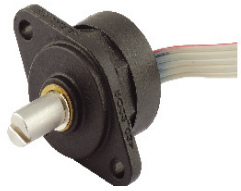
RotaCol® - *Ecoline*

'SPI' Interface Precision Digital Contactless Rotary Position Sensors

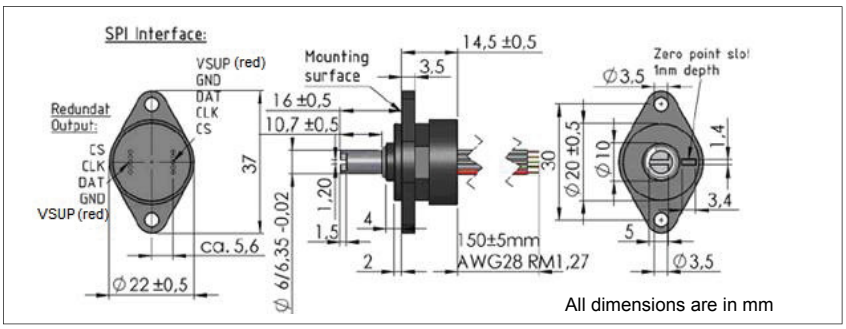
Flange Mounting

Series 22P ERCF



SPI - 3 wire - half duplex or 4 wire - full duplex
Economical - SPI digital -interface - 22 mm ø housing
Direct SPI interface to microcontroller
Flange mounting
Shock and vibration proof

1-Supply (Red) 2-Ground (Grey) 3-MOSI/ MISO (Grey) 4-Clock (Grey) 5-Chip select (Grey) : For 3 wire SPI
1-Supply (Red) 2-Ground (Grey) 3-Clock (Grey) 4-MOSI (Grey) 5-MISO (Grey) 6-Chip select (Grey) : For 4 wire



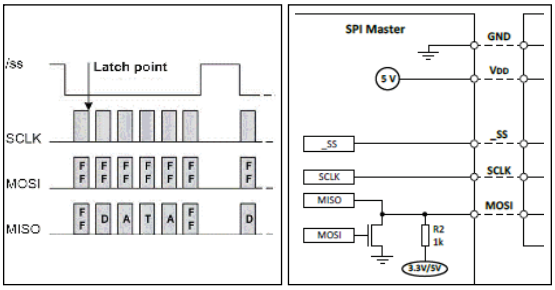
All dimensions are in mm

For full range of Rotary Sensors 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) <u>For 3 wire SPI</u> - 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) <u>For 4 wire SPI</u>- 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.

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)
Mechanical speed (Max.)	3000 rpm
Shaft diameter X length (FMS)	6 mm Ø X 16 mm
Operating Life	~ 20 million rotations
Operating temperature	- 40 ... +85 °C
Operating torque (Low.)	0.3 to 0.5 Ncm (default)
Vibration (IEC 68-2-6, Test Fc)	±1.5 mm / 20g / 2000Hz / 16cycles
Mechanical shock (IEC 68-2-7, Test Ea)	50g /11ms /halfsine (3X6 shocks)
Weight	18 gm
Interconnection	5 core flat cable 0.15 mtr long - 3 wire SPI 6 core flat cable 0.15 mtr long - 4 wire SPI

MATERIAL

Bearing	Polymer bearing
Housing	Nylon 66 Glass Fibre reinforced
Shaft	Stainless steel

Default Version :
22mm housing, Flange mount,SPI interface,360° Electrical & Mechanical angle, Low Torque, 5 core flat cable 0.15 mtr long - 3 wire SPI / 6 core flat cable 0.15 mtr long - 4 wire SPI

ORDERING INFORMATION

Refer to electrical and mechanical options on page 2

Housing diameter	Serial peripheral interface (SPI)	Ecoline RotaCol	Flange (shaft 6 mm Ø)	Signal	5V SPI - 3 wire 5V SPI - 4 wire 3.3V SPI - 4 wire 2 channel 5V SPI - 3 wire	14 bit output	O = without stop (default 360°)	Direction of rotation	Clockwise (default- for 3 wire SPI) Counter clockwise (default- for 4 wire SPI)	Programming options	Zero point	Special shaft length (default 16 mm FMS)	Special cable length (default 0.15 mtr long)
22	P	ERC	F1		S05SPI SE05SPI SE33SPI S05SPI2C	S 14	O360	CW CCW		POx	POZ	Axx	CVxx
22	**P**	**ERC**	**F1**		**SxxSPI**	**S14**	**O360**	**CW / CCW**		**POZ**		**Axx**	**CVxx**

Example with description - **22P ERC F1 S05SPI S14 O360 CW POZ**- 22 mm housing, SPI interface, Ecoline RotaCol, Flange 6mm shaft, 5V SPI - 3 wire, 14 bit, 360° clockwise, zero point, 5 core flat cable 0.15 mtr long

ELECTRICAL OPTIONS FOR SPI VERSIONS 22P ERCF

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 optoelectronical 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 22P ERCF

Type / Series	Standard mechanical options	Customized mechanical options
22P ERCF	Mu metal cap , special cable length	Special shaft length

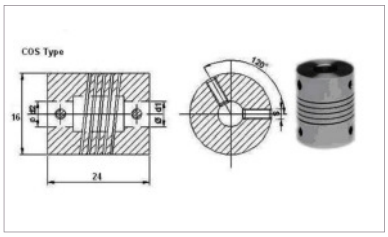
INTERCONNECTION

Standard Interconnections - 5 core flat cable 0.15 mtr long - (for 3 wire SPI), 6 core flat cable 0.15 mtr long (for 4 wire SPI)

ACCESSORIES - SPIRAL COUPLINGS

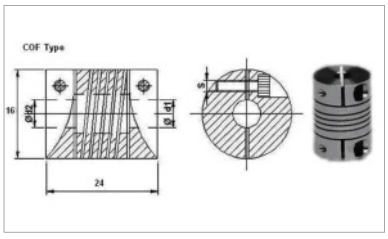
Whenever the shafts of the sensors are available only in metric (mm) or radial force is expected on the shaft, we recommend our very economical precision machined metal spiral couplings with set screws or clamp fixing. there are two dimensions in stock. One side for 6 mm dia shaft and other side either 1/4th inch or 1/8 inch shaft dia. These can be used to connect metric and non metric devices

COS Type - Set Screw Fitting



6 mm (d1) - 1/4" (d2)
6 mm (d1) - 1/8" (d2)

COF Type - Flange Clamping



6 mm (d1) - 1/4" (d2)
6 mm (d1) - 1/8" (d2)

MegAuto KG
Am Tummelsgrund 48
D 01156 Dresden, Germany
Tel : +49 351 6587894 0 Fax : +49 351 6587894 9
Email : info@megauto.de / www.megauto.de
skype:megautodd / whats app: +491781244294

Sensall - MegAuto International
Div of Sendap Precision Electronics Pvt Ltd.
3, Electronic Sadan - I, MIDC, Bhosari, Pune - 411026, INDIA
Tel : +91 8669617194, +91 8669617195
Email : mail@megacraft.net / www.sensall.info
skype: sendapimc / whats app: +91 8669617198