

machinery, and so forth.

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

through hollow shaft up to a diameter of 60 mm (2.36") are available.

# EL - ER 30 E / H SOLID SHAFT INCREMENTAL ENCODER

# MAIN FEATURES

Miniaturized ø 30 mm encoder series for application in small devices. Recommended when a minimal size is required even providing excellent performances.

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 220 kHz output frequency
- Cable output, connector available on cable end
- Solid shaft diameter up to 6 mm

**ORDERING CODE** 

Mounting by clamping or threaded flange





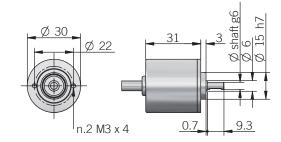




									MODEL	SERIES incremental encoder series El incremental encoder series EF	
									mm 30E	clamping flange ø 1 M18 threaded	
								SOLUTION			
								1 to 2500	ppr from		
								pulses list	e available	refer to	
							RO PULSE				
							ro pulse S ro pulse Z	VITNOUT Zer	V		
						R SUPPLY	•	WILLI ZCI			
							al interface)	h L electrica	(wit		
						V DC 5/28					
					NTERFACE						
					collector C		N				
					ush-pull P ne driver L						
					RS-422 RS		ply 5/28V	power sup			
				DIAMETER							
				d. E) mm 4	(mod						
				mm 6							
			IP 54 X	ENCLOSUR							
			X ROTATIO	МД							
		00 rpm 3									
2	PUT TYPE										
			cable (stan								
			cable (stand	radial o to be added	2/5/10 ~	nc 1 5 / 2 / 3	cable length	proformed			
VARIANT	;. i NJ)	OI IIFE (#	ailti UUIF	נט שב מעשבע	) / J / 10 III,	15 1,3 / 2 / 3	Janie Ieligili	presenta (			
AVIVIVIA											

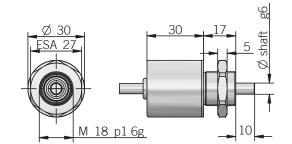
EL 30E 50 S 5/28

# 30 E (axial output)



dimensions in mm

# 30 H (axial output)



ELECTRICAL SPECIFICATIONS					
Resolution	from 1 to 2500 ppr				
Power supply <sup>1</sup>	$5=4,5\dots5,5$ V DC $5/28=4,5\dots30$ V DC (reverse polarity protection)				
Power draw without load	800 mW max				
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	100 kHz EL series 220 kHz ER series				
Counting direction	A leads B clockwise (shaft view)				
Electromagnetic compatibility					
RoHS	according to 2015/863/EU directive				
UL / CSA	certificate n. E212495				

CUNNECTIONS		
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 SPECIFICA	MECHANICAL SPECIFICATIONS					
Shaft diameter	ø 4 / 6 mm					
Enclosure rating	IP 54 (IEC 60529)					
Max rotation speed	3000 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	0,05 x 10 <sup>-6</sup> kgm <sup>2</sup> (1,2 x 10 <sup>-6</sup> lbft <sup>2</sup> )					
Starting torque (at +20°C / +68°F)						
Bearing stage material	EN-AW 2011 aluminum					
Shaft material	1.4305 / AISI 303 stainless steel					
Housing material	PA66 glass fiber reinforced					
Bearings	n.2 ball bearings					
Bearings life	10 <sup>9</sup> revolutions					
Operating temperature <sup>4,5</sup>	.5 -10° +60°C (+14° +140°F) EL series -25° +85°C (-13° +185°F) ER series					
Storage temperature <sup>5</sup>	-25° +85°C (-13° +185°F)					
Weight	70 g (2,47 oz)					

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

# **EL SERIES RESOLUTIONS**

1 - 10 - 20 - 25 - 50 - 60 - 64 - 150

# **ER SERIES RESOLUTIONS**

**100** - 128 - **200** - 250 - 256 - **300** - 360 - **400** - **500** - **512** - **600** - 625 - **720** - 800 - **1000** - **1024** - **1200** - 1250 - **1440** - 1600 - **2000** - **2048** - 2500

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









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

<sup>&</sup>lt;sup>3</sup> maximum load for static usage

<sup>&</sup>lt;sup>4</sup> measured on the transducer flange

<sup>&</sup>lt;sup>5</sup> condensation not allowed



# EH 38 A / B / D SOLID SHAFT INCREMENTAL ENCODER

# MAIN FEATURES

Miniaturized ø 38 mm encoder series for application in small devices. Recommended when a minimal size is required even providing excellent performances.

- · 3 channel encoder (A / B / Z) up to 1024 ppr
- Power supply up to +30 V DC with several electrical interfaces available
- Up to 105 kHz output frequency
- Cable output, connector available on cable end
- Solid shaft diameter up to 6 mm
- Mounting by clamping or centering square flange





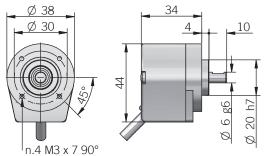




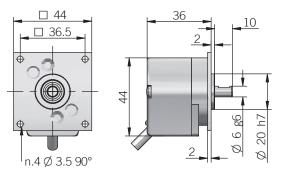


ORDERING CODE	EH	38A	500	S	5/28	P	6	Х	3	PR	. XXX
incremental encoder s		MODEL									
clamping fl square flan; square fla	ange ø 20 m	nm 38A nm 38B									
	ppi refer to the a	r from 50	OLUTION to 1024 pulses list								
			<b>ZER</b> ithout zer	O PULSE o pulse S o pulse Z							
			WICH ZO	POWER	<b>R SUPPLY</b> 5 V DC 5 / DC 5/28						
				ELEC	TRICAL IN PN open c						
		ţ	oower sup	ply 5/28V -	lin	e driver L S-422 RS	IAMETER				
							IAMETER mm 6	RATING			
							MA	IP 54 X   <b>X Rotatio</b>   300	N SPEED 00 rpm 3		
			nrafarrad o	ahla lanath	c 1 5 / 2 / 2	/5/10 m	radial ca to be added	able (stand	<b>OUTP</b> ard length 0		

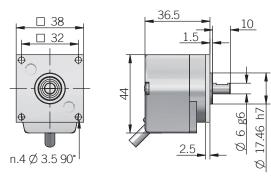
38 A



# 38 B



# 38 D



dimensions in mm

# RESOLUTIONS

50\* - **100** - **200** - 250 - 256 - 360 - 400 - **500** - **512** - **1000** - 1024

please directly contact our offices for other pulses, preferred resolutions in bold \*available only without zero pulse

# **ELECTRICAL SPECIFICATIONS**

Resolution	from 50 to 1024 ppr
Power supply <sup>1</sup>	$5 = 4.5 \dots 5.5 \text{ V DC}$ $5/28 = 4.5 \dots 30 \text{ V DC}$ (reverse polarity protection)
Current consumption without load	100 mA max
Max load current	C / P = 50 mA / channel L = 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	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2015/863/EU directive
UL / CSA	certificate n. E212495

ECHANICAL SPECIFICATIONS			
Shaft diameter	ø 6 mm		
Enclosure rating	IP 54 (IEC 60529)		
Max rotation speed	3000 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	0,05 x 10 <sup>-6</sup> kgm <sup>2</sup> (1,2 x 10 <sup>-6</sup> lbft <sup>2</sup> )		
Starting torque (at +20°C / +68°F)			
Bearing stage material	aluminum UNI 5076		
Shaft material	1.4305 / AISI 303 stainless steel		
Housing material	PA66 glass fiber reinforced		
Bearings	n.2 ball bearings		
Bearings life	10 <sup>9</sup> revolutions		
Operating temperature <sup>4,5</sup>	-20° +70°C (-4° +158°F)		
Storage temperature <sup>5</sup>	-20° +70°C (-4° +158°F)		
Weight	150 g (5.29 oz)		

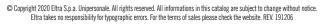
<sup>&</sup>lt;sup>1</sup> as measured at the transducer without cable influences

CONNECTIONS

COMMECTIONS		
Function	Cable C / 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
<u></u>	shield	shield









VARIANT







<sup>&</sup>lt;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 - ER 40 A/B/C/H/I/N/X

# MAIN FEATURES

Miniaturized ø 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, connector available on cable end
- Solid shaft diameter up to 8 mm
- Mounting by clamping, threaded or synchronous flange



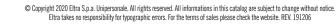




ORDERING CODE	ER	40A	100	S	5/28	Р	6	Х	6	Р	R	. XXX
	series incremental encoder series EL incremental encoder series ER  clamping flange Ø 20 square flange ☐ 36,5 clamping flange Ø 17,46 M18 threaded fla M20 threaded fla synchronous flange Ø 21 synchronous flange Ø 30  (mod. A / B) p (mod. C / H / I / N / X) refer to the	mm 40B mm 40C nge 40H ange 40I mm 40N mm 40X RES pr from 1 ppr from 1 e available	to 2500 pulses list ZER vithout zer with zer	POWER POWER of interface) 5 28 V ELEC	DC 5/28 Trical in	ITERFACE						
		į	oower sup	ply 5/28V -	lin	sh-pull P e driver L S-422 RS SHAFT D	IAMETER C) mm 4					
		р	referred cal			B/C/H/I/ (mod. <b>E</b> (m	N) mm 6 X) mm 8 NCLOSURI od. A / B / F	IP 54 X	0 rpm 3 0 rpm 6 <b>OUTP</b> dard length			
				-		ŕ				DIRECTIO C/H/I/N)		

# Eltra 1985-2020



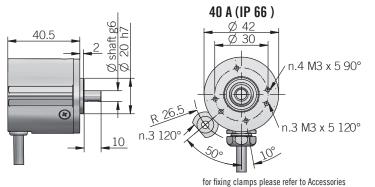


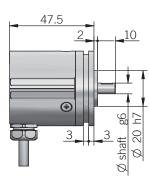
VARIANT custom version XXX

radial R

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

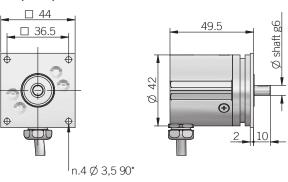
# 40 A (IP54) n.4 M3 x 5 90° i.3 M3 x 5 120°





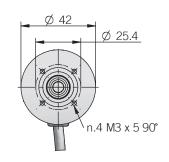
□ 44 □ 36.5 n.4 Ø 3,5 90°

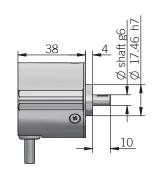
40 B (IP 66)

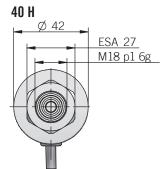


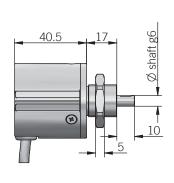
40 C

40 B (IP54)

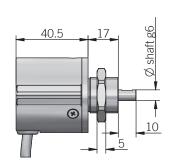


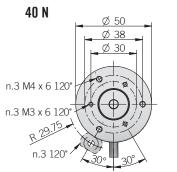


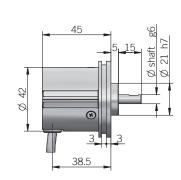




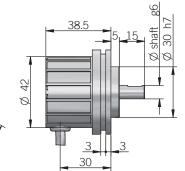
40 I ESA 27 M20 p1,5 6g

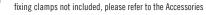






fixing clamps not included, please refer to the Accessories





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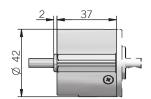


n.3 M3 x 5 120°

dimensions in mm

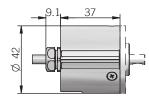
40 X

# 40 (axial output)



dimensions in mm

# 40 (IP 66 axial output)



ELECTRICAL SPECIFICATIONS					
Resolution	from 1 to 14400 ppr (mod. A / B) from 1 to 2500 ppr (mod. C / H / I / N / X)				
Power supply <sup>1</sup>	$5 = 4.5 \dots 5.5 \text{ V DC}$ $5/28 = 4.5 \dots 30 \text{ V DC}$ (reverse polarity protection)				
Power draw without load	800 mW max				
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	EL series 150 kHz ER series 250 kHz up to 3600 ppr 500 kHz from 4000 ppr				
Counting direction	A leads B clockwise (shaft view)				
Electromagnetic compatibility					
RoHS	according to 2015/863/EU directive				
UL / CSA	certificate n. E212495				

ONNECTIONS					
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 SPECIFICA	ATIONS	
Shaft diameter	ø4/6/8 mm	
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)	
Max rotation speed	IP 54 - 6000 rpm IP 66 - 3000 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	0,1 x 10 <sup>-6</sup> kgm <sup>2</sup> (2,4 x 10 <sup>-6</sup> lbft <sup>2</sup> )	
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin) IP 54 < 0,05 Nm (7,10 Ozin) IP 66	
Bearing stage material	EN-AW 2011 aluminum	
Shaft material	1.4305 / AISI 303 stainless steel	
Housing material	PA66 glass fiber reinforced	
Bearings	n.2 ball bearings	
Bearings life	10 <sup>9</sup> revolutions	
Operating temperature <sup>4, 5</sup>	-10° +60°C (+14° +140°F) EL series -25° +85°C (-13° +185°F) ER series	
Storage temperature <sup>5</sup>	-25° +70°C (-13° +158°F)	
Weight	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

