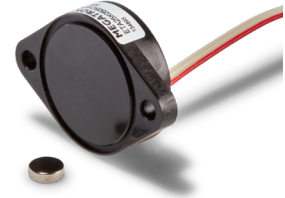


Series ETI25K – singleturn, incremental output, not redundant

Key features ETI25K:

- Channels: A, B and index signal Z
- TTL, Push Pull or Open Collector electronics
- Option: ex works programmable number of pulses from 1 to 10,000 ppr in one pulse step-width

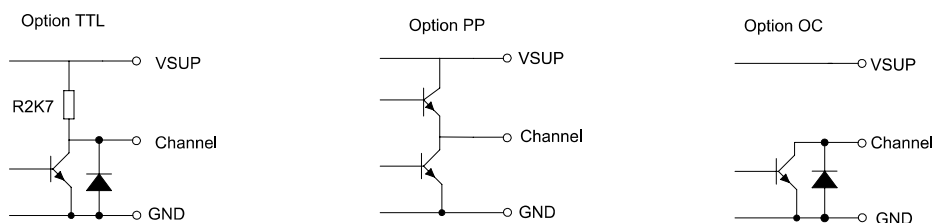


Electrical data ETI25 – incremental output, not redundant

Output Signal	TTL	Push-Pull	Open Collector
Number of pulses	1 to 10,000 ppr.		
Limit frequency	100 kHz		10 kHz
Switch-on delay	20 ms		
Supply voltage	3.3 or 5 VDC ±10%	5 to 30 V	5 to 30 V
Power consumption (no load)	≤ 15 mA	≤ 50 mA	≤ 25 mA
Output load	≥ 5 kOhm		
Max. pull-up voltage	-		30 VDC
Insulation voltage 1.)	1000 VAC @ 50 Hz, 1 min		
Insulation resistance 1.)	2 MOhm @ 500 VDC, 1 min		
MTTF (EN29500-2005-1)	-	-	-

1.) According to IEC 60393

Output circuit ETI25K per channel

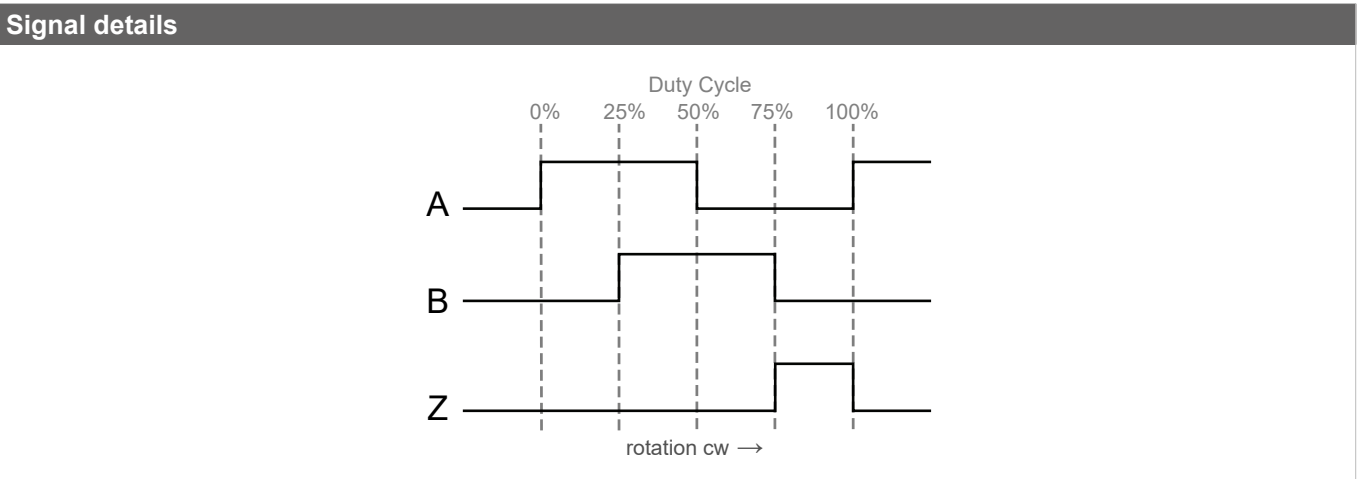


For details on output programming see page 25.

