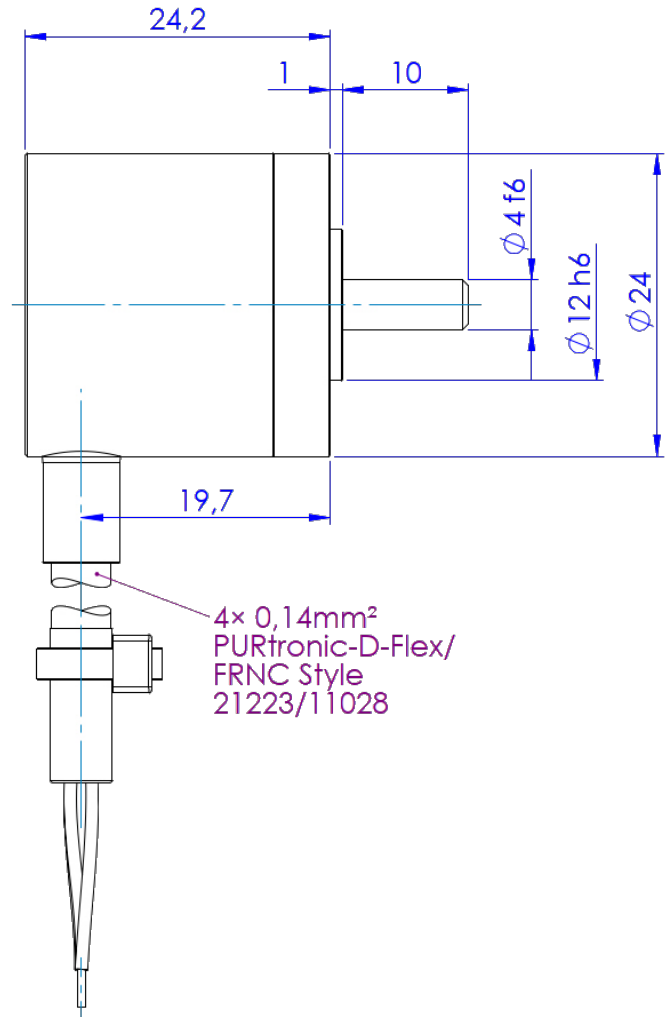
## Mechanic performance: radial version



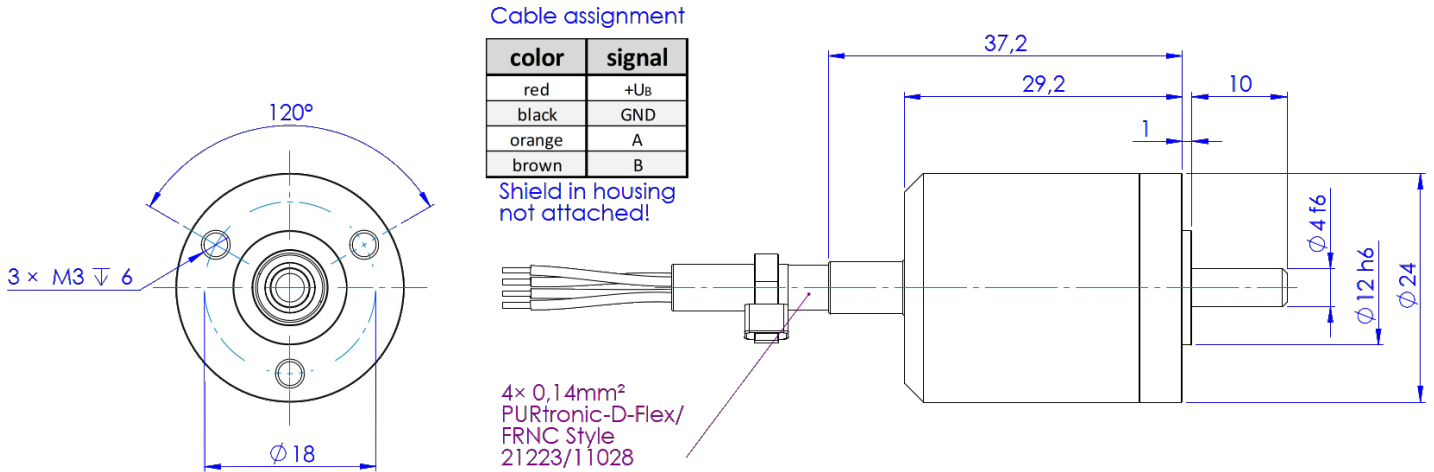
### Cable assignment

color	signal
red	+U <sub>B</sub>
black	GND
orange	A
brown	B

Shield in housing  
not attached!



