

Data Sheet for Angle Sensors

Hall Effect Multiturn Rotary Encoder with Analog Output



- 10 to 100-times longer life compared with multiturn potentiometers
- Free user programmable start and end position (electrical angle 10° up to 72000°)
- Simple user programming
- Space saving bushing mounting, housing with 25mm diameter

The Series ETA25PM offers based on the programming interface an easy and exact adaptation to the application. This helps reducing costs and the number of different versions in stock.

Electrical Data

Effective electrical angle of rotation 1.)	0...10° - 0...72000° (max. 200 turns) Start point, endpoint and sense of rotation programmable by customer. Ex works the angle is set to 3600°. For detecting absolute position >360 the sensor should not be turned more than ±179° without supply voltage.	
Independent linearity (best straight line) 1.)	±0.05 % @ 3600°	
Absolute Linearity 1.)	±0.1 % @ 3600°	
Output signal	0...5 V	0...10 V
Resolution 1.)	12Bit	
Update rate	3 ms	
Supply voltage	9...30 V	15...30 V
Power consumption (no load)	< 10 mA	
Output load	≥ 5 kOhm	
Insulation voltage 1.)	1000 VAC @ 50 Hz, 1 min	
Insulation resistance 1.)	2 MOhm @ 500 VDC, 1 min	
Max. number of programming cycles	10000	

Mechanical and Environmental Data

Mechanical angle of rotation 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 (< 1 min 800 rpm)
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:	
Flat band or round cable (option F or R)	-40..+85 °C (fixed cable)
With integrated programming board (option TS)	-25..70 °C
Storage temperature range:	
Flat band or round cable (Option F or R)	-40..+105 °C
With integrated programming board (option TS)	-40..+90 °C
Protection grade front side (IEC 60529)	
Standard	IP40
Option D (with shaft sealing)	IP55M, IP66S
Protection grade rear side (IEC 60529)	
Flat ribbon - and round cable (Option F or R)	IP66 (end of cable excluded)
With integrated programming board (option TS)	IP00
Vibration (IEC 68-2-6, Test Fc) 3.)	±1,5 mm / 20 g / 10 to 2000 Hz / 16 frequency cycles (3x4 h)
Mechanical shock (IEC 68-27, Test Ea) 3.)	50 g / 11 ms / halfsine (3x6 shocks)

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Mechanical and Environmental Data

Max. radial load	1 N
Mass (option F)	32 g
Mass (option R)	60 g
Mass (option TS)	27,5 g
Fastening parts included in delivery	Hex nut (AF14) and tooth washer
Fastening torque mounting nut	≤ 3 Nm
Material shaft	Stainless steel
Material housing	Plastic / Bronze

Immunity

EN 61000-4-2 ESD 3.)	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

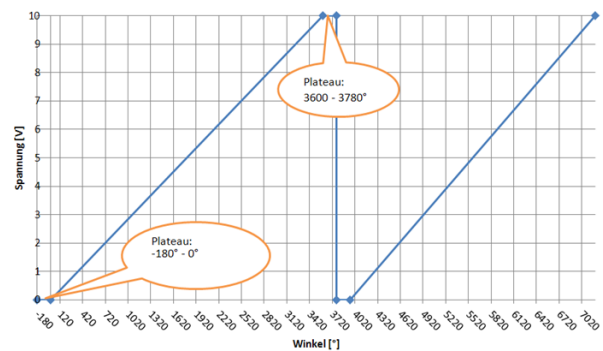
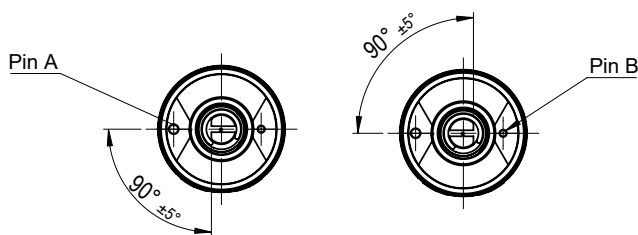
2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives

3.) Not tested for Option TS

Relationship between anti rotation pin and effective electrical angle in the state of delivery

Option anti rotation pin A If shaft flattening is facing antirotation pin A then output signal is 0% FS.

Option anti rotation pin B If shaft flattening is facing antirotation pin B then output signal is 0% FS.



