

POSIC

PO2300 Series Incremental encoder kit

Product data

Features

- Differential inductive sensing mechanism
- Insensitive to magnetic interference fields
- Robust in oil, water, dust, particles
- Ultra-thin package, 1.8 mm thick
- Thin and low-cost PCB-type target strips/discs

Applications

- Industrial automation
- Stages and X-Y tables
- Assembly / Pick & Place equipment
- Linear motor, voice coil actuator
- Pneumatic/hydraulic actuator
- Machine tools

General Specifications

Resolution.....0.3 - 150 μ m, see Table 1
 Maximum speed0.05 – 50 m/s, see Table 1
 Airgap rangeup to 0.9 mm, see Table 1
 Supply voltage5.0 \pm 0.5 V
 Supply current..... 15 mA typ
 Temperature0 – 100°C
 Target length.....up to 300 mm
 Target material.....Copper on FR4
 Target period1.2 mm
 Target therm. exp. coef..... 11 ppm/°C
 Output formats.....A quad B, PWM, Analog

Description

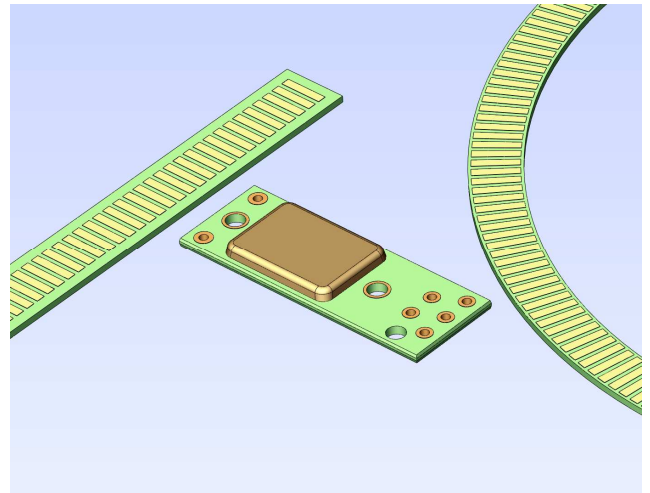
The PO2300 series encoder kit consists of a sensor element and a PCB-type target. The target is supplied either in the form of a strip for linear applications or a disc/ring for rotational applications.

The sensor-element is a differential transformer structure (similar to an LVDT or a resolver) with the coils integrated on a silicon chip. The electronics to drive the sensor and to treat the sensor signals are integrated in the same chip.

The linear target or disk/ring is a PCB with a copper pattern with a period length of 1.2 mm. The copper pattern is covered by a solder-mask, which provides a protection against liquids and against mechanical impact. The PCB-material is easy to "cut to length". For alternative targets, please contact POSIC.

Output format A quad B (Fig. 1)

Channel frequency.....up to 500 kHz
 Phase shift.....90 \pm 45°
 Duty cycle50 \pm 25%
 Hysteresis.....1 increment
 Index pulse (I).....1 per period, synchr. to B-signal



Output format PWM (Fig. 2)

Repetition frequency..... 500 Hz \pm 20%
 Resolution below 1 μ m
 Pulse Width Range..... 10 – 90%
 Rotor Distance..... 1.0 – 1.4 mm
 The output signals are redundant: PWM2 = NOT(PWM1).

Output format Analog Ratiometric (Fig. 2)

Bandwidth..... 1 kHz
 Resolution below 1 μ m
 Output Signal Range 0.5 – 4.5 V (with VDD = 5.0 V)
 Rotor Distance..... 1.0 – 1.4 mm

Index (Fig. 2)

The variants with PWM and AR outputs have an Index output signal, which provides one pulse per period. This allows very fast movement over several periods, during which only the Index-pulse is counted in order to keep track of the coarse position.

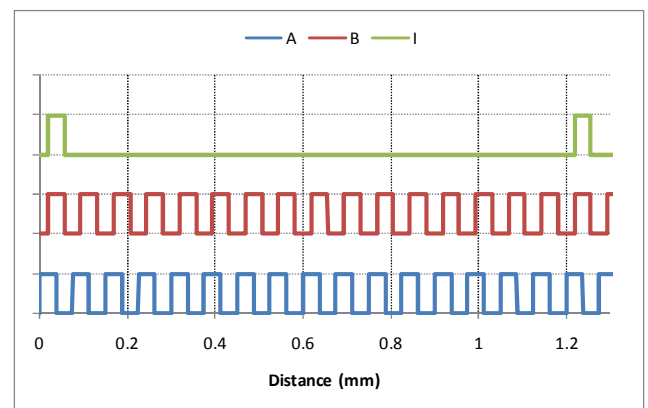


Figure 1: A quad B signals over one period of 1.2 mm with Index synchronous to B-pulse. Resolution 18.8 μ m.