4 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



# EL - ER 58 B / C / H / T

# 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











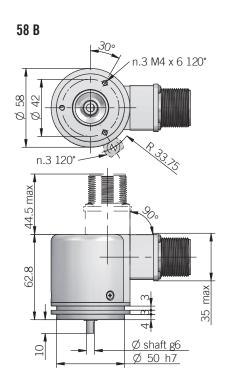
ORDERING CODE	ER	58C	M*	500	S	5/28	P	8	X	6	P	R	. XXX
ORDERING CODE	SERIES incremental encoder series EL incremental encoder series ER synchronous flange ø 50 clamping flange ø 36 clamping flange ø 50 coupling flange ø 40	MODEL mm 58B mm 58C mm 58H mm 58T METAL	L COVER I cover M I RES Or from 1 available V	SOLUTION to 24000 pulses list ZEF without zer with zer h L electrica	RO PULSE o pulse S o pulse Z POWEI al interface) 5 28 \ ELEC N	R SUPPLY 5 V PC 5 7 DC 5/28 ETRICAL IN PN open c pu lin - output R:	ITERFACE ollector C sh-pull P e driver L S-422 RS SHAFT I (mod / H) (3/8") (mod.	DIAMETER . B) mm 6 . C) mm 8 mm 9,52 mm 10 T) mm 12 ENCLOSUR mod. B / C / MA	<b>E RATING</b> IP 54 X T) IP 66 S <b>X ROTATI(</b> (IP 66) 3C (IP 54) 6C cable (sta	DN SPEED 000 rpm 3 000 rpm 6 000 rjm 6 fount matard lengt	PUT TYPE h 1,5 m) P eg. PR5) nnector M	R	. XXX
				preferr	ed cable lei	ngths 2 / 3 /	′ 5 / 10 m, t	o be added	after DIREC	TION TYPE ( MIL cor	eg. PR5) nnector M		
								ı		M12 conne	ector M12 nnector H		
					female c	onnector in	cluded, with	nout female			ant code	ION TYPE	
											DIKEUI	axial A radial R	





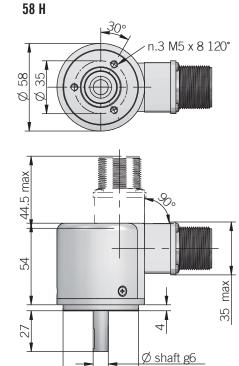


VARIANT custom version XXX



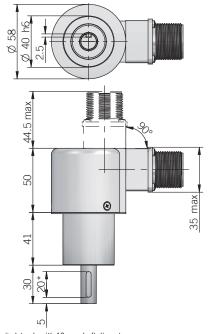
fixing clamps not included, please refer to Accessories

# 58 C n.3 M3 x 6 120° **①** Ø shaft g6



Ø 50 h7

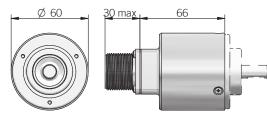
# 58 T



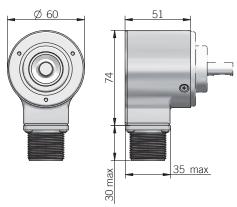
\* slot only with 12mm shaft diameter dimensions in mm

# Dimension with metal cover and axial output

Ø 36 f6



# Dimension with metal cover and radial output





Resolution	from 1 to 24000 ppr
Power supply <sup>1</sup>	$5 = 4.5 \dots 5.5 \text{ V DC}$ $5/28 = 4.5 \dots 30 \text{ V DC}$ (reverse polarity protection)
Power draw without load	800 mW max
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 (AEIT-5000 or equivalent)
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive

# **EL SERIES RESOLUTIONS**

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 25 - 30 - 32 - 40 - 50 - 60 - 70 - 80 - 90 - 160 - 180 - 350 - 450 - 660 - 700 - 750 - 1500

**UL / CSA** | certificate n. E212495

**RoHS** | according to 2015/863/EU directive

# **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 - 9000 - **10000** - 10240 - 12000 - **14400** - 16000 - 16384 - 18000 - **20000** -20480 - 24000

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

MECHANICAL SPECIFICA	ATIONS
Shaft diameter	ø6/8/9,52 (3/8")/10/12 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	IP 54 - 6000 rpm IP 66 - EL 3000 rpm / 60° C ER 3000 rpm / 70° C - 2000 rpm / 85° C
Max shaft load <sup>3</sup>	10 N axial / 20 N radial with ø6 mm shaft 200 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	1,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (36 x 10 <sup>-6</sup> lbft <sup>2</sup> )
Starting torque (at +20°C / +68°F)	< 0,02 Nm (2,83 Ozin) IP 54 < 0,06 Nm (8,50 Ozin) IP 66
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced / painted aluminum
Bearings	n.2 ball bearings
Bearings life	10 <sup>9</sup> revolutions
Operating temperature <sup>4, 5</sup>	-10° +60°C (+14° +140°F) EL series -25° +85°C (-13° +185°F) ER series
Storage temperature <sup>5</sup>	-25° +70°C (-13° +158°F)
Weight	350 g (12,35 oz) 450 g (15,87 oz) with metal cover

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

 $^{\rm 2}$  for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

<sup>3</sup> maximum load for static usage

4 measured on the transducer flange

<sup>5</sup> condensation not allowed

CONNEC	TIONS												
Function	Cable C / P	Cable L / RS	7 pin J C / P	7 pin J L / RS no Zero	7 pin M C / P	7 pin M L / RS no Zero	10 pin J L / RS with Zero	10 pin M L / RS with Zero	5 pin M12 C / P	8 pin M12 L / RS	12 pin H	5 pin C C / P	8 pin C L/RS
+V DC	red	red	6	4	F	D	4 - 5	D - E	2	7	12	5	7
0 V	black	black	1	6	Α	F	6	F	4	1	10	1	8
A+	green	green	3	1	С	Α	1	A	3	6	5	2	1
A-	/	brown or grey	/	3	/	С	7	G	/	5	6	/	2
B+	yellow	yellow	5	2	E	В	2	В	1	4	8	4	3
B-	/	orange	/	5	/	Е	8	Н	/	3	1	/	4
Z+	blue	blue	4	/	D	/	3	С	5	2	3	3	5
Z-	/	white	/	/	/	/	9	I	/	8	4	/	6
÷	shield	shield	7	7	G	G	10	J	housing	housing	9	/	/

J connector (7 pin) JIS-C-5432 Size 16 solder side view FV



J connector (10 pin) JIS-C-5432 Size 16 solder side view FV



M connector (7 pin) Amphenol MS3102-E-16-S solder side view FV



M connector (10 pin) Amphenol MS3102-E-18-1 solder side view FV



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



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



C connector (5 pin) IEC 60130-9 solder side view FV



C connector (8 pin) IEC 60130-9 solder side view FV

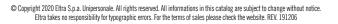


H connector (12 pin) - M23 CCW Hummel 7.410.000000 -7.002.912.603 solder side view FV



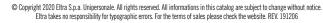
















# EL - ER 63 A / D / E SOLID SHAFT INCREMENTAL ENCODER

# MAIN FEATURES

Standard ø 63 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 10 mm
- Mounting by synchronous or centering 2,5" square flange











ORDERING CODE E	R 63A	M*	500	S	5/28	P	8	X	6	P	R	. XXX
SERII incremental encoder series l incremental encoder series f synchronous flange ø 31 centering square flange ø centering square flange ø	MODEL ,75 mm 63A ,75 mm 63D 50 mm 63E	AL COVER										
		RES	OLUTION to 24000									
		he available	pulses list									
		V	<b>ZEI</b> vithout zei	RO PULSE ro pulse \$								
				ro pulse Z	 R Supply							
		(wit	h L electrica	al interface)								
				ELEC	TRICAL IN							
				N	IPN open c	ollector C sh-pull P						
			nower sun	ply 5/28V	lin	e driver L						
			porror oup	pij 0/201	output it		IAMETER					
						(3/8")	mm 8 mm 9,52					
							mm 10	F RATING				
						•	020001	IP 54 X IP 66 S				
							MA	X ROTATIO	IN SPEED			
								(IP 66) 30 (IP 54) 60	00 rpm 3 00 rpm 6			
								cable (sta	<b>OUTI</b> ndard lengt	PUT TYPE		
			prefer	red cable le	ngths 2 / 3 /	′ 5 / 10 m, t	o be added a		TION TYPE (	eg. PR5)		
									C-5432 co			
									M12 conne M23 coi	ector M12 nnector H		
				female o	onnector in	cluded, with	out female		0130-9 coi 162 as varia			
						,					ION TYPE	
											axial A radial R	

# 63 A n.3 M5 x 7 120° Ø shaft g6 Ø 31.75 h7

fixing clamps not included, please refer to Accessories

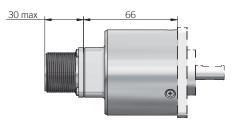
n.4 Ø 5.5 90°

Ø shaft g6 Ø 50 h7

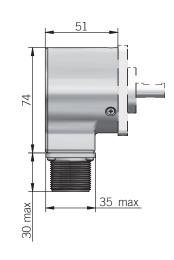
63 E

# - n.4 Ø 5.5 90°

# Dimension with metal cover and axial output



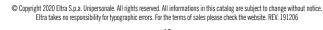
# Dimension with metal cover and radial output



63 D



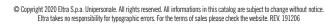






VARIANT

custom version XXX







dimensions in mm

# MAIN FEATURES

Explosion proof encoder for applications within explosive and hazardous areas.

- 3 channel encoder (A / B / Z) up to 10000 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- 10 mm solid shaft diameter
- Mounting by syncronous or centering square flange

# **EX CLASSIFICATION**

It has been assured with EC-TYPE Examination Certificate CESI 04 ATEX 082 that the EX 80 comply with essential health and safety requirements according to

- EN 60079-0:2012+A11:2013
- EN 60079-1:2014

ORDERING CODE

EN 60079-31:2014

The UE declaration is available on www.eltra.it









OA	500	S	5/28	P	10	Х	3	PR	. XX
<b>DEL</b> 80A 80D									
100	to 10000 pulses list								
١	without zer	RO PULSE ro pulse S ro pulse Z							
(wit		POWEI al interface)	R SUPPLY						
			TRICAL IN						

SHAFT DIAMETER **ENCLOSURE RATING** 

NPN open collector push-pull F line driver L

power supply 5/28V - output RS-422 RS

IP 65

MAX ROTATION SPEED 3000 rpm 3

**OUTPUT TYPE** radial cable (standard length 1.5 m) PR

preferred cable lengths 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5  $^{\circ}$ 

custom version XXX

J)		
	VARIANT	

Shaft diameter	ø 8 / 9,52 (3/8") / 10 mm

X = IP 54 (IEC 60529)**Enclosure rating** S = IP 66 (IEC 60529)

MECHANICAL SPECIFICATIONS

IP 54 - 6000 rpm IP 66 - EL 3000 rpm / 60° C Max rotation speed

ER 3000 rpm / 70° C - 2000 rpm / 85° C Max shaft load<sup>3</sup> 200 N axial / radial

Shock 50 G, 11 ms (IEC 60068-2-27) 10 G. 10 ... 2000 Hz (IEC 60068-2-6) Vibration

Moment of inertia 1,5 x 10<sup>-6</sup> kgm<sup>2</sup> (36 x 10<sup>-6</sup> lbft<sup>2</sup>) < 0,02 Nm (2,83 Ozin) IP 54 Starting torque  $(at +20^{\circ}C / +68^{\circ}F) < 0.06 \text{ Nm} (8.50 \text{ Ozin}) \text{ IP } 66$ 

Bearing stage material | EN-AW 2011 aluminum Shaft material 1.4305 / AISI 303 stainless steel

**Housing material** PA66 glass fiber reinforced / painted aluminum **Bearings** n.2 ball bearings

Bearings life 109 revolutions -10° ... +60°C (+14° ... +140°F) EL series -25° ... +85°C (-13° ... +185°F) ER series Operating temperature4, Storage temperature<sup>5</sup>

-25° ... +70°C (-13° ... +158°F) 350 g (12,35 oz) Weight 450 g (15,87 oz) with metal cover

<sup>2</sup> for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section 3 maximum load for static usage

as measured at the transducer without cable influences

4 measured on the transducer flange

<sup>5</sup> condensation not allowed

# **ER SERIES RESOLUTIONS**

180 - 350 - 450 - 660 - 700 - 750 - 1500

**EL SERIES RESOLUTIONS** 

**ELECTRICAL SPECIFICATIONS** 

Power supply<sup>1</sup>

Max load current

Max output frequency

Electromagnetic

compatibility

Power draw without load 800 mW max

**Resolution** from 1 to 24000 ppr

 $5 = 4.5 \dots 5.5 \text{ V DC}$ 

Electrical interface push-pull / line driver HTL (AEIC-7272)

**Counting direction** A leads B clockwise (shaft view)

UL / CSA | certificate n. E212495

C/P = 50 mA/channel

L/RS = 20 mA/channel

250 kHz up to 6000 ppr

500 kHz from 7200 ppr

 $5/28 = 4.5 \dots 30 \text{ V DC}$  (reverse polarity protection)

NPN open collector (AEIC-7273, pull-up max +30 V DC)

line driver RS-422 (AELT-5000 or equivalent)

according to 2014/30/EU directive

**RoHS** according to 2015/863/EU directive

**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 - 9000 - **10000** - 10240 - 12000 - **14400** - 16000 - 16384 - 18000 - **20000** -20480 - 24000