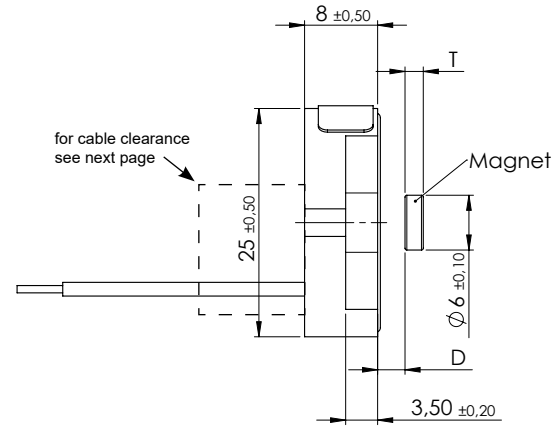
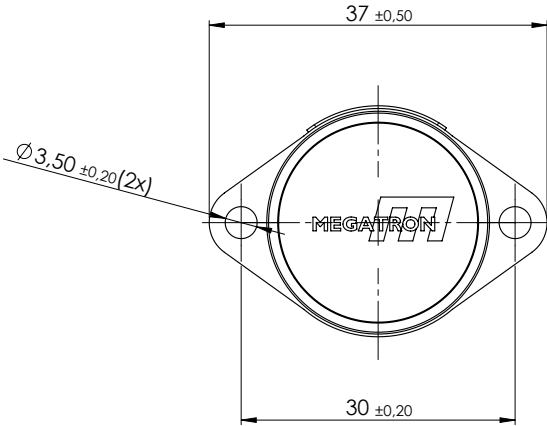
Order Code ETI25K – incremental output			
Description	Selection: standard= black/bold , possible options= <i>grey/italic</i>		
Series	ETI25K		
Number of pulses (ppr): 32 64 128 256 512 1024 <i>User-defined number of pulses 1 to 10000, increment 1 pulse</i>		32 64 128 256 512 1024 <i>0XXX</i>	
Supply voltage / output signal: Push-pull A, B, Z / $V_{SUP} = 5$ to 30 V TTL A, B, Z / $V_{SUP} = 3,3$ V or 5 V \pm 10% Open collector A, B, Z / $V_{SUP} = 5$ to 30 V			BZPP BZTTL BZOC
Electrical connection, cable length: Flat ribbon cable, standard length 0.15 <i>Flat ribbon cable with custom length [x.xx m]</i> Round cable, standard length 1 m <i>Round cable with custom length [x.xx m]</i>			F0,15 <i>FX,XX</i> R1,00 <i>RX,XX</i>

Order example ETI25K – incremental output
Requirement: number of pulses 1024 TTL output, VSUP=5 V/TTL, flat ribbon cable 0,15 m
Example for order code: ETA25K 1024 05BZTTL F0,15

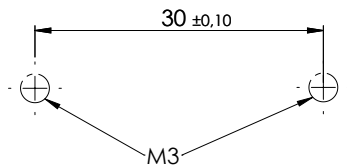
Cable/colour assignment			
Flat ribbon cable (option F)		Round signal cable (option R)	
Lead	Function	Wire colour	Function
Lead 1 (red)	VSUP	red	VSUP
Lead 2	GND	black	GND
Lead 3	A	brown	A
Lead 4	B	orange	B
Lead 5	Z	yellow	Z
		green	n/c



Drawing ETx25K Family



drilling pattern



Tightening torque $\leq 0,5\text{Nm}$

planarity of installation surface $\square 0,1$
 roughness of installation surface $\sqrt{Ra} 6,3$

