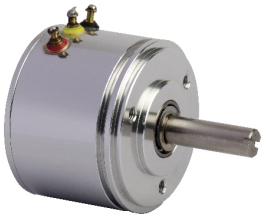
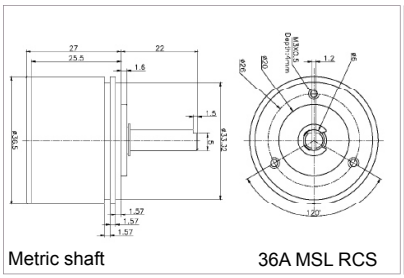
# RotaCol® - *Silverline*
# PRECISION ANALOG CONTACTLESS ROTARY POSITION SENSOR

**Economical - Metalcase - 2 Ball bearings**
**Hall effect magnetic**
**Precision potentiometer replacement**
**Output : 0 - 5V, 0 - 10V, 4 - 20 mA, 0 - 20 mA, PWM**
**Robust metal aluminium housing with ball bearings**
**Servo mount / Screw fitting**
**Shock & vibration proof**
**Measurement range 0° - 360 °**

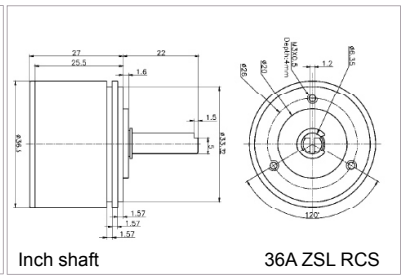
## Series 36A MSL RCS
## Series 36A ZSL RCS



www.rotacol.info/36amslrcs.pdf
www.rotacol.info/36azslrcs.pdf



Metric shaft 36A MSL RCS



Inch shaft 36A ZSL RCS

1-Supply (red) 2-Output (yellow) 3-Ground (black)

All dimensions are in mm

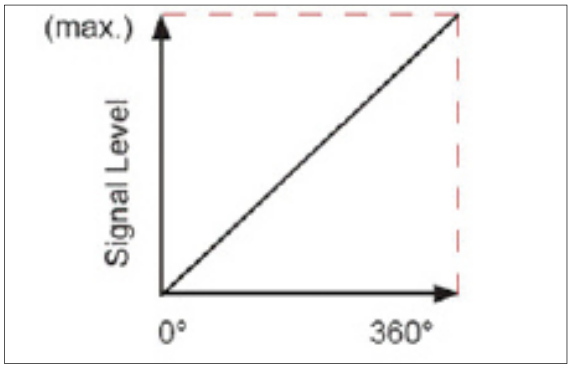
## FUNCTION PRINCIPLE

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.

## ELECTRICAL CHARACTERISTICS

| | | |
|---|---|---|
| Electrical angle | 0 - 360°, any angle from 0 - 20..0 - 360 programmable in steps of 1° | |
| Resolution | 4096 step (12 bit) | |
| Signal type | Supply voltage | Output signal |
| 0505 | 5V ± 10% | 0 - 5V (ratiometric) |
| DC05 | 9 - 30V | 0 - 5V |
| 2410 | 15 - 30V | 0 -10V |
| 2442 | 15 - 30V | 4 - 20 mA |
| 2420 | 15 - 30V | 0 - 20 mA |
| PWM | 5V ± 10% | PWM |
| Supply current | < 25 mA | |
| Independent linearity tolerance | 0.5% | |

## ANALOG INTERFACE




At the output of the sensor a variable voltage or variable current is provided proportional to the position of the shaft / axis over a complete angle range of 360 ° or a subrange. The contactless sensor electronic guarantees a steady signal level and a very low linearity error of 0.5%. With supply voltages of 5VDC ± 10% ; 9 - 30VDC ; 15 - 30V (24VDC) output signals of 0 - 5VDC; 0 -10VDC; 0 - 20mA ; 4 - 20mA at the sensor output are provided. Besides this a large variety of electrical options such as Zero point programming, Centre point programming, Multipoint programming, PWM, 2 Channel redundant are provided. Other options on request.