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 25 - 30 - 32 - 40 - 50 - 60 - 70 - 80 - 90 - 160 -

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

# CONNECTIONS

OUMILLO	TION												
Function	Cable C / P	Cable L / RS	7 pin J C / P	7 pin J L / RS no Zero	7 pin M C / P	7 pin M L / RS no Zero	10 pin J L / RS with Zero	10 pin M L / RS with Zero	5 pin M12 C / P	8 pin M12 L / RS	12 pin H	5 pin C C / P	8 pin C L/RS
+V DC	red	red	6	4	F	D	4 - 5	D - E	2	7	12	5	7
0 V	black	black	1	6	Α	F	6	F	4	1	10	1	8
A+	green	green	3	1	С	Α	1	А	3	6	5	2	1
A-	/	brown or grey	/	3	/	С	7	G	/	5	6	/	2
B+	yellow	yellow	5	2	Е	В	2	В	1	4	8	4	3
B-	/	orange	/	5	/	Е	8	Н	/	3	1	/	4
Z+	blue	blue	4	/	D	/	3	С	5	2	3	3	5
Z-	/	white	/	/	/	/	9	I	/	8	4	/	6
÷	shield	shield	7	7	G	G	10	J	housing	housing	9	/	/

J connector (7 pin) JIS-C-5432 Size 16 solder side view FV

J connector (10 pin)

JIS-C-5432 Size 16

solder side view FV



M connector (7 pin)

Amphenol MS3102-E-16-S

M connector (10 pin) Amphenol MS3102-E-18-1





M12 connector (5 pin)

M12 A coded

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





C connector (5 pin)







H connector (12 pin) - M23 CCW

Hummel 7.410.000000 -

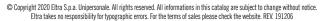
7.002.912.603

solder side view FV

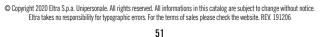








www.eltra.it



EX 80A 500

MODEL

RESOLUTION ppr from 100 to 10000 refer to the available pulses list

SERIES

syncronous flange ø 40 mm 80A centering square flange ø 40 mm 80D

explosion proof encoder series EX

- n.4 Ø 5,5 90°

Ø 40 h7 Ø shaft g6

MECHANICAL SPECIFICATIONS

Shaft diameter | Ø 10 mm

80 D

# MAIN FEATURES

Encoder series for harsh environments with high mechanical resistance requirements. Model 90 can be mounted by flanges or fixing clamps; model 115 has a tachometer generator REO-444 type compatible plug with optional centrifugal relay.

- Mounting by syncronous or REO-444 flange











ORDERING CODE	EH	90A	500	S	8/24	Р	1000	Z	8/24	Р	8	Х	6	Р	R	. XXX	+ 2000
incremental encode	SERIES r series EH										_ ;						
		MODEL															
synchronous f fla	ange REO-44	14 115A															
flange REO-444 with cer	ntrifugal rela	-	LUTION														
		rom 200	to 2048														
	refer to the a	vailable p		O PULSE													
			hout zero	pulse S pulse Z													
			WILLI ZELL	POWER													
		(with L		interface) 5 8 24 V													
				ELECTI	RICAL INT												
				NPN		h-pull P											
					line	driver L	DLUTION										
						KESI		O PULSE									
									SUPPLY								
								ELECTI	RICAL INT	ERFACE   Shaft dia	AMETED						
										(mod. 90/	A) mm 8						
										A) (3/8") n	mm 10						
									(mod. 11	5A - 115R)	mm 11 Closure	DATING					
												IP 54 X					
												) IP 66 S Rotation	N SPEED				
											(	IP 66) 300 IP 54) 600	0 rpm 3				
													OUTP	UT TYPE			
						pref	erred cable	e lengths 2	/3/5/1	0 m, to be a		ble (stand er DIRECTIO					
						·		Ü		,			MIL coni 5432 con	nector M			
							fema	le connect	or included	l, without fo	emale plea		2 as variai	nt code			
														DIRECTION	axial A		
															radial R	VADIANT	
; To be indicated only in the mode	Is 90A - 115A	for double	electroni	cs and dou	ble resolut	ion									custom ve		
See examples:																	ON SPEED

· 3 channel encoder (A / B / Z) up to 2048 ppr

- Redundancy encoder with double output and / or double resolutions
- Power supply up to +24 V DC with several electrical interfaces available
- Up to 105 kHz output frequency
- Solid shaft diameter up to 11 mm
- Model 115R available with centrifugal relay





# **ELECTRICAL SPECIFICATIONS Resolution** from 100 to 10000 ppr $5 = 4,5 \dots 5,5 \text{ V DC}$ Power supply<sup>1</sup> $5/28 = 4.5 \dots 30 \text{ V DC}$ (reverse polarity protection) **Current consumption** 80 mA max without load C/P = 50 mA/channelMax load current L/RS = 20 mA/channelNPN open collector (AEIC-7273, pull-up max +30 V DC) Electrical interface push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent) Max output frequency | 2500 kHz from 7200 ppr 250 kHz up to 6000 ppr **Counting direction** A leads B clockwise (shaft view) Electromagnetic according to 2014/30/EU directive compatibility **RoHS** | according to 2015/863/EU directive **UL / CSA** certificate n. E212495

fixing clamps not included, please refer to the Accessories

Ø shaft g6

n.3 M6 x 10 120°

# **EPL MARKING**



# II 2GD

80 A

n.3 120°

II: group II: different than mines

2: category 2: high level of protection

GD: areas containing gas (G) and dust (D)

# Ex d IIC T6 Gb

Ex d: flameproof enclosure for explosive atmospheres with gases, vapours and mists IIC: group of gas IIC

T6: max surface temperature +85°C of the device for atmospheres with gas

Gb: product with a high level of protection

# Ex tb IIIC T85°C Db

Ex tb: flameproof enclosure safety type

IIIC: group of dust combustibles IIIC

T85°C: max surface temperature +85°C of the device in the presence of dust

Db: product with a high level of protection

Enclosure rating	IP 65 (IEC 60529)
Max rotation speed	3000 rpm
Max shaft load <sup>3</sup>	200 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	1,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (36 x 10 <sup>-6</sup> lbft <sup>2</sup> )
Starting torque (at +20°C / +68°F)	< 0,06 Nm (8,50 Ozin)
Bearing stage material	anodized aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	anodized aluminum
Bearings	n.2 ball bearings
Bearings life	10° revolutions
Operating temperature <sup>4, 5</sup>	-20° +50°C (-4° +122°F)
Storage temperature <sup>5</sup>	-20° +70°C (-4° +158°F)
Weight	1200 g (42,33 oz)

UNNECTION2		
Function	Cable C / P	Cable L/RS
+V DC	brown	brown
0 V	gray	gray
A+	green	green
A-	/	red
B+	yellow	yellow
B-	/	pink
Z+	white	blue
Z-	/	white
<u></u>	shield	shield

# RESOLUTIONS

CONNECTIONS

**100** - 200 - **360** - 400 - **500** - **1000** - **1024** - 1440 - **2000** - **2048** - **2500** - 3000 -**3600** - 4000 - 4096 - **5000** - 6000 - **7200** - 8000 - 8192 - 9000 - **10000** 

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



for other speeds please contact our offices directly

(mod. 115R) from 600 to 4300





dimensions in mm

Double resolution and double electronics: EH90A1024Z5L-2048Z8/24L10X...

Double resolution and same electronics: EH90A1024-2048Z5L10X..

Same resolution and double electronics: EH90A1024Z5L-Z8/24L10X...

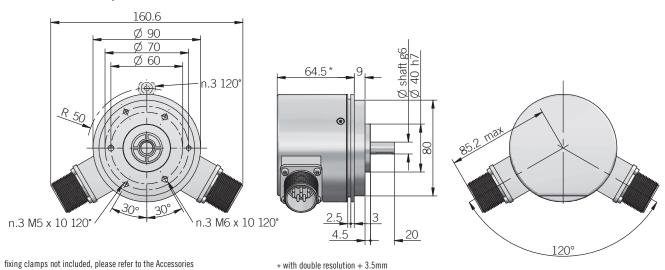
<sup>&</sup>lt;sup>1</sup> as measured at the transducer without cable influences

 $<sup>^{\</sup>rm 2}$  for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

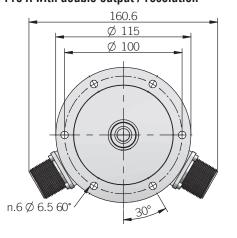
<sup>&</sup>lt;sup>3</sup> maximum load for static usage

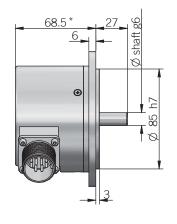
<sup>&</sup>lt;sup>4</sup> measured on the transducer flange <sup>5</sup> condensation not allowed

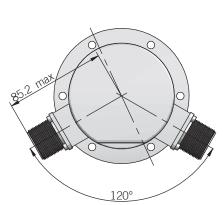
# 90 A with double output / resolution



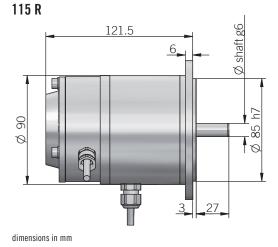
# 115 A with double output / resolution

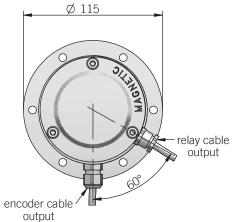






 $\star$  with double resolution + 3.5mm





**ELECTRICAL SPECIFICATIONS Resolution** from 200 to 2048 ppr Power supply<sup>1</sup> **Current consumption** 100 mA max without load C/P = 50 mA/channelL = 20 mA/channelMax load current 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 | 105 kHz **Counting direction** A leads B clockwise (shaft view) Electromagnetic according to 2014/30/EU directive compatibility **RoHS** | according to 2015/863/EU directive

UL / CSA | certificate n. E212495

# RESOLUTIONS

200 - 250 - 500 - 512 - **1000 - 1024 - 2000 - 2048** 

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

RELAY CHARACTERISTICS			
Intervention speed   from 600 to 4300 rpm			
Accuracy	± 3 %		
Contact capacity   2 A / 250 V AC   3,3 A / 125 V AC			
Type of contact Normally Closed (NC)			

MECHANICAL SPECIFICA	MECHANICAL SPECIFICATIONS				
Shaft diameter	ø 8 / 9,52 (3/8") / 10 / 11 mm				
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)				
Max rotation speed	IP 54 - 6000 rpm IP 66 - 3000 rpm				
Max shaft load <sup>3</sup>	200 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	3,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (83 x 10 <sup>-6</sup> lbft <sup>2</sup> )				
Starting torque (at +20°C / +68°F)	< 0,02 Nm (2,8 OzIn) IP 54 < 0,06 Nm (8,5 OzIn) IP 66				
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>	-10° +60°C (+14° +140°F)				
Storage temperature <sup>5</sup>	-25° +70°C (-13° +158°F)				
Weight	750 g (26,46 oz) 1050 g (37,04 oz) with relay				

<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

3 maximum load for static usage

4 measured on the transducer flange

5 condensation not allowed

# CONNECTIONS

Function	Cable C / P	Cable L	7 pin J C / P	7 pin J L no Zero	7 pin M C / P	7 pin M L / RS no Zero	10 pin J L with Zero	10 pin M L with Zero
+V DC	red	red	6	4	F	D	4 - 5	D - E
0 V	black	black	1	6	А	F	6	F
A+	green	green	3	1	С	А	1	А
A-	/	brown or grey	/	3	/	С	7	G
B+	yellow	yellow	5	2	E	В	2	В
B-	/	orange	/	5	/	E	8	Н
Z+	blue	blue	4	/	D	/	3	С
Z-	/	white	/	/	/	/	9	I
<u></u>	shield	shield	7	7	G	G	10	J

J connector (7 pin) JIS-C-5432 Size 16 solder side view FV



M connector (7 pin) Amphenol MS3102-E-16-S solder side view FV



J connector (10 pin) JIS-C-5432 Size 16 solder side view FV

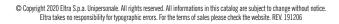


M connector (10 pin) Amphenol MS3102-E-18-1 solder side view FV











# EL - ER 90 A EL - ER 115 A

# **SOLID SHAFT INCREMENTAL ENCODER**

# MAIN FEATURES

Encoder series for harsh environments with high mechanical resistance requirements. Model 90 can be mounted by flanges or fixing clamps; model 115 has a tachometer generator REO-444 type compatible plug.

