

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

Series ETA25PS



ETA25PS - L

- Shaft encoder for variable applications
- Programmable via DIP switches
- Angle 0..20° to 0..360° free configurable
- Sense of rotation selectable (CW / CCW)
- Supply voltage: 5 V / 3.3 V (switchable), 24 V
- Analog output: 0..5 V / 0..3.3 V (ratiom.), 0..10 V
- High life expectancy >100 mio. shaft revolutions
- Small housing case (ø25 mm)
- Power save mode < 1 mA on request

Only one sensor for different applications. User friendly to program. This saves money and time and simplifies the logistics. In combination with the long life expectancy ETA25PS offers an outstanding price performance relationship.

Electrical Data

Effective electrical angle of rotation 1.)	0...360° (20° minimum angle)		
Independent linearity (best straight line) 1.)	±0.05 % @ 360°		
Absolute Linearity 1.)	±0.1 % @ 360°		
Output signal	0...3.3 V ratiometric	0...5 V ratiometric	0...10 V
Resolution	12Bit		
Update rate	150 µs		
Supply voltage	3.3 V ± 10 %	5V ± 10 %	15...30 V
Supply current (no load)	≤ 8 mA	≤ 8 mA	≤ 10 mA
Output load	≥ 5 kOhm		
Insulation resistance 1.)	100 MOhm @ 1000 VDC, 1 min		
Insulation voltage 1.)	1000 VAC @ 50 Hz, 1 min		
Maximum amount of configuration cycles	With DIP-Switch: 1x (OTP)		

Mechanical and Environmental Data

Mechanical angle 1.)	Endless
Lifetime 2.)	> 100 Mio. shaft rotating movements For Option D (with shaft sealing) the sealing is at least working up to 200 000 shaft rotating movements
Bearing	Sleeve bearing
Max. operational speed	100 rpm (800 rpm within short time)
Operational torque without / with X-Ring	0.1 ≤ M ≤ 0.6 Ncm / 0.3 ≤ M ≤ 1.3 Ncm (@ RT, 10 rev./min)
Operating temperature range	-40°...85 °C (cabling fixed installed)
Storage temperature range	-40°...+105 °C
Protection grade front side (IEC 60529) Standard	IP40
Protection grade rear side (IEC 60529)	IP40 (solder pads excluded)

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Mechanical and Environmental Data

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 (product with option ST1)	Approx. 26 g
Fastening parts included in delivery	Hex nut (AF14) and tooth washer, if option D is ordered then an additional O-Ring is part of delivery as sealing between mounting panel and rotary encoder.
Fastening torque mounting nut	≤ 3 Nm
Material shaft	Stainless steel
Material housing	Plastic / Bronze

Immunity

EN 61000-4-2 ESD	Class B
EN 61000-4-3 RF sine wave	Class A
EN 61000-4-6 Conducted sine wave	Class A
EN 61000-4-8 Power frequency magnetic fields	Class A

1.) According IEC 60393

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

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Order Code

Description User programmable angle sensor: - Electrical rotation angle until 360° - Sense of rotation CW oder CCW - OTP (1x) programmable via DIP switches		Selection: standard=black/bold, possible options=grey/cursive				
Series ETA25PS	ETA25PS					
Shaft diameter, shaft length: Shaft diameter Ø 6 mm, shaft length 22 mm Option: Shaft diameter Ø 6.35 mm, shaft length 22 mm Option: User defined shaft dimensions [mm] Ø ≤6.35mm		6x22 <i>6,35x22</i> <i>XXXX</i>				
Supply voltage / Output signal: VSUP=5 V (4,5...5,5 V) / OUT=0...5 V (ratiometric) VSUP=24 V (15...30 V) / OUT=0...10 V				0505 2410		
Shaft sealing (standard without shaft sealing): Option: D with shaft sealing					<i>D</i>	
Electrical connection, cable length, anti rotation pin (according drawing): Standards: Solder pads (anti rotation pin compatible to former series MAB25A, anti rotation pin A)						LA
Electrical connection, cable length, anti rotation pin (according drawing): Options: Electrical connection: Option: solder pads Option: clamping terminals Anti rotation pin: Option: anti rotation pin A (anti rotation pin compatible to former series MAB25A)					<i>L</i> <i>K</i>	<i>A</i>

Order example ETA25PS
Requirement:

