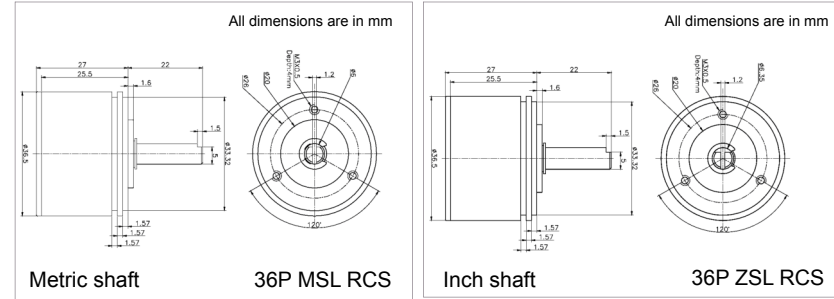


**Economical Hall effect magnetic sensor**  
**Direct SPI interface to microcontroller**  
**SPI - 3 wire - half duplex or 4 wire - full duplex**  
**36 mm Ø metal aluminium housing with 2 precision ball bearings**  
**Servo mount / Screw fitting**  
**Shock & Vibration proof, Measurement range 0° - 360°**



1-Supply (Red) 2-Ground (Black) 3-MOSI / MISO (Brown) 4-Clock (Orange) 5-Chip select (Yellow) : For 3 wire SPI - for OCG/OCTR  
 1-Supply 2-Ground 3-MOSI/ MISO 4-Clock 5-Chip select : For 3 wire SPI - for OCM/OCTA/OCTR  
 1-Supply (Red) 2-Ground (Black) 3- Clock(Orange) 4 - MOSI (Blue) 5 - MOSI (Brown) 6-Chip select(Yellow) : For 4 wire SPI - for OCG/OCTR  
 1-Supply 2 -Ground 3- Clock 4 -MOSI 5 -MISO 6 -Chip select : For 4 wire SPI - For OCM/OCTA/OCTR



**ELECTRICAL CHARACTERISTICS**

Electrical angle	0 - 360°	
Electrical speed (Max.)	800 rpm	
Resolution	14 bit (16383 steps)	
Signal type	Supply voltage	Output signal
S05SPI	5V±10%	5V SPI - 3 wire
SE05SPI	5V±10%	5V SPI - 4 wire
SE33SPI	3.3V±10%	3.3V SPI - 4 wire
S05SPI2C	5V±10%	2 channel 5V SPI - 3 wire
Frequency response	5 KHz	
Supply current	< 30 mA	
Update rate	0.6 ms	

**MECHANICAL CHARACTERISTICS**

Mechanical angle	360° (continuous)	
Shaft diameter and length (FMS)	Metric 6 mm Ø X 22 mm (MSL) Inch 1/4" Ø X 22 mm (ZSL)	
Operating torque (approx.)	0.05 Ncm	
Protection	IP 40	
Operating temperature	- 40 to +85° C	
Operating life (approx.)	~ 40 million rotations	
Mechanical speed (max.)	8000 rpm	
Weight	95 gm	
Interconnection	5 core round cable 1 mtr long - 3 wire SPI 6 core round cable 1 mtr long - 4 wire SPI	

**MATERIAL**

Housing	Anodized aluminium
Shaft	Stainless steel
Bearings	2 precision ball bearings

**ORDERING INFORMATION**

Refer to electrical and mechanical options on page 2

Housing diameter	Serial peripheral interface (SPI)	Metric Silverline ( Shaft 6mm Ø)	Inch Silverline ( Shaft 1/4" Ø)	RotaCol	Servo mount with 2 ball bearings	Signal	14 bit output	Without stop (default 360°)	Direction of Rotation	Programming options	Zero point	Special shaft length (default length - 22 mm FMS)	Special cable length - only for OCR, OCG (default 1 mtr long)	Output connections
36	P	MSL	ZSL	RC	S	S05SPI SE05SPI SE33SPI S05SPI2C	S14	O360	CW CCW	POZ	Axx	CVxx	OCxx	5/6 Pins 5/6 Core round cable 1 mtr long (default) Miniature connector Cable gland with 1 m round cable Terminal block Axial Terminal block Radial
<b>36</b>	<b>P</b>	<b>xSL</b>	<b>RC</b>	<b>S</b>	<b>SxxSPI</b>	<b>S14</b>	<b>O360</b>	<b>CW/CCW</b>	<b>POZ</b>	<b>Axx</b>	<b>CVxx</b>	<b>OCxx</b>		

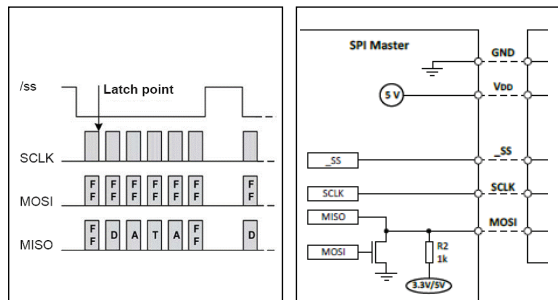
Example with description - **36P MSL RCS S05SPI S14 O360 CW POZ OCTR** - 36 mm diameter, SPI interface , Metric Silverline ( Shaft 6 mm Ø ) , RotaCol, Servo mount with 2 ball bearings, 5V SPI - 3 wire, 14 bit output, 360° clockwise, Zero point, Terminal block Radial

**For full range of Rotary Sensor refer -**  
**www.rotacol.info/rotamec.pdf**

**FUNCTION PRINCIPLE**

The angular position and the signal generation is detected by a CMOS Hall sensor over which a parallel diametrically polarized magnet induces a magnetic field. An integrated electronic provides the output of a 2 byte WORD with an SPI interface.

