

Series HTI25 – singleturn, incremental output

Key features HTI25:

- Channels: A, B and index signal Z
- TTL or Open Collector electronics
- Maximum number of pulses per channel 10.000 pulses per revolution
- Option: ex works programmable number of pulses in pulse step width 1

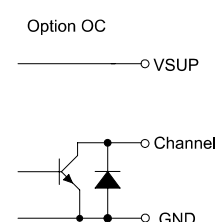
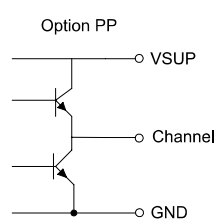
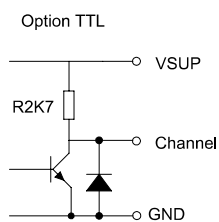


Electrical data HTI25K – singleturn, incremental output

Output Signal	TTL	Open Collector
Number of pulses	1 to 1024 ppr	1 to 10.000 ppr
Limit frequency	100 kHz	250 kHz
Switch-on delay	20 ms	6.3 ms
Supply voltage	3.3 or 5 VDC $\pm 10\%$	4.8 to 42 V
Power consumption (no load)	≤ 15 mA	≤ 24 mA (for 5 V input)
Output load	≥ 5 kOhm	
Max. pull-up voltage	-	42 VDC
Max. pull-up current	600 mA	
Insulation voltage 1.)	1000 VAC @ 50 Hz, 1 min	
Insulation resistance 1.)	2 MOhm @ 500 VDC, 1 min	
MTTF (SN29500-2005-1)	473a	1000a

1.) According to IEC 60393

Output circuit HTI25 per channel



For details on zero point definition and output programming see page 29.

Incremental Encoders

Series HTI25

Order code HTI25 – singleturn, incremental output

Description	Selection: standard= black/bold , possible options= <i>grey/italic</i>			
Series	HTI25			
Shaft diameter, shaft length: Shaft diameter Ø 6 mm, shaft length 12 mm Shaft diameter Ø 4 mm, shaft length 10 mm Custom shaft dimensions [mm] Ø ≤ 6.35 mm		6x12 <i>4x10</i> <i>XxXX</i>		
Number of pulses (ppr): 32 64 128 256 512 1024 <i>User-defined number of pulses</i>			32 64 128 256 512 1024 <i>XXXX</i>	
Supply voltage / output signal: VSUP=5 V ± 10% / OUT=TTL A, B, Z VSUP=4.8 to 42 V / OUT=open collector A, B, Z			05BZTTL BZOC	
Electrical connection, cable length: 1 m round cable, axial 1 m round cable, radial Connector M8, 8 pol., radial* <i>Round cable, customer-specific cable length [X.XX m], axial</i> <i>Round cable, customer-specific cable length [X.XX m], radial</i>				PG PGR M8R <i>PGX,XX</i> <i>PGRX,XX</i>

* M8 axial connector variant not available

Order example HTI25 – singleturn, incremental output

Requirement:

Shaft Ø 6.00 mm, shaft length 12 mm, number of pulses 1024 TTL output, VSUP=5 V/TTL, round cable 1 m

Example for order code:

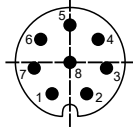
HTA25 6x12 1024 05BZTTL PG

Cable and pin assignments – single outputs

Option M8(R), 8 pin		Option PG(R), round cable	
Pin-No.	Function	Wire colour	Function
Pin 1	VSUP	red	VSUP
Pin 2	GND	black	GND
Pin 3	A	brown	A
Pin 4	B	orange	B
Pin 5	Z	yellow	Z
Pin 6	n/c	green	n/c
Pin 7	n/c		
Pin 8	n/c		

Connector M8 – pin assignment for 8-pin connector

Pin-Numbering of socket connector in the encoder housing



8 pin (HTI25)

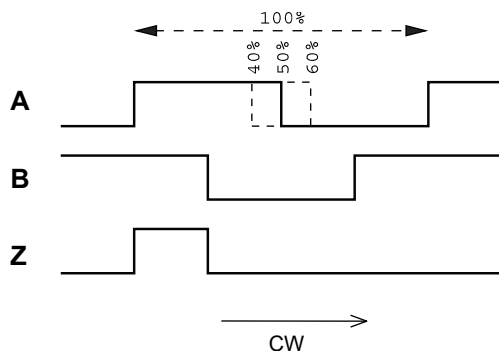
The orientation of the connector relative to the encoder body is not defined and varies from encoder to encoder. When using right-angle connectors in combination with axial outlets, the orientation of the cable outlet is therefore not defined.