Shaft Ø 6.00 mm, shaft length 22 mm, VSUP=5V/OUT=0...5V, no shaft sealing, solder pads, anti rotation pin A

Example for order code:

ETA25PS 6x22 0505 LA

Additional options

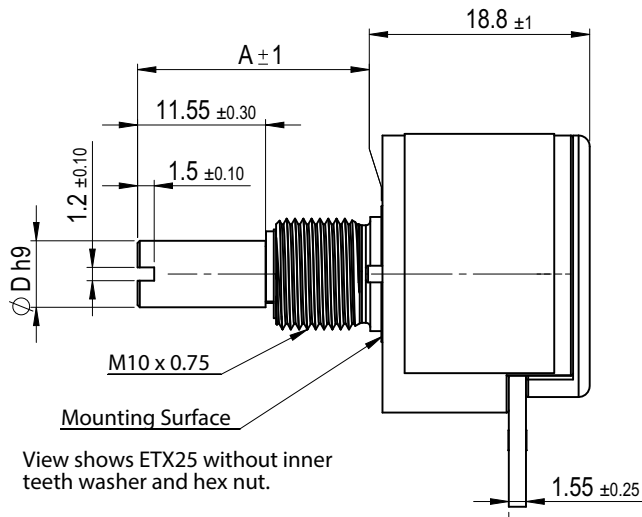
For higher quantities or on-going demand, additional options are available as described below



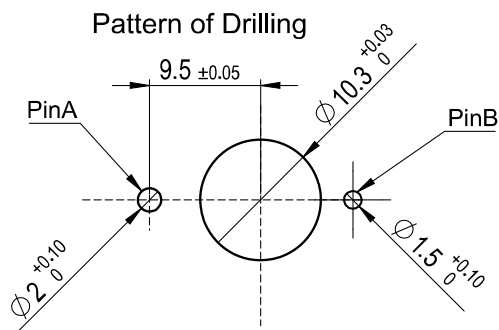
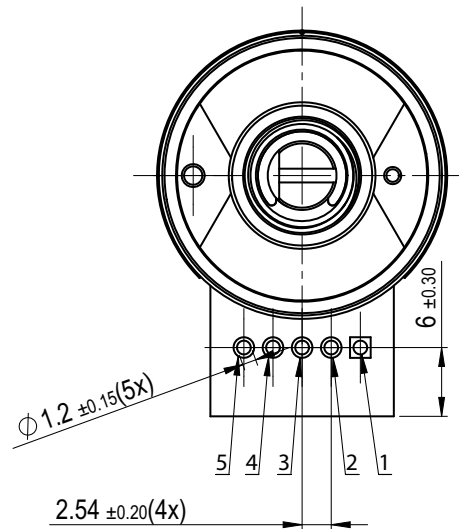
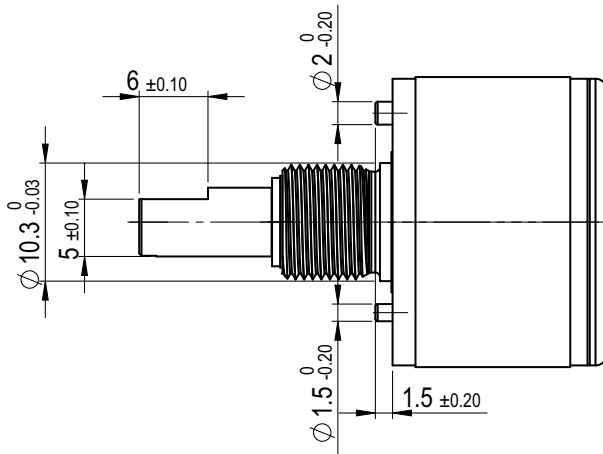
For example:

- ③ Modified shaft shape
- ③ Clamping terminal, special cable design
- ③ Output signal 0,5...4,5 V
- ③ Output signal 5 V PWM (10-90 % Duty-Cycle)
- ③ Ultra Low Power (ULP) / Ultra Low Speed (ULS) version

