

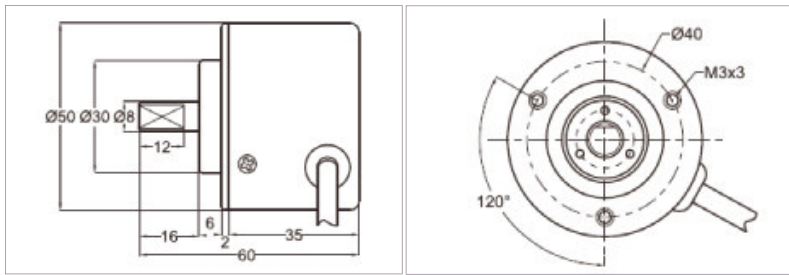
# RotaCol® - Diamondline PRECISION INCREMENTAL CONTACTLESS ROTARY POSITION SENSOR

50I DRKW



[www.rotacol.info/50idrkw.pdf](http://www.rotacol.info/50idrkw.pdf)

**Hall effect magnetic sensor**  
**A - B - Z channels- Any pulse from 2 - 1024 ppr**  
**Robust metal aluminium housing with 2 ball bearings.**  
**Clamping flange with 3 screws.**  
**Shock & vibration proof**  
**Measurement range 0° - 360 °**



All dimensions are in mm

TTL / HLD cable output: 1-Supply (Brown) 2-Ch Z (Grey) 3-Ch B (Green) 4-Ch A (Yellow)  
 5-Ch Z inv. (Pink) 6-Ch B inv. (Red) 7-Ch A inv. (blue) 8-Gnd-(white)  
 Push-pull cable output : 1-Supply (Brown) 2-Gnd (Shield) 3-0V (White)  
 4-Ch A (Yellow) 5-Ch B (Green) 6 2-Ch Z (Grey)

## ELECTRICAL CHARACTERISTICS

Electrical angle	0 - 360°
Pulses	Any pulse from 2 to 1024 ppr
Resolution	4096 step (12 bit)
Supply voltage	5V ± 10% / 8 - 24V DC
Output signal	5V TTL / LD, 5V / 24V OC, 24V PP, 24V HLD
Supply current	< 40 mA

## MECHANICAL CHARACTERISTICS

Mechanical angle	360° (continuous)
Shaft diameter	8 mm
Protection	IP 54
Operating temperature	- 20 to +80° C
Operating life	~ 75 million rotations
Mechanical speed (max.)	5000 rpm
Limited frequency	10 KHz
Weight	270 gm

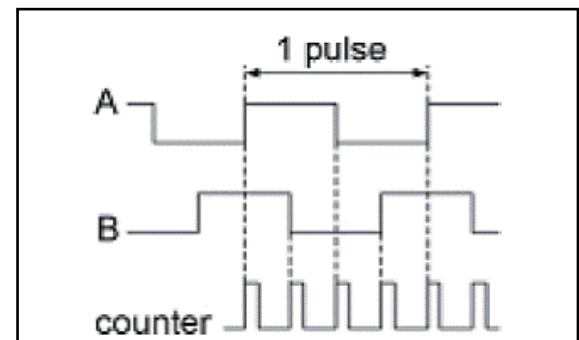
## MATERIAL

Housing	anodized aluminium
Shaft	stainless steel
Cable	2.5m round cable - radial
Bearings	2 precision ball bearings

## FUNCTION PRINCIPLE

The determination of angular position and signal generation is realised by an intelligent CMOS Hall sensor. A diametrical polarised magnet induces its magnetic field into the sensor. It rotates and provides a conditioned signal to the integrated electronic.

## INCREMENTAL INTERFACE



There are 3 signals for incremental output : A,B and Z. Signals A and B are quadrature signals, shifted by 90° and signal Z is a reference mark. One revolution generates N pulses of signal A or B. The reference mark signal is produced once per revolution. The width of the Z pulse is 1/4 of quadrature signal period and is matched with A high and B high. Generally, the magnetic incremental encoders are directly comparable with the conventional optical incremental encoders. They provide additional features and can much easier be adjusted to customer requirements. Nevertheless optical and magnetic incremental encoders do not provide an absolute signal.

## OPTIONS AND ORDERING REFERENCES

Refer to **electrical and mechanical options on page 2**

Housing diameter	Incremental output	Diamondline	RotaCol	Clamping flange with 3 screws	Signal	No of Pulses	Clockwise (CW) Counter clockwise (CCW)	Programming options	Output connections
50	I	D	RK	W	5V TTL / Line driver 5V Open collector 24V Open collector 24V Push-pull 24V High Line Driver	Any pulse from 2 - 1024 ppr	CW CCW	Zero point Inverted signal	2.5m round cable - radial Miniature connector Cable gland with 2.5m round cable Terminal block Axial Terminal block Radial
50	I	D	RK	W	Sxxx	xxxx	CW / CCW	POx	OCxx