If you need a defined orientation of the cable outlet, please choose our housings with radial cable outlet and use straight mating connectors.

Signal details

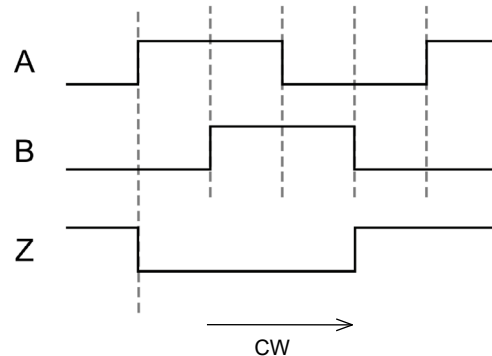
Incremental signal output function

A, B, Z (version 05BZTTL)

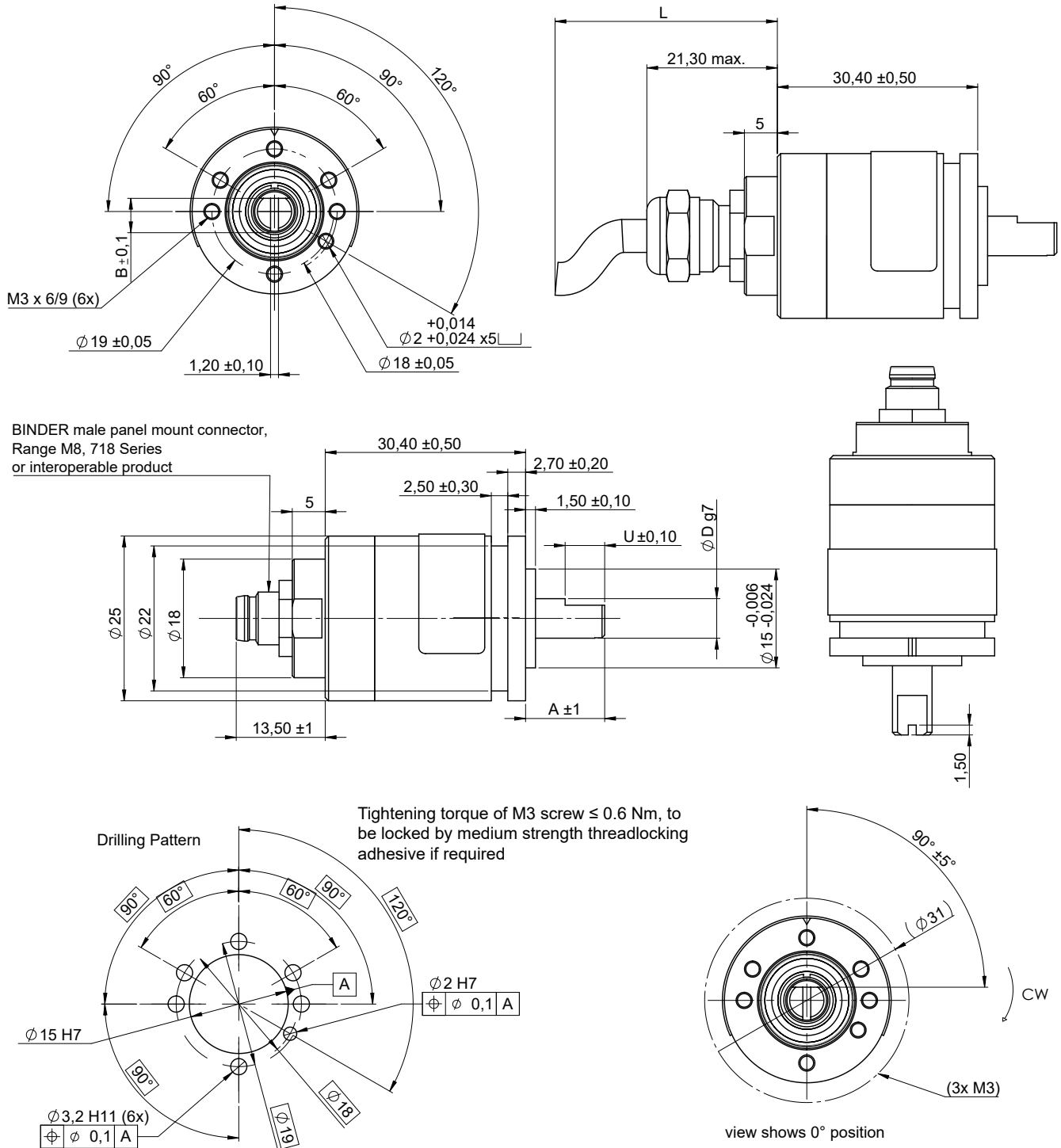


The percentage information describes the proportion of a pulse in dependency to the duration of one period

A, B, Z (version BZOC)



Drawing HTx25 - axial versions (option PG and M8), shaft dimensions, drilling pattern and zero position