Option F - Flat ribbon cable

Option R - Round cable

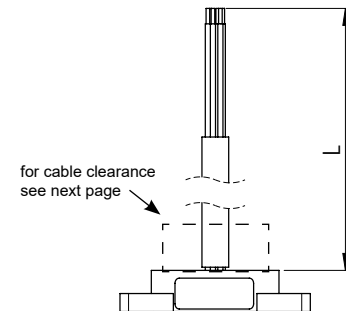
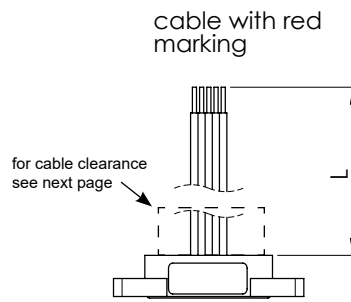


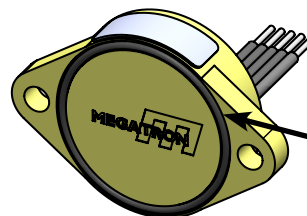
Table for parameter L see next page

Magnet thickness and distance from sensor surface (standard magnet only)

Electronics	Thickness T of the magnet	Mounting distance D
Analogue single turn not redundant, ETA25K, ETP25K, ETS25K (SPI only)	2 mm	1.00 +/- 0.15 mm
Analogue / Serial redundant, ETA25KX, ETS25KX	2.5 mm	0.50 +/- 0.15 mm
Incremental ET125K, Serial ETS25K (SSI only)	4 mm	0.20 +/- 0.15 mm
Analogue Multi/singleturn ETA25KPM	4 mm	0.20 +/- 0.15 mm

Angular error in dependency of the deviation of the magnet to the center axis

Deviation from the center axis	Angular error
0.50 mm	0.6°
0.75 mm	1.2°



O-ring, part no. 133324
 DIN 3771-22x1-NBR 70

- for sealing between sensor front and installation surface,
- not included in delivery, please order separately

Important note:

The correct thickness T of the magnet, the mounting distance D and the positioning relative to the central axis of the kit encoder are crucial for its correct function.

Cable specs for option F (flat ribbon cable) and R (round control cable)						
Option	Standard cable length L	Number of single strands (depends on electronics)	Cable sheath Ø or width	Single strands cross section	Allowed tolerance (L)	Minimum bending radius
R	Standard 1000 mm	3	4.3 mm	AWG26	-20 mm to +50 mm	3 x D Ø (D = cable sheath diameter Ø)
		6	5.2 mm			
		8	5.6 mm			
		12	6 mm	AWG28		
F	150 mm	3 to 12	ca. 1.25 per strand	AWG26	-20 mm to +25 mm	-

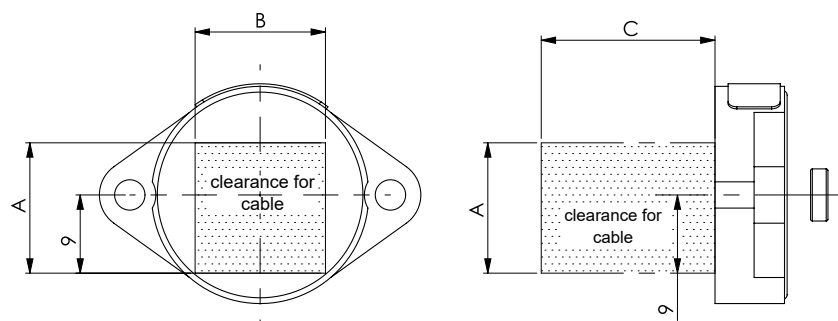
Cables without cable shield

(*) Tolerances according IPC Association

Cable length tolerances – custom lengths	
Length L	Tolerance
≤ 0.3 m	+25 mm / -20 mm
> 0.3 m - 1.5 m	+50 mm / -20 mm
> 1.5 m - 3 m	+100 mm / -40 mm
> 3 m - 7.5 m	+150 mm / -60 mm

