

# EL - ER 40 A/B/C/H/I/N/X SOLID SHAFT INCREMENTAL ENCODER

## MAIN FEATURES

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

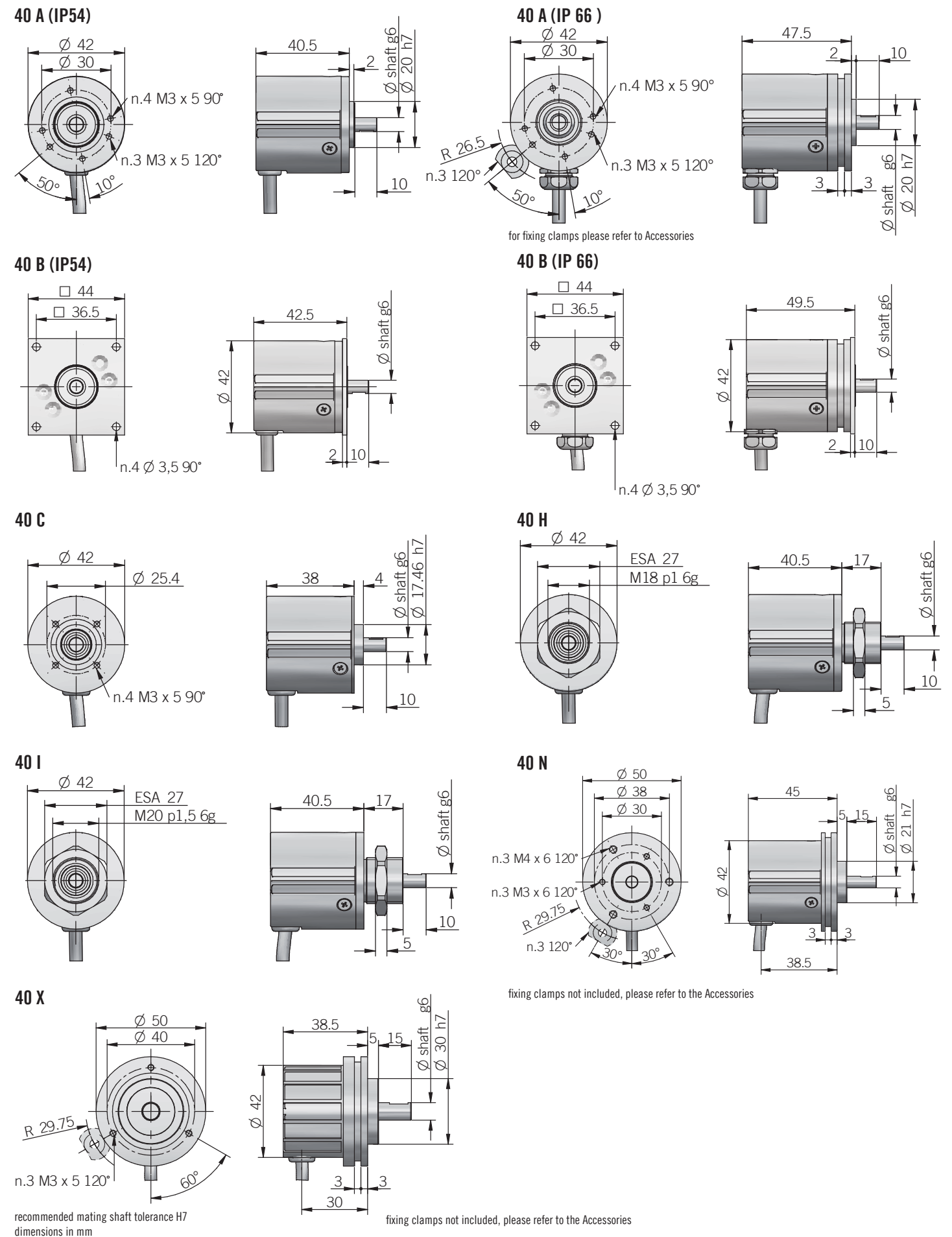
- 3 channel encoder (A / B / Z) up to 14400 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable output, connectors available on cable end
- Solid shaft diameter 6 mm or 8 mm
- Mounting by clamping, threaded or synchronous flange