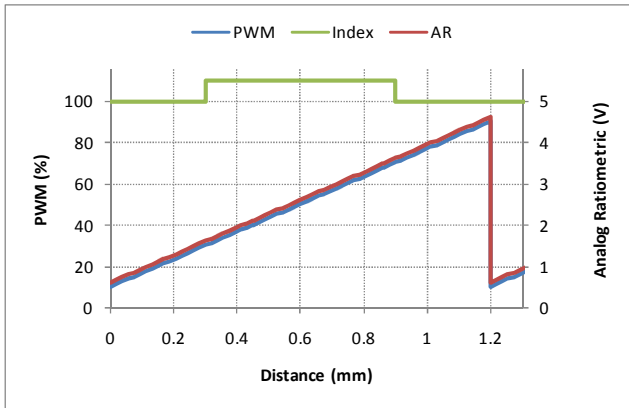
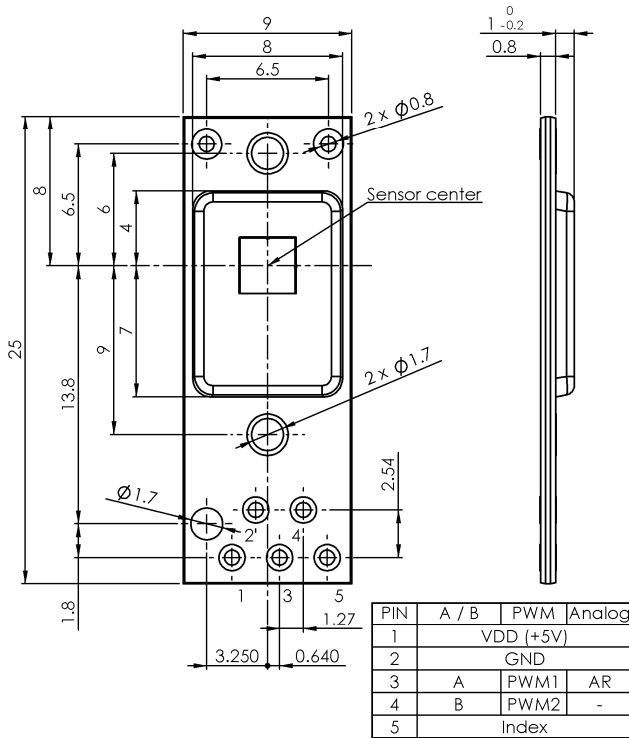


Figure 2: Analog Ratiometric (AR), PWM and Index (I) signals over one period of 1.2 mm.

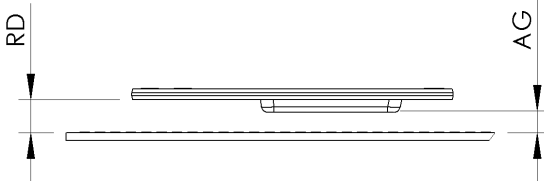
Technical drawing



Compatible to connector: tyco 0-215570-4

Airgap and Rotor Distance

The Air-Gap (AG) is the distance between the glob-top protection layer and the target as shown below.



The Rotor Distance (RD) is the distance between the frontside of the sensor-PCB and the target. Because the frontside (or backside) of the PCB is typically used as a mechanical reference for assembly of the sensor into a mechanical system, the Rotor Distance rather than the Air-Gap is used in the specifications.

The maximum Rotor Distance as a function of resolution and maximum speed is listed in Table 1. These parameters are programmable ex-factory (see ordering information below).

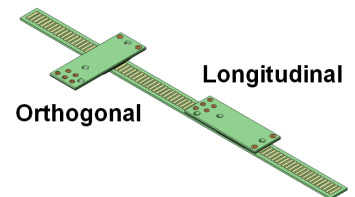
Table 1: Maximum Rotor Distance as a function of Resolution and Linear Speed for A quad B output format.

		Maximum linear speed (m/s)									
		0.05	0.1	0.2	0.5	1	2	5	10	20	50
Resolution (um)	0.3	1.1	-	-	-	-	-	-	-	-	-
	0.6	1.3	1.1	1.1	-	-	-	-	-	-	-
	1.2	1.3	1.3	1.1	1.1	-	-	-	-	-	-
	4.7	1.5	1.5	1.5	1.3	1.3	1.3	1.1	-	-	-
	9.4	1.7	1.7	1.5	1.5	1.5	1.5	1.3	1.1	1.1	-
	18.8	1.9	1.7	1.7	1.7	1.5	1.5	1.3	1.3	1.1	1.1
	37.5	1.9	1.9	1.9	1.7	1.7	1.7	1.5	1.5	1.3	1.3
	75	1.9	1.9	1.9	1.9	1.7	1.7	1.7	1.7	1.5	1.5
	150	1.9	1.9	1.9	1.9	1.9	1.9	1.7	1.7	1.7	1.7

Ordering information

Product number: PO23AB-CD

A	Orientation
0	Longitudinal
1	Orthogonal



B	Output
0	A quad B
1	PWM
2	AR

C	Resolution
0	0.3 um
1	0.6 um
2	1.2 um
3	4.7 um
4	9.4 um
5	18.8 um
6	37.5 um
7	75 um
8	150 um

D	Speed
0	0.05 m/s
1	0.1 m/s
2	0.2 m/s
3	0.5 m/s
4	1 m/s
5	2 m/s
6	5 m/s
7	10 m/s
8	20 m/s
9	50 m/s

Customization of the sensor to a specific application (form of PCB, period/material of target, interpolation factor etc) as well as cable/connector solutions are offered. Please contact POSIC for more detailed information.

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