

**MAIN FEATURES**

Miniaturized  $\varnothing$  42 mm encoder series for general factory automation applications.

- 3 channel encoder (A / B / Z) up to 14400 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable output, connectors available on cable end
- Solid shaft diameter 6 mm or 8 mm
- Mounting by clamping, threaded or synchronous flange



**ORDERING CODE**

**ER 40A 100 S 5/28 P 6 X 6 P R .XXX**

**SERIES**  
(mod. A / B / C / H / I / X) incremental encoder series **EL**  
(mod. A / B / C / H / I / N / X) incremental encoder series **ER**

**MODEL**  
clamping flange  $\varnothing$  20 mm **40A**  
square flange  $\square$  36,5 mm **40B**  
clamping flange  $\varnothing$  17,46 mm **40C**  
M18 threaded flange **40H**  
M20 threaded flange **40I**  
synchronous flange  $\varnothing$  21 mm **40N**  
synchronous flange  $\varnothing$  30 mm **40X**

**RESOLUTION**  
(mod. A / B) ppr from 1 to 14400  
(mod. C / H / I / N / X) ppr from 1 to 2500  
(mod. N) ppr from 100 to 2500  
refer to the available pulses list

**ZERO PULSE**  
without zero pulse **S**  
with zero pulse **Z**

**POWER SUPPLY**  
(with L electrical interface) 5 V DC **5**  
5 ... 28 V DC **5/28**

**ELECTRICAL INTERFACE**  
NPN open collector **C**  
push-pull **P**  
line driver **L**  
power supply 5/28 V DC - output RS-422 **RS**

**SHAFT DIAMETER**  
(mod. A / B / C / H / I / N) mm **6**  
(mod. X) mm **8**

**ENCLOSURE RATING**  
IP 54 **X**  
(mod. A / B / H) IP 66 **S**

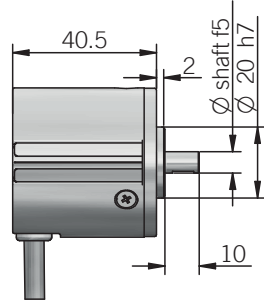
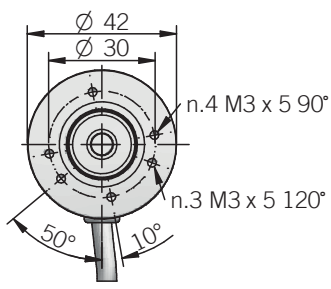
**MAX ROTATION SPEED**  
(IP 66) 3000 rpm **3**  
(IP 54) 6000 rpm **6**

**OUTPUT TYPE**  
cable (standard length 0,5 m) **P**  
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)

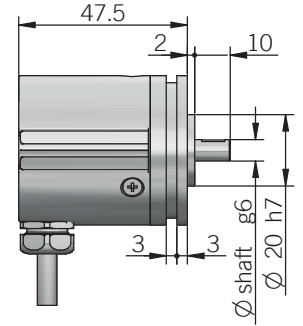
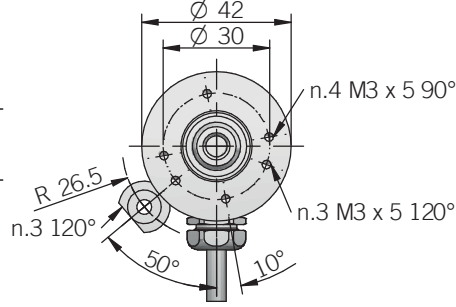
**DIRECTION TYPE**  
(mod. A / B / C / H / I / N) axial **A**  
radial **R**

**VARIANT**  
custom version **XXX**

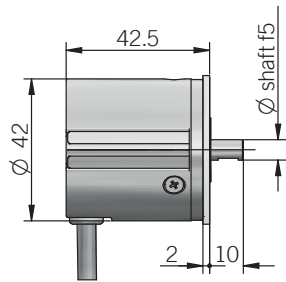
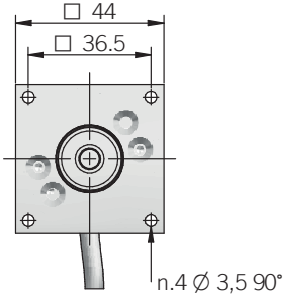
**40A (X ENCLOSURE RATING)**



