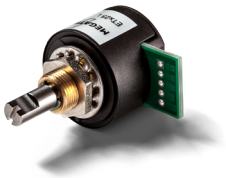
Data Sheet for Angle Sensors

Hall-Effect Singleturn Rotary Encoder with serial output — Series ETS25



- Serial micro controller interface (SER) or Serial Peripheral Interface (SPI) available
- Versatile electrical connections on demand: Solder- or clamping terminals, flat ribbon or round cable
- Compact Ø25 mm design
- Simple and time-saving bushing design

The high reliable Hall-Effect technology provides a constant signal quality over the whole life cycle..

Electrical Data		
Effective electrical angle of rotation 1.)	10° ≤ α ≤ 360° (programmable in factory), ±0.5°	
Independent linearity (best straight line) 1.)	±0,4 % @ 360°	
Absolute linearity 1.)	±0,8 % @ 360°	
Output signal	SER	SPI
Resolution	0,08°	0,02°
Update rate	100 µs	600 µs
Supply voltage	5 VDC ±10 %	
Power consumption (no load)	≤ 14 mA	≤ 12 mA
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
Lifetime 2.)	> 100 x 10^6 revolutions
Bearing	Sleeve bearing
Max. operational speed	100 rpm (800 rpm 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 (fixed cable)
Storage temperature range	-40..+105 °C
Protection grade front side (IEC 60529) Standard Option D (with shaft sealing)	 IP40 IP55M, IP66S
Protection grade rear side (IEC 60529) Solder- and clamping terminals Flat ribbon - and round cable	 IP50 (solder pads and connectors excluded) IP66 (end of cable excluded)
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 / half-sine (3x6 shocks)

Specifications are subject to change without notice

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Max. radial load	1 N
Mass (product with option L)	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

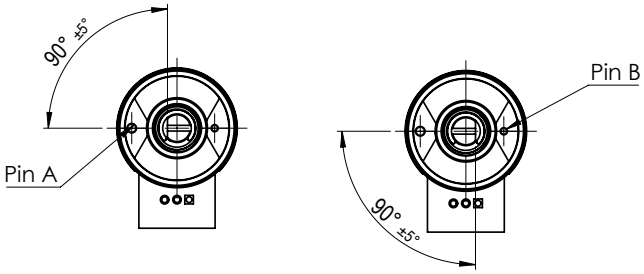
1.) According IEC 60393
2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives

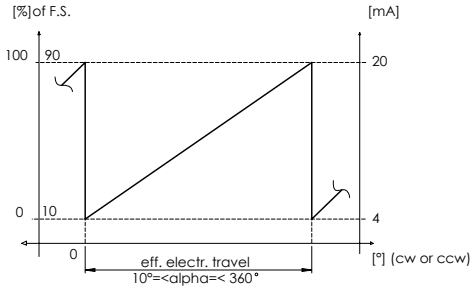
Further information

Relationship between anti rotation pin and effective electrical angle

Option anti rotation pin A	Option 05SPI: If shaft flattening is facing antirotation pin A then output signal is 0% FS.
Option anti rotation pin B	Option 05SPI: If shaft flattening is facing antirotation pin B then output signal is 0% FS.

For option 05SER no zero point alignment is available ex works.