- · 3 channel encoder (A / B / Z) up to 10000 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable or connector output
- Metal cover for heavy duty applications
- Solid shaft diameter up to 11 mm
- Mounting by synchronous or REO-444 flange



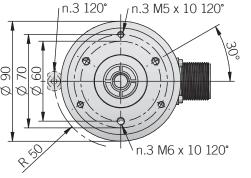


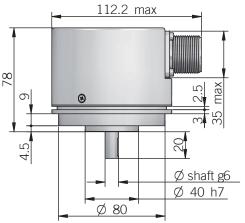






ORDERING CODE	ER	90A	500	S	5/28	P	8	X	6	P	R	. XXX
ORDERING CODE	SERIES incremental encoder series EL incremental encoder series ER synchronous flange ø 40 flange REO-	MODEL mm 90A 444 115A RES opr from 1 e available v	colution to 10000 pulses list ZEF vithout zer with zer h L electrica	RO PULSE o pulse S o pulse Z POWEI al interface) 5 28 \ ELEC N	SUPPLY 5 V DC 5 DC 5/28 TRICAL IN PN open c pu lin output R	TERFACE Ollector C sh-pull P e driver L S-422 RS SHAFT (mod. 90) (3/8") (mod. 11	DIAMETER 90) mm 8,52 mm 10 5) mm 11 ENCLOSUR (mod. 9	E RATING	<b>N SPEED</b> 00 rpm 3 00 rpm 6 0UTF 100 TYPE (c	PUT TYPE 1.5 m)P eg. PR5) inector M	R	. XXX
				female c	nnector in	cluded with	iout female	JIS-( please add 1	C-5432 co	nnector J		
				rennare c	JIIII IOCIOI III	Jiudeu, With	iout ieiiiale	piease add 1	to∠ as valla		ION TYPE	
											axial A radial R	

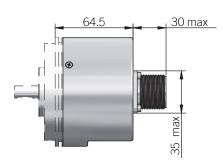




fixing clamps not included, please refer to Accessories

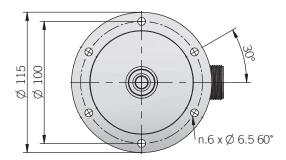
# 90 A axial output

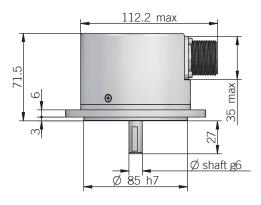
90 A



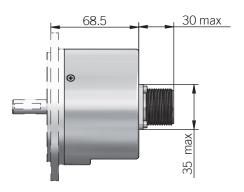
dimensions in mm

# 115 A



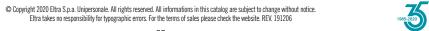


# 115 A axial output









VARIANT custom version XXX



ELECTRICAL SPECIFICATIONS					
Resolution	from 1 to 10000 ppr				
Power supply <sup>1</sup>	$5 = 4.5 \dots 5.5 \text{ V DC}$ $5/28 = 4.5 \dots 30 \text{ V DC}$ (reverse polarity protection)				
Power draw without load	800 mW				
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 6000 ppr 500 kHz from 7200 ppr				
Counting direction	A leads B clockwise (shaft view)				
Electromagnetic compatibility	according to 2014/30/EU directive				
RoHS	according to 2015/863/EU directive				
UL / CSA	certificate n. E212495				

# **EL SERIES RESOLUTIONS**

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 25 - 30 - 32 - 40 - 50 - 60 - 70 - 80 - 90 - 160 - 180 - 350 - 450 - 660 - 700 - 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 - 9000 - **10000** 

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

MECHANICAL SPECIFICA	MECHANICAL SPECIFICATIONS					
Shaft diameter	ø 8 / 9,52 (3/8") / 10 / 11 mm					
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)					
Max rotation speed	IP 54 - 6000 rpm IP 66 - EL 3000 rpm / 60° C ER 3000 rpm / 70° C - 2000 rpm / 85° C					
Max shaft load <sup>3</sup>	200 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	3,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (83 x 10 <sup>-6</sup> lbft <sup>2</sup> )					
Starting torque (at +20°C / +68°F)	< 0,02 Nm (2,83 Ozin) IP 54 < 0,06 Nm (8,50 Ozin) IP 66					
Bearing stage material	EN-AW 2011 aluminum					
Shaft material	1.4305 / AISI 303 stainless steel					
Housing material	PA66 glass fiber reinforced / painted aluminum					
Bearings	n.2 ball bearings					
Bearings life	10° revolutions					
Operating temperature <sup>4, 5</sup>	-10° +60°C (+14° +140°F) EL series -25° +85°C (-13° +185°F) ER series					
Storage temperature <sup>5</sup>	-25° +70°C (-13° +158°F)					
Weight	350 g (12,35 oz) 450 g (15,87 oz) with metal cover					

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

<sup>&</sup>lt;sup>5</sup> condensation not allowed

CONNECTIONS				<u>'</u>			<u>'</u>	
Function	Cable C / P	Cable L / RS	7 pin J C / P	7 pin J L / RS no Zero	7 pin M C / P	7 pin M L / RS no Zero	10 pin J L / RS with Zero	10 pin M L/RS with Zero
+V DC	red	red	6	4	F	D	4 - 5	D - E
0 V	black	black	1	6	А	F	6	F
A+	green	green	3	1	С	А	1	А
A-	/	brown or grey	/	3	/	С	7	G
B+	yellow	yellow	5	2	E	В	2	В
B-	/	orange	/	5	/	Е	8	Н
Z+	blue	blue	4	/	D	/	3	С
Z-	/	white	1	/	/	/	9	I
÷	shield	shield	7	7	G	G	10	J

J connector (7 pin) JIS-C-5432 Size 16 solder side view FV





J connector (10 pin)

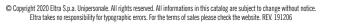
JIS-C-5432 Size 16

M connector (10 pin) Amphenol MS3102-E-18-1 solder side view FV









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# MAIN FEATURES

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

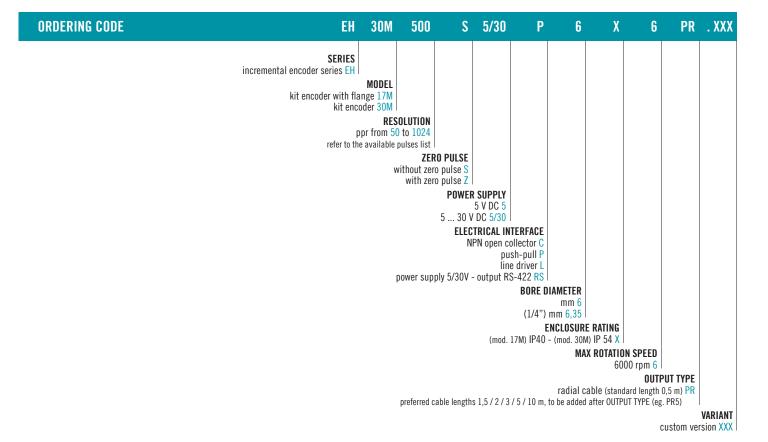
- · 3 channel encoder (A / B / Z) up to 1024 ppr
- · Power supply up to +30 V DC with several electrical interfaces available
- · Up to 105 kHz output frequency
- No wear due to absense of bearings
- Easy assembly
- Compact size











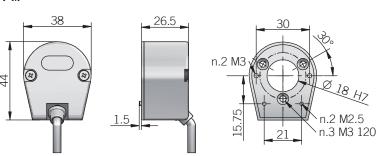




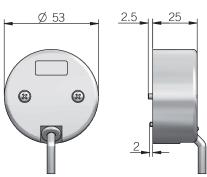
<sup>&</sup>lt;sup>2</sup> for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

<sup>&</sup>lt;sup>3</sup> maximum load for static usage

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

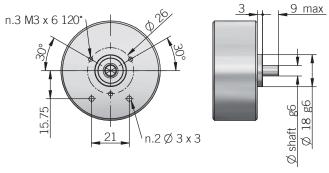


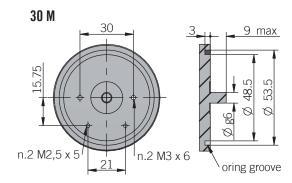
# 30 M



# RECOMMENDED INTERFACE FLANGE DESIGN

# 17 M





# dimensions in mm

ELECTRICAL SPECIFICATIONS					
Resolution	from 50 to 1024 ppr				
Power supply <sup>1</sup>	$5 = 4,5 \dots 5,5 \text{ V DC}$ $5/30 = 4,5 \dots 30 \text{ V DC}$ (reverse polarity protection)				
Current consumption without load	50 mA (2 channels A / B) 100 mA (3 channels A / B / Z)				
Max load current	C / P = 50 mA / channel L = 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 (AEIT-5000 or equivalent)				
Max output frequency	105 kHz				
Counting direction	A leads B clockwise (shaft view)				
Electromagnetic compatibility	according to 2014/30/EU directive				
RoHS	according to 2015/863/EU directive				
UL / CSA	certificate n. E212495				

# CONNECTIONS

Cable P	Cable L/RS
red	red
black	black
green	green
/	brown or grey
yellow	yellow
/	orange
blue	blue
1	white
shield	shield
	red black green / yellow / blue

# **MECHANICAL SPECIFICATIONS**

Bore diameter	ø 6 / 6,35 (1/4") mm			
Enclosure rating	mod. 17 IP 40 (IEC 60529) mod. 30 IP 54 (IEC 60529) when properly installed with oring kit (not supplied, please refer to the Accessories)			
Max rotation speed	6000 rpm (limited by output frequency)			
Shock	50 G, 11 ms (IEC 60068-2-27)			
Vibration	1 10 G, 10 2000 Hz (IEC 60068-2-6)			
Moment of inertia	0,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (12 x 10 <sup>-6</sup> lbft <sup>2</sup> )			
Flange material (mod. 17)	aluminium			
Hub material	EN-AW 2011 aluminium			
Cover material	PA66 glass fiber reinforced			
Shaft radial play allowed	± 0,04 mm			
Shaft axial play allowed	± 0,1 mm			
Operating temperature <sup>3, 4</sup>	-20° +60°C (-4° +140°F)			
Storage temperature <sup>4</sup>	-25° +70°C (-13° +158°F)			
Weight	50 g (1,76 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

4 condensation not allowed

# RESOLUTIONS

50\* - **100** - **200** - 250 - 256 - 360 - 400 - **500** - 512 - **1000** - 1024

\*available only without zero pulse

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

















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

- · 3 channel encoder (A / B / Z) up to 5000 ppr Power supply up to +30 V DC with several electrical interfaces available
- Up to 500 kHz output frequency No wear due to absense of bearings
- Easy assembly

MAIN FEATURES

Compact size



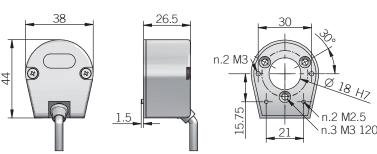
ORDERING CODE	EH :	30MH	2000	S	5/30	P	6	X	X	PR	. XXX
incremental high resolution ki high	SERIES encoder series EH encoder with flang resolution kit encode ppr 2000 / 2048 / 25	TYPE ge 17MH er 30MH   RES 5500 / 409	OLUTION 16 / 5000 ZER vithout zer with zer	RO PULSE o pulse S o pulse Z POWEI 530 V ELEC	R SUPPLY 7 DC 5/30 TRICAL IN PU linu - output R3	TERFACE sh-pull P e driver L S-422 RS BORE D (1/4")	IAMETER mm 6 mm 6,35 NCLOSURE (mod. 30MH	E <b>RATING</b> ) IP 54 X to be re	<b>OPTION</b> eported X	UT TYPE	
			preterred c	able length	s 1,5/2/3	/ 5 / 10 m,	to be added	atter OUTPl	UT TYPE (eg.		VARIANT



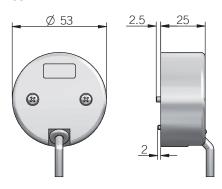


# **BLIND HOLLOW SHAFT INCREMENTAL ENCODER**

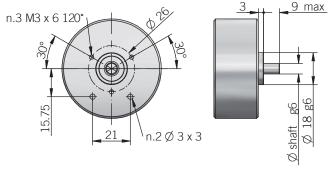
# 17 MH

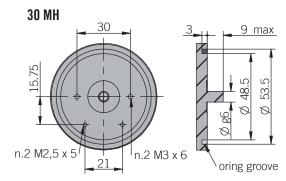


# 30 MH



# RECOMMENDED INTERFACE FLANGE DESIGN 17 MH





# dimensions in mm

ELECTRICAL SPECIFICATIONS					
Resolution	2000 - 2048 - 2500 - 4096 - 5000 ppr				
Power supply <sup>1</sup>	$4,5\ldots30VDC$ (reverse polarity protection)				
Current consumption without load	60 mA max				
Max load current	20 mA / channel				
Electrical interface <sup>2</sup>	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)				
Max output frequency	500 kHz				
Counting direction	A leads B clockwise (shaft view)				
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/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") mm
Enclosure rating IEC 60529	mod. 17 IP 40 mod. 30 IP 54 when properly installed with oring kit (not supplied, please refer to the Accessories)
Max rotation speed	6000 rpm (limited by output frequency)
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (12 x 10 <sup>-6</sup> lbft <sup>2</sup> )
Flange material (mod. 17)	aluminium
Hub material	EN-AW 2011 aluminium
Cover material	PA66 glass fiber reinforced
Shaft radial play allowed	± 0,04 mm
Shaft axial play allowed	± 0,1 mm
Operating temperature <sup>3, 4</sup>	-20° +85°C (-4° +185°F)
Storage temperature	-20° +85°C (-4° +185°F)
Weight	50 g (1,76 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

4 condensation not allowed



# MAIN FEATURES

ø 36 mm encoder series recommended in feedback control systems on AC servomotors, interchangeable with size 15 Resolver in the back of the motor.

- · 6 channels encoder with optical generation of "Hall effect phases" (commutation signals)
- Signal transmission by bit parallel bus
- Easy mechanical mounting
- Small dimensions
- Wide range of resolutions available
- High temperature resistance









ORDERING CODE	EF	36K	4	L	512	S	5	L	8	Х	6	PR	. XXX
incremental encoder v	SERIES												
	low shaft with rear fix	MODEL											
Silita itsi		-	R POLES										
	6 pol	es (3 pole: es (4 pole:	s pair) 6										
ELE	CTRICAL INTERFACE	FOR COMM											
			ne driver R	S-422 L	OLUTION								
			ppr refer to the	from 500	) to 1024								
			reier to the		ZER	0 PULSE							
				V	vithout zero with zero	o pulse Z							
							SUPPLY 5 V DC 5						
			ELEC	CTRICAL I	NTERFACE		REMENTAL ine driver	RS-422 L					
									IAMETER mm 8				
									mm 9,52 mm 10				
								E	NCLOSUR	E RATING IP 40 X			
									MA	X ROTATII 60	ON SPEED 000 rpm 6		
									radial o	able (stan	<b>OUT</b> dard length	PUT TYPE 0,3 m) PR	
					preferred c	able length:	s 1,5 / 2 / 3	/5/10 m,			PUT TYPE (eg		VADIANT

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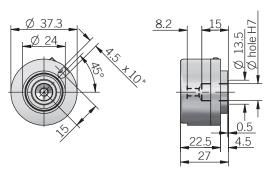
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VARIANT custom version XXX





# 36 K



<sup>\*</sup> ø 4 mm torque pin min 0.5mm from bottom end

for size 15 Resolver flange please refer to Accessories dimensions in mm

ELECTRICAL SPECIFICAT	TIONS
Incremental resolution	from 500 to 1024 ppr
Power supply <sup>1</sup>	4,5 5,5 V DC
Current consumption without load	150 mA max
Max load current	20 mA / channel (line driver RS-422) 30 mA / channel (NPN open collector)
Electrical interface for incremental signals <sup>2</sup>	line driver RS-422 (AELT-5000 or equivalent)
Electrical interface for Hall phases <sup>2</sup>	NPN open collector (pull-up max +30V DC) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	150 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2015/863/EU directive
UL / CSA	certificate n. E212495

CONNECTIONS	
Function	Cable
+V DC	red
0 V	black
A+	green
B+	yellow
Z+	blue
A-	brown
B-	orange or pink
Z-	white
U+	grey
V+	violet
W+	grey-pink
U-	red-blue
V-	white-green
W-	brown-green
÷	shield

MECHANICAL SPECIFICA	ATIONS
Bore diameter	ø 8 / 9,52 (3/8") / 10 mm
Enclosure rating	IP 40 (IEC 60529)
Max rotation speed	6000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	5 G, 10 500 Hz (IEC 60068-2-6)
Moment of inertia	0,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (12 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	EN-AW 2011 aluminum
Bearings	n.2 ball bearings
Bearings life	10 <sup>9</sup> revolutions
Operating temperature <sup>3, 4</sup>	-10° +85°C (+14° +185°F)
Storage temperature <sup>4</sup>	-25° +85°C (-13° +185°F)
Weight	150 g (5,29 oz)

as measured at the transducer without cable influences <sup>2</sup> for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

# **RESOLUTIONS**

500 4 / 6 poles 512 4 / 6 poles 1000 6 / 8 poles 1024 4 / 6 / 8 poles

please directly contact our offices for other pulses



# MAIN FEATURES

Miniaturized encoder series for general factory automation applications, small AC motors and gearmotors.

- · 3 channel encoder (A / B / Z) up to 14400 ppr
- Power supply up to +30 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable output, connector available on cable end
- Metal cover for high IP enclosure rating
- Blind hollow shaft diameter up to 10 mm
- Mounting by stator coupling or torque pin









ORDERING CODE	ER	38F	500	S	5/30	Р	10	X	X	PR	. XXX
	SERIES incremental encoder series EM incremental encoder series ER										
	blind hollow shaft with stator coup blind hollow shaft with torque	e pin 38G	OLUTION								
		pr from 1 e available	pulses list								
		V	vithout zer	o pulse Z	SUPPLY						
		(wit	h L electrica	ıl interface) 5 30 V							
				N	PN open co pu lin	ollector C sh-pull P e driver L					
			power sup	ply 5/30V -	output R	BORE D	IAMETER mm 6				
							mm 6,35 mm 8 mm 10	F DATING			
							NGLUSUK	IP 65 X	OPTION		
							radial c	to be re able (stand		PUT TYPE 0,5 m) PR	
			preferred c	able length	s 1,5 / 2 / 3	/5/10 m,	to be added	after OUTP	_		VARIANT

custom version XXX

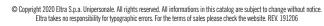








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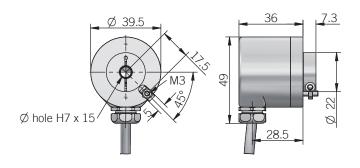






<sup>&</sup>lt;sup>3</sup> measured on the transducer flange

<sup>4</sup> condensation not allowed



dimensions in mm

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

38 G

ELECTRICAL SPECIFICATIONS					
Sensing principle	magnetic Asic (EM) / reflective OptoAsic (ER)				
Resolution	from 1 to 14400 ppr				
Power supply <sup>1</sup>	$5 = 4.5 \dots 5.5 \text{ V DC}$ $5/30 = 4.5 \dots 30 \text{ V DC}$ (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
<u></u>	shield	shield

ATIONS				
ø 6* / 8* / 10 mm * with supplied shaft adapter				
IP 65 (IEC 60529)				
6000 rpm				
5 N axial / radial				
50 G, 11 ms (IEC 60068-2-27)				
10 G, 10 2000 Hz (IEC 60068-2-6)				
0,8 x 10 <sup>-6</sup> kgm <sup>2</sup> (19 x 10 <sup>-6</sup> lbft <sup>2</sup> )				
< 0,01 Nm (1,42 Ozin)				
EN-AW 2011 aluminum				
1.4305 / AISI 303 stainless steel				
painted aluminum				
n.2 ball bearings				
10 <sup>9</sup> revolutions				
-25° +85°C (-13° +185°F)				
-25° +85°C (-13° +185°F)				
150 g (5,29 oz)				

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

 $^{\rm 2}$  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**

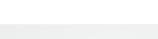
1 - 2 - 4 - 5 - 6 - 10 - 15 - 16 - 20 - 30 - 32 - 40 - 50 - 60 - 70 - 80 - 90

# **ER SERIES RESOLUTIONS**

**100**-120-128-150-200-240-250-256-300-**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











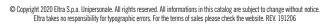
# MAIN FEATURES

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 4	48C 50	0 S	5	L	8	X	6	PR	. XXX
	SERIES Ital encoder series EL  MO blind hollow shaft through hollow shaft	it 48C t 48P RESOLUTIO om 100 to 204 ailable pulses li without with	N 8 8 st let let let let let let let let let le	R SUPPLY 0.5 V DC 5 V DC 8/24 CTRICAL IN IPN open c pt	ITERFACE ollector C ish-pull P e driver L BORE D	IAMETER mm 6 mm 8 ENCLOSUR	E RATING IP 40 X IX ROTATIO	I <b>N SPEED</b> 00 rpm 6		. XXX
		preferre	d cable length	ns 1,5 / 2 / 3	3 / 5 / 10 m,			dard length	0,3 m) PR	VARIANT





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3 channel encoder (A / B / Z) up to 2048 ppr

Cable output, connector available on cable end Through hollow shaft diameter up to 12,7 mm (1/2")

Interchangeable with size 19 Resolver

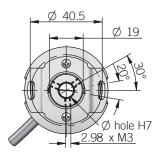
Up to 150 kHz output frequency

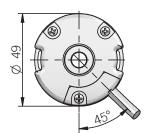
ø 49 mm encoder recommended in feedback control systems on AC servomotors,

Power supply up to +24 V DC with several electrical interfaces available

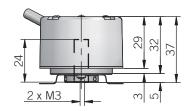
MAIN FEATURES

# 48 C / P





model C without hole on cover



dimensions in mm

ELECTRICAL SPECIFICATIONS						
Resolution	from 100 to 2048 ppr					
Power supply <sup>1</sup>	5 = 4,5 5,5 V DC 8/24 = 7,6 25,2 V DC					
Current consumption without load	100 mA max					
Max load current	C / P = 30 mA / channel L = 20 mA / channel					
Electrical interface <sup>2</sup>	NPN open collector (pull-up max +30V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)					
Max output frequency	150 kHz					
Counting direction	A leads B clockwise (shaft view)					
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
+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
<u></u>	shield	shield

MECHANICAL SPECIFICA	ATIONS
Bore diameter	ø6/8 mm
Enclosure rating	IP 40 (IEC 60529)
Max rotation speed	6000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 500 Hz (IEC 60068-2-6)
Moment of inertia	2,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (59 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	PA 66 glass fiber reinforced
Bearings	n.2 ball bearings
Bearings life	10 <sup>9</sup> revolutions
Operating temperature <sup>3, 4</sup>	-20° +85 °C (-4° +185°F)
Storage temperature <sup>4</sup>	-25° +85°C (-13° +185°F)
Weight	100 g (3,53 oz)

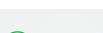
Weight | 100 g (3,53 oz)

1 as measured at the transducer without cable influences

# RESOLUTIONS

**100** - 200 - 360 - 400 - 500 - **512** - 1000 - **1024** - 2000 - **2048** 

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









ORDERING CODE	EL	49C	500	S	5	L	8	X	6	PR	. XXX
	SERIES										
	incremental encoder EL	MODEL									
	blind hollow s	MODEL haft 49C									
	through hollow s	haft 49P									
	nn	RES r from 100	OLUTION 1 to 2049								
	refer to the										
				RO PULSE							
		V		o pulse S o pulse Z							
			WILII ZCI		SUPPLY						
		(witl	n L electrica	al interface)	5 V DC 5						
					DC 8/24 Trical in						
					PN open c	ollector C					
					pu	sh-pull P e driver L					
					1111		IAMETER				
						DONE	mm 6				
						(3/8")	mm 8				
						(3/0 )	mm 9,52 mm 10				
						(1/2")	mm 12 mm 12,7				
							NCLOSUR	E RATING			
								IP 40 X			
							MA		ON SPEED		
								bl	00 rpm 6	PUT TYPE	
									dard length	0,3 m) PR	
			preferred of	able length:	1,5/2/3	/5/10 m,	to be added	after OUTF	OT TYPE (eg	(. PR5)	



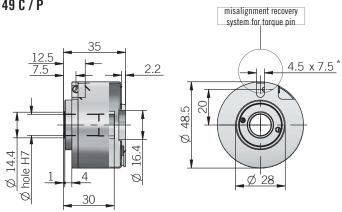
VARIANT custom version XXX

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 $<sup>^{\</sup>rm 2}$  for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

<sup>&</sup>lt;sup>3</sup> measured on the transducer flange 4 condensation not allowed

# 49 C / P



<sup>\*</sup> ø 4 mm torque pin min 0.5 mm from bottom end

for size 19 (version 01 or 14) resolver flange please refer to Accessories

## dimensions in mm

ELECTRICAL SPECIFICATIONS						
Resolution	from 100 to 2048 ppr					
Power supply <sup>1</sup>	5 = 4,5 5,5 V DC 8/24 = 7,6 25,2 V DC					
Current consumption without load	100 mA max					
Max load current	20 mA / channel					
Electrical interface <sup>2</sup>	NPN open collector (pull-up max +30V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AEIT-5000 or equivalent)					
Max output frequency	150 kHz					
Counting direction	A leads B clockwise (shaft view)					
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
+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

MECHANICAL SPECIFICATIONS					
Bore diameter	ø 6 / 8 / 9,52 (3/8") / 10 / 12 / 12,7 (1/2") mm				
Enclosure rating	IP 40 (IEC 60529)				
Max rotation speed	6000 rpm				
Shock	50 G, 11 ms (IEC 60068-2-27)				
Vibration	20 G, 10 2000 Hz (IEC 60068-2-6)				
Moment of inertia	2 x 10 <sup>-6</sup> kgm <sup>2</sup> (47 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	nickel plated brass				
Bearings	n.2 ball bearings				
Bearings life	10 <sup>9</sup> revolutions				
Operating temperature <sup>3, 4</sup>	-20° +85 °C (-4° +185°F) -10° +100°C (+14° +212°F) on demand				
Storage temperature <sup>4</sup>	-25° +85 °C (-13° +185°F)				
Weight	150 g (5,29 oz)				

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

# RESOLUTIONS

100 - 200 - 500 - 512 - 1000 - 1024 - 2000 - 2048

please directly contact our offices for other pulses



ø 49 mm encoder series recommended in feedback control systems on AC servomotors. They include a traditional incremental encoder and commutation signals (Hall effect phases).

- Easy mechanical mounting
- Small dimensions
- Wide range of resolutions available
- High temperature resistance
- 6 channels encoder with optical generation of "Hall effect phases" (commutation signals)
- Signal transmission by bit parallel bus





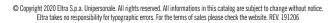




ORDERING CODE	EF	49C	6	L	500	S	5	L	8	Х	6	PR	. XXX
	SERIES												
incremental encoder	·	NODEL											
	blind hollow sha	ft 49C											
	through hollow sha	Ht 49P I	DUI EC										
	4 poles	(2 poles	pair) 4										
	6 poles 8 poles	3 (3 poles 5 (4 poles	pair) 6										
ELF	ECTRICAL INTERFACE FO	R COMM	UTATION										
				ollector C RS-422 L									
				ENTAL RES	OLUTION								
			pp	r from 100 e available	to 2048								
		ı	reier to the	e avallable		O PULSE							
				٧	ithout zer	o pulse S							
					WILII Zei	o pulse Z	SUPPLY						
							5 V DC 5						
			ELE	CTRICAL I	NTERFACE	FOR INC		SIGNALS e driver L					
									IAMETER				
									mm 6 mm 8				
								(3/8")	mm 9,52				
									mm 10 mm 12				
									mm 12,7				
								E	NCLOSUR	E RATING IP 40 X			
									MA	X ROTATIO	N SPEED 00 rpm 6		
									مامالم	- h l - / 1   1		UT TYPE	
					preferred c	able length	s 1.5 / 2 / 3	/ 5 / 10 m.	radial c to be added		lard length ( JT TYPE (eg.		







shield



www.eltra.it





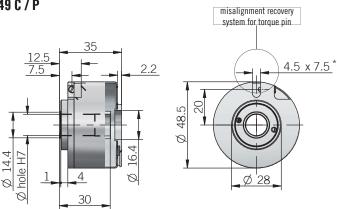


VARIANT

 $<sup>^{\</sup>rm 2}$  for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

<sup>&</sup>lt;sup>3</sup> measured on the transducer flange

<sup>4</sup> condensation not allowed



\* ø 4 mm torque pin min 0.5 mm from bottom end for size 19 (version 01 or 14) resolver flange please refer to Accessories

# dimensions in mm

ELECTRICAL SPECIFICATIONS					
Incremental resolution	from 100 to 2048 ppr				
Power supply <sup>1</sup>	4,5 5,5 V DC				
Current consumption without load	150 mA max				
Max load current	20 mA / channel				
Electrical interface for incremental signals <sup>2</sup>	line driver RS-422 (AELT-5000 or equivalent)				
Electrical interface for Hall phases <sup>2</sup>	NPN open collector (pull-up max +30V DC) line driver RS-422 (AELT-5000 or equivalent)				
Max output frequency	150 kHz				
Counting direction	A leads B clockwise (shaft view)				
Electromagnetic compatibility	according to 2014/30/EU directive				
RoHs	according to 2015/863/EU directive				
UL / CSA	certificate n. E212495				

# CONNECTIONS

Function	Cable							
+V DC	red							
0 V	black							
A+	green							
B+	yellow							
Z+	blue							
A-	brown							
B-	orange or pink							
Z-	white							
U+	grey							
V+	violet							
W+	grey-pink							
U-	red-blue							
V-	white-green							
W-	brown-green							
÷	shield							

MECHANICAL SPECIFICA	ATIONS
Bore diameter	ø 6 / 8 / 9,52 (3/8") / 10 / 12 / 12,7 (1/2") mm
Enclosure rating	IP 40 (IEC 60529)
Max rotation speed	6000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	5 G, 10 500 Hz (IEC 60068-2-6)
Moment of inertia	2 x 10 <sup>-6</sup> kgm <sup>2</sup> (47 x 10 <sup>-6</sup> lbft <sup>2</sup> )
Starting torque (at $+20^{\circ}$ C / $+68^{\circ}$ F)	< 0,01 Nm (1,42 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	nickel plated brass
Bearings	n.2 ball bearings
Bearings life	10 <sup>9</sup> revolutions
Operating temperature <sup>3, 4</sup>	-20° +85 °C (-4° +185°F) -10° +100°C (+14° +212°F) on demand
Storage temperature <sup>4</sup>	-25° +85°C (-13° +185°F)
Weight	150 g (5,29 oz)

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

# RESOLUTIONS

100 4 / 6 poles 200 4 / 6 poles 500 4 / 6 / 8 poles 512 4 / 6 / 8 poles 1000 4 / 6 / 8 poles 1024 4 / 6 / 8 poles 2000 4 / 6 / 8 poles 2048 4 / 6 / 8 poles

please directly contact our offices for other pulses







# MAIN FEATURES

ø 50 mm encoder recommended for motor feedback. Suitable for small size motors due to its compact dimensions.

- · 3 channel encoder (A / B / Z) up to 1024 ppr
- Higly integrated optical ASIC
- Wide power supply up to +30 V DC
- Through hollow shaft up to 10 mm diameter
- Mounting by coupling flange or stator coupling (front or rear fixing)
- IP 65 as protection grade
- Wide temperature range -40 ... + 100°C



ORDERING CODE	EH	50FP	1024	S	5/30	P	6	X	6	PR	. XXX
incremental encod	SERIES er series EH	MODEL									
through hollow shaft through hollow shaf		xing 50FP	OLUTION								
		or from 100 ne available	pulses list								
		V	vithout zer	o pulse Z							
				5 30 V	R SUPPLY DC 5/30 Trical in	TERFACE					
			power sup	ply 5/30V -	lin	sh-pull P e driver L S-422 RS					
							mm 6 mm 8				
						1	mm 9,52 .0 mm 10 ENCLOSURI				
								IP 65 X <b>X rotatio</b>	N SPEED 00 rpm 6		
			preferred o	able length	s 1,5 / 2 / 3	/5/10 m,	radial c	able (stand	<b>OUTF</b> dard length		
				3.	,	,			_		VARIANT sion XXX





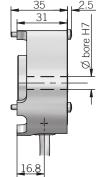


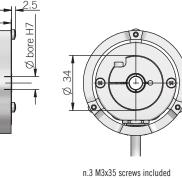
 $<sup>^{\</sup>rm 2}$  for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

<sup>&</sup>lt;sup>3</sup> measured on the transducer flange

<sup>4</sup> condensation not allowed

50 FP





dimensions in mm

ELECTRICAL SPECIFICATIONS					
Resolution	from 100 to 1024 ppr				
Power supply <sup>1</sup>	4,5 30 V DC (with reverse polarity protection)				
Power draw without load	800 mW max				
Max load current	20 mA / channel				
Electrical interface <sup>2</sup>	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)				
Max output frequency	105 kHz				
Counting direction	A leads B clockwise (shaft view)				
Electromagnetic compatibility	according to 2014/30/EU directive				
RoHS	according to 2015/863/EU directive				
UL / CSA	certificate n. E212495				

# RESOLUTIONS

100 - 200 - 256 - **360** - 400 - 500 - **1000** - **1024** ppr

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

CONNECTIONS		
Function	Cable 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 SPECIFICA	ATIONS					
Bore diameter	ø 6 / 8 / 9,52 (3/8") / 10 mm					
Enclosure rating	IP 65 (IEC 60529)					
Max rotation speed	6000 rpm					
Shock	50 G, 11 ms (IEC 60068-2-27)					
Vibration	10 G, 10 2000 Hz (IEC 60068-2-6)					
Moment of inertia	0,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (12 x 10 <sup>-6</sup> lbft <sup>2</sup> )					
Starting torque (at $+20^{\circ}$ C / $+68^{\circ}$ F)	< 0,01 Nm (1,42 Ozin)					
Bearing stage material	EN-AW 2011 aluminum					
Shaft material	1.4305 / AISI 303 stainless steel					
Housing material	EN-AW 2011 aluminum					
Bearings	n.2 ball bearings					
Bearings life	10° revolutions					
Operating temperature <sup>3, 4</sup>	-40° +100 °C (-40° +212°F)					
Storage temperature <sup>4</sup>	-40° +100 °C (-40° +212°F)					
Weight	150 g (5,29 oz) mod.FP 200 g (7,05 oz) mod.FA					

as measured at the transducer without cable influences



**BLIND HOLLOW SHAFT INCREMENTAL ENCODER** 

# MAIN FEATURES

Encoder series for direct mounting on motors; integrated elastic coupling allows radial and axial shaft play.

- · 3 channel encoder (A / B / Z) up to 1024 ppr
- Power supply up to +24 V DC with several electrical interfaces available
- Up to 150 kHz output frequency
- Cable outuput, connector available on cable end
- Up to 10 mm bore diameter
- Integrated elastic couplig









ORDERING CODE	EH	53A	500	S	8/24	P	8	X	6	PR.N	XXX
	SERIES incremental encoder series EH adjustable flange m adjustable flange m										
	ŗ										
		V	rithout zer	ro pulse S ro pulse Z							
		(with	n L electrica	al interface)	5 V DC 5 DC 8/24						
					<b>TRICAL IN</b> PN open co pu	ollector C sh-pull P					
					III	e driver L Bore D	IAMETER mm 6 mm 8				
						E	mm 10	E RATING IP 54 X			
							MA	X ROTATIO	00 rpm 6		
		p	referred cal	ble lengths	1,5/2/3/			ole (standar fter OUTPUT	d length 0,	PR5)	
									(	custom ver	VARIANT sion XXX

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<sup>&</sup>lt;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

# 1 x Ø 46.5 h7

# 53 B interface



# dimensions in mm

<b>ELECTRICAL SPECIFICA</b>	TIONS
Resolution	from 100 to 1024 ppr
Power supply <sup>1</sup>	$ 5 = 4.5 \dots 5.5 \text{ V DC}                                  $
Current consumption without load	100 mA max
Max load current	C / P = 50 mA / channel L = 20 mA / channel
Electrical interface <sup>2</sup>	NPN open collector (pull-up max +30V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	150 kHz
Counting direction	A leads B clockwise (shaft view)
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
+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 SPECIFICA	ATIONS				
Bore diameter	ø6/8/10 mm				
Enclosure rating	IP 54 (IEC 60529)				
Max rotation speed	6000 rpm				
Shock	50 G, 11 ms (IEC 60068-2-27)				
Vibration	10 G, 10 2000 Hz (IEC 60068-2-6)				
Moment of inertia	1 x 10 <sup>-6</sup> kgm <sup>2</sup> (24 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	PA66 glass fiber reinforced				
Bearings	n.2 ball bearings				
Bearings life	10° revolutions				
Operating temperature <sup>3, 4</sup>	-10° +60°C (+14° +140°F)				
Storage temperature <sup>4</sup>	-25° +70°C (-13° +158°F)				
Weight	150 g (5,29 oz)				
as measured at the transducer without eable influence					

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

# RESOLUTIONS

50 - 100 - 120 - 125 - 128 - 150 - 180 - 200 - 250 - 256 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 1000 - 1024

please directly contact our offices for other pulses







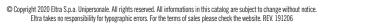
Encoder series for direct mounting on motors; integrated elastic coupling allows radial and axial shaft play.

- · 3 channel encoder (A / B / Z) up to 10000 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
- · Integrated elastic couplig up to 10 mm bore diameter



ORDERING CODE	ER	53A	M*	500	S	5/28	P	8	X	6	Р	R	XXX
ORDERING CODE	SERIES incremental encoder series EL incremental encoder series ER adjustable flange mo adjustable flange mo	MODEL del 53A del 53B META dd for meta	L COVER al cover M RES pr from 1 e available p W	<b>OLUTION</b> to 10000 pulses list	RO PULSE o pulse S o pulse Z POWER al interface) 5 28 V ELEC	S SUPPLY 5 V DC 5 DC 5/28 TRICAL IN PN open c pu lin	TERFACE Ollector C sh-pull P e driver L S-422 RS BORE I		E RATING	6	P	R	XXX
				preferr	ed cable len	gths 2 / 3 /		MA	IP 54 X IP 64 S X ROTATIO (IP 64) 30 (IP 54) 60 cable (sta after DIREC	DN SPEED 100 rpm 3 100 rpm 6 OUTI ndard lengt TION TYPE ( MIL coi -C-5432 cc	PUT TYPE th 1,5 m) P reg. PR5) nnector M onnector J		
					female co	onnector in	cluded, with	l nout female	P40 IEC 6	M12 conne M23 co 0130-9 co	ector M12 nnector H nnector C ant code	I <b>ON TYPE</b> axial A radial R	VARIANT





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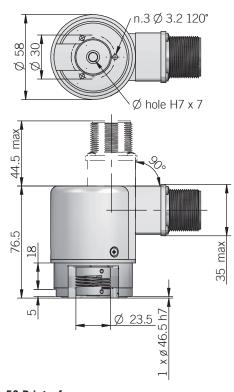


<sup>&</sup>lt;sup>2</sup> for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

<sup>&</sup>lt;sup>3</sup> measured on the transducer flange

<sup>4</sup> condensation not allowed

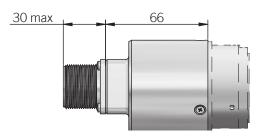
# 53 A



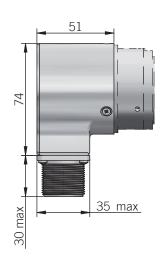
# 53 B interface



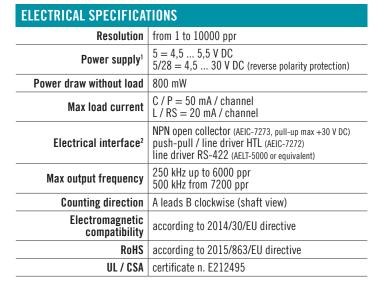
dimensions in mm



# Dimensions with metal cover and radial output



# Dimensions with metal cover and axial output



# **EL SERIES RESOLUTIONS**

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 25 - 30 - 32 - 40 - 50 - 60 - 70 - 80 - 90 - 160 - 180 - 350 - 450 - 660 - 700 - 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 **-**

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

MECHANICAL SPECIFICA	ATIONS
Bore diameter	ø6/8/10 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 64 (IEC 60529)
Max rotation speed	IP 64 - 3000 rpm IP 54 - 6000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 2000 Hz (IEC 60068-2-6)
Moment of inertia	1 x 10 <sup>-6</sup> kgm <sup>2</sup> (24 x 10 <sup>-6</sup> lbft <sup>2</sup> )
Starting torque (at $+20^{\circ}$ C / $+68^{\circ}$ F)	< 0,01 Nm (1,42 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced / painted aluminum
Bearings	n.2 ball bearings
Bearings life	10 <sup>9</sup> revolutions
Operating temperature <sup>3, 4</sup>	-10° +60°C (+14° +140°F) -25° +85°C (-13° +185°F) ER series
Storage temperature <sup>4</sup>	-25° +70°C (-13° +158°F)
Weight	350 g (12,35 oz)

as measured at the transducer without cable influences

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

3 measured on the transducer flange

4 condensation not allowed

# CONNECTIONS

													/
Function	Cable C / P	Cable L / RS	7 pin J C / P	7 pin J L / RS no Zero	7 pin M C / P	7 pin M L / RS no Zero	10 pin J L / RS with Zero	10 pin M L / RS with Zero	5 pin M12 C / P	8 pin M12 L / RS	12 pin H	5 pin C C / P	8 pin C L/RS
+V DC	red	red	6	4	F	D	4 - 5	D - E	2	7	12	5	7
0 V	black	black	1	6	A	F	6	F	4	1	10	1	8
A+	green	green	3	1	С	Α	1	A	3	6	5	2	1
A-	/	brown or grey	/	3	/	С	7	G	/	5	6	/	2
B+	yellow	yellow	5	2	E	В	2	В	1	4	8	4	3
B-	/	orange	/	5	/	E	8	Н	/	3	1	/	4
Z+	blue	blue	4	/	D	/	3	С	5	2	3	3	5
Z-	/	white	/	/	/	/	9	I	/	8	4	/	6
<u></u>	shield	shield	7	7	G	G	10	J	housing	housing	9	/	/

J connector (7 pin) JIS-C-5432 Size 16 solder side view FV



J connector (10 pin)

JIS-C-5432 Size 16

solder side view FV

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M connector (10 pin) Amphenol MS3102-E-18-1 solder side view FV

M connector (7 pin)

Amphenol MS3102-E-16-S

solder side view FV



M12 A coded solder side view FV

M12 connector (5 pin)



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



C connector (5 pin) IEC 60130-9 solder side view FV



C connector (8 pin) IEC 60130-9 solder side view FV

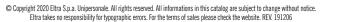


H connector (12 pin) - M23 CCW Hummel 7.410.000000 -7.002.912.603 solder side view FV



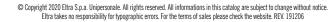
















# EL - ER 58 F / G EL - ER 63 F / G

# **BLIND HOLLOW SHAFT INCREMENTAL ENCODER**

# MAIN FEATURES

Hollow shaft encoder series for industrial applications with high mechanical resistance requirements. These encoders are designed to withstand high radial and axial shaft loads.

- · 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
- Blind hollow shaft diameter up to 15 mm
- Mounting by stator coupling, torque stop slot or torque pin







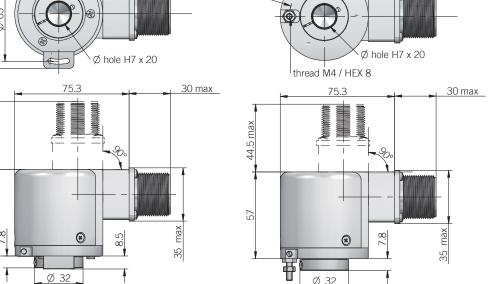
58 F

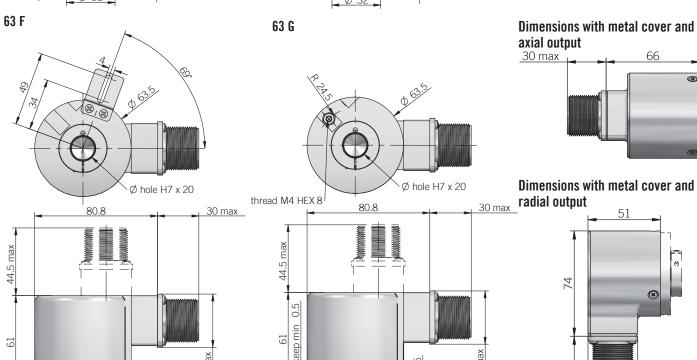




ORDERING CODE	ER	58F	M*	500	S	5/28	P	8	X	3	P	R	. XXX
bl	SERIES incremental encoder series EL incremental encoder series ER lind hollow shaft with stator cou blind hollow shaft with torqu ind hollow shaft with torque stoj blind hollow shaft with torqu	MODEL pling 58F e pin 58G p slot 63F e pin 63G META add for met	AL COVER Al cover M RES opr from 1 e available v (with	SOLUTION to 24000 pulses list ZEF without zer with zer h L electrica	RO PULSE o pulse S o pulse Z POWE al interface) 5 28 V ELEC N	R SUPPLY 5 V DC 5 / DC 5/28 STRICAL IN IPN open c pu lin - output R	ITERFACE ollector C ish-pull P e driver L S-422 RS BORE C	DIAMETER mm 8 mm 10 mm 12 mm 14 mm 15 ENCLOSUR	IE RATING IP 54 X IP 66 S AX ROTATIO 3C cable (sta	ON SPEED 100 rpm 3 OUT 100 TYPE ( MIL coi C3-5432 co M12 conn	PUT TYPE th 1,5 m) P eg. PR5) nnector t nnector t pector M12	R	. XXX
									IP40 IEC 6	M23 co 0130-9 co	nnector H nnector C		
					female o	onnector in	cluded, with	out female	please add	162 as vari		ION TYPE	
												axial A radial R	

# 58 G





torque pin is included in model G, for model F please refer to Accessories dimensions in mm









35 max

VARIANT custom version XXX

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# OPTICAL HOLLOW SHAFT INCREMENTAL ENCODERS | EL - ER 58 F / G - EL - ER 63 F / G

ELECTRICAL SPECIFICATIONS						
Resolution	from 1 to 2500 ppr (58 G) from 1 to 24000 ppr (58 F - 63 F / G)					
Power supply <sup>1</sup>	$5 = 4.5 \dots 5.5 \text{ V DC}$ $5/28 = 4.5 \dots 30 \text{ V DC}$ (reverse polarity protection)					
Power draw without load	800 mW max					
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 6000 ppr 500 kHz from 7200 ppr					
Counting direction	A leads B clockwise (shaft view)					
Electromagnetic compatibility	according to 2014/30/EU directive					
RoHS	according to 2015/863/EU directive					
UL / CSA	certificate n. E212495					

# **EL SERIES RESOLUTIONS**

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 25 - 30 - 32 - 40 - 50 - 60 - 70 - 80 - 90 - 160 - 180 - 350 - 450 - 660 - 700 - 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 - 9000 - **10000** - 10240 - 12000 - **14400** - 16000 - 16384 - 18000 - **20000** - 20480 - 24000

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

MECHANICAL SPECIFIC	ATIONS
Bore diameter	$\emptyset$ 8* / 10* / 12* / 14 / 15 mm   * with supplied shaft adapter (valid for resolutions $\ge$ 3000 ppr)
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	3000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 2000 Hz (IEC 60068-2-6)
Moment of inertia	4 x 10 <sup>-6</sup> kgm <sup>2</sup> (95 x 10 <sup>-6</sup> lbft <sup>2</sup> )
Starting torque (at $+20^{\circ}$ C / $+68^{\circ}$ F)	
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced / painted aluminum
Bearings	n.2 ball bearings
Bearings life	10 <sup>9</sup> revolutions
Operating temperature <sup>3, 4</sup>	-10° +60°C (+14° +140°F) EL series -20° +70°C (-4° +158°F) ER series
Storage temperature <sup>4</sup>	-25° +70°C (-13° +158°F)
Fixing torque for collar clamping	1,5 Nm (212 Ozin) recommended

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

4 condensation not allowed

CONNEC	TIONS												
Function	Cable C / P	Cable L / RS	7 pin J C / P	7 pin J L / RS no Zero	7 pin M C / P	7 pin M L / RS no Zero	10 pin J L / RS with Zero	10 pin M L / RS with Zero	5 pin M12 C / P	8 pin M12 L / RS	12 pin H	5 pin C C / P	8 pin C L / RS
+V DC	red	red	6	4	F	D	4 - 5	D - E	2	7	12	5	7
0 V	black	black	1	6	Α	F	6	F	4	1	10	1	8
A+	green	green	3	1	С	Α	1	Α	3	6	5	2	1
A-	/	brown or grey	/	3	/	С	7	G	/	5	6	/	2
B+	yellow	yellow	5	2	Е	В	2	В	1	4	8	4	3
B-	/	orange	/	5	/	E	8	Н	/	3	1	/	4
Z+	blue	blue	4	/	D	/	3	С	5	2	3	3	5
Z-	/	white	/	/	/	/	9	I	/	8	4	/	6
÷	shield	shield	7	7	G	G	10	J	housing	housing	9	/	/

J connector (7 pin) JIS-C-5432 Size 16 solder side view FV



J connector (10 pin) JIS-C-5432 Size 16 solder side view FV



M connector (7 pin) Amphenol MS3102-E-16-S solder side view FV



M connector (10 pin) Amphenol MS3102-E-18-1 solder side view FV



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



M12 connector (5 pin)

M12 A coded

solder side view FV

C connector (5 pin) IEC 60130-9 solder side view FV



C connector (8 pin) IEC 60130-9

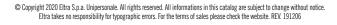


H connector (12 pin) - M23 CCW Hummel 7.410.000000 -7.002.912.603 solder side view FV













# EL 63 FB / GB / PB / PBF / PC / PCF

BLIND / THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

# MAIN FEATURES

Hollow shaft encoder series for small AC motors, thanks to compact size (only 35mm height).

- · 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 300 kHz output frequency
- · Cable output, connector available on cable end
- · Through or blind hollow shaft diameter up to 15 mm
- Shaft fixing by collar clamping





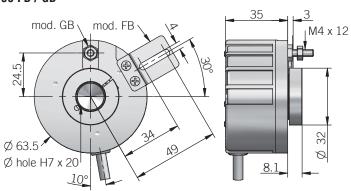




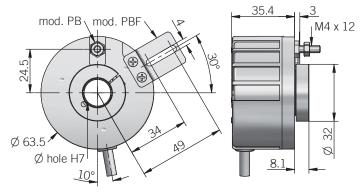
ORDERING CODE	EL	63GB	500	S	5/28	Р	8	X	3	PR	. XXX
increi blind hollow sha blind hollow through hollow through hollow shaft rear fixin	SERIES mental encoder EL  ft with torque stop s v shaft with torque p v shaft with torque g with torque stop slo g shaft with torque g with torque stop slo	MODEL slot 63FB bin 63PB pin 63PBF pin 63PCF RES ppr from 1 e available	OLUTION L to 2500 pulses list ZEF without zer with zer h L electrica	RO PULSE O pulse S To pulse Z POWEF al interface) 5 28 V ELEC	R SUPPLY 5 V DC 5 DC 5/28 TRICAL IN PN open co pu lin - output R:	TERFACE Ollector C sh-pull P e driver L S-422 RS BORE D	IAMETER mm 8 mm 10 mm 12 mm 14 mm 15 NCLOSURI MA	E RATING IP 54 X X ROTATIO 30 able (standa	<b>N SPEED</b> 00 rpm 3 <b>OUTF</b> dard length	PUT TYPE 1,5 m) PR	. XXX
											VARIANT



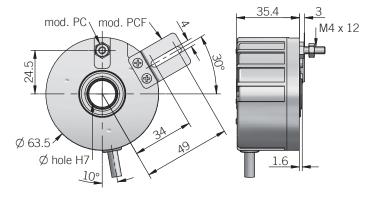




# 63 PB / PBF



# 63 PC / PCF



torque pin is included in model GB / PB / PC, for model FB / PBF / PCF please refer to Accessories

dimensions in mm

ELECTRICAL SPECIFICATIONS					
Resolution	from 1 to 2500 ppr				
Power supply <sup>1</sup>	$5 = 4.5 \dots 5.5 \text{ V DC}$ $5/28 = 4.5 \dots 30 \text{ V DC}$ (reverse polarity protection)				
Power draw without load	800 mW max				
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	300 kHz				
Counting direction	A leads B clockwise (shaft view)				
Electromagnetic compatibility	according to 2014/30/EU directive				
RoHS	according to 2015/863/EU directive				
UL / CSA	certificate n. E212495				

