



# INCREMENTAL ENCODER

DESIGNED IN ORDER TO CONTROL THE POSITION  
AND THE ANGULAR SPEED OF MOVING MECHANICAL AXES

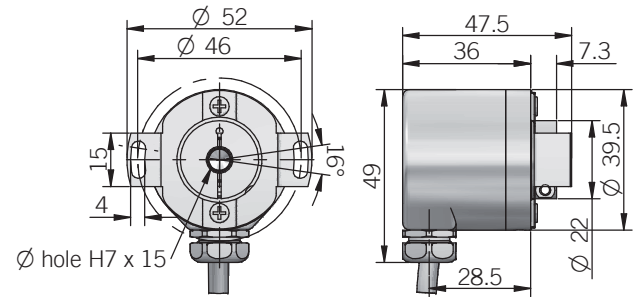
Main application field are: wood-working machinery, textile machines, CNC machinery, and so forth.

ELTRA brand encoders offers a complete range of encoders with resolution up to 24000 pulses per turn (ppr) with a wide flange choice and several electrical

interfaces. Shaft, blind hollow shaft and through hollow shaft up to a diameter of 60 mm (2.36") are available.

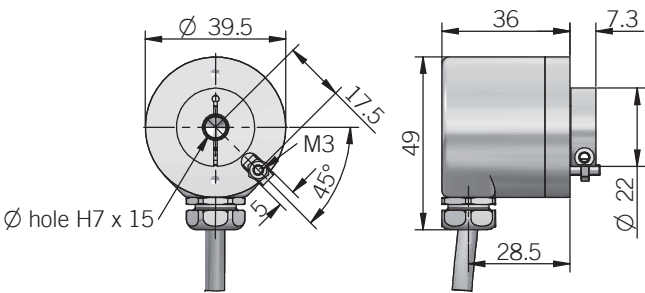


38 F



dimensions in mm

38 G



torque pin is included, for mounting instruction please refer to product installation notes

ELECTRICAL SPECIFICATIONS	
Sensing principle	magnetic Asic (EM) / reflective OptoAsic (ER)
Resolution	from 1 to 14400 ppr
Power supply <sup>1</sup>	5 = 4,5 ... 5,5 V DC 5/30 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	5 = 200 mW typical 5/30 = 800 mW typical
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface <sup>2</sup>	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	250 kHz up to 3600 ppr / 500 kHz from 4000 ppr
Counting direction	A leads B clockwise (shaft view)
Startup time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2015/863/EU directive
UL / CSA	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	
Bore diameter	Ø 6* / 8* / 10 mm * with supplied shaft adapter
Enclosure rating	IP 65 (IEC 60529)
Max rotation speed	6000 rpm
Max shaft load <sup>3</sup>	5 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,8 x 10 <sup>-6</sup> kgm <sup>2</sup> (19 x 10 <sup>-6</sup> lbft <sup>2</sup> )
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	painted aluminum
Bearings	n.2 ball bearings
Bearings life	10 <sup>9</sup> revolutions
Operating temperature <sup>4,5</sup>	-25° ... +85°C (-13° ... +185°F)
Storage temperature <sup>5</sup>	-25° ... +85°C (-13° ... +185°F)
Weight	150 g (5,29 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

EM SERIES RESOLUTIONS	
1 - 2 - 4 - 5 - 6 - 10 - 15 - 16 - 20 - 30 - 32 - 40 - 50 - 60 - 70 - 80 - 90	

ER SERIES RESOLUTIONS	
100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - <b>360</b> - 400 - 480 - <b>500</b> - <b>512</b> - 600 - 625 - 720 - 800 - 900 - <b>1000</b> - <b>1024</b> - 1200 - 1250 - 1440 - 1600 - 1800 - <b>2000</b> - <b>2048</b> - <b>2500</b> - 3000 - <b>3600</b> - 4000 - 4096 - <b>5000</b> - 6000 - <b>7200</b> - 8000 - 8192 - 10000 - 12000 - 14400	
please directly contact our offices for other pulses, preferred resolutions in bold	

MAIN FEATURES

Hollow shaft Ø 48 mm encoder series recommended for motor feedback.

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +24 V DC with several electrical interfaces available
- Up to 150 kHz output frequency
- Cable output, connector available on cable end
- Through hollow shaft diameter up to 8 mm
- Mounting by stator coupling



ORDERING CODE

EL	48C	500	S	5	L	8	X	6	PR	.XXX
SERIES incremental encoder series EL										
MODEL blind hollow shaft 48C through hollow shaft 48P										
RESOLUTION ppr from 100 to 2048 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 8 ... 24 V DC 8/24										
ELECTRICAL INTERFACE NPN open collector C push-pull P line driver L										
BORE DIAMETER mm 6 mm 8										
ENCLOSURE RATING IP 40 X										
MAX ROTATION SPEED 6000 rpm 6										
OUTPUT TYPE radial cable (standard length 0,3 m) PR preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)										
VARIANT custom version XXX										