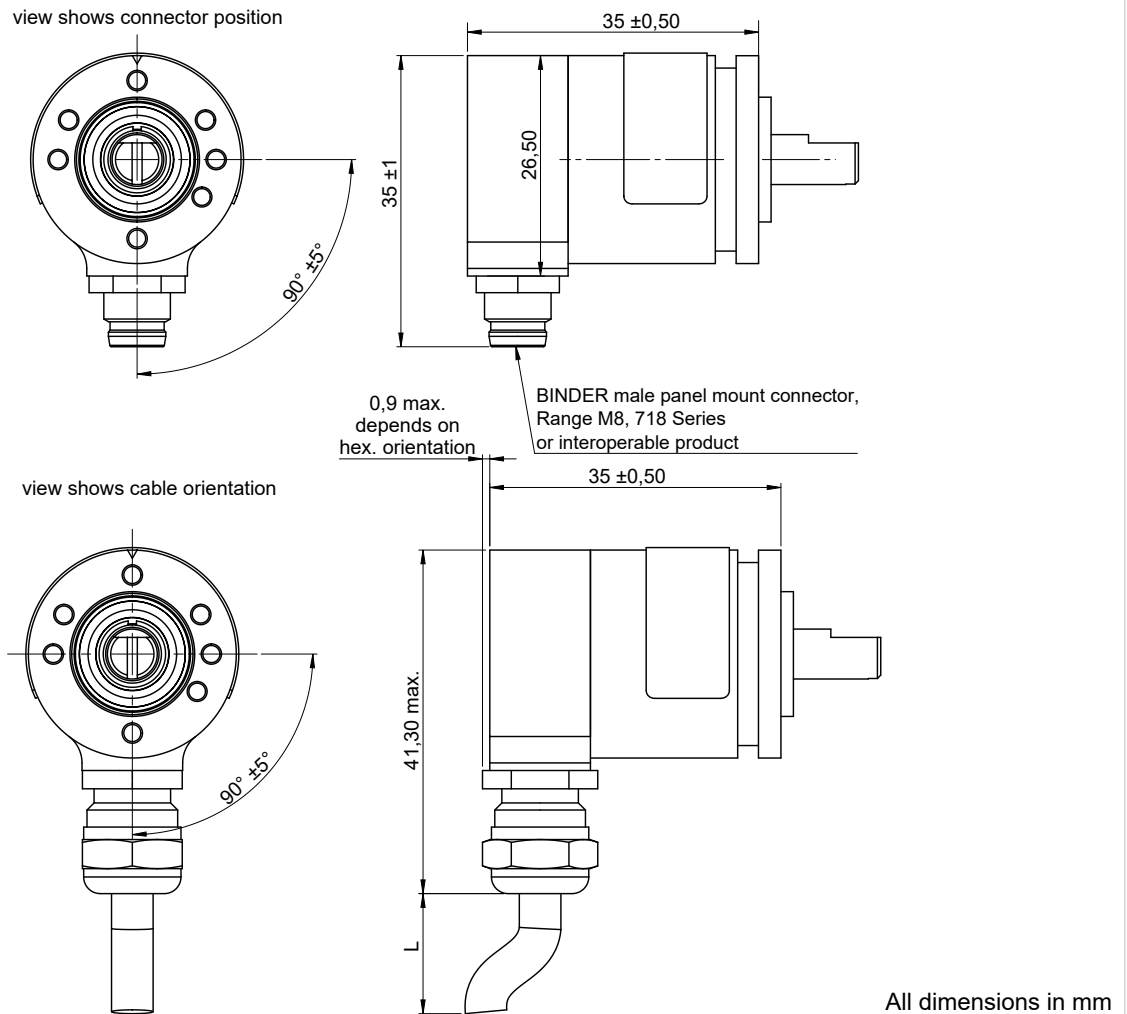


Standard shaft dimensions / tolerances

	Standard type 6 mm	Standard type 4 mm	Other types $\leq 6.35 \text{ mm}$
Shaft length A	12 +/- 1 mm,	10 +/- 1 mm	A (custom length)
Shaft diameter D	6 h9 mm	4 h9 mm	D h9 (custom diameter)
Shaft flattening U length	6 +/- 0.1 mm	1 +/- 0.1 mm	6 +/- 0.1 mm
Shaft flattening B	4.5 +/- 0.1 mm	3.5 mm +/- 0.1 mm	D - 1 mm +/- 0.1 mm

All dimensions in mm

Drawings HTx25 – Radial cable versions with orientation



Cable specs for option PG(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
PG PGR	Standard 1000 mm	3		AWG26	-20 mm to +40 mm	10 x D Ø (D = cable sheath diameter Ø)
		6				
		8				
		10		AWG28		
		12				

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	+40 mm / -20 mm
> 1.5 m - 3 m	+100 mm / -40 mm
> 3 m - 7.5 m	+150 mm / -60 mm

Wire harness length measured from sensor face including connector. Minimum cable length: 0.08 m (for round cable). Please contact us for lengths > 3 m regarding handling and packaging.

Mechanical and Environmental data	
Shaft type	Solid shaft
Mechanical angle of rotation ^{1.)}	Endless
Lifetime ^{2.)}	@100 % of max. permissible radial shaft load >1.4x10E8 shaft revolutions @80 % of max. permissible radial shaft load >2x10E9 shaft revolution @20 % of max. permissible radial shaft load >1.7x10E10 shaft revolutions