The function as shown above represents the relationship between the anti-rotation pin A or B, the 0° position and the resulting output signal in the delivery state of the sensor when the shaft is turned clockwise (CW direction of rotation). The delivery state of the sensor is 10turns (= 3600°). Before and after the linear rising output signal for 3600° are located two signal plateaus with each of 180°. The following example describes the output signal when the shaft is operated by 11 turns clockwise, starting at the 0° position:

- 10 rotations of the shaft clockwise 0° to 3600°, linearly rising output signal 0% to 100% FS
- 1/2 turn of shaft 180° (3600° to 3780°) signal plateau 100% FS
- 1/2 turn shaft 180° (3780° to 3960°) signal plateau 0% FS

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Order Code						
Description: User programmable multiturn rotary encoder. Sense of rotation, rotation angle ex works: CW, 3600°		Selection: standard=black/bold, possible options=grey/cursive				
Series:		ETA25PM				
Shaft diameter x shaft length: Ø6 x 22 mm <i>Option Ø6,35 x 22 mm</i> <i>Option user defined shaft dimensions X x XX [mm] Ø ≤6,35mm</i>		6x22 <i>6,35x22</i> <i>XxXX</i>				
Supply voltage / Output signal: VSUP=24 V (9...30 V) / OUT=0...5 V (not available for option TS) VSUP=24 V (15...30 V) / OUT=0...10 V				2405 2410		
Shaft sealing: Standard without shaft sealing <i>Option D with shaft sealing</i>				- <i>D</i>		
Electrical connection: Flat ribbon cable 0,15 m <i>Option round cable 1 m</i> <i>Option flat ribbon cable length in x,xx [m] (≤ 3 m)</i> <i>Option round cable length in x,xx [m]</i> <i>Option PCB with clamping terminal, two programming buttons, direction switch (CW/CCW) and LED for programming status. (Plug is part of delivery)</i>					F0,15 <i>R1,00</i> <i>Fx,xx</i> <i>Rx,xx</i> <i>TS</i>	
Anti rotation pin: Anti rotation pin B (compatible to former series ENA22A) <i>Option anti rotation pin A (compatible to former series MAB25A)</i>						B <i>A</i>

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Additional options:

Order example ETA25PM:

Requirement:

Shaft Ø 6.00 mm, shaft length 22 mm, VSUP=5 V / OUT=0...5 V, sense of rotation CW, rotation angle ex works 3600° (can be programmed by customer), no shaft sealing, flat ribbon cable 1.00 m, anti rotation pin B

Example for order code:

ETA25PM 6x22 0505 R1.00B

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

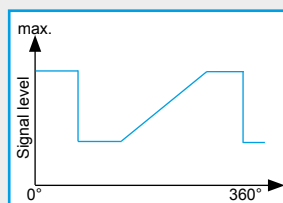
Examples:

- Special shaft design
- Special cable and connection design
- Special torque

Customized signal characteristic

For Example:

- Minimum/maximum signal level



Option with solder pads:



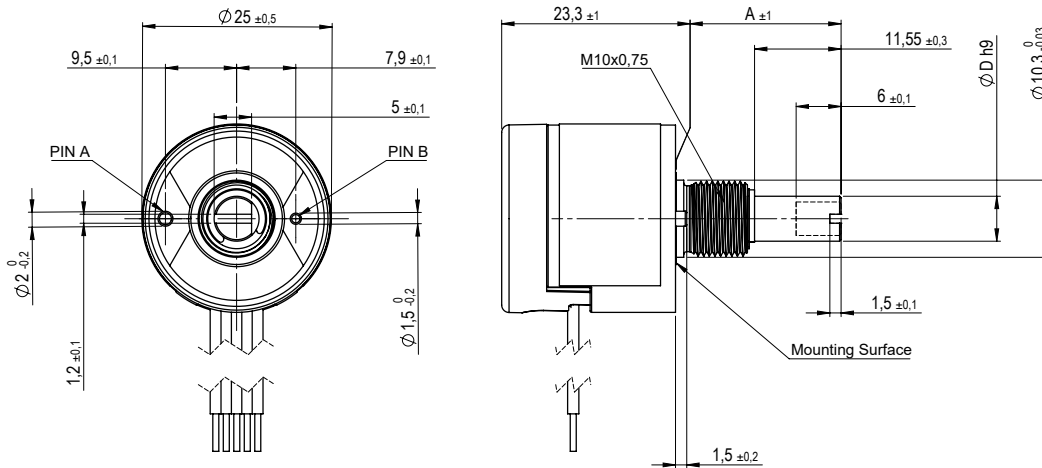
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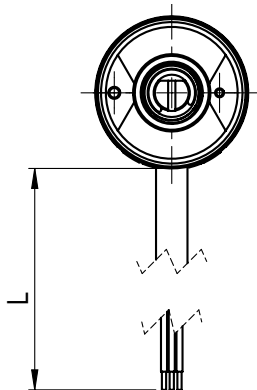
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Drawing

