

# Datasheet

## Characteristics

- Mini Encoder with shaft
- Shaft Encoder: Ø24 mm
- Shaft: Ø2 mm - 1/4 inch
- Resolution up to 7.500 ppr
- IP64 / IP50 (with IDC connector)



## Mechanical data

Material: Housing	Brass
Shaft	Stainless Steel
Cap	Electroplated Steel/ Aluminium (with flat cable)
Weight: Encoder	~35 gr
Cable	50 gr / Meter
Bearing Life	>1,9 x 10 <sup>10</sup> revolutions at rated load
Shaft Loads	axial: max. 20 N radial: max. 20 N
Shaft Speed	max. 12.000 rpm
Starting Torque	< 0,005 Nm at 25°C
Mass Moment of Inertia	1,0 gcm <sup>2</sup>
Operating Temp.	-40°C to +85°C
Storage Temp.	-40°C to +85°C
Shock	100 G / 11 ms
Vibration	10- 2.000 Hz / 10 G
Bump	10 G / 16 ms (1.000 x 3 axis)
Humidity	98% RH without condensation
Enclosure Rating	IP64 / IP50 (with flat cable)

## Electrical data

Code	Incremental	
Resolutions (pulses per revolutions)	min. 1, 4, 10, 11, 12, 15, 20, 25, 30, 36, 50, 60, 64, 75, 90, 100, 125, 128, 150, 180, 200, 250, 256, 300, 360, 400, 500, 512, 600, 1.000, 1.024, 1.250, 1.800, 2.000, 2.048, 2.500, 3.000, 3.600, 5.000, 7.500* (other options on request)	
*operating temperature: -20°C to +50°C		
Supply Voltage	4,5 VDC to 30 VDC (35mA max. – no load)	
Output Voltage	High	V <sub>in</sub> - 0,6 at - 10 mA
	Low	V <sub>in</sub> - 1,3 at - 25 mA 500 mV max. at 10 mA
Output Current	25 mA max. load per output channel	
Frequency Response	200 kHz max.	
Output Format	Two channel (A, B) quadrature with Index (Z) and optional complementary (A ,B , Z ) outputs	
Phase Sense	A leads B clockwise from the mounting end of the encoder	
Index	Gated with Channels A and B high	
Accuracy	± 0,8 arc-min.	
Outputs	ASIC	Push-Pull and differential
	OL7272 26C31	Push-Pull And differential Line Driver differential Line Driver 5V output (with 5V input)
Electrical Protection	Reverse polarity and output short circuit protected	
Noise Protection	EN 61000-6-2 (2005)	
	EN 61000-6-3 (2007)	

# Datasheet

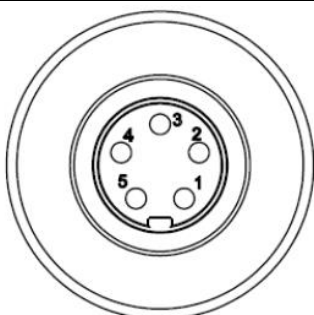
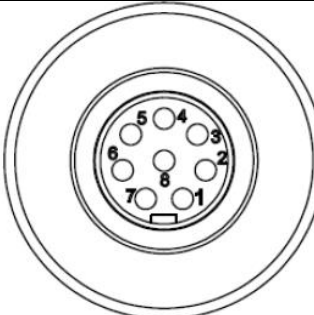
## Connection Options

Cable	8 leads (0,05 mm <sup>2</sup> , 30 AWG) - Differential 5 leads (0,14mm <sup>2</sup> , 26 AWG - Standard twisted pairs, shielded
Flat Cable	10 leads flat cable with IDC connector

## Output Terminations

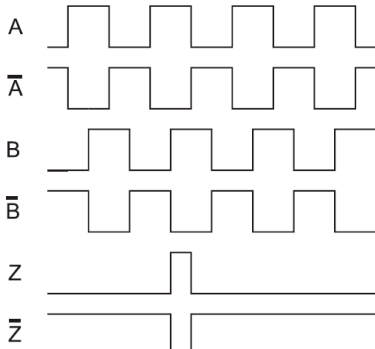
Standard Cable			Flat Cable with IDC connector	
	Differential Output	Standard Output		Differential Output*
Channel	Wire color		Position	Channel
A	Pink	Green	1	NC
$\bar{A}$	Gray	NC	2	V <sub>sup</sub>
B	Green	Yellow	3	GND
$\bar{B}$	Yellow	NC	4	<small>GND = Circuit Ground</small> NC
Z	White	Gray	5	A
$\bar{Z}$	Brown	NC	6	$\bar{A}$
V <sub>sup</sub>	Red	Brown	7	B
GND	Blue	White	8	$\bar{B}$
<small>GND = Circuit Ground</small>			9	Z
			10	$\bar{Z}$