MAIN FEATURES

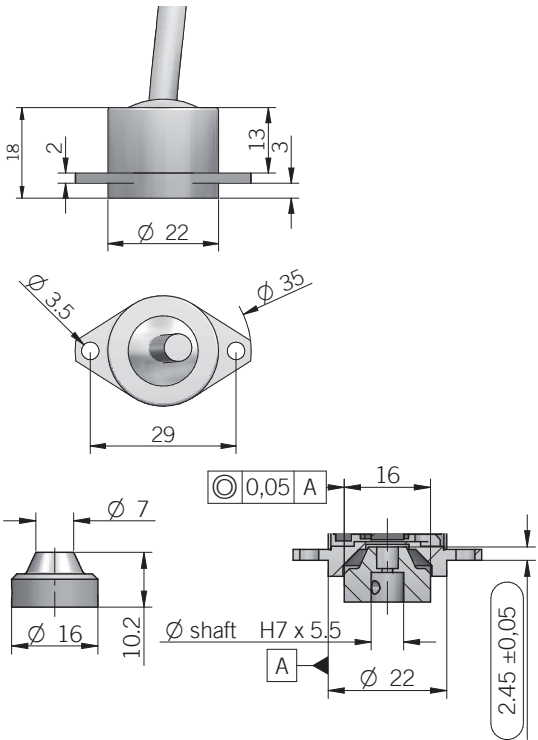
EMI series encoders are suitable for several application fields like electric motors marine industry, iron and steel industry, textile machines, wood-working, paper-working, glass working, marble-working machinery and, more generally, automation and process control fields.

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Cable output, connector available on cable end
- Compact dimensions
- No wear due to no contact magnetic technology
- Bore shaft diameter up to 10 mm
- IP 67 enclosure rating
- Wide operating temperature -40° ... +125°C (-40° ... +257°F)

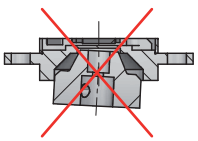
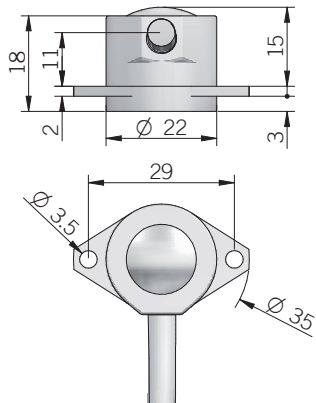


ORDERING CODE	EMI	22A	1024	Z	5	P	6	S	10	P	R	.XXX
<b>SERIES</b> magnetic incremental encoder series EMI												
<b>MODEL</b> clamping flange ø 22 mm 22A for anodized version please directly contact our offices												
<b>RESOLUTION</b> ppr from 2 to 2048 refer to the available pulses list												
<b>ZERO PULSE</b> without zero pulse S with zero pulse Z												
<b>POWER SUPPLY</b> 5 V DC 5												
<b>ELECTRICAL INTERFACE</b> push-pull P line driver RS-422 L												
<b>MAGNET-ACTUATOR BORE DIAMETER</b> mm 6 mm 8 (3/8") mm 9,52 mm 10												
<b>ENCLOSURE RATING</b> IP 67 S												
<b>MAX ROTATION SPEED</b> 10000 rpm 10												
<b>OUTPUT TYPE</b> 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)												
<b>DIRECTION TYPE</b> axial A radial R												
<b>VARIANT</b> custom version XXX												

22 A axial cable output



22 A radial cable output



dimensions in mm

ELECTRICAL SPECIFICATIONS	
Resolution	from 2 to 2048 ppr
Power supply <sup>1</sup>	4,5 ... 5,5 V DC
Current consumption without load	100 mA max
Max load current	20 mA / channel
Electrical interface <sup>2</sup>	push pull / line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	205 kHz
Counting direction	A leads B with clockwise rotation (flange view)
Accuracy	± 0,35° typical / ± 0,50° max
Electromagnetic compatibility	according to 2014/30/EU directive
RoHs	according to 2015/863/EU directive
UL / CSA	certificate n. E212495

CONNECTIONS		
Function	Cable P	Cable L
+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	
Bore diameter (magnet-actuator)	ø 6 / 8 / 9,52 (3/8") / 10 mm
Enclosure rating	IP 67 (IEC 60529)
Max rotation speed	10000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia (magnet-actuator)	0,1 x 10 <sup>-6</sup> kgm <sup>2</sup> (2,4 x 10 <sup>-6</sup> lbft <sup>2</sup> )
Bearing stage material	EN-AW 2011 aluminum
Housing material	EN-AW 2011 aluminum
Magnet-actuator material	EN-AW 2011 aluminum
Operating temperature <sup>3,4</sup>	-40° ... +125°C (-40° ... +257°F)
Storage temperature <sup>4</sup>	-25° ... +85°C (-13° ... +185°F)
Weight	30 g (1,06 oz)
Magnet actuator mounting tolerances (to get best electrical performances)	± 0,2 mm (axial) ± 0,1 mm (radial)