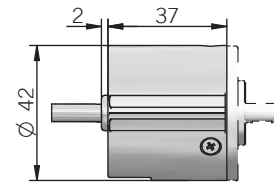
## ORDERING CODE

| ER   | 40A | 100 | S | 5/28 | P | 6 | X | 6 | P | R | .XXX |
|--|-----|-----|---|------|---|---|---|---|---|---|------|
| <p><b>SERIES</b><br/>incremental encoder series <b>EL</b><br/>incremental encoder series <b>ER</b></p> <p><b>MODEL</b><br/>clamping flange <math>\varnothing 20</math> mm <b>40A</b><br/>square flange <math>\square 36,5</math> mm <b>40B</b><br/>clamping flange <math>\varnothing 17,46</math> mm <b>40C</b><br/>M18 threaded flange <b>40H</b><br/>M20 threaded flange <b>40I</b><br/>synchronous flange <math>\varnothing 21</math> mm <b>40N</b><br/>synchronous flange <math>\varnothing 30</math> mm <b>40X</b></p> <p><b>RESOLUTION</b><br/>(mod. A / B) ppr from 1 to 14400<br/>(mod. C / H / I / N / X) ppr from 1 to 2500<br/>refer to the available pulses list</p> <p><b>ZERO PULSE</b><br/>without zero pulse <b>S</b><br/>with zero pulse <b>Z</b></p> <p><b>POWER SUPPLY</b><br/>(with L electrical interface) 5 V DC <b>5</b><br/>5 ... 28 V DC <b>5/28</b></p> <p><b>ELECTRICAL INTERFACE</b><br/>NPN open collector <b>C</b><br/>push-pull <b>P</b><br/>line driver <b>L</b><br/>power supply 5/28V - output RS-422 <b>RS</b></p> <p><b>SHAFT DIAMETER</b><br/>(mod. A / B / C / H / I / N) mm <b>6</b><br/>(mod. X) mm <b>8</b></p> <p><b>ENCLOSURE RATING</b><br/>IP 54 <b>X</b><br/>(mod. A / B / H) IP 66 <b>S</b></p> <p><b>MAX ROTATION SPEED</b><br/>(IP 66) 3000 rpm <b>3</b><br/>(IP 54) 6000 rpm <b>6</b></p> <p><b>OUTPUT TYPE</b><br/>cable (standard length 0,5 m) <b>P</b><br/>preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)</p> <p><b>DIRECTION TYPE</b><br/>(mod. A / B / C / H / I / N) axial <b>A</b><br/>radial <b>R</b></p> <p><b>VARIANT</b><br/>custom version <b>XXX</b></p> |     |     |   |      |   |   |   |   |   |   |      |

## OPTICAL SOLID SHAFT INCREMENTAL ENCODERS | EL - ER 40 A/B/C/H/I/N/X

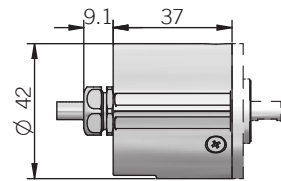


40 (axial output)



dimensions in mm

40 (IP 66 axial output)



