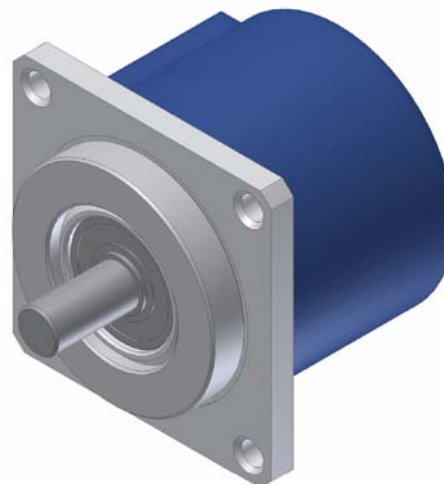


Code ST20	Project A33	Release A	Title TECHNICAL DATASHEET
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OPTICAL ENCODER EN650

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

MECHANICAL <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. ELECTRICAL <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

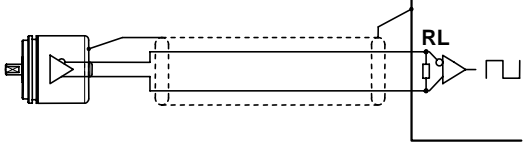
Example  **OPTICAL ENCODER EN650 HRS 01000 05V D06CE PP2 V2**

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

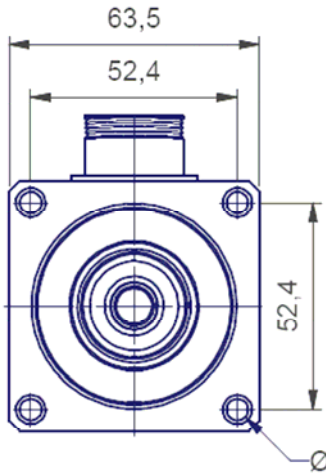
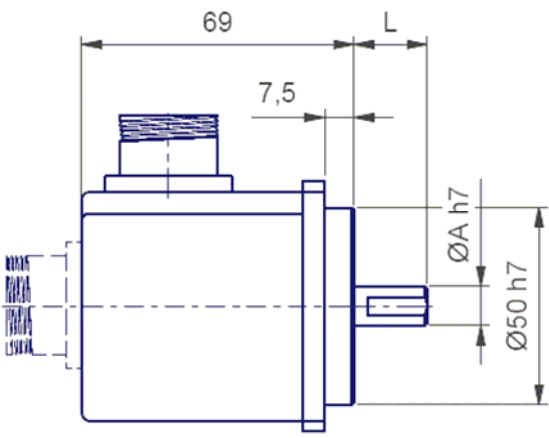
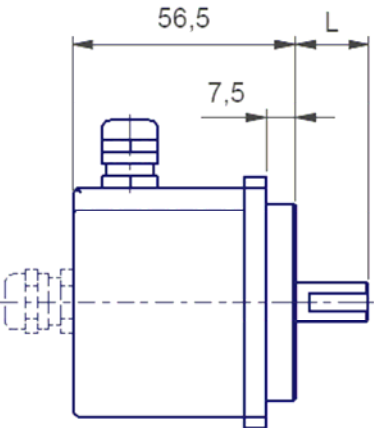
<p>Cable 8 cores $\varnothing = 6.5$ mm, PVC external sheath</p> <p>Wires section:</p> <ul style="list-style-type: none"> - for power supply: 0.5 mm^2 - for signals: 0.14 mm^2 <p>Cable 5 cores $\varnothing = 5.4$ mm, PVC external sheath</p> <p>Wires section:</p> <ul style="list-style-type: none"> - for power supply: 0.22 mm^2 - for signals: 0.14 mm^2 <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
			\bar{A}	Orange
			\bar{B}	Light Blue
			\bar{Z}	Yellow
	V+	Red	V+	Red
	GND	Blue	GND	Blue
	\perp	Shield	\perp	Shield

SHIELDED CABLE


	LINE DRIVER CONNECTION	
	POWER SUPPLY	RL
	5 V	120 Ω
	12 V	330 Ω
	24 V	1000 Ω

In case of cable extension, the electrical connection between the body of connectors must be ensured.

DIMENSIONS AND RECOMMENDED FIXING

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

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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