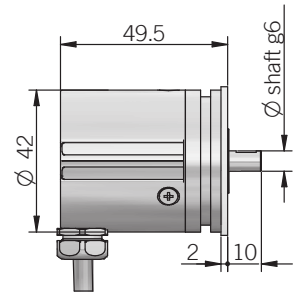
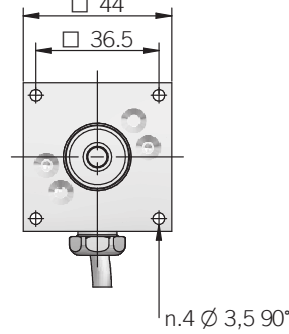
**40A (S ENCLOSURE RATING)**



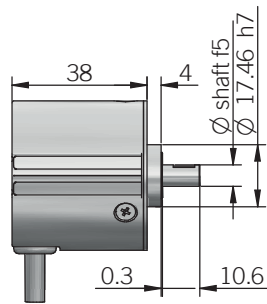
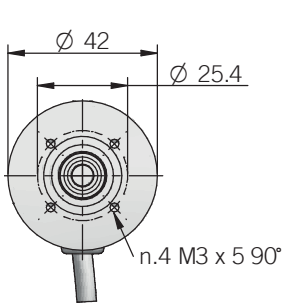
**40B (X ENCLOSURE RATING)**



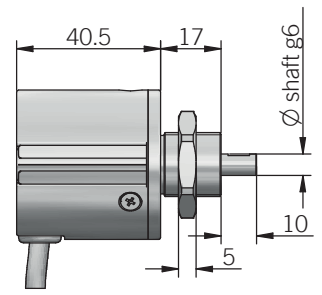
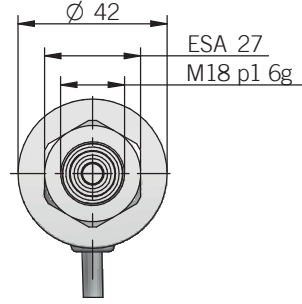
**40B (S ENCLOSURE RATING)**



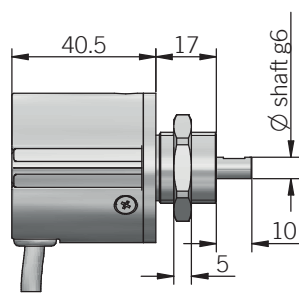
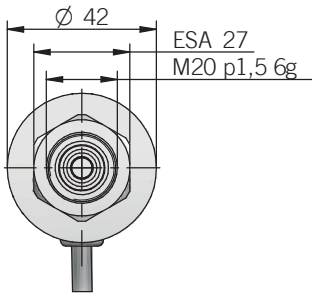
**40C**



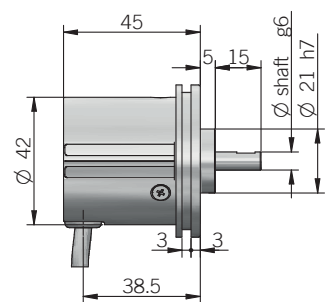
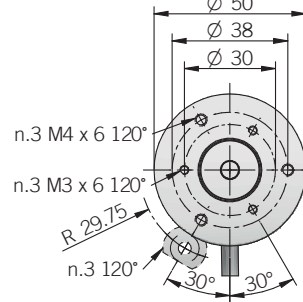
**40H**



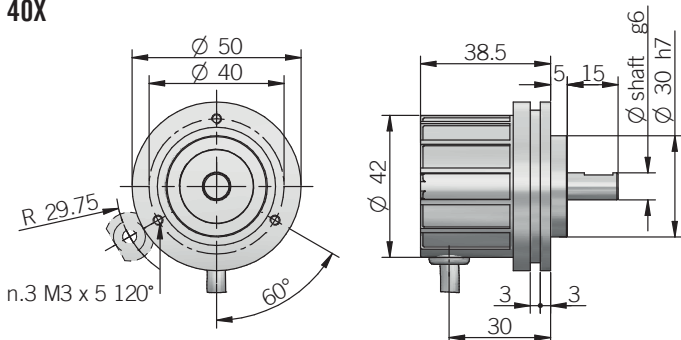
**40I**



**40N**

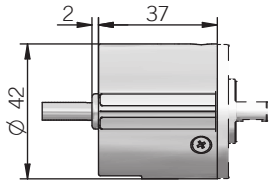


**40X**



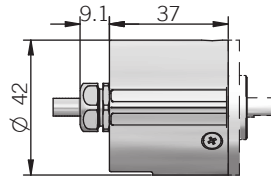
fixing clamps not included, please refer to the Accessories  
recommended mating shaft tolerance H7  
dimensions in mm