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Order Code

Description: Electrical angle: 360° Output signal: CW (clockwise) rising	Selection: standard=black/bold, possible options=grey/cursive						
Series ETS25	**ETS25**						
Shaft diameter, shaft length: **Shaft diameter Ø 6 mm, shaft length 22mm** Option: Shaft diameter Ø 6.35 mm, shaft length 22 mm Option: User defined shaft [mm] Ø ≤6.35mm		**6x22** *6.35x22* *XxXX*					
Supply voltage / Output signal: **SPI VSUP=5 V ±10 % / OUT = MOSI, SCLK, SS** **(Only Option F und R)** **VSUP=24 V (15...30 V) / OUT=0...10 V**			**05SPI** **05SER**				
Shaft sealing (standard without shaft sealing): Option: D with shaft sealing				*D*			
Electrical connection, cable length, anti rotation pin (according drawing): **(Standard)** **Flat ribbon cable standard length 0.15 m** **(drilling pattern compatible to the predecessor series ENA22, drilling pattern option B)**					**F0.15B**		
Electrical connection, cable length, anti rotation pin (according drawing): **(Options)** **Electrical connection:** Option: solder pads Option: clamping Terminals Option: flat ribbon cable Option: round cable **Cable length:** Option: cable length in user defined length [x.xx m] (for option F und R, max. allowed cable length 1m) **Anti rotation pin:** Option: anti rotation pin A (anti rotation pin compatible to former series MAB25A) Option: anti rotation pin B (anti rotation pin compatible to former series ENA22A)					*L* *K* *F* *R*	*X.XX*	*A* *B*

Order example ETS25

Requirement:
Shaft Ø 6.00 mm, shaft length 22 mm, 05SPI, no shaft sealing, flat ribbon cable 0.15 m, anti rotation pin B

Example for order code:
ETS25 6x22 05SPI F0.15B

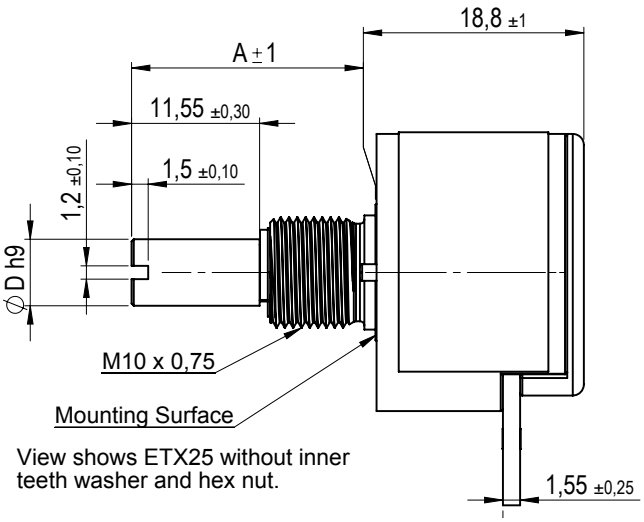
Additional options:

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

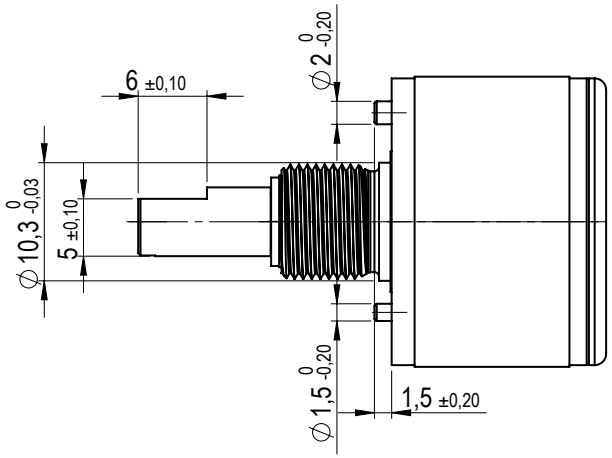
For example:
- 3,3 V supply voltage
- Special shaft design
- Special cable and connection design

