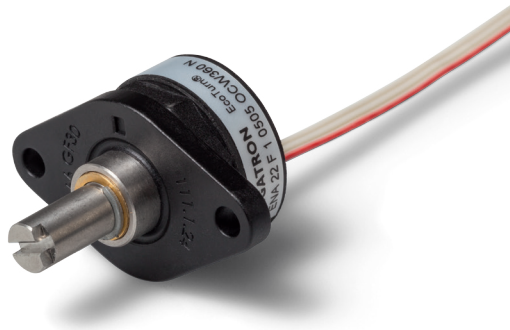


# Data Sheet for Angle Sensors

## Hall-Effect Single-Turn Rotary Encoder with Serial Output

Series ENS22F



- SPI-Interface (SSI redundant on request)
- Resolution up to 14 bit
- Life expectancy > 25 x 10<sup>6</sup> shaft revolutions
- Potted electronics

The Series ENS22F closes the gap between potentiometric sensors and high end sensors with ball bearings. Due to the easy connection of the flat ribbon cable, e.g. using IDC, the cost of soldering can be reduced as well.

### Electrical Data

Effective electrical angle of rotation 1.)	0..360°
Independent linearity (best straight line) 1.)	± 0,5 %
Output signal	SPI
Theoretical Resolution	14 Bit
Update rate	200 µs
Supply voltage	5 VDC ±10%
Power consumption (no load)	≤ 10 mA
Insulation voltage 1.)	1000 VAC @ 50 Hz, 1 min
Insulation resistance 1.)	2 MOhm @ 500 VDC, 1 min

### Mechanical Data, Environmental Conditions, Miscellaneous

Mechanical angle of rotation 1.)	Without stops
Lifetime 2.)	> 25 x 10 <sup>6</sup> rotations Depending on the application - values determined at room temperature +20 °C, with a radial load of 1 N
Bearing	Sleeve bearing
Max. operational speed	4000 rpm
Starting torque @ ambient temperature 1.) 2.)	< 0,6 Ncm
Operating temperature range	-40..+85 °C (fixed cable, extended temperature range on request)
Storage temperature range	-40..+105 °C
Protection grade (IEC 60529)	IP65
Sealing shaft / bearing	no sealing (IP40)
Vibration (IEC 68-2-6, Test Fc)	±1,5 mm / 20 g / 10 bis 2000 Hz / 16 frequency cycles (3x4 h)
Shock (IEC 68-2-27, Test Ea)	50 g / 11 ms / half sine (3x6 Shocks)
Max. radial load	1 N
Mass	approx. 19 g
Material shaft	Stainless steel
Material housing	Plastic

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## Hall-Effect Single-Turn Rotary Encoder with Serial Output

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### Emission / Immunity

EN 55011 Emission AC/DC power	Class B
EN 55011 Emission housing	Class B
EN 61000-4-2 Immunity housing ESD	Class B
EN 61000-4-3 Immunity RF sine wave	Class A
EN 61000-4-4 Immunity DC power, I/O cable: Burst	Class B
EN 61000-4-5 Immunity DC power, I/O cable: Surge	Class B
EN 61000-4-6 Immunity DC power, I/O cable: Conducted sine wave	Class A

1.) According IEC 60393

2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives

### Order code

Description	Options					
<b>Series ENS22</b>	<b>ENS22</b>					
Shaft diameter Ø 6 mm / M10 Ø 6,35 mm (1/4") (*)		F1 F2 (*)				
Resolution / supply voltage / interface 14 bit / 5 V ± 10% / SPI 12 bit / 24 V (9-30 V) / SSI (*)			1405SPI 1224SSI (*)			
Without stops; clockwise rising signal; 360°; zero point alignment				OCW360 N		
Other shaft length [mm] (*)					Axx (*)	
Other cable length [m] (*)						CVxx (*)

(\*) = on request available for projects

### On request for higher quantities or on-going demand, additional options are available as described below

For example:

- SPI redundant version (cable length max. 0,6m)
- Mu-Metal shielding
- Other mechanical angle
- Other starting torque
- Special housings
- Special shaft design

# Data Sheet for Angle Sensors

## Hall-Effect Single-Turn Rotary Encoder with Serial Output

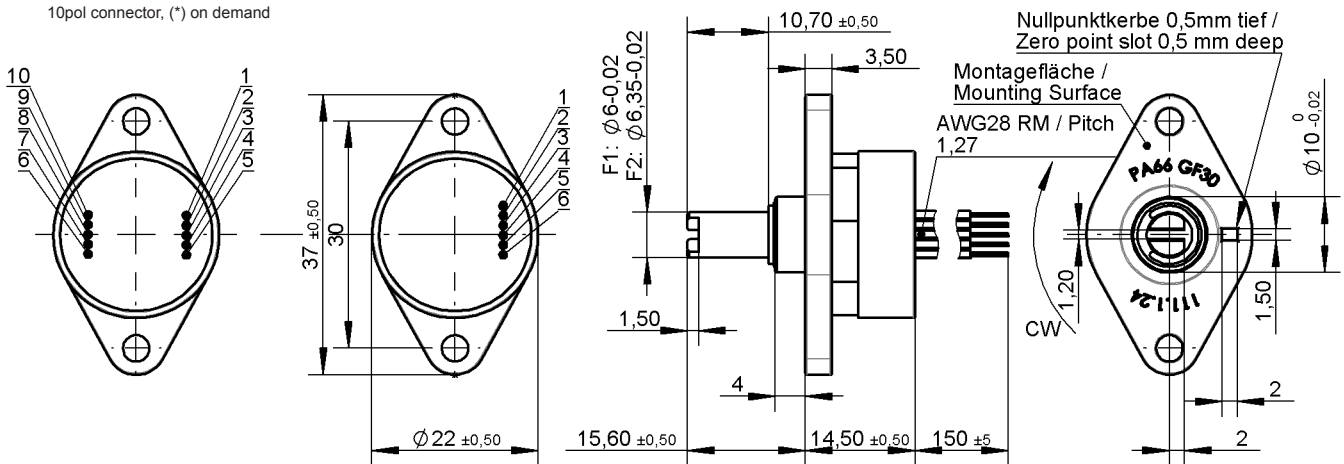
Series ENS22F

### Drawing

SPI single electronic  
5pol connector (standard)

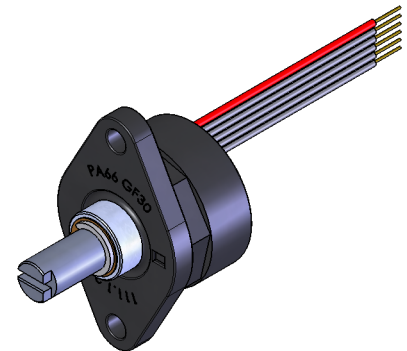
SPI redundant electronic  
10pol connector, (\*) on demand

SSI version



Cable assignment SPI version	
VSUP 1	1
GND 1	2
DAT 1	3
CLK 1	4
CS 1	5

Cable assignment SSI version	
VSUP 1	1
GND 1	2
CLK +	3
CLK -	4
DAT +	5
DAT -	6



For details of the communication of the interfaces please have a look at the data sheets of the chip producer.

#### SER-Interface

Producer: ams  
Type: AS5045  
web: www.ams.com

#### SPI-Interface

Producer: Melexis  
Type: MLX90316EDC  
web: www.melexis.com