ELECTRICAL SPECIFICATIONS

|   |   |
|---|---|
| <b>Resolution</b>                       | from 1 to 14400 ppr (mod. A / B)<br>from 1 to 2500 ppr (mod. C / H / I / N / X)   |
| <b>Power supply<sup>1</sup></b>         | 5 = 4,5 ... 5,5 V DC<br>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<br>L / RS = 20 mA / channel   |
| <b>Electrical interface<sup>2</sup></b> | NPN open collector (AEIC-7273, pull-up max +30 V DC)<br>push-pull / line driver HTL (AEIC-7272)<br>line driver RS-422 (AELT-5000 or equivalent) |
| <b>Max output frequency</b>             | EL series 150 kHz<br>ER series 250 kHz up to 3600 ppr<br>500 kHz from 4000 ppr  |
| <b>Counting direction</b>               | A leads B clockwise (shaft view)  |
| <b>Electromagnetic compatibility</b>    | according to 2014/30/EU directive   |
| <b>RoHS</b>                             | according to 2011/65/EU (01/09/2020) directive  |
| <b>UL / CSA</b>                         | certificate 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>                      | ø 6 / 8 mm   |
| <b>Enclosure rating</b>                    | X = IP 54 (IEC 60529)<br>S = IP 66 (IEC 60529)   |
| <b>Max rotation speed</b>                  | IP 54 - 6000 rpm<br>IP 66 - 3000 rpm   |
| <b>Max shaft load<sup>3</sup></b>          | 5 N 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) IP 54<br>< 0,05 Nm (7,10 Ozin) IP 66                               |
| <b>Bearing stage material</b>              | EN-AW 2011 aluminum  |
| <b>Shaft material</b>                      | 1.4305 / AISI 303 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>4,5</sup></b> | -10° ... +60°C (+14° ... +140°F) EL series<br>-25° ... +85°C (-13° ... +185°F) ER series |
| <b>Storage temperature<sup>5</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> maximum load for static usage  
<sup>4</sup> measured on the transducer flange  
<sup>5</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

MAIN FEATURES

Standard ø 58 mm encoder series for industrial applications with high mechanical resistance requirements. These encoders are designed to support high radial and axial shaft load and they can be mounted by means of flanges or fixing clamps.

- 3 channel encoder (A / B / Z) up to 24000 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable or connector output
- Available with metal cover for heavy duty applications
- Solid shaft diameter up to 12 mm
- Mounting by synchronous, clamping or coupling flange



ORDERING CODE

ER 58C M\* 500 S 5/28 P 8 X 6 M R .162 +XXX

|   |   |   |  |  |   |  |   |  |   |  |  |   |
|---|---|---|--|--|---|--|---|--|---|--|--|---|
| <b>SERIES</b><br>incremental encoder series EL<br>incremental encoder series ER | <b>MODEL</b><br>synchronous flange ø 50 mm 58B<br>clamping flange ø 36 mm 58C<br>clamping flange ø 50 mm 58H<br>coupling flange ø 40 mm 58T | <b>METAL COVER</b><br>* add for metal cover M | <b>RESOLUTION</b><br>ppr from 1 to 24000<br>refer to the available pulses list | <b>ZERO PULSE</b><br>without zero pulse S<br>with zero pulse Z | <b>POWER SUPPLY</b><br>(with L electrical interface) 5 V DC 5<br>5 ... 28 V DC 5/28 | <b>ELECTRICAL INTERFACE</b><br>NPN open collector C<br>push-pull P<br>line driver L<br>power supply 5/28V - output RS-422 RS | <b>SHAFT DIAMETER</b><br>(mod. B) mm 6<br>(mod. C) mm 8<br>(mod. B / C / H) (3/8") mm 9,52<br>mm 10<br>(mod. T) mm 12 | <b>ENCLOSURE RATING</b><br>IP 54 X<br>(mod. B / C / T) IP 66 S | <b>MAX ROTATION SPEED</b><br>(IP 66) 3000 rpm 3<br>(IP 54) 6000 rpm 6 | <b>OUTPUT TYPE</b><br>cable (standard length 1,5 m) P<br>preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)<br>MIL male connector M<br>JIS-C-5432 male connector J<br>M12 male connector M12<br>M23 male connector H<br>M16 male connector C | <b>DIRECTION TYPE</b><br>axial A<br>radial R | <b>MATING CONNECTOR</b><br>mating connector not included .162<br>to be reported only with connector output (eg. MR.162), for mating connector see Accessories |
|---|---|---|--|--|---|--|---|--|---|--|--|---|

VARIANT  
custom version +XXX