**DIMENSIONS WITH AXIAL OUTPUT WITH X ENCLOSURE RATING**



dimensions in mm

**DIMENSIONS WITH AXIAL OUTPUT WITH S ENCLOSURE RATING**



ELECTRICAL SPECIFICATIONS	
<b>Resolution</b>	from 1 to 14400 ppr (mod. A / B) from 1 to 2500 ppr (mod. C / H / I / X) from 100 to 2500 ppr (mod. N)
<b>Power supply<sup>1</sup></b>	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
<b>Power draw without load</b>	800 mW max
<b>Max load current</b>	C / P = 50 mA / channel L / RS = 20 mA / channel
<b>Electrical interface<sup>2</sup></b>	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272 or similar) line driver RS-422 (AELT-5000 or similar)
<b>Max output frequency</b>	150 kHz EL series 250 kHz up to 3600 ppr ER series 500 kHz from 4000 ppr ER series
<b>Counting direction</b>	A leads B clockwise (shaft view)
<b>Index signal</b>	180°e (gated A)
<b>Mean time to dangerous failure (MTTF)<sub>d</sub><sup>3</sup></b> according to EN ISO 13849-1	200 years EL series 263 years ER series
<b>Mission time (Tm)<sup>3</sup></b>	20 years
<b>Diagnostic coverage (DC)<sup>3</sup></b>	0%
<b>Cable type</b>	shielded - fixed installation conductors section 0,22 mm <sup>2</sup> / AWG 24 bending radius min 60 mm
<b>Electromagnetic compatibility</b>	according to 2014/30/EU directive
<b>RoHS</b>	according to 2011/65/EU directive
<b>UL / CSA</b>	file n. E212495

**CONNECTIONS**

Function	Cable C / P	Cable L / RS
+V DC	red	red
0 V	black	black
A+	green	green
A-	/	brown or grey
B+	yellow	yellow
B-	/	orange
Z+	blue	blue
Z-	/	white
⏏	shield	shield

MECHANICAL SPECIFICATIONS	
<b>Shaft diameter</b>	∅ 6 / 8 mm
<b>Enclosure rating IEC 60529</b>	X = IP 54 S = IP 66
<b>Max rotation speed</b>	6000 rpm with X enclosure rating 3000 rpm with S enclosure rating
<b>Max shaft load<sup>4</sup></b>	30 N (6,74 lbs) axial / radial
<b>Shock</b>	50 G, 11 ms (IEC 60068-2-27)
<b>Vibration</b>	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
<b>Moment of inertia</b>	0,1 x 10 <sup>-6</sup> kgm <sup>2</sup> (2,4 x 10 <sup>-6</sup> lbf <sup>2</sup> )
<b>Starting torque (at +20°C / +68°F)</b>	< 0,01 Nm (1,42 Ozin) with X enclosure rating < 0,05 Nm (7,10 Ozin) with S enclosure rating
<b>Bearing stage material</b>	aluminum
<b>Shaft material</b>	stainless steel
<b>Housing material</b>	PA66 glass fiber reinforced
<b>Bearings</b>	n.2 ball bearings
<b>Bearings life</b>	10 <sup>9</sup> revolutions
<b>Operating temperature<sup>5,6</sup></b>	-10° ... +60°C (+14° ... +140°F) EL series -25° ... +85°C (-13° ... +185°F) ER series
<b>Storage temperature<sup>6</sup></b>	-25° ... +70°C (-13° ... +158°F)
<b>Weight</b>	100 g (3,52 oz)

<sup>1</sup> as measured at the transducer without cable influences

<sup>2</sup> for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

<sup>3</sup> this product is not a safety component, for further details refer to TECHNICAL BASICS section

<sup>4</sup> maximum load for static usage

<sup>5</sup> measured on the transducer flange

<sup>6</sup> condensation not allowed

**EL SERIES RESOLUTIONS**

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 30 - 32 - 40 - 50 - 70 - 80 - 90 - 750 - 1500

**ER SERIES RESOLUTIONS**

100 - 120 - 128 - **150** - 200 - 240 - 250 - 256 - **300** - **360** - **400** - 480 - **500** - **512** - 600 - 625 - **720** - 800 - 900 - **1000** - **1024** - **1200** - 1250 - **1440** - 1600 - 1800 - **2000** - **2048** - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 7200 - 8000 - 8192 - 10000 - 12000 - 14400

please directly contact our offices for other pulses, preferred resolutions in bold