Example with description - **50 I DRKW S24 HLD 512 CW POZ OCM** - 50 mm diameter, incremental output, Diamondline, RotaCol Servo mount version with 2 ball bearings, 24V High line driver, 512 pulses, clockwise, Zero point programming, Miniature connector

**Standard Version** : 360° CW Electrical & Mechanical angle, 1024 ppr , 2.5m long round cable - radial

For complete RotaCol Contactless Rotary Sensor product range refer - [www.rotacol.info/rotamec.pdf](http://www.rotacol.info/rotamec.pdf)

## ELECTRICAL OPTIONS FOR INCREMENTAL VERSION 50I DRKW

**Rotary incremental magnetic encoders and sensors** - are angular position sensors with an integrated signal conditioning unit, which generates constant amplitude sine and cosine voltages which are used for angle calculation. The maximum resolution is 4096 angular measurements per revolution (0.1°). Like in the standard optical incremental encoders a rising and falling edge at channel A and channel B is available. Thus the rotational direction can be detected. The quadrature signal consist of 2 wave signal out of phase. The Z channel enables the counter to be reset to zero with the function of a non true power on absolute encoder. The programming of the position for the reference "Z" impulse in a relation to the marking on the shaft and housing can be factory set. Contrary to optical encoders, any pulse between 2 - 1024 pulses per revolution can be programmed by software without disc change.

### Number of Pulses & Direction (xxxx CW / CCW)

As a unique feature any number of pulses from 2 - 1024 pulses per revolution (ppr) can be programmed in a 3 channel configuration. Default is 1024 ppr. The default direction of rotation is clockwise (CW). With this option it is also possible to change direction from clockwise(CW) to counter clockwise (CCW).

### Start Up Performance

In the basic default version, when the sensor is switched on, first the output A-B pulses are received only if the shaft rotates. After reaching the Z pulse it is used for resetting the counter (identical to optical encoders). In this option, when the electronic is switched on, the A and B output pulses are received automatically till the Z pulse is reached. Then the counter can be reset without rotating the shaft. From this point, the A, B and Z outputs are received corresponding to the shaft rotation.

### Zero point Programming (POZ)

Mechanical zero point is aligned with marking on the sensor housing. Electrical zero point can be aligned to mechanical zero point. Zero point can be programmed at any offset.

### Z Pulse

A counter which is connected to the sensor is reset once per revolution by the Z - pulse. Within one rotation a simulation of non - true power on encoder is possible. In the basic type the counter is reset manually.

### Inverted Signal (POI)

The channels A and B can be inverted or not inverted independent of each other. The basic type is not inverted.

### Push Pull Function

In an open collector mode the driver current is limited by pull up resistor. In push - pull mode the driver current goes up to 300 mA. Longer distances and faster switching is possible.

## MECHANICAL OPTIONS FOR INCREMENTAL VERSION 50I DRKW

Type / Series	Standard mechanical options	Customized mechanical options
50I DRKW	Cable gland (OCG) ; Terminal Block (OCTA / OCTR) ; Miniature connector (OCM)	Special shaft length ; Special cable

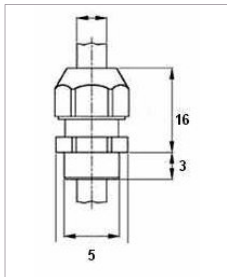
## INTERCONNECTIONS

Standard Interconnections - 8 Core round cable - radial (2.5m)

### Other Interconnection options

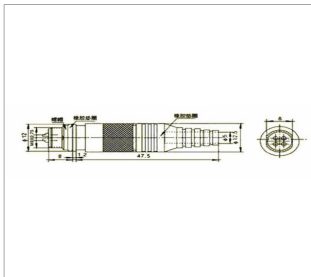
#### Cable gland (OCG)

8 core cable of 2.5 m length



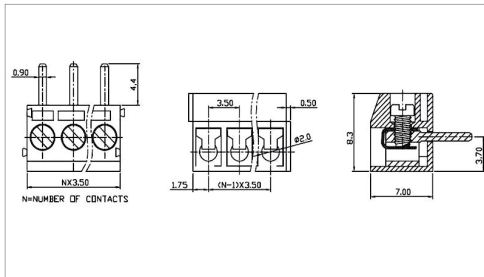
#### Miniature connector (OCM)

5 pin in integrated socket with plug (only for PP)



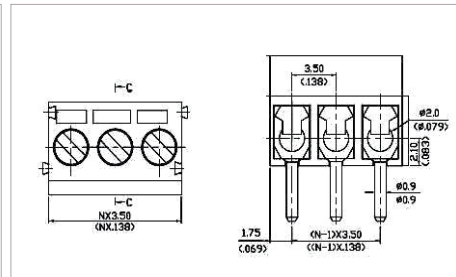
#### Terminal block - Axial (OCTA) Wires leaving axial to shaft axis

5 sockets (only for PP)



#### Terminal block - Radial (OCTR) Wires leaving radial to shaft axis

5 sockets (only for PP)



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