MECHANICAL SPECIFICATIONS			
Bore diameter	ø8/10/12/14/15 mm		
Enclosure rating	IP 54 (IEC 60529)		
Max rotation speed	3000 rpm		
Shock	50 G, 11 ms (IEC 60068-2-27)		
Vibration	10 G, 10 2000 Hz (IEC 60068-2-6)		
Moment of inertia	4 x 10 <sup>-6</sup> kgm <sup>2</sup> (95 x 10 <sup>-6</sup> lbft <sup>2</sup> )		
Starting torque (at +20°C / +68°F)	< 0,04 Nm (5,66 Ozin)		
Bearing stage material	EN-AW 2011 aluminum		
Shaft material	1.4305 / AISI 303 stainless steel		
Housing material	PA 66 glass fiber reinforced		
Bearings	n.2 ball bearings		
Bearings life	10 <sup>9</sup> revolutions		
Operating temperature <sup>3, 4</sup>	-10° +60 °C (+14° +140°F)		
Storage temperature <sup>4</sup>	-25° +70 °C (-13° +158°F)		
Weight	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
- 4 condensation not allowed

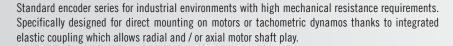
CONNECTIONS		
Function	Cable C / P	Cable L / RS
+V DC	red	red
0 V	black	black
A+	green	green
A-	/	brown or grey
B+	yellow	yellow
B-	/	orange
Z+	blue	blue
Z-	/	white
<u></u>	shield	shield

# RESOLUTIONS

1 - 2 - 5 - **20** - 25 - **32** - 50 - 60 - 100 - 128 - **200** - 250 - 256 - **360** - 400 - 500 -512 - 600 - 720 - 1000 - **1024** - 1440 - 1800 - **2000** - 2048 - 2500

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





- · 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
- Integrated elastic couplig up to 10 mm bore diameter



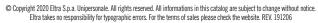






incremental encoder series II. incremental encoder series II. incremental encoder series II. fixing holes \$63,5 mm 721 fixing holes \$65 mm 722 fixing holes \$60 mm 724 fixing type 8  METAL COVER  * add fir metal cover M  RESOLUTION por from 1 to 24000 refer to the available pulses into your fear fear fear fear fear fear fear fea	ORDERING CODE	ER	721	A	M*	500	S	5/28	Р	8	X	6	Р	R	. XXX
incremental encoder series ER I  MODEL fixing plotes § 63.5 mm 721 tixing plotes § 65 mm 722 tixing plotes § 67 mm 723 tixing holes § 67 mm 723 tixing holes § 67 mm 723 tixing holes § 60 mm 724 tixing plotes § 60 mm 724 tixing per form 1 to 24000 refer to the available plotes list  EED PULSE without zero pulse S with zero pulse S with zero pulse S with zero pulse S vivit zero pulse S vivit zero pulse S vivit zero pulse S S 2.8 V D C 228 ELECTRICAL INTERFACE UPS power supply 5/28V - output RS.422 RS  BORE DIAMETER mm 6 mm 8 mm 10  ENCLOSIBLE RATING PS 4 X (mod. EL721 / ED22 PP 66 S) mm 8 mm 10  ENCLOSIBLE RATING PS 4 X (mod. EL722 / ED22 PP 66 S) MR ROTATION SPEED (ps 65) 3000 rpm 3 (ps 54) 3000 rpm 3 (ps 56) 3000 rpm 3 (p															
fixing plotes \$6.3.5 mm 721 though plotes \$6.5 mm 722 thing plotes \$6.5 mm 723 thing plotes \$6.5 mm 723 thing plotes \$6.5 mm 724 thing plotes \$6.5 mm 725 thing plotes \$6.5															
fixing holes \$6 5 mm 722   fixing holes \$6 5 mm 723   fixing holes \$6 0 mm 724   FLANGE TYPE   flange type \$6   flange type \$1   flange type \$2   flange type \$		fixing holes ø 63 5													
flange type A flange type B  METAL COVER  * add for metal cover MI  RESOLUTION  ppur from 1 to 24000  refer to the available pulses list I  POWER SUPPLY  (with L electrical interface) 5 V DC. 5  5 28 V DC. 5/28  ELECTRICAL INTERFACE  NPR open collector C  push-pull P  line driver I  power supply 5/28V - output RS-342 B B  BORE DIAMETER  mm 6  mm 8  mm 10  ENCLOSUBE RATING  IP 54 X  (mod. E1/21 / E1/22 IP 66 S)  MAX ROTATION SPEED  (IP 66) 3000 rpm 3  (IP 69) 3000 ppm 6  UTPUT YPE  Cable Ctandard legish 1,5 m) P  preferred cable lengths 2 / 3 / 5 / 10 m, to be added after interciton YPYE (px) S  MI L connector MI Z  M22 connector I  M23 connector I  M24 Connector II  M25 connector II  M26 connector II  M27 connector II  M27 connector II  M27 connector II  M28 connector II  M29 connector II  M20 connector II  M21 connector II  M22 connector II  M23 connector II  M25 connector II  M25 connector II  M25 connector II  M26 connector II  M27 connector II  M27 connector III  M27 connector II  M28 connector II  M27 connector II  M27 connector II  M27 connector II  M28 connector II  M28 connector II  M29 connector II  M27 connector II  M27 connector II  M28 connector II  M29 connector II		fixing holes ø 65 fixing holes ø 57	mm 722 mm 723												
## add for metal cover M  ## add for metal cover M  ## resolution  ## profer to the available pulse list  ## power supplies Z  ## power supply 5/28V - output RS-422 RS  ## power supply 5/28V - outpu															
* add for metal cover M PRESOLUTION ppr from 1 to 24000 refer to the available pulses list  ***ERR PULSE** without zero pulse S with zero pulse S with zero pulse S vith zero pulse S vith zero pulse S vith zero pulse S vith zero pulse S S S - 28 V to 55 S - 28 V to 52 S S S - 28 V to 52 S S S S S S S S S S S S S S S S S S				ge type B											
ppr from 1 to 24000 refer to the available pulses list    ZERO PULSE without zero pulse S with zero pulse P pulse pull P line driver L power supply 5/28V - output RS-422 RS  BORE DIAMETER mm 6 mm 8 mm 10  ENCLOSURE RATING    ENCLOSURE RATING    (mod. EL721 / EL722) IP 66 S    MAX ROTATION SPEED    (p 65) 3000 rpm 3 (IP 54) 6000 rpm 6    (p 65) 3000 rpm 6    OUTPUT TYPE cable (standard length 1,5 m) P    preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (E.p. PR5)    MIL connector MIL			* a												
refer to the available pulses list I  ZERO PULSE  without zero pulse S  with zero pulse S  power suppty 5/28 S  ELECTRICAL INTERFACE  NPN open collector C  pulse-pull P  line driver L  power suppty 5/28V - output RS-422 RS  BORE DIAMETER  mm 6  mm 8  mm 10  ENCLOSURE RATING  IP 94 X  (mod. EL721 / EL722) IP 66 S  MAX ROTATION SPEED  (#65) 5000 rpm 6  (#65) 5000 rpm 6  OUTPUT TYPE  Cable (standard length 1,5 m) P  preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE, e. PR6)  MIL connector M  JIS-C-5432 connector J  MIZ connector M12  MIZ connector M12  MIZ connector M12  MIZ connector C  female connector included, without female please add 162 as variant code  DIRECTION TYPE  axial A															
without zero pulse S with zero pulse S with zero pulse Y POWER SUPPLY (with L electrical interface) 5 V D C 5 / 28  ELECTRICAL INTERFACE NPN open collector C push-pull P line driver L power supply 5/28V - output RS-422 RS BORE DIAMETER mm 6 mm 8 mm 10  ENCLOSURE RATING IP 54 X (mod. EL721 / EL721 / E 6 S S S S S S S S S S S S S S S S S S															
with zero pulse 7   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 5/28V - output RS-422 RS  BORE DIAMFEER ATING					v										
(with L electrical interface) S V DC 5/28   ELECTRICAL INTERFACE NPN open collector C push-pull P line driver L power supply 5/28V - output RS-422 RS  BORE DIAMETER mm 6 mm 8 mm 10  ENCLOSURE RATING IP 54 X (mod. EL721/EL722) IP 66 S  MAX ROTATION SPEED (IP 63 3000 rpm 3 (IP 95 4 S000 rpm 6) (IP 64 6000 rpm 6)  DUTPUT TYPE  Cable (standard length 1,5 m) P preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. RS) MIL connector M JIS-C-5432 connector J MIL connector M JIS-C-5432 connector J MIL connector M12 M23 connector M12 M23 connector C female connector included, without female please add 162 as variant code  DIRECTION TYPE axial A						with zer	ro pulse Z								
ELECTRICAL INTERFACE NPN open collector C push-pull P line driver L power supply 5/28V - output RS-422 RS  BORE DIAMETER mm 6 mm 8 mm 10  ENCLOSURE RATING IP 54 X (mod. EL721 / EL722) IP 66 S  MAX ROTATION SPEED (IP 60) 3000 rpm 3 (IP 54) 6000 rpm 6 (IP 63) 6000 rpm 3 (IP 54) 6000 rpm 6  OUTPUT TYPE Cable (standard length 1,5 m) P preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5) MIL connector M JIS-C-5432 connector J M12 connector M12 M23 connector H IP40 IEC 60130-9 connector C female connector included, without female please add 162 as variant code  DIRECTION TYPE axial A					(wit	h L electrica	al interface)	5 V DC 5							
NPN open collector C push-pull P line driver L power supply 5/28V - output RS-422 RS  BORE DIAMETER mm 6 mm 8 mm 10  ENCLOSURE RATING IP 54 X (mod. EL721 / EL722) IP 66 X  MAX ROTATION SPEED (IP 66) 3000 rpm 3 (IP 54) 6000 rpm 6  UP 54) 6000 rpm 6  OUTPUT TYPE cable (standard length 1,5 m) P preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5) MIL connector M JIS-C-5432 connector J M12 connector M JP 50 - 5432 connector L M23 connector H IP 40 IEC 60130-9 connector C female connector included, without female please add 162 as variant code  DIRECTION TYPE axial A															
ine driver L power supply 5/28V - output RS-422 RS  BORE DIAMETER mm 6 mm 8 mm 10  ENCLOSURE RATING								PN open c	ollector C						
BORE DIAMETER mm 6 mm 8 mm 10  ENCLOSURE RATING IP 54 X (mod. EL721 / EL722) IP 66 S  MAX ROTATION SPEED (IP 66) 3000 rpm 3 (IP 54) 6000 rpm 6  OUTPUT TYPE  Cable (standard length 1,5 m) P preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5) MIL connector M JIS-C-5432 connector J M12 connector M JIS-C-5432 connector H IP 40 IEC 60130-9 connector C female connector included, without female please add 162 as variant code  DIRECTION TYPE axial A							1 5/001/	İin	e driver L						
mm 8 mm 10  ENCLOSURE RATING IP 54 X (mod. EL721/EL722) IP 66 S  MAX ROTATION SPEED (IP 66) 3000 rpm 3 (IP 54) 6000 rpm 6  OUTPUT TYPE  cable (standard length 1,5 m) P preferred cable lengths 2/3/5/10 m, to be added after DIRECTION TYPE (eg. PRS) MIL connector M  JIS-C-5432 connector J MI2 connector M12 M23 connector H IP40 IEC 60130-9 connector C female connector included, without female please add 162 as variant code  DIRECTION TYPE axial A						power sup	ply 5/28V -	- output K		IAMETER					
ENCLOSURE RATING IP 54 X (mod. EL721 / EL722) IP 66 S  MAX ROTATION SPEED (IP 66) 3000 rpm 3 (IP 54) 6000 rpm 6  OUTPUT TYPE Cable (standard length 1,5 m) P preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5) MIL connector M JIS-C-5432 connector J M12 connector M12 M23 connector H IP40 IEC 60130-9 connector C female connector included, without female please add 162 as variant code  DIRECTION TYPE axial A										mm 6					
IP 54 X  (mod. EL721 / EL722) IP 66 S  MAX ROTATION SPEED  (IP 66) 3000 rpm 3  (IP 54) 6000 rpm 6  OUTPUT TYPE  Cable (standard length 1,5 m) P  preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)  MIL connector M  JIS-C-5432 connector J  M12 connector M12  M23 connector H  IP40 IEC 60130-9 connector C  female connector included, without female please add 162 as variant code  DIRECTION TYPE  axial A									_	mm 10					
MAX ROTATION SPEED  (IP 66) 3000 rpm 3  (IP 54) 6000 rpm 6  OUTPUT TYPE  Cable (standard length 1,5 m) P  preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)  MIL connector M  JIS-C-5432 connector J  M12 connector M12  M23 connector H  IP40 IEC 60130-9 connector C  female connector included, without female please add 162 as variant code  DIRECTION TYPE  axial A											IP 54 X				
(IP 66) 3000 rpm 3 (IP 54) 6000 rpm 6  OUTPUT TYPE  cable (standard length 1,5 m) P  preferred cable lengths 2/3/5/10 m, to be added after DIRECTION TYPE (eg. PR5)  MIL connector M  JIS-C-5432 connector J  M12 connector M12  M23 connector H  IP40 IEC 60130-9 connector C  female connector included, without female please add 162 as variant code  DIRECTION TYPE  axial A									(mod. EL						
OUTPUT TYPE  cable (standard length 1,5 m) P  preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)  MIL connector M  JIS-C-5432 connector J  M12 connector M12  M23 connector H  IP40 IEC 60130-9 connector C  female connector included, without female please add 162 as variant code  DIRECTION TYPE  axial A										IVIE	(