## Mechanic performance: axial version

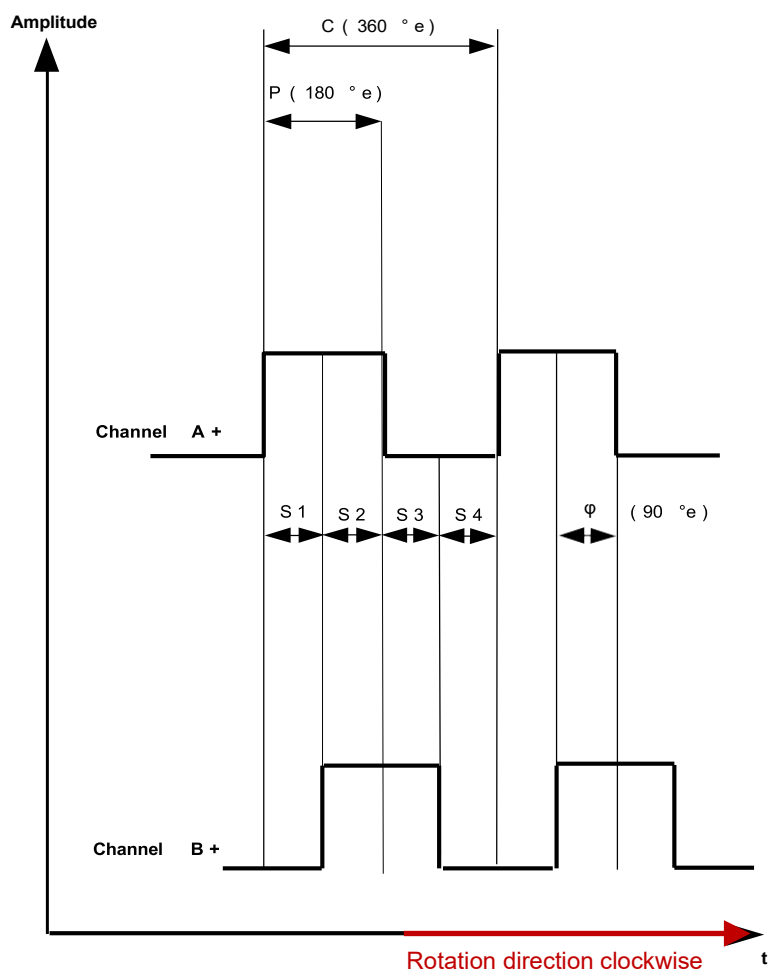


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## Electrical interface



### Definitions

#### Pulses per Revolution (PPR):

The number of bar and window pairs or increments per revolution of the code wheel.

#### One Cycle (C):

360 electrical degrees ( $^{\circ}e$ ), one period of the signal, caused by one pair of bar and window.

#### Pulse Width (P):

The number of electrical degrees that an output is high during one cycle. This value is nominally  $180^{\circ}e$ .

#### State Width (S):

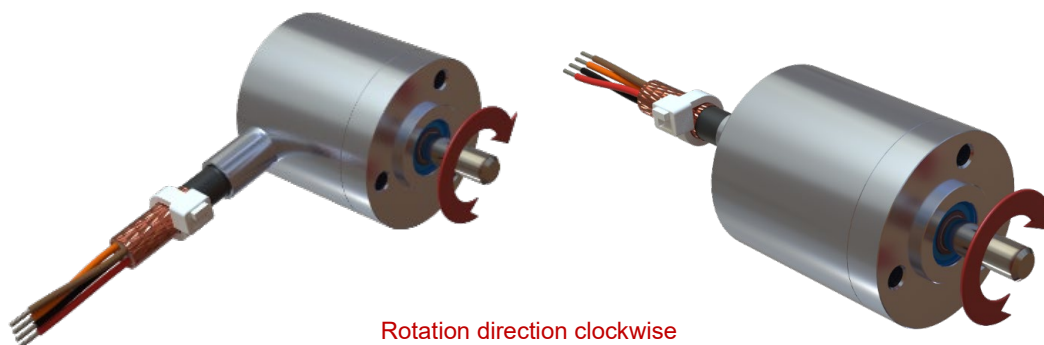
The number of electrical degrees between a transition in the output of channel A and the neighbouring transition in the output of channel B. There are 4 states per cycle, each nominally  $90^{\circ}e$ .

#### Phase ( $\phi$ ):

The number of electrical degrees between the center of the high state of channel A and the center of the high state of channel B. This value is nominally  $90^{\circ}e$ .

#### Position Error ( $\Delta Q$ ):

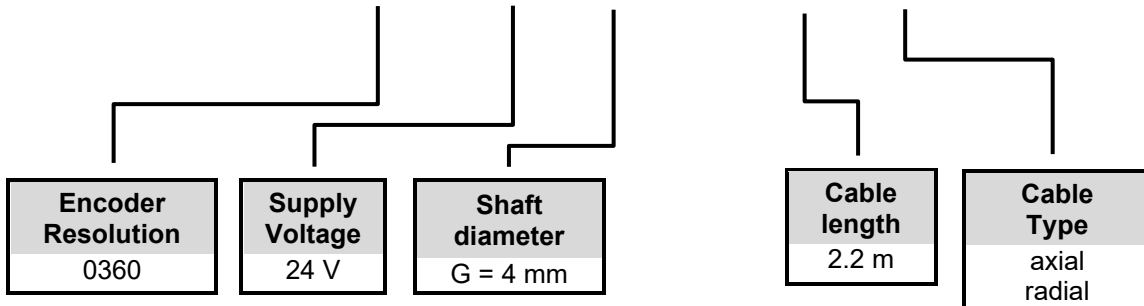
The angular difference between the actual angular shaft position and the position indicated by the encoder cycle count.



## Ordering information

Ordering code:

**GEO 24 I - 2 - 0360 - 24 - G - S - 2.2 - X**



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