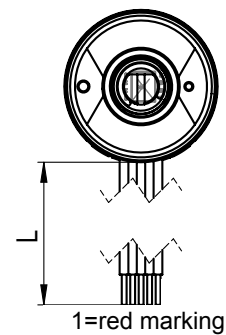
The following drawing is applicable for option R and F



Option R

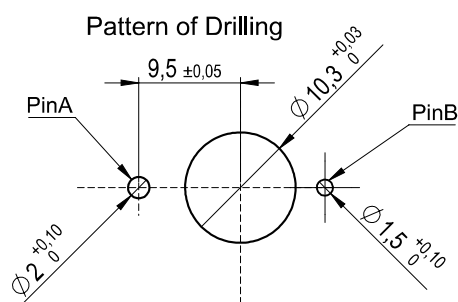


Option F



Option	Standard Cable Length L	Cable Cross Section	Allowed Tolerance (*)
R	1000 mm	AWG26	-20 mm...+40 mm
F	150 mm	AWG26	-10 mm...+25 mm

(*) Tolerances according IPC Association



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

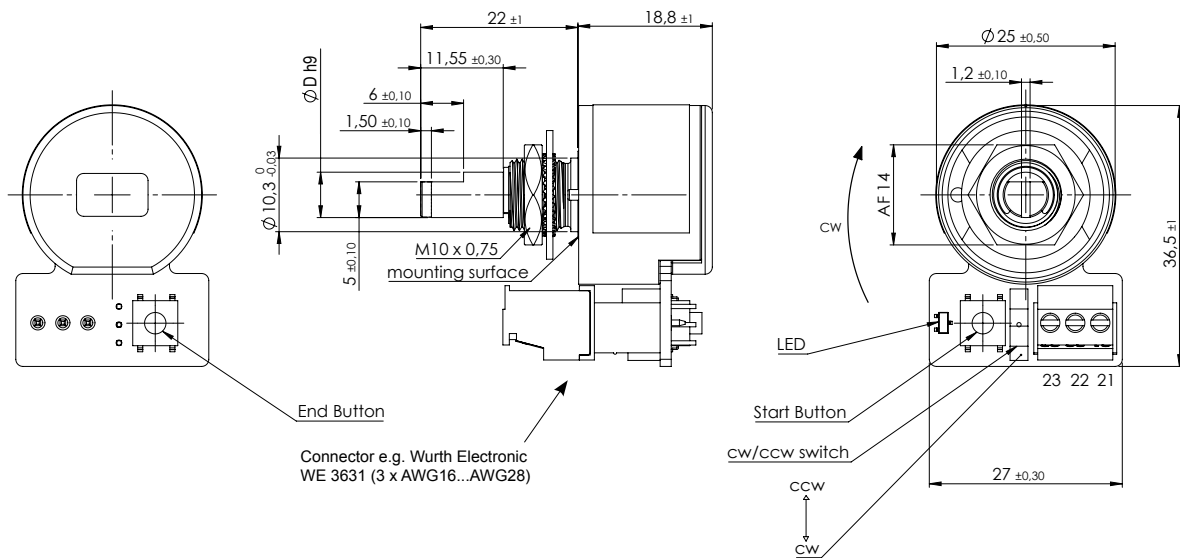
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Drawing

Option TS



Cable and pin assignment

Function:	Option F	Option R
DIR	Strand 1 (red)	orange
END	Strand 2	green
START	Strand 3	yellow
VSUP	Strand 4	red
OUT	Strand 5	brown
GND	Strand 6	black

Plug Connection

Function	Option ST
	Numbers according drawing for option TS from above
VSUP	23
OUT	22
GND	21

Further information can be found in the programming manual. For download of the programming manual please visit <https://www.megatron.de>