Cable harness length measured from sensor surface or soldering pad including connector.
 Minimum cable length: 0.08 m (for round cable), 0.05 m for ribbon cable

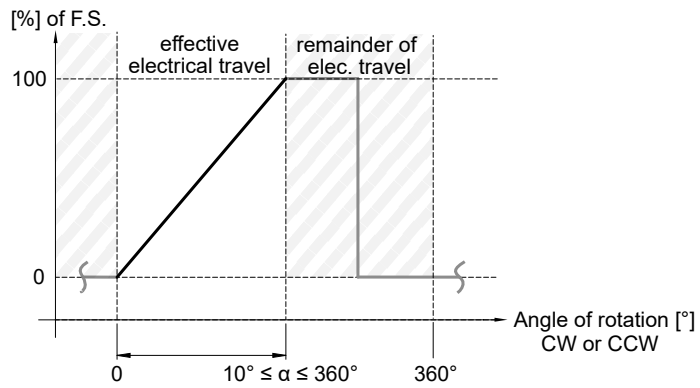
Series	Electronics	Clearance parameters [mm]		
		A	B	C
ETP25K	PWM, single turn	6	8	15
ETA25K	Analogue, single turn	6	8	15
ETA25KPM	Analogue, programmable multiturn	6	14	15
ETA25KX	Analogue, redundant single turn	18	8	15
ETI25K	Incremental, single turn, A, B, Z	6	14	15
	Serial, single turn, SER (deprecated)	6	14	15
	Serial, single turn, SPI, SSI	9	14	15
ETS25KX	Serial, redundant, single turn (SPI)	18	12	20



Signal definition for custom rotation angles

Custom angles $< 360^\circ$

When programming the electrical angle of rotation of $< 360^\circ$, the remaining non-effective range of rotation is divided equally into high and low.



Mechanical and environmental data - ETx25K Family	
Mechanical angle of rotation 1.)	Endless
Lifetime 2.)	Mechanically unlimited
Max. operational speed	<p>The maximum actuation speed is not limited mechanically. The maximum permissible actuation speed [rev./min] is calculated in relation to the resolution. For absolute encoders:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;"> $\text{rev./min. (@max. resolution)} = \frac{1}{2^{\text{Resolution in Bit}} * \text{Update rate in s}} * 60s$ </div> <p>For incremental encoders:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;"> $\text{Max. rev./min.} = \frac{\text{Limit Frequency } \frac{1}{s} * 60s}{\text{Number of Pulses}}$ </div>
Operating temperature range	-40..+85°C (fixed cable)
Storage temperature range	-40..+105°C
Protection grade front side (IEC 60529)	IP6
Protection grade rear side (IEC 60529)	IP67 (end of cable excluded) - standard with encapsulated electronics IP00 (end of cable excluded) - option without encapsulated electronics
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)
Housing diameter / length	25 mm (dimensions of the mounting flange, height: 37 mm, width 25 mm)
Housing depth	8 mm
Shaft diameter	No limitation
Mass	Option F (0.15 m flat ribbon cable) approx. 15 g Option R (1.00 m round cable) approx. 40 g
Connection type	<ul style="list-style-type: none"> ▪ Flat ribbon cable (AWG26, 0.15 m with tinned cable endings) ▪ Round cable (AWG26, 1 m with tinned cable endings) ▪ Other connection types on request
Connection position	Axial
Sensor mounting	Flange, by means of two pieces of screws M3
Delivery content	Kit Encoder and Magnet. O-ring/gasket must be ordered separately (Screws for fastening the rotary encoder are not part of the scope of delivery)
Fastening torque (per screw or nut)	≤ 0.5 Nm
Housing material	Glass-fibre reinforced thermoplastic

1.) According IEC 60393

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

Immunity / Electrostatic Discharge	
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
EN 61000-4-2 ESD	Class B