<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> measured on the transducer flange  
<sup>4</sup> condensation allowed

RESOLUTIONS	
2 - 4 - 8 - 10 - 16 - 20 - 32 - 40 - 64 - 80 - 100 - 125 - 128 - 200 - 250 - 256 - 400 - 500 - 512 - 1024 - 2048	

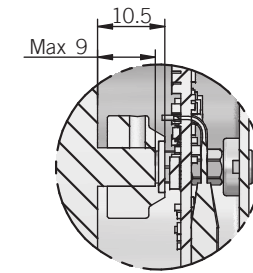
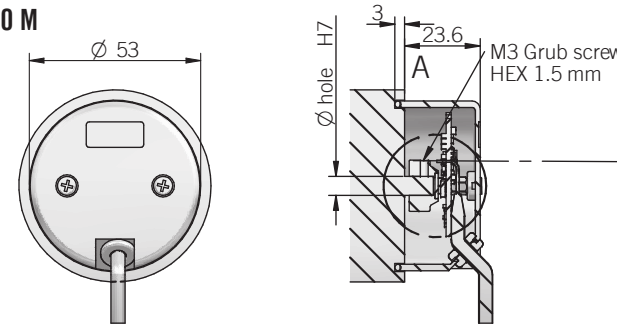
### MAIN FEATURES

Series of miniaturized encoders for integration on small size AC/DC motors, stepper motors or for limited size applications.

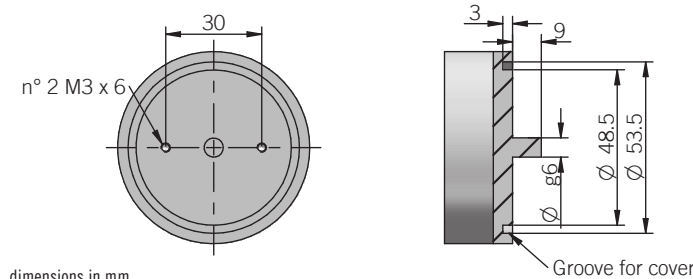
- 3 channel encoder (A / B / Z) up to 90 ppr
- Power supply up to +30 V DC with several electrical interfaces available
- Cable output, connector available on cable end
- Compact dimensions (only 23,6 mm height)
- No wear due to no contact magnetic technology
- Bore shaft diameter up to 10 mm
- Wide operating temperature -20° ... +100°C (-4° ... +212°F)
- OEM version without cover available



30 M



### RECOMMENDED INTERFACE FLANGE DESIGN



dimensions in mm

### ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 90 ppr
Power supply <sup>1</sup>	5 = 4,5 ... 5,5 V DC 5/30 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	5 = 200 mW typical 5/30 = < 400 mW
Max load current	C / P = 50 mA for channel L / RS = 20 mA per channel
Electrical interface <sup>2</sup>	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	15 kHz
Counting direction	A leads B clockwise (magnet actuator view)
Accuracy	± 0,35° typical / ± 0,90° max according to mounting tolerances and temperature range
Startup time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2015/863/EU directive
UL / CSA	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

Bore diameter	Ø 6 / 6,35 (1/4") / 8 / 10 mm
Enclosure rating	IP 54 (IEC 60529) when properly installed with supplied oring
Max rotation speed	limited only by output frequency
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,1 x 10 <sup>-6</sup> kgm <sup>2</sup> (2,4 x 10 <sup>-6</sup> lbft <sup>2</sup> )
Magnet-actuator material	EN-AW 2011 aluminium
Cover material	PA66 glass fiber reinforced
Shaft radial play allowed	± 0,25 mm
Shaft axial play allowed	± 0,5 mm
Operating temperature <sup>3,4</sup>	-20° ... +100°C (-4° ... +212°F)
Storage temperature <sup>4</sup>	-20° ... +100°C (-4° ... +212°F)
Weight	100 g approx (3,5 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> measured on the transducer flange

<sup>4</sup> condensation not allowed

### ORDERING CODE

EMI	30M	*S	50	Z	5/30	P	6	X	X	PR	.XXX
SERIES	MODEL	COVER	RESOLUTION	ZERO PULSE	POWER SUPPLY	ELECTRICAL INTERFACE	BORE DIAMETER	ENCLOSURE RATING	OPTION	OUTPUT TYPE	VARIANT
magnetic incremental encoder series EMI	kit encoder 30M	* add if without cover S	ppr from 1 to 90	without zero pulse S with zero pulse Z	5 V DC 5 5 ... 30 V DC 5/30	NPN open collector C push-pull P line driver L power supply 5/30V - output RS-422 RS	mm 6 (1/4") mm 6,35 mm 8 mm 10	IP 54 X	to be reported X	radial cable (standard length 0,5 m) PR preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)	custom version XXX