Drawing

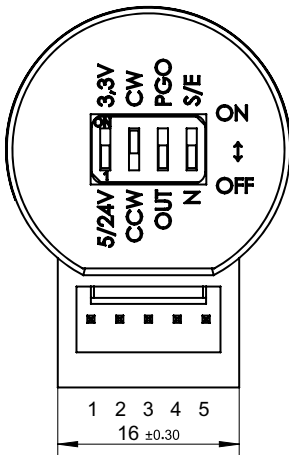
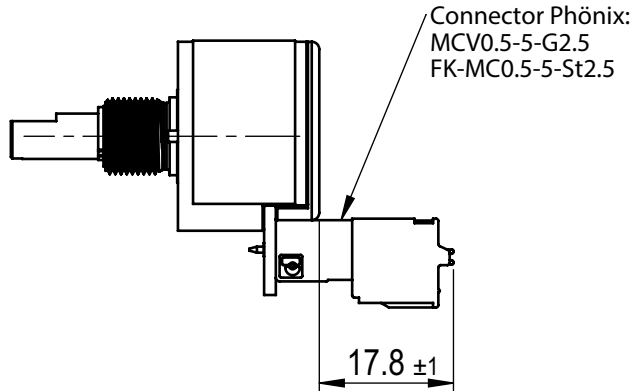
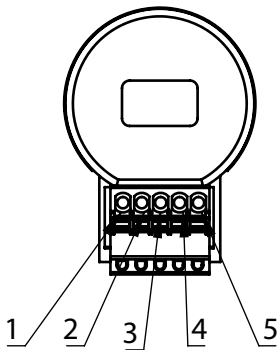


Standard shaft dimensions	
Shaft length A	22 mm
Shaft diameter D	6 mm



Drawing

Option K



Cable- and Pin-assignment

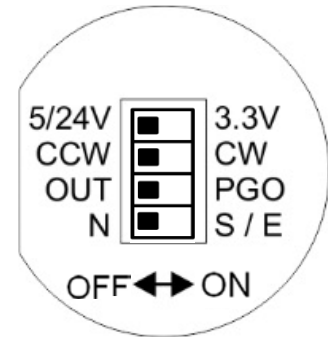
<u>Function</u>	
VSUP	PIN 1
OUT	PIN 2
GND	PIN 3
SCL	PIN 4
SDA	PIN 5

Operation of the Programming Interface ETA25PS



Pin-Assignment:
Solder lugs, 5-PIN, Contact Spacing 2,54mm

1 = VSUP
2 = OUT
3 = GND
4 = SCL
5 = SDA

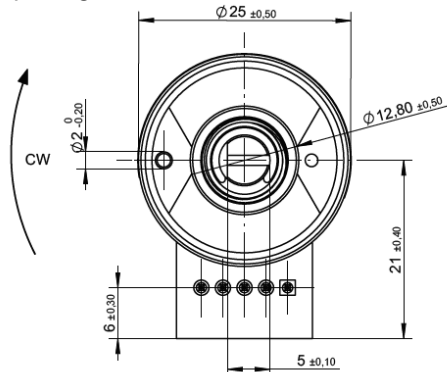


Function	Switch No.	DIP-Switch OFF	DIP-Switch ON
Supply voltage	1	5V (24V *)	3.3V
Sense of rotation	2	CCW	CW
Operating mode	3	OUT (measuring mode)	PGO (programming mode)
Programming input	4	N (inactive)	S / E (setting start / end position)

Programming Procedure:

A. Before you connect the supply voltage:

1. Configure DIP-Switch 1: Chose supply Voltage (5V (24V / 3.3V)). (*) In case that 24V supply voltage version was ordered it is not allowed to switch DIP switch 1 to 3.3V position.
2. Configure DIP-Switch 2: Chose sense of rotation (rising output signal in CW or CCW direction → please see drawing on the right hand)
3. DIP-Switches 3 and 4 must be set both in OFF-Position



B. Programming the start- and end position:

1. Connect power supply voltage
2. Switch DIP-Switch 3 to ON-Position (programming mode)
3. Put the shaft to start position and set DIP-Switch 4 for > 1s to ON and then back to OFF
4. Put the shaft to the end position and set DIP-Switch 4 for > 1s to ON and then back to OFF
5. Switch DIP-Switch 3 to OFF-Position (measuring mode)

READY

Please note:



- **The adjustment of the start- and end position by means of the DIP-Switch programming procedure can be proceed only once (OTP).**
- The change of the sense of rotation (CW / CCW) and the supply voltage (5V / 3.3V) can be changed several times (<500x).
- The programming switches 3 and 4 are out of function after programming.