

### MAIN FEATURES

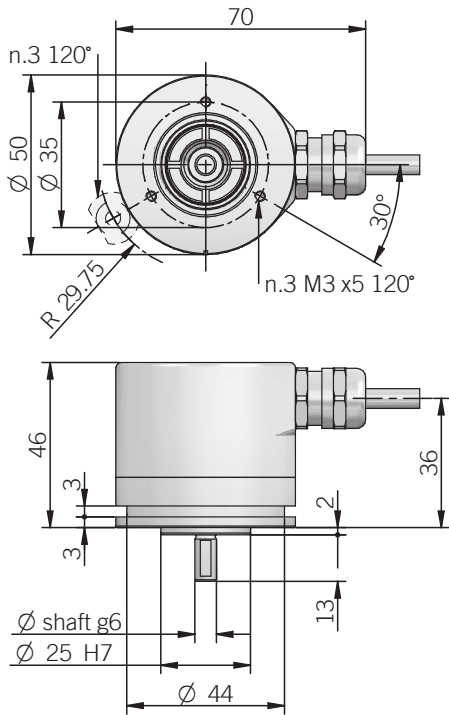
Singleturn absolute magnetic encoder size 50 mm with solid shaft

- Resolution up to 13 bit (8192 ppr)
- Power supply up to +30 V DC with SSI or Bit Parallel as electrical interface
- Code reset for easy setup
- Cable or M12 output, other connectors available on cable end
- Sturdy construction
- Solid shaft diameter up to 10 mm
- IP 67 enclosure rating
- Mounting by synchronous flange



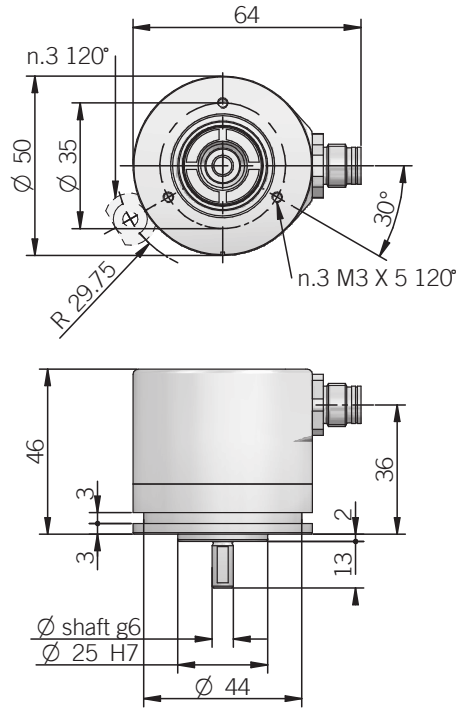
| ORDERING CODE  | EMA | 50B | 1024 | G | 8/30 | N | N | X | 6 | X | 3 | M12 | R | .162 | +XXX |
|--|-----|-----|------|---|------|---|---|---|---|---|---|-----|---|------|------|
| <p><b>SERIES</b><br/>magnetic singleturn absolute encoder <b>EMA</b></p> <p><b>MODEL</b><br/>synchronous flange ø 25 mm <b>50A</b><br/>synchronous flange ø 30 mm <b>50B</b><br/>for anodized version please directly contact our offices</p> <p><b>RESOLUTION</b><br/>(N / C / R / U / P interface) ppr from 2 to <b>4096</b><br/>(S interface) ppr from 2 to <b>8192</b></p> <p><b>CODE TYPE</b><br/>binary <b>B</b><br/>gray <b>G</b><br/>(no powers of 2) binary offset code (0-XXX) <b>BC</b><br/>(no powers of 2) gray offset code (0-XXX) <b>GC</b></p> <p><b>POWER SUPPLY</b><br/>5 V DC <b>5</b><br/>8 ... 30 V DC <b>8/30</b></p> <p><b>ELECTRICAL INTERFACE</b><br/>NPN <b>N</b><br/>NPN open collector <b>C</b><br/>PNP <b>R</b><br/>PNP open collector <b>U</b><br/>push pull <b>P</b><br/>Serial Synchronous Interface - SSI <b>S</b></p> <p><b>LOGIC</b><br/>negative <b>N</b><br/>positive <b>P</b></p> <p><b>OPTIONS</b><br/>to be reported if not used <b>X</b><br/>reset with external input <b>ZE</b><br/>(with binary code) strobe <b>S</b><br/>(with binary code) strobe and reset with external input <b>SZE</b></p> <p><b>SHAFT DIAMETER</b><br/>(mod. 50A) mm <b>6</b><br/>(mod. 50B) mm <b>8</b><br/>(mod. 50B) mm <b>10</b></p> <p><b>ENCLOSURE RATING</b><br/>IP 65 <b>X</b><br/>IP 67 <b>S</b></p> <p><b>MAX ROTATION SPEED</b><br/>3000 rpm <b>3</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)<br/>(S interface) M12 plug connector <b>M12</b></p> <p><b>DIRECTION TYPE</b><br/>axial <b>A</b><br/>radial <b>R</b></p> <p><b>SOCKET</b><br/>socket not included <b>.162</b><br/>to be reported only with connector output (eg. M12R.162), for socket see Accessories</p> <p><b>VARIANT</b><br/>custom version <b>XXX</b></p> |     |     |      |   |      |   |   |   |   |   |   |     |   |      |      |

**50A WITH RADIAL CABLE OUTPUT**



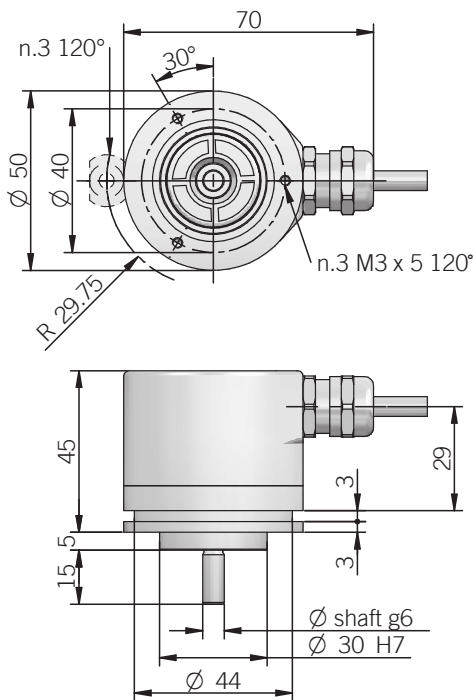
fixing clamps not included, please refer to Accessories

**50A WITH RADIAL M12 OUTPUT**



fixing clamps not included, please refer to Accessories

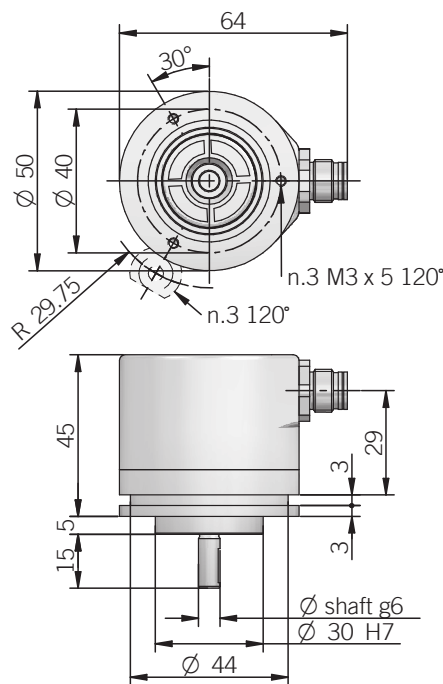
**50B WITH RADIAL CABLE OUTPUT**



fixing clamps not included, please refer to Accessories

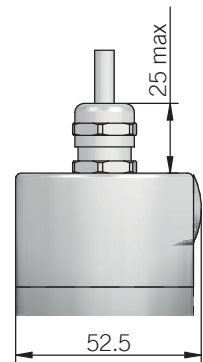
recommended mating shaft tolerance H7  
dimensions in mm

**50B WITH RADIAL M12 OUTPUT**



fixing clamps not included, please refer to Accessories

**DIMENSIONS WITH AXIAL OUTPUT**



**ELECTRICAL SPECIFICATIONS**

|  |   |
|--|---|
| <b>Resolution</b>  | from 2 to 4096 ppr (N / C / P / R / U interface)<br>from 2 to 8192 ppr (S interface)  |
| <b>Power supply<sup>1</sup></b>  | 5 = 4,5 ... 5,5 V DC<br>8/30 = 7,6 ... 31,5 V DC (reverse polarity protection)  |
| <b>Current consumption without load</b>  | < 100 mA  |
| <b>Max load current</b>  | P = 20 mA / channel<br>N / C / R / U = 40 mA / channel  |
| <b>Electrical interface<sup>2</sup></b>  | NPN / NPN open collector (ULN2003A)<br>PNP / PNP open collector (TD62783)<br>push pull (iC-DL)<br>RS-422 (LTC1690 or similar) |
| <b>Auxiliary inputs (U/D - RESET)</b>  | active high (+V DC)<br>connect to 0 V if not used / RESET tmin 150 ms   |
| <b>Max frequency</b>   | output 25 kHz LSB (Bit parallel)<br>clock input 100 kHz ... 1 MHz (SSI)   |
| <b>Code type</b>   | binary or gray  |
| <b>SSI monostable time (Tm)</b>  | 20 µs   |
| <b>SSI pause time (Tp)</b>   | > 35 µs   |
| <b>Strobe time</b>   | 20 µs   |
| <b>SSI frame</b>   | MSB ... LSB 13 bit data length  |
| <b>Counting direction</b>  | decreasing clockwise (shaft view)   |
| <b>Start-up time</b>   | 150 ms  |
| <b>Accuracy</b>  | ± 0,35° typical   |
| <b>Mean time to dangerous failure (MTTF<sub>d</sub>)<sup>3</sup> according to EN ISO 13849-1</b> | 149 years with BIT PARALLEL output<br>160 years with SSI output   |
| <b>Mission time (Tm)<sup>3</sup></b>   | 20 years  |
| <b>Diagnostic coverage (DC)<sup>3</sup></b>  | 0%  |
| <b>Cable type SSI</b>  | shielded - fixed installation<br>conductors section 0,22 mm <sup>2</sup> / AWG 24<br>bending radius min 60 mm                 |
| <b>Cable type Bit Parallel</b>   | shielded - fixed installation<br>conductors section 0,14 mm <sup>2</sup> / AWG 26<br>bending radius min 50 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   |

**BIT PARALLEL CONNECTIONS**

| Function    | Gray / Binary                     | Cable          |
|-------------|-----------------------------------|----------------|
| bit 1 (LSB) | G <sup>0</sup> / B <sup>0</sup>   | green          |
| bit 2       | G <sup>1</sup> / B <sup>1</sup>   | yellow         |
| bit 3       | G <sup>2</sup> / B <sup>2</sup>   | blue           |
| bit 4       | G <sup>3</sup> / B <sup>3</sup>   | brown          |
| bit 5       | G <sup>4</sup> / B <sup>4</sup>   | orange or pink |
| bit 6       | G <sup>5</sup> / B <sup>5</sup>   | white          |
| bit 7       | G <sup>6</sup> / B <sup>6</sup>   | grey           |
| bit 8       | G <sup>7</sup> / B <sup>7</sup>   | violet         |
| bit 9       | G <sup>8</sup> / B <sup>8</sup>   | grey / pink    |
| bit 10      | G <sup>9</sup> / B <sup>9</sup>   | white / green  |
| bit 11      | G <sup>10</sup> / B <sup>10</sup> | brown / green  |
| bit 12      | G <sup>11</sup> / B <sup>11</sup> | white / yellow |
| 0 V         | /                                 | black          |
| + V DC      | /                                 | red            |
| U / D       | /                                 | red / blue     |
| RESET       | /                                 | yellow / brown |
| STROBE      | /                                 | white / grey   |
| ⏏           | /                                 | shield         |

**MECHANICAL SPECIFICATIONS**

|  |   |
|--|---|
| <b>Shaft diameter</b>                      | ∅ 6 / 8 / 10 mm   |
| <b>Enclosure rating IEC 60529</b>          | X = IP 65<br>S = IP 67  |
| <b>Max rotation speed</b>                  | 3000 rpm continuous / 5000 rpm instantaneous                                      |
| <b>Max shaft load<sup>4</sup></b>          | 30 N (6,74 lbs) axial / 50 N (11,24 lbs) radial                                   |
| <b>Shock</b>                               | 50 G, 11 ms (IEC 60068-2-27)  |
| <b>Vibration</b>                           | 20 G, 10 ... 2000 Hz (IEC 60068-2-6)  |
| <b>Moment of inertia</b>                   | 0,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (12 x 10 <sup>-6</sup> lbf <sup>2</sup> ) |
| <b>Starting torque (at +20°C / +68°F)</b>  | < 0,03 Nm (4,25 Ozin)   |
| <b>Bearing stage material</b>              | aluminum  |
| <b>Shaft material</b>                      | stainless steel   |
| <b>Housing material</b>                    | painted aluminum  |
| <b>Bearings</b>                            | n.2 ball bearings   |
| <b>Bearings life</b>                       | 10 <sup>9</sup> revolutions   |
| <b>Operating temperature<sup>5,6</sup></b> | -25° ... +85°C (-13° ... +185°F)  |
| <b>Storage temperature<sup>6</sup></b>     | -25° ... +85°C (-13° ... +185°F)  |
| <b>Weight</b>                              | 200 g (7,05 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

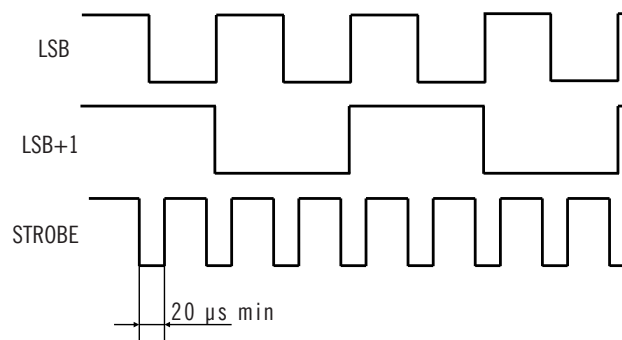
<sup>3</sup> this product is not a safety component, for further details refer to TECHNICAL BASICS section

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

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

<sup>6</sup> condensation not allowed

**STROBE TIMING**



**SSI CONNECTIONS**

| Function | Cable          | 8 pin M12 |
|----------|----------------|-----------|
| + V DC   | red            | 8         |
| 0 V      | black          | 5         |
| DATA +   | green          | 3         |
| DATA -   | brown or grey  | 2         |
| CLOCK +  | yellow         | 4         |
| CLOCK -  | orange or pink | 6         |
| U / D    | red / blue     | 7         |
| RESET    | white          | 1         |
| ⏏        | shield         | housing   |

M12 connector (8 pin)  
M12 A coded  
front view