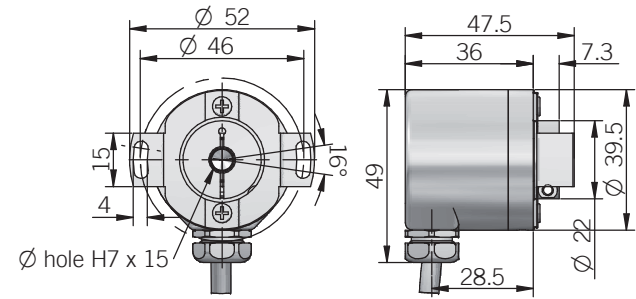
MAIN FEATURES

Thanks to the magnetic technology, the EMI 38 series is suitable for harsh environment applications such as marble and glass working machines, washing systems and generally for industrial automation.

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Cable output, connector available on cable end
- Compact dimensions
- Blind hollow shaft diameter up to 10 mm with shaft fixing by collar clamping
- Sturdy construction due to separated chambers design
- Wide operating temperature -25° ... +100°C (-13° ... +212°F)

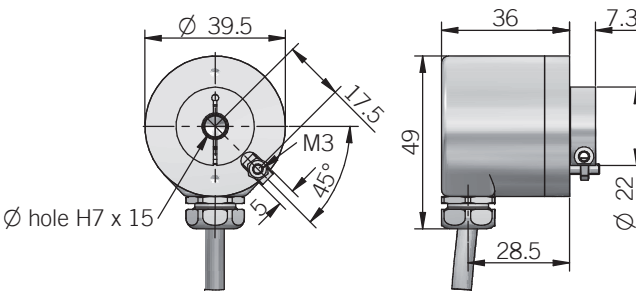


38 F



dimensions in mm

38 G



torque pin is included, for mounting instruction please refer to product installation notes

ORDERING CODE	EMI	38F	1024	Z	5	L	6	X	6	PR	.XXX
<b>SERIES</b>											
magnetic incremental encoder series <b>EMI</b>											
<b>MODEL</b>											
blind hollow shaft with stator coupling <b>38F</b>											
blind hollow shaft with torque pin <b>38G</b>											
<b>RESOLUTION</b>											
ppr from <b>2</b> to <b>2048</b>											
refer to the available pulses list											
<b>ZERO PULSE</b>											
without zero pulse <b>S</b>											
with zero pulse <b>Z</b>											
<b>POWER SUPPLY</b>											
(with L electrical interface) 5 V DC <b>5</b>											
(with L electrical interface) 8 ... 24 V DC <b>8/24</b>											
5 ... 28 V DC <b>5/28</b>											
<b>ELECTRICAL INTERFACE</b>											
push-pull <b>P</b>											
line driver <b>L</b>											
<b>SHAFT DIAMETER</b>											
mm <b>6</b>											
(1/4") mm <b>6,35</b>											
mm <b>8</b>											
(3/8") mm <b>9,52</b>											
mm <b>10</b>											
<b>ENCLOSURE RATING</b>											
IP 64 <b>X</b>											
IP 66 <b>S</b>											
<b>MAX ROTATION SPEED</b>											
(IP 66) 3000 rpm <b>3</b>											
(IP 64) 6000 rpm <b>6</b>											
<b>OUTPUT TYPE</b>											
radial cable (standard length 0,5 m) <b>PR</b>											
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)											
<b>VARIANT</b>											
custom version <b>XXX</b>											

ELECTRICAL SPECIFICATIONS	
Resolution	from 2 to 2048 ppr
Power supply <sup>1</sup>	5 = 4,5 ... 5,5 V DC 5/28 = 4,75 ... 29,4 V DC 8/24 = 7,6 ... 25,2 V DC (reverse polarity protection)
Current consumption without load	80 mA max
Max load current	20 mA per channel
Electrical interface <sup>2</sup>	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	205 kHz
Counting direction	A leads B clockwise (shaft view)
Accuracy	± 0,35° typical / ± 0,50° max
Electromagnetic compatibility	according to 2014/30/EU directive
RoHs	according to 2015/863/EU directive

CONNECTIONS		
Function	Cable P	Cable L
+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	
Shaft diameter	ø 6* / 8* / 9,52 (3/8") / 10 mm * with supplied shaft adapter
Enclosure rating	X = IP 64 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	IP 66 - 3000 rpm IP 64 - 6000 rpm
Max shaft load <sup>3</sup>	5 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,25 x 10 <sup>-6</sup> kgm <sup>2</sup> (6 x 10 <sup>-6</sup> lbf <sup>2</sup> )
Starting torque (at +20°C / +68°F)	< 0,02 Nm (2,83 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	painted aluminum
Bearings	n.2 ball bearings
Bearing lifetime	10 <sup>9</sup> revolutions
Operating temperature <sup>4,5</sup>	-25° ... +100°C (-13° ... +212°F)
Storage temperature <sup>5</sup>	-25° ... +85°C (-13° ... +185°F)
Weight	150 g (5,29 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