## MECHANICAL CHARACTERISTICS

| | |
|---|---|
| Mechanical angle | 360° (continuous) |
| Starting torque (approx.) | 0.5 Ncm |
| Protection | IP 40 |
| Operating temperature | - 40 to +85° C |
| Operating life (approx.) | 35 million rotations |
| Mechanical speed (max.) | 8000 rpm |
| Electrical speed (max.) | 160 rpm |
| Weight | 60 gm |

## MATERIAL

| | |
|---|---|
| Housing | anodized aluminium |
| Shaft | stainless steel |
| Terminals | 3 pins |
| Bearings | 2 precision ball bearings |

## OPTIONS AND ORDERING REFERENCES

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

| Housing diameter | Analog output | Metric Silverline (Shaft Ø 6mm) | Inch Silverline (Shaft Ø 1/4" ) | RotaCol | Servo mount with 2 ball bearings | Signal | 0 - 5V (ratiometric) Pulse width modulation ( only for 0505 ) 0 - 5V 0 - 10V 4 - 20mA 0 - 20mA | 2 Channel redundant output (only for voltage) | Angle and electrical rotational direction | Angle and Clockwise (CW) Angle and Counter clockwise (CCW) | Programming options for non - effective electrical angle | Delta 1/2 Low level High level Variable level | Programming options | Zero point Center point Multipoint | Output connections | 3 Pins (standard) 3 Core Flat cable Miniature connector Cable gland with 1m round cable Terminal block Axial Terminal block Radial |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36 | A | MSL | ZSL | RC | S | S 0505 S PWM | S DC05 S 2410 S 2442 S 2420 | 2C | xxx CW xxx CCW | | PEx | PE1 PE2 PE3 PE4 | POx | POZ POC POM | OCxx | OCP OCF OCM OCG OCTA OCTR |
| **36** | **A** | **xSL** | | **RC** | **S** | **Sxxxx** | | **2C** | **xxx CW / CCW** | | **PEx** | | **POx** | | **OCxx** | |

Example with description - **36A MSL RCS S2442 180CW PE1 POZ OCM -** 36mm diameter, analog output, Metric Silverline ( Shaft Ø 6 mm), RotaCol, Servo mount version with 2 ball bearings, Signal - 4 - 20 mA, 180 angle and clockwise, Delta 1/2, Zero point, Miniature connector

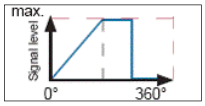
**Standard Version** : 360° CW Electrical & Mechanical angle, OCP - 3 pins

**For complete RotaCol Contactless Rotary Sensor product range refer - www.rotacol.info/rotamec.pdf**

## ELECTRICAL OPTIONS FOR ANALOG VERSION 36A MSL / ZSL RCS

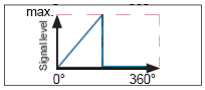
### Non-effective Electrical Angle (PE1) - Delta 1/2

If the electrical effective angle is programmed smaller than 360°, the remaining electrical non-effective angle is divided in two equal parts : high level & low level (Delta 1/2)



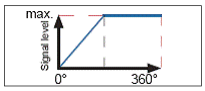

### Low level (PE2)

If the electrical effective angle is programmed smaller than 360°, after reaching the maximum, the signal level falls to low level.



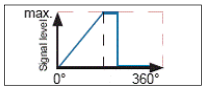

### High level (PE3)

If the elecrical angle is programmed smaller than 360°, the signal level remains high after reaching the full level.



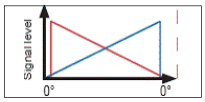

### Variable level (PE4)

If the electrical angle is programmed smaller than 360°,remaining electrical non effective angle can be divided into high and low level in any ratio according to customer request.