**SERIAL PERIPHERAL INTERFACE**



The serial peripheral interface (SPI) is a bus system for a serial synchronous data transmission between different integrated circuits.

**A) For 3 wire SPI** - The bus consists of 3 lines MOSI / MISO (one common line), SCLK - (Serial Clock, output from master) and SS Slave Select (active low; output from master).

**B) For 4 wire SPI** - The bus consists of 4 lines MOSI (Master Out Slave In), MISO (Master In Slave Out), SCLK - (Serial Clock, output from master) and SS Slave Select (active low; output from master).

By these signal lines the master selects the slave for communication. This is done because the master sets the SS line from high to low. The angular informations are calculated all 350 µs and are available for the master on demand. There is no fixed protocol for the SPI bus. Nevertheless many microcontroller IC's have a SPI input. By programming this microcontroller IC many SPI suitable sensors can be managed by one microcontroller. Two channel redundant outputs can be provided.

**Default Version** : 36mm housing, Servo mount, SPI interface, 360° Electrical & Mechanical angle, 5 core round cable 1 mtr long - 3 wire SPI / 6 core round cable 1 mtr long - 4 wire SPI

Please note: The specification and information in this datasheet cannot consider all special demands that are caused by the application. Because of this, they are no general description of the properties of the product. Megacraft does not assume any responsibility for damages due to improper application of our products. The user has to ensure on his own, that the products used are suitable for his application. Megacraft does not warrant the reproducibility of published information. The specifications can be changed any time without notice.

## ELECTRICAL OPTIONS FOR SPI VERSION 36P MSL/ZSL RCS

RotaCol® are the latest development in rotational position sensors and contactless devices. Modern Hall IC's in combination with special magnets and RISC processors provide intelligent customizing of output signals and interfacing. Not only precision potentiometer but also optoelectronic incremental and absolute encoders are replaced. The RotaCol® series is divided into 3 groups : analog types with analog output (replacement for precision potentiometer), incremental output (replacement of optoelectronic encoders), absolute digital SPI and SSI interface. Because of wide variety of mechanical and electrical options it is possible to use them in almost any automation and control application where rotary angular sensing is required. Regardless of the wide variety of existing technical features, the price is relative low.

### SPI Bus Interface

The Serial Peripheral Interface bus or SPI bus is a synchronous serial data link standard developed by Motorola that operates in full duplex mode. One or more devices can communicate with one master. The length of the signal wire should not be longer than 0.5 mtr. To bridge larger distances it is recommended to use the SSI interface. The digital signal in 2 byte Grey code transmits the angular position information through the data bus.

### Direction of Rotation (CW / CCW)

The default direction of rotation is clockwise (CW) for 3 wire SPI. It is also possible to change the direction of turning to counter clockwise mode (CCW). The default direction of rotation is counter clockwise (CCW) for 4 wire SPI. It is not possible to change the direction from counter clockwise (CCW) to clockwise (CW).

### Zero Point Programming (POZ)

The electrical zero point is at the beginning of the signal rise. If a shaft marking is brought in line with the housing marking, the electrical zero point can be set to that position. In any case it is necessary to have a reference to the shaft marking.

### 2 Channel Redundant Output (2C) - Special type (only for 3 wire SPI)

**2 Channel Output (2C)** : The sensor provides 2 operating modes: A) Redundancy i.e. channel one and channel two are identical. If one channel fails the other channel remains active. B) It is also possible to have 2 different programs in the 2 channels. For this, additional functions can be obtained.

## MECHANICAL OPTIONS FOR SPI VERSION 36P MSL/ZSL RCS

Type / Series	Standard mechanical options	Customized mechanical options
36P MSL/ZSL RCS	Cable gland (OCG), pins (OCP), miniature connector (OCM), terminal block (OCTA / R)	Special shaft length; Special cable length

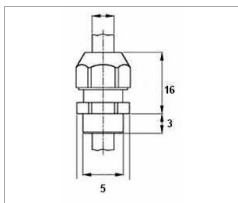
## INTERCONNECTIONS

Standard Interconnections - 5 core round cable 1 mtr long - (for 3 wire SPI), 6 core round cable 1 mtr long (for 4 wire SPI)

### Other Interconnection options

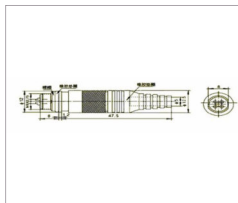
#### Cable gland (OCG)

5 core ( 3 wire SPI )  
6 core ( 4 wire SPI )  
( Round cable 1m long )



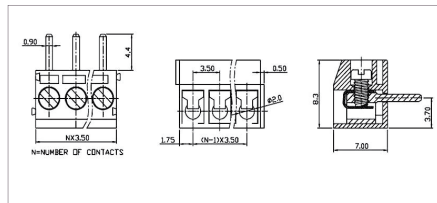
#### Miniature connector (OCM)

5 pin ( 3 wire SPI )  
6 pin ( 4 wire SPI )  
In integrated socket with plug



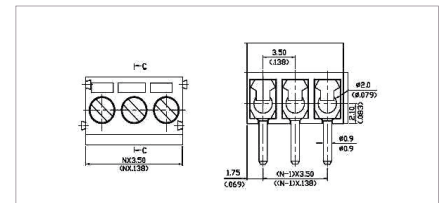
#### Terminal block - Axial (OCTA) Wires leaving axial to shaft axis

5 sockets ( 3 wire SPI )  
6 sockets ( 4 wire SPI )



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

5 sockets ( 3 wire SPI )  
6 sockets ( 4 wire SPI )



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