RESOLUTIONS
2 - 4 - 8 - 10 - 16 - 20 - 32 - 40 - 64 - 80 - 100 - 125 - 128 - 200 - 250 - 256 - 400 - 500 - 512 - 1024 - 2048



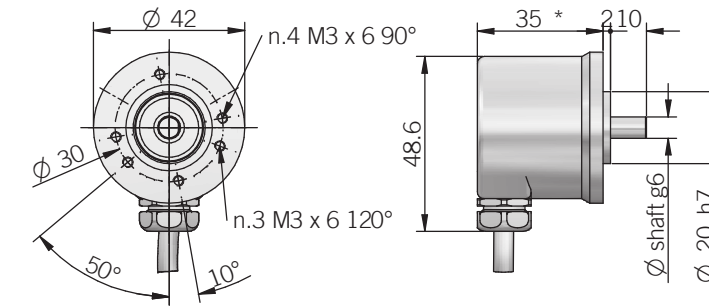
#### MAIN FEATURES

Thanks to the magnetic technology, EMI 40 series is suitable for harsh environment applications such as marble and glass working machines, washing systems and generally for industrial automation.

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Cable output, connector available on cable end
- Compact dimensions
- Solid shaft diameter up to 6 mm
- Sturdy construction due to separated chambers design
- Wide operating temperature -25° ... +100°C (-13° ... +212°F)

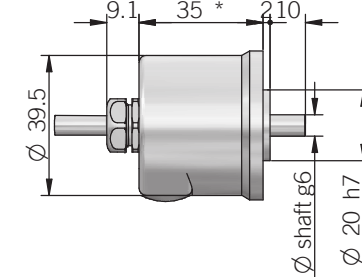


#### 40 A radial cable output



dimensions in mm

#### 40A axial cable output



\* IP66 + 7mm

ORDERING CODE	EMI	40A	1024	Z	5	L	6	X	3	P	R	.XXX
<b>SERIES</b> magnetic incremental encoder series EMI												
<b>MODEL</b> clamping flange ø 20 mm 40A												
<b>RESOLUTION</b> ppr from 2 to 2048 refer to the available pulses list												
<b>ZERO PULSE</b> without zero pulse S with zero pulse Z												
<b>POWER SUPPLY</b> (with L electrical interface) 5 V DC 5 (with L electrical interface) 8 ... 24 V DC 8/24 5 ... 28 V DC 5/28												
<b>ELECTRICAL INTERFACE</b> push-pull P line driver L												
<b>SHAFT DIAMETER</b> mm 4 mm 6												
<b>ENCLOSURE RATING</b> IP 64 X IP 66 S												
<b>MAX ROTATION SPEED</b> (IP 66) 3000 rpm 3 (IP 64) 6000 rpm 6												
<b>OUTPUT TYPE</b> 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)												
<b>DIRECTION TYPE</b> axial A radial R												
<b>VARIANT</b> custom version XXX												

#### ELECTRICAL SPECIFICATIONS

<b>Resolution</b>	from 2 to 2048 ppr
<b>Power supply</b> <sup>1</sup>	5 = 4,5 ... 5,5 V DC 5/28 = 4,75 ... 29,4 V DC 8/24 = 7,6 ... 25,2 V DC (reverse polarity protection)
<b>Current consumption without load</b>	80 mA max
<b>Max load current</b>	20 mA / channel
<b>Electrical interface</b> <sup>2</sup>	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
<b>Max output frequency</b>	205 kHz
<b>Counting direction</b>	A leads B clockwise (shaft view)
<b>Accuracy</b>	± 0,35° typical / ± 0,50° max
<b>Electromagnetic compatibility</b>	according to 2014/30/EU directive
<b>RoHS</b>	according to 2015/863/EU directive
<b>UL / CSA</b>	certificate n. E212495

#### CONNECTIONS

Function	Cable P	Cable L
+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 4 / 6 mm
<b>Enclosure rating</b>	X = IP 64 (IEC 60529) S = IP 66 (IEC 60529)
<b>Max rotation speed</b>	IP 66 - 3000 rpm IP 64 - 6000 rpm
<b>Max shaft load</b> <sup>3</sup>	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>	0,5 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>	< 0,02 Nm (2,83 Ozin)
<b>Bearing stage material</b>	EN-AW 2011 aluminum
<b>Shaft material</b>	1.4305 / AISI 303 stainless steel
<b>Housing material</b>	painted aluminum
<b>Bearings</b>	n.2 ball bearings
<b>Bearing lifetime</b>	10 <sup>9</sup> revolutions
<b>Operating temperature</b> <sup>4,5</sup>	-25° ... +100°C (-13° ... +212°F)
<b>Storage temperature</b> <sup>5</sup>	-25° ... +85°C (-13° ... +185°F)
<b>Weight</b>	150 g (5,29 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

#### RESOLUTIONS

2 - 4 - 8 - 10 - 16 - 20 - 32 - 40 - 64 - 80 - 100 - 125 - 128 - 200 - 250 - 256 - 400 - 500 - 512 - 1024 - 2048

### MAIN FEATURES

EMI series encoders are suitable for several application fields like electric motors marine industry, iron and steel industry, textile machines, wood-working, paper-working, glass working, marble-working machinery and, more generally, automation and process control fields.