\*Hewlett Packard (HP) compatible

		
<b>Position</b>	<b>M9 (5-pin)</b> Standard Output <b>Channel</b>	<b>M9 (8-pin)</b> Differential Output <b>Channel</b>
1	VDD	VDD
2	GND	GND
3	A	A
4	B	$\bar{A}$
5	Z	B
6		$\bar{B}$
7		Z
8		$\bar{Z}$

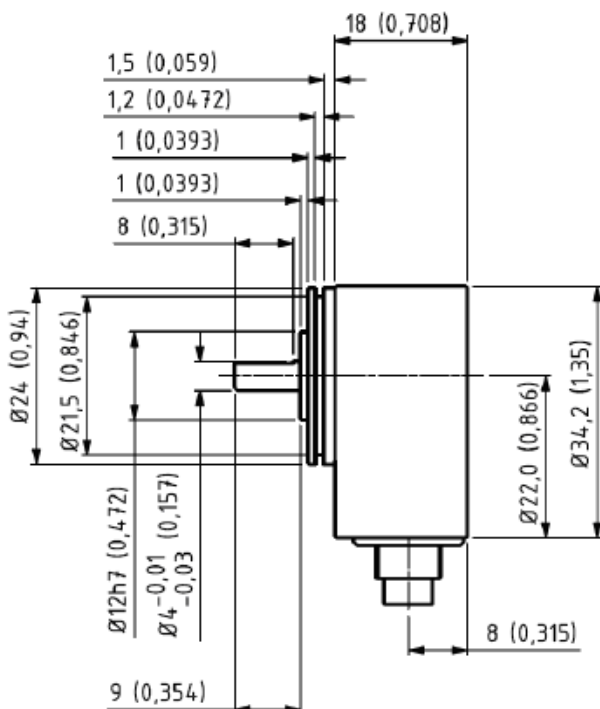
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## Output waveform

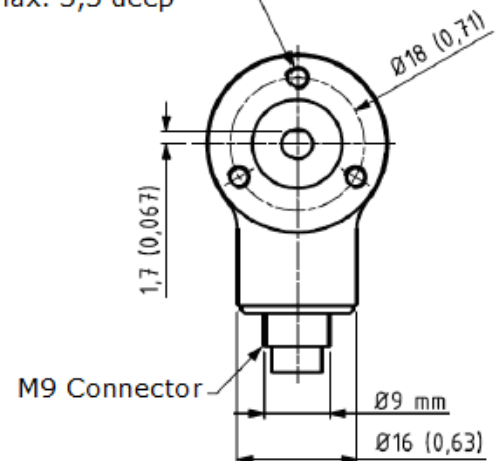
	<p>Channel tolerance Phase difference tolerance Z Channel tolerance</p>	<p><math>180^\circ \pm 36^\circ e</math> <math>90^\circ \pm 18^\circ e</math> <math>90^\circ \pm 18^\circ e</math></p>
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## Mechanical Dimensions (ISO 2768f)

### M9 Connector mm (inches)



3 pcs. M3 at 120°  
max. 3,5 deep





# Datasheet

## Ordering example

**Type** SCA24 - 100 - D - 02-13 - 64 - 01 - B - 00

### Pulse per Revolution

See table

### Output

**D** = Differential  
**N** = Standard  
**NON** = Standard-open collector  
**NPN**  
**NOP** = Standard-open collector  
**PNP**  
**L** = 26C31 Line Driver/ only  
5V/5V  
**M** = OL 7272 Line Driver  
**T** = Standard - with built-in  
**TSM\*\*\***

### Shaft Dia. / Shaft Length

**02-13** = 2 x 13mm  
**04-05** = 4 x 5mm\*  
**04-09** = 4 x 9mm\*  
**04-15** = 4 x 15mm\*  
**04-20** = 4 x 20mm\*  
**04-25** = 4 x 25mm\*  
**04-35** = 4 x 35mm\*  
**05-10F** = 5 x 10mm\*\*  
**06-10** = 6 x 10mm  
**06-14** = 6x 14mm\*  
**1/8-3/8** = 1/8 inch x 3/8 inch  
**1/4-10F** = 1/4inch x 10mm\*\*  
**1/4-20F** = 1/4inch x 20mm\*\*

### IP

**50** = IP 50\*\*  
**64** = IP 64

### Cable Length

#### Standard Cable

**01** = 1 m  
xx = specify length  
**00** = no cable

#### Flat cable with IDC connector\*

**0,5** = 0,5 m  
**01** = 1 m  
**02** = 2 m

### Cable Takeout

**S** = Standard Cable-radial  
**PUR** = PUR cable-radial  
**B** = axial  
**SF** = Flat cable\*

### Connector

#### Standard Cable

**M9/5** = M9 5-pin  
**M9/8** = M9 8-pin  
**00** = no connector

#### Flat cable

**IDC** = IDC-connector

\*available with flat: To order with flat, add 'F' to the shaft length

\*\*only with flat cable

\*\*\*Designed specifically for Wind Power applications/ TSM = Transient Suppression Module