

# Data Sheet for Angle Sensors

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

Series ENA22F



- Durable alternative to potentiometers
- Analog output (voltage, current)
- Versatile programming ex works
- Potted electronics
- Life expectancy > 25 x 10<sup>6</sup> shaft revolutions

The Series ENA22 F 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..10° - 0..360°				
Independent linearity (best straight line) 1.)	±0,5 % @ 360°				
Output signal	0.5 V ratiometric	0..10 V	0..5 V	0..20 mA	4..20 mA
Resolution	12 bit (4096 steps) (electrical angle 90°..360°)				
Update rate	1 ms				
Supply voltage	5 V ±10 %	15..30 V	9.. 30 V		
Power consumption (no load)	< 10 mA				
Output load	≥ 5 kOhm			≤ 500 Ohm	
Insulation voltage 1.)	1000 VAC @ 50 Hz, 1 min				
Insulation resistance 1.)	2 MOhm @ 500 VDC, 1 min				

### Mechanical and Environmental Data

Mechanical angle of rotation 1.)	Endless, 320°
Lifetime 2.)	> 25 x 10 <sup>6</sup> revolutions Tested under room temperature +20 °C, with radial load 1N, without sealing ring
Bearing	Sleeve bearing
Max. operational speed	4000 rpm
Starting torque @ ambient temperature 1.) 2.)	< 0,3 Ncm
Operating temperature range	-40..+85 °C (fixed cable, other temperature on request)
Storage temperature range	-40..+90 °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)
Mechanical shock (IEC 68-27, Test Ea)	50 g / 11 ms / halfsine (3x6 shocks)
Max. radial load	1 N
Mass	Approx. 24 g
Material shaft	Stainless steel
Material housing	Plastic

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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 ENA22 flange mounted single electronic</b>	ENA22				
Shaft diameter / bushing thread Ø 6 mm / M10 Ø 6,35 mm (1/4") / 32-UNEF		F1 F2 (*)			
Supply voltage / Output signal 5 V ± 10 % / 0..5 V ratiometric 24 V (9..30 V) / 0..5 V (*) 24 V (15..30 V) / 0..10 V 24 V (9..30 V) / 4..20 mA 24 V (9..30 V) / 0..20 mA (*)			0505 DC05 (*) 2410 2442 2420 (*)		
Without mechanical stops; clockwise; 360°; zero point alignment				OCW360 N	
Signal raising in counterclockwise (*)				OCCW360(*)	
Free choice of the electrical angle (*)				OC(C)Wxxx (*)	
Other shaft length [mm] (*)					Axx (*)
Other cable length [m] (*)					CVxx (*)

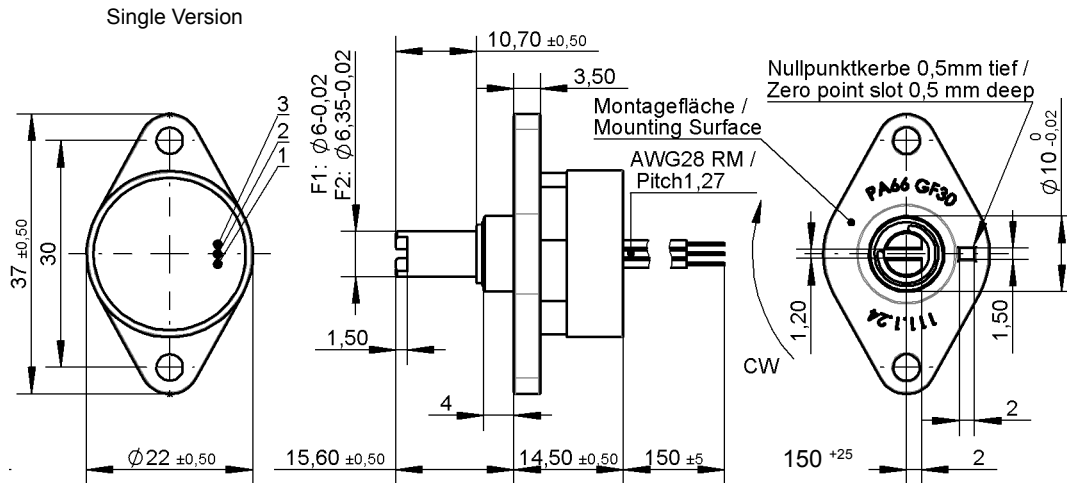
(\*) = on request available for projects

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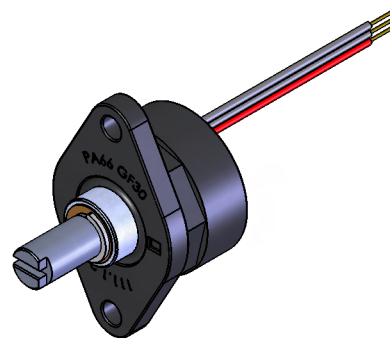
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## Technical Drawing



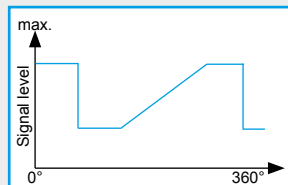
Cable assignment	
VSUP 1	1
OUT 1	2
GND 1	3



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

For example:

- Customized signal characteristic
- Mu-Metal shielding



### Customized output signal

For example:

- Other minimum and maximum signal level
- Multi point programming