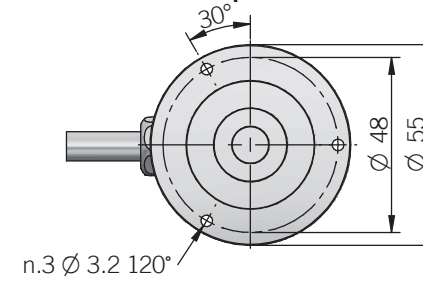
- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Cable or M12 connector output, other connector available on cable end
- Compact dimensions
- No wear due to no contact magnetic technology
- Bore shaft diameter up to 10 mm
- IP 67 Enclosure rating
- Wide operating temperature -40° ... +125°C (-40° ... +257°F)



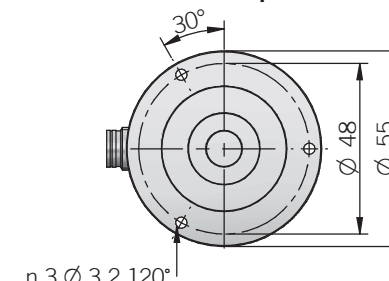
### ORDERING CODE

EMI	55A	512	Z	5/28	P	10	X	10	P	R	.XXX
<p><b>SERIES</b> magnetic incremental encoder series EMI</p> <p><b>MODEL</b> fixing holes <math>\varnothing</math> 48 mm 55A for anodized version please directly contact our offices</p> <p><b>RESOLUTION</b> ppr from 2 to 2048 refer to the available pulses list</p> <p><b>ZERO PULSE</b> without zero pulse S with zero pulse Z</p> <p><b>POWER SUPPLY</b> (with L electrical interface) 5 V DC 5 5 ... 28 V DC 5/28</p> <p><b>ELECTRICAL INTERFACE</b> push-pull P line driver L power supply 5/28 V - output RS-422 RS</p> <p><b>MAGNET ACTUATOR BORE DIAMETER</b> mm 6 mm 8 (3/8") mm 9,52 mm 10</p> <p><b>ENCLOSURE RATING</b> IP 64 X IP 67 S</p> <p><b>MAX ROTATION SPEED</b> 10000 rpm 10</p> <p><b>OUTPUT TYPE</b> 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) M12 connector M12 female connector included, without female please add 162 as variant code</p> <p><b>DIRECTION TYPE</b> axial A radial R</p> <p><b>VARIANT</b> custom version XXX</p>											

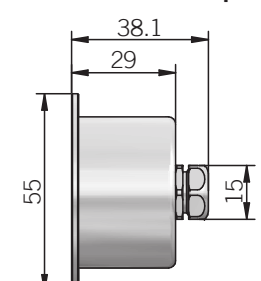
55 A radial cable output



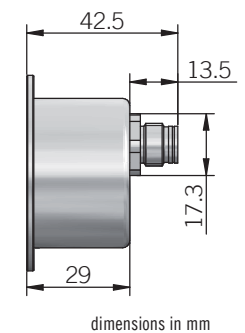
55 A radial M12 output



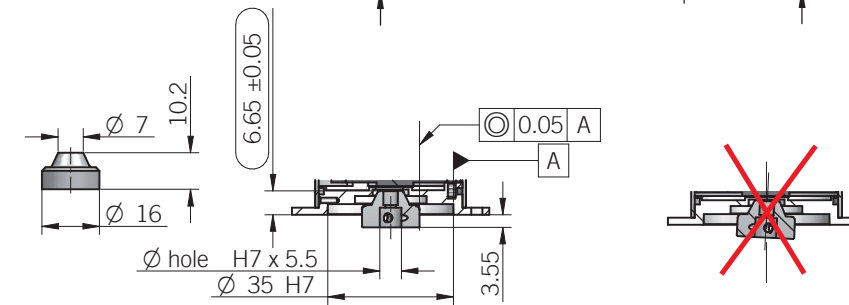
55 A axial cable output



55 A axial M12 output



dimensions in mm



### ELECTRICAL SPECIFICATIONS

<b>Resolution</b>	from 2 to 2048 ppr
<b>Power supply</b> <sup>1</sup>	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>	20 mA / channel
<b>Electrical interface</b> <sup>2</sup>	push-pull / line driver HTL (AELC-7272) line driver RS-422 (AELT-5000 or equivalent)
<b>Max output frequency</b>	205 kHz
<b>Counting direction</b>	A leads B clockwise (flange view)
<b>Accuracy</b>	± 0,35° typical / ± 0,50° max
<b>Electromagnetic compatibility</b>	according to 2014/30/EU directive
<b>RoHS</b>	according to 2015/863/EU directive
<b>UL / CSA</b>	certificate n. E212495

