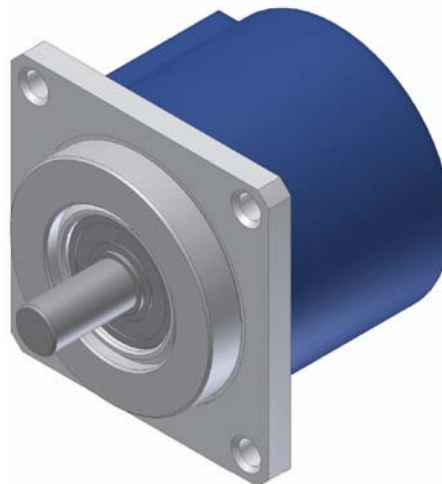


Code ST20	Project A33	Release A	Title TECHNICAL DATASHEET
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OPTICAL ENCODER EN650

GENERAL FEATURES

- Optical rotary encoder.
- Bi-directional signals with zero pulse.
- Flange and body made of aluminium.
- Output by connector or cable (with sealing fairlead), radial or axial.



MECHANICAL AND ELECTRICAL FEATURES

<p>MECHANICAL</p> <ul style="list-style-type: none"> • Flange and body made of aluminium. • Shaft made of stainless steel. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. <p>ELECTRICAL</p> <ul style="list-style-type: none"> • Protection against short circuits. • Protection against inversion of polarity. • High stability of output signals. • Reading device with an infra-red light emitter and receiving photodiodes. • A and B output signals with phase displacement of 90° electrical. 	Code EN650	PP	LD	OC	
	Pulses per revolution	5 to 64000 ppr			
	Max. rotating speed	momentary	12000 rpm	permanent	8000 rpm
	Max. load on shaft	100 N (radial) – 100 N (axial)			
	Shaft (diameter A x length L) mm	Ø6x10-Ø8x20 -Ø9.52x20 -Ø10x20 others on request			
	Protection class	IP65 (standard) * IP67 (optional)			
	Operating temperature	0 + 70°C			
	Storage temperature	-20 + 80°C			
	Relative humidity	20 + 90% (not condensed)			
	Power supply	5 V ± 5% 5 + 28 V ± 5%			
	Max. consumption at 5 V (with no load)	25 mA			
	Max. output current (each channel)	30 mA			
	Max. frequency	300 kHz			
	Output	Push-Pull	Line Driver	Open Collector	
	Standard length of cable	1 m			
	Electrical connections	see the rel. table			
Electrical protection	inversion of power supply polarity and short circuits on output port				
Weight (according to model)	280 + 340 g				

* It is important to note that shaft rotates more freely in the version with protection class IP65.

ORDERING CODE

MODEL	CABLE/ CONN. OUTPUT	ACCURACY	PPR	POWER SUPPLY	SHAFT Ø	CABLE / CONN.	OUTPUT	CONNECTION	OPTIONS
EN650	HR	S	xxxxx	05V	D06	CE	PP	2	V2

HR = radial HA = axial	No code = standard S = special	05V = 5V 0528 = 5+28V	D06 = ø6 mm D08 = ø8 mm 9.52 = ø9.52 mm D10 = ø10 mm	M.5 = 0.5m M01 = 1m CE = 7P Amph. CF = 10P Amph. CG = 12P Connei	LD = LINE DRIVER PP = PUSH-PULL ON = OC NPN OP = OC PNP	C = cable n = no. wiring	No code = standard configuration V2 = protection class IP67
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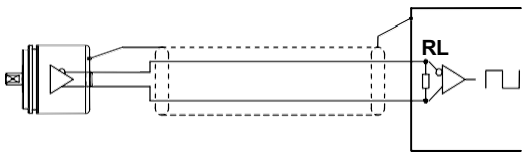
Example **OPTICAL ENCODER EN650 HRS 01000 05V D06CE PP2 V2**

Code ST20	Project A33	Release A	Title TECHNICAL DATASHEET
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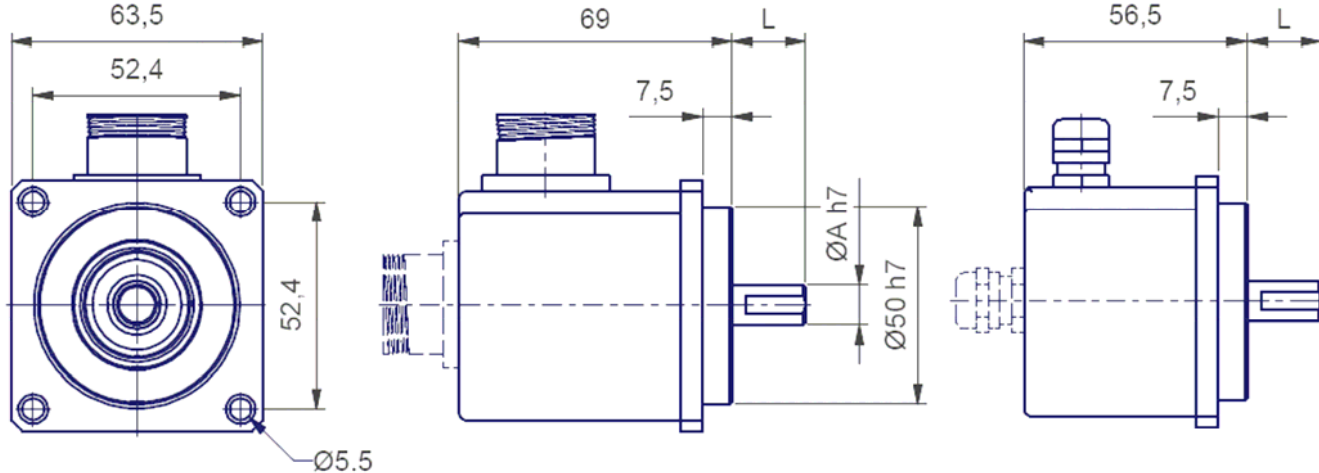
CABLE AND ELECTRICAL CONNECTIONS

<p>Cable 8 cores $\varnothing = 6.5$ mm, PVC external sheath</p> <p>Wires section:</p> <ul style="list-style-type: none"> - for power supply: 0.5 mm² - for signals: 0.14 mm² <p>Cable 5 cores $\varnothing = 5.4$ mm, PVC external sheath</p> <p>Wires section:</p> <ul style="list-style-type: none"> - for power supply: 0.22 mm² - for signals: 0.14 mm² <p>NOTES: Do not exceed the minimum cable bending radius of 30 mm.</p>	PP / OC		LD	
	SIGNAL	WIRE COLOUR	SIGNAL	WIRE COLOUR
	A	Green	A	Green
	B	White	B	White
	Z	Brown	Z	Brown
			A	Orange
			B	Light Blue
			Z	Yellow
	V+	Red	V+	Red
	GND	Blue	GND	Blue
	≡	Shield	≡	Shield


SHIELDED CABLE

	LINE DRIVER CONNECTION	
	POWER SUPPLY	RL
	5 V	120 Ω
	12 V	330 Ω
	24 V	1000 Ω
<p>In case of cable extension, the electrical connection between the body of connectors must be ensured.</p>		

DIMENSIONS AND RECOMMENDED FIXING

	<ul style="list-style-type: none"> Use an elastic coupling for shaft junction.
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WHAT TO AVOID

<ul style="list-style-type: none"> Any type of mechanical working (cut, drill, mill, etc.) Any modification either on the body or on the shaft of the encoder Any kind of bad usage External hits or stresses 	
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