Bearing	2 pcs. groove ball bearings type 2RS
Max. operational speed (with shaft sealing)	max. 12.000 rpm
Operational torque: (@ room temperature and 10 rev/min)	≤ 0.3 Ncm
Operating temperature range	Option M8 (connector) ▪ -25 to +80°C Option PG (cable gland incl. cable) ▪ -30 to +85°C Kabel fest verlegt ▪ -10 to +85°C Kabel in Bewegung
Storage temperature range	-30 to +105°C
Protection grade (IEC 60529) front side	IP65S
Protection grade (IEC 60529) rear side	Option PG: IP68 (cable ends excluded) Option M8: IP67 (when mated with IP67 type M8 cable)
Vibration (DIN EN 60068-2-64:2008 + A1: 2019)	±1.5 mm / 30 g / 10 to 2000 Hz / 16 frequency cycles (3x4 h)
Shock (DIN EN 60068-2-27)	400 m/s ² / 6 ms / half sine (100±5) shocks
Housing diameter	Ø 25 mm
Housing depth	In dependency to the electrical connection position: ▪ axial 51.7 mm (PG) / 43.9 mm (M8) ▪ radial 35 mm
Shaft diameter	Standards: Ø6 mm, Ø4 mm, details see drawings Option Custom diameter [mm] Ø ≤ 6.35 mm
Max. radial load	80 N (load point 80% in dependency to the visible standard shaft length)
Max. axial load	40 N (axial application of force onto the shaft end)
Masse (zirka)	HTx25 mit Stecker M8(R) 40 g HTx25 mit Kabelverschraubung und 1 m Signalkabel PG(R) 69 g

1.) According IEC 60393

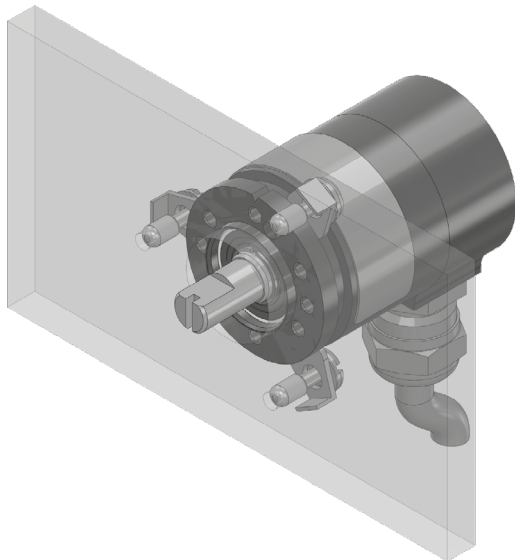
2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives

Mechanical Data

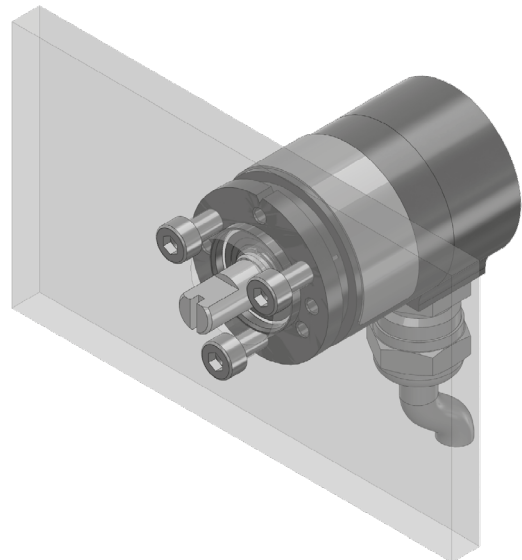
Family HTx25

Mechanical and environmental data, miscellaneous

Sensor mounting	1. Via threaded holes integrated in the sensors head by use of stainless steel screws M3x0.5 2. Via synchro flange with optional available servo mount fixing nails SFN1 incl. screws M3 x 0.5 from MEGATRON (not enclosed), recommended at angles of 120°
Mounting hardware included	none ▪ To attach the rotary encoder using a synchro flange, the MEGATRON SFN1 synchro clamps available as accessories ▪ For the electrical connection option M8 (R), cables and mating connectors are not part of the scope of delivery. M8 connectors with cables are available as accessories from MEGATRON
Fastening torque per screw for fastening of the rotary encoder	≤ 0.6 Nm (M3 screw, thread tensile strength class 5.6) For screw securing, the use of a medium-strength thread securing adhesive is recommended
Material shaft	Stainless steel
Material housing	Aluminium
Material cable gland (PG)	Stainless steel
Material connector M8	CuZn nickel-plated



Servo mount using fixing nails SFN1
incl. 3 screws M3 x 0.5



Flange mount using 3 screws M3

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

Definition of the zero position / anti-rotation pin

Output at the zero point:

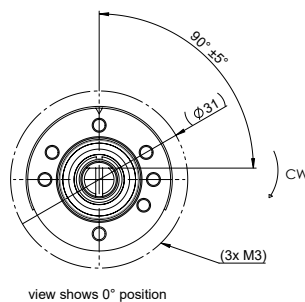
HTA25 (analogue outputs): Output signal 0% full scale (F. S.)

HTP25 (PWM output): duty cycle 10% (10% duty cycle)

HTS25 (serial output): Output signal 0% full scale (F. S.)

HTI25 (incremental output): The index signal is output (Z)

Position of the zero position see drawing below (nodge at top)



Signal definition for custom rotation angles

Custom angles <360°

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