<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> measured on the transducer flange

<sup>4</sup> condensation not allowed

### CONNECTIONS

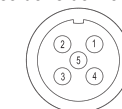
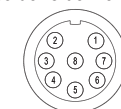
Function	Cable P	Cable L / RS	5 pin M12 P	8 pin M12 L / RS
+V DC	red	red	2	7
0 V	black	black	4	1
A+	green	green	3	6
A-	/	brown or grey	/	5
B+	yellow	yellow	1	4
B-	/	orange	/	3
Z+	blue	blue	5	2
Z-	/	white	/	8
≡	shield	shield	housing	housing

### MECHANICAL SPECIFICATIONS

<b>Bore diameter (magnet-actuator)</b>	$\varnothing$ 6 / 8 / 9,52 (3/8") / 10 mm
<b>Enclosure rating</b>	X = IP 64 (IEC 60529) S = IP 67 (IEC 60529)
<b>Max rotation speed</b>	10000 rpm
<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 (magnet actuator)</b>	0,1 x 10 <sup>-6</sup> kgm <sup>2</sup> (2,4 x 10 <sup>-6</sup> lbf <sup>2</sup> )
<b>Bearing stage material</b>	EN-AW 2011 aluminum
<b>Housing material</b>	painted aluminum
<b>Magnet-actuator material</b>	EN-AW 2011 aluminum
<b>Operating temperature</b> <sup>3,4</sup>	-40° ... +125°C (-40° ... +257°F) (with + 5 V DC) -40° ... +100°C (-40° ... +212°F)
<b>Storage temperature</b> <sup>4</sup>	-40° ... +125°C (-40° ... +257°F)
<b>Weight</b>	150 g (5,29 oz)
<b>Magnet actuator mounting tolerances (to get best electrical performances)</b>	± 0,2 mm (axial) ± 0,1 mm (radial)

### RESOLUTIONS

2 - 4 - 8 - 10 - 16 - 20 - 32 - 40 - 64 - 80 - 100 - 125 - 128 - 200 - 250 - 256 - 400 - 500 - 512 - 1024 - 2048

M12 connector (5 pin)  
M12 A coded  
solder side view FV

M12 connector (8 pin)  
M12 A coded  
solder side view FV


### MAIN FEATURES

Thanks to the magnetic technology, the EMI 63 series is suitable for harsh environment applications such as marble and glass working machines, washing systems, metal working machines and all the applications where high temperature resistance is required.

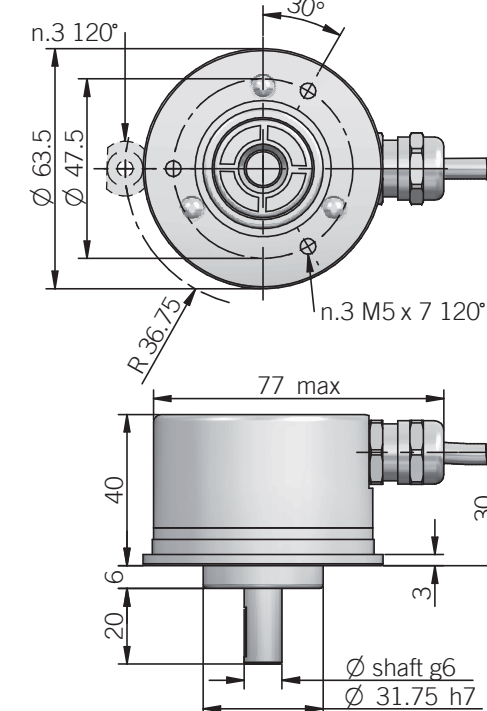
- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 300 kHz output frequency
- Cable or M12 connector output, other connector available on cable end
- Solid shaft diameter up to 10 mm
- Mounting by synchronous or centering 2,5" square flange
- Sturdy construction due to separated chambers design
- Wide operating temperature -25° ... +100°C (-13° ... +212°F)