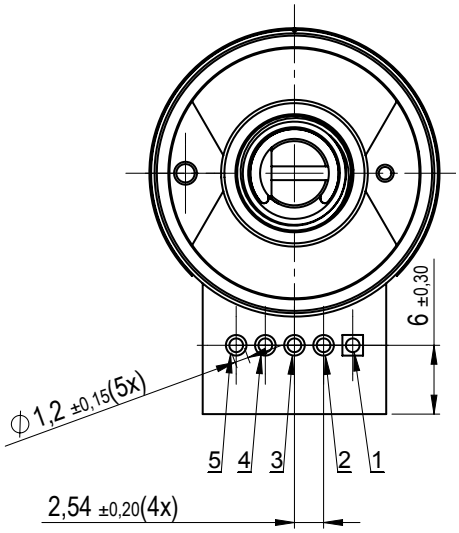
Drawing

Option L

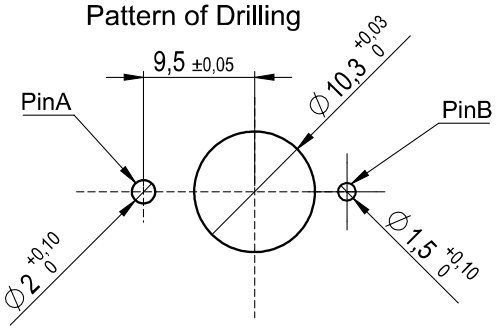


Standard shaft dimensions	
Shaft length A	22 mm
Shaft diameter D	6 mm



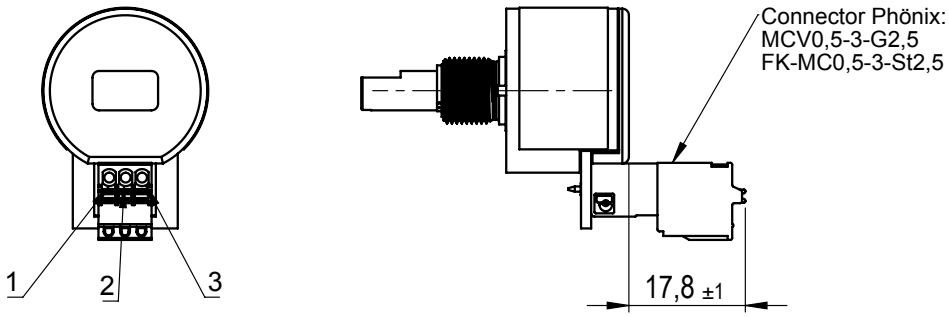


Pattern of Drilling

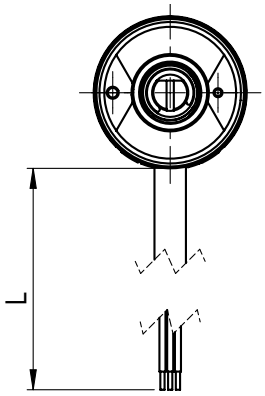


Drawing

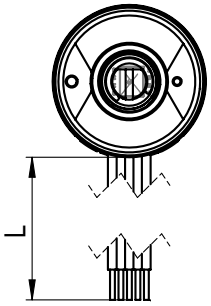
Option K



Option R

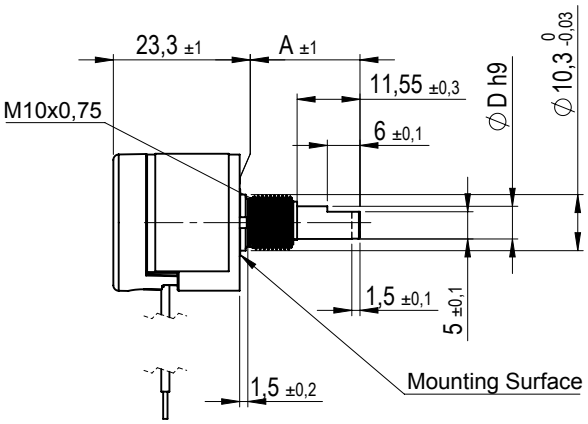


Option F



1=red marking

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



Drawing is applicable for option F and R

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Cable- and Pin Assignment

Function:	Option L and K:	Function:	Option F	Option R
VSUP	PIN 1	VSUP	Lead 1 (red)	red
Chipselect	PIN 2	GND	Lead 2	black
Clock	PIN 3	Data	Lead 3	brown
Data out	PIN 4	Clock	Lead 4	orange
Ground	PIN 5	Chipselect	Lead 5	yellow

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