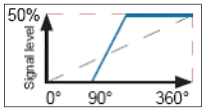

### Direction of Rotation (CW/CCW)

By default the direction of rotation is clockwise (CW). With this option it is also possible to change the direction from clockwise(CW) to counterclockwise (CCW).



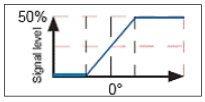

### Zero point Programming (POZ)

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.



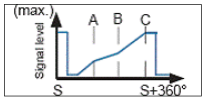

### Center Point Programming (POC)

Effective electrical angle is aligned with the mechanical zero point in such a way that equal effective angles in both rotating directions are achieved. Center point can be programmed at any offset.



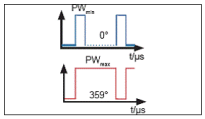

### Multi Point Programming (POM)

Output characteristics : 3 to 6 rising or falling linear segments. Min and max signal level can be defined within the total electrical angle. First and last linear segment (min/max) is always horizontal.1 to 3 setable calibration points.



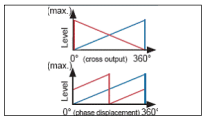

### Pulse Width Modulation (PWM)

PWM provides a constant carrier frequency which defines high to low ratio. The ratio between high & low corresponds to the signal characteristics. It is in a fixed relation to the angle. Generally, for further signal processing, no A/D converter is required because many microcontrollers already have PWM input (valid only for 0505 output).




### 2 Channel Redundant Output (2C)

This is realized by a Hall sensor chip consisting of 2 galvanically seperated sensing elements. One magnet provides a magnetic field simultaneously for both elements. Both elements can be programmed identically, or channel 2 can also be programmed independently from channel1. (Valid only for 0505, DC05, and 2410 outputs).




## MECHANICAL OPTIONS FOR ANALOG VERSION 36A MSL / ZSL RCS

| Type / Series | Standard mechanical options | Customized mechanical options |
|---|---|---|
| 36A MSL / ZSL RCS | Cable gland (OCG) ; Terminal Block (OCTA / OCTR) ; Miniature connector (OCM) | Special shaft length ; Special cable |

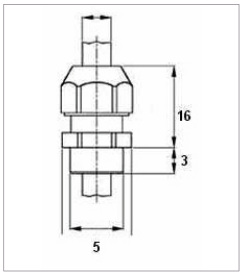
## INTERCONNECTIONS

Standard Interconnections - 3 Pins

### Other Interconnection options

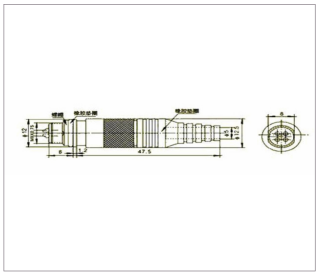
**Cable gland (OCG)**

3,core cable of 1 m length



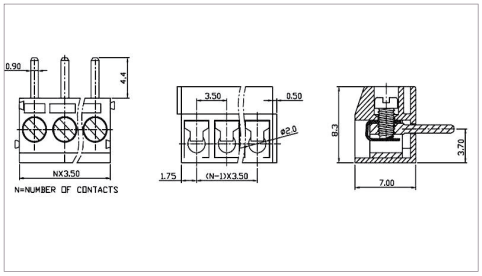

**Miniature connector (OCM)**

3 pin in integrated socket with plug



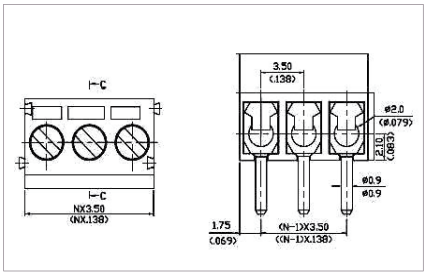
**Terminal block - Axial (OCTA)**
**Wires leaving axial to shaft axis**

3 sockets




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

3 sockets





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