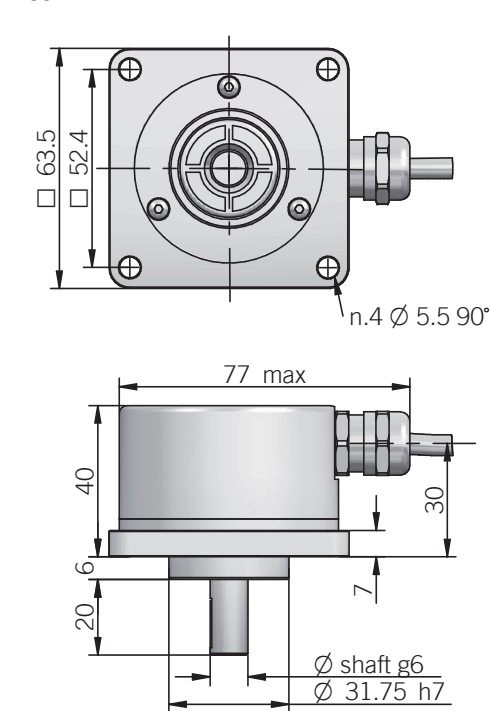
### ORDERING CODE

EMI	63A	1024	Z	5	L	10	X	6	P	R	.XXX
<p><b>SERIES</b> magnetic incremental encoder series EMI</p> <p><b>MODEL</b> synchronous flange ø 31,75 mm 63A centering square flange ø 31,75 mm 63D</p> <p><b>RESOLUTION</b> ppr from 2 to 2048 refer to the available pulses list</p> <p><b>ZERO PULSE</b> without zero pulse S with zero pulse Z</p> <p><b>POWER SUPPLY</b> (with L electrical interface) 5 V DC 5 5 ... 28 V DC 5/28</p> <p><b>ELECTRICAL INTERFACE</b> push-pull P line driver L power supply 5/28 V - output RS-422 RS</p> <p><b>SHAFT DIAMETER</b> (3/8") mm 9,52 mm 10</p> <p><b>ENCLOSURE RATING</b> IP 64 X IP 66 S</p> <p><b>MAX ROTATION SPEED</b> (IP 66) 3000 rpm 3 (IP 64) 6000 rpm 6</p> <p><b>OUTPUT TYPE</b> 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) M12 connector M12 female connector included, without female please add 162 as variant code</p> <p><b>DIRECTION TYPE</b> axial A radial R</p> <p><b>VARIANT</b> custom version XXX</p>											

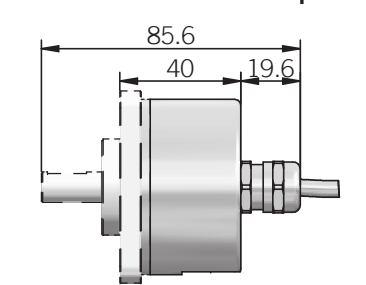
### 63 A



### 63 D



### Dimensions with axial output



fixing clamps not included, please refer to Accessories  
dimensions in mm

### ELECTRICAL SPECIFICATIONS

<b>Resolution</b>	from 2 to 2048 ppr
<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>	20 mA / channel
<b>Electrical interface<sup>2</sup></b>	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
<b>Max output frequency</b>	205 kHz
<b>Counting direction</b>	A leads B clockwise (shaft view)
<b>Accuracy</b>	± 0,35° typical / ± 0,50° max
<b>Electromagnetic compatibility</b>	according to 2014/30/EU directive
<b>RoHS</b>	according to 2015/863/EU directive
<b>UL / CSA</b>	certificate n. E212495

### CONNECTIONS

Function	Cable P	Cable L / RS	5 pin M12 P	8 pin M12 L / RS
+V DC	red	red	2	7
0 V	black	black	4	1
A+	green	green	3	6
A-	/	brown or grey	/	5
B+	yellow	yellow	1	4
B-	/	orange	/	3
Z+	blue	blue	5	2
Z-	/	white	/	8
⊥	shield	shield	housing	housing

### MECHANICAL SPECIFICATIONS

<b>Shaft diameter</b>	ø 9,52 (3/8") / 10 mm
<b>Enclosure rating</b>	X = IP 64 (IEC 60529) S = IP 66 (IEC 60529)
<b>Max rotation speed</b>	IP 66 - 3000 rpm IP 64 - 6000 rpm
<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>	0,5 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>	< 0,01 Nm (1,42 Ozin) (IP 64) < 0,08 Nm (11,33 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>	EN-AW 2011 aluminum
<b>Bearings</b>	n.2 ball bearings
<b>Bearing lifetime</b>	10 <sup>9</sup> revolutions
<b>Operating temperature<sup>3,4</sup></b>	-25° ... +100°C (-13° ... +212°F)
<b>Storage temperature<sup>4</sup></b>	-25° ... +85°C (-13° ... +185°F)
<b>Weight</b>	350 g (12,35 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> measured on the transducer flange

<sup>4</sup> condensation not allowed

### RESOLUTIONS

2 - 4 - 8 - 10 - 16 - 20 - 32 - 40 - 64 - 80 - 100 - 125 - 128 - 200 - 250 - 256 - 400 - 500 - 512 - 1024 - 2048

M12 connector (5 pin)  
M12 A coded  
solder side view FV



M12 connector (8 pin)  
M12 A coded  
solder side view FV

