

### 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 connector available on cable end
- Sturdy construction (separated chambers)
- 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 P R .XXX

**SERIES**  
magnetic singleturn absolute encoder **EMA**

**MODEL**  
synchronous flange ø 25 mm **50A**  
synchronous flange ø 30 mm **50B**  
synchronous flange ø 25 mm anodized **50BY**

**RESOLUTION**  
(N / C / R / U / P interface) ppr from **2** to **4096**  
(S interface) ppr from **2** to **8192**

**CODE TYPE**  
binary **B**  
gray **G**  
(no powers of 2) binary offset code (0-XXX) **BC**  
(no powers of 2) gray offset code (0-XXX) **GC**

**POWER SUPPLY**  
5 V DC **5**  
8 ... 30 V DC **8/30**

**ELECTRICAL INTERFACE**  
NPN **N**  
NPN open collector **C**  
PNP **R**  
PNP open collector **U**  
push pull **P**  
Serial Synchronous Interface - SSI **S**

**LOGIC**  
negative **N**  
positive **P**

**OPTIONS**  
to be reported if not used **X**  
reset **ZE**  
(with binary or offset binary code) strobe **S**  
(with binary or offset binary code) strobe and code reset **SE**

**SHAFT DIAMETER**  
mm **6**  
mm **8**  
(3/8") 9,52 mm **9**  
mm **10**

**ENCLOSURE RATING**  
IP 65 **X**  
IP 67 **S**

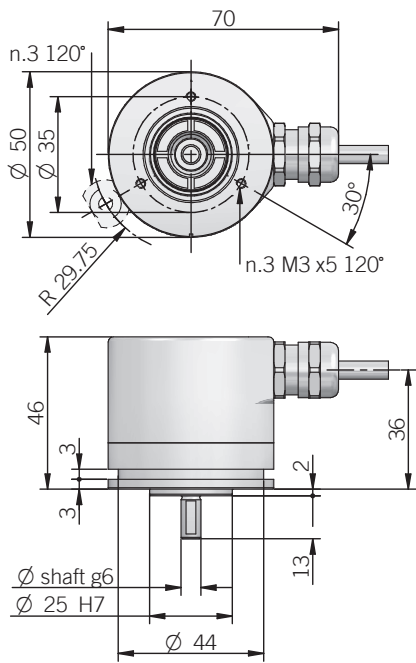
**MAX ROTATION SPEED**  
3000 rpm **3**

**OUTPUT TYPE**  
cable (standard length 0,5 m) **P**  
(S interface) M12 connector **M12**  
female connector included, without female please add 162 as variant code

**DIRECTION TYPE**  
axial **A**  
radial **R**

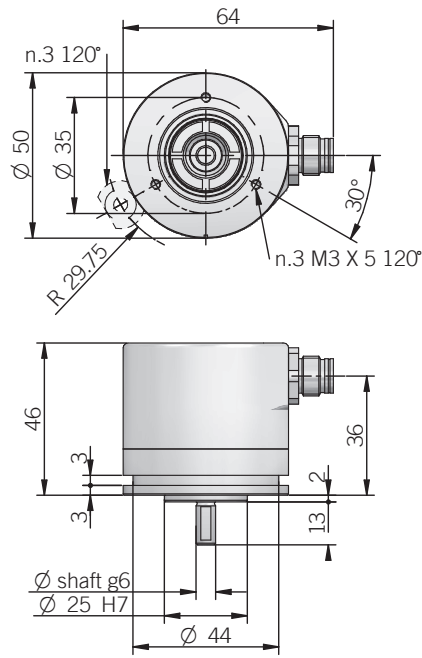
**VARIANT**  
custom version **XXX**

**50 A**  
radial cable output



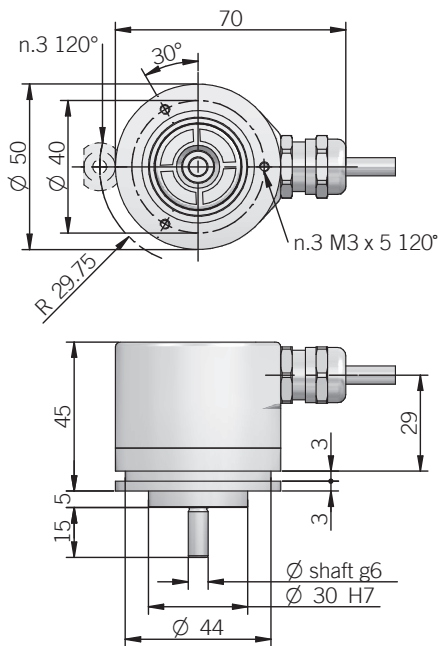
fixing clamps not included, please refer to Accessories section

**50 A**  
radial M12 output



fixing clamps not included, please refer to Accessories section

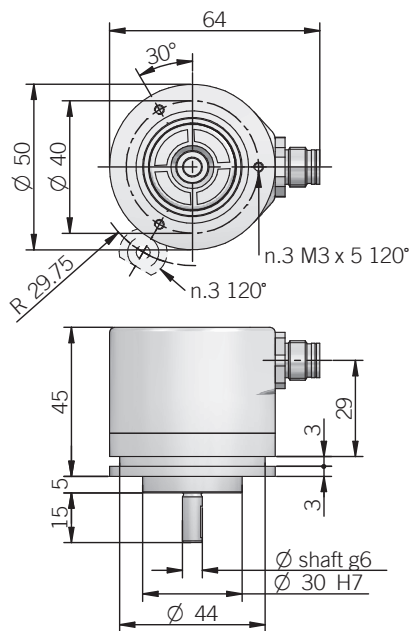
**50 B / BY**  
radial cable output



fixing clamps not included, please refer to Accessories section

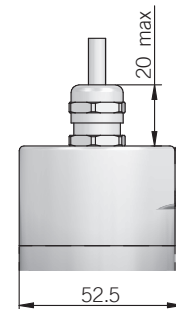
dimensions in mm

**50 B / BY**  
radial M12 output



fixing clamps not included, please refer to Accessories section

**Axial output**



**ELECTRICAL SPECIFICATIONS**

<b>Resolution</b>	from 2 to 4096 ppr (N / C / P / R / U interface) from 2 to 8192 ppr (S interface)
<b>Power supply</b>	5 = 4,5 ... 5,5 V DC 8/30 = 7,6 ... 31,5 V DC
<b>Current consumption without load</b>	< 100 mA
<b>Max load current</b>	20 mA / channel (push pull) 40 mA / channel (NPN / PNP)
<b>Output type*</b>	NPN / NPN open collector (ULN2003A) PNP / PNP open collector (TD62783) push pull (ic-DL) RS-422 (LTC1690 or equivalent)
<b>Auxiliary inputs (U/D - Reset)</b>	active high (+V DC) connect to 0 V if not used / Reset tmin 150 ms
<b>Max frequency</b>	output: 25 kHz LSB (Bit parallel) clock input: 100 kHz ... 1 MHz (SSI)
<b>SSI monostable time (Tm)</b>	20 μs
<b>SSI pause time (Tp)</b>	> 35 μs
<b>Strobe time</b>	20 μs
<b>Accuracy</b>	± 0,35° typical
<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>Electromagnetic compatibility</b>	according to 2014/30/EU directive
<b>RoHS</b>	according to 2011/65/EU directive
<b>UL / CSA</b>	certificate n. E212495

\* for further details please see OUTPUT LEVELS under TECHNICAL BASICS section

**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

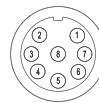
**MECHANICAL SPECIFICATIONS**

<b>Shaft diameter</b>	φ 6 / 8 / 9,52 (3/8") / 10 mm
<b>Enclosure rating</b>	X = IP 65 (IEC 60529) S = IP 67 (IEC 60529)
<b>Max rotation speed</b>	3000 rpm continuous / 5000 rpm instantaneous
<b>Max shaft load</b>	30 N axial / 50 N 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>	EN-AW 2011 aluminum
<b>Shaft material</b>	1.4305 / AISI 303 stainless steel
<b>Housing material</b>	EN-AW 2011 aluminum
<b>Bearings</b>	2 ball bearings
<b>Bearings life</b>	10 <sup>9</sup> revolutions
<b>Operating temperature</b>	-25° ... +85°C (-13° ... +185°F)
<b>Storage temperature</b>	-25° ... +85°C (-13° ... +185°F)
<b>Weight</b>	200 g (7,05 oz)

**SSI CONNECTIONS**

Function	Cable	8 pin M12
+ V DC	red	8
0 V	black	5
data +	green	3
data -	brown	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  
solder side view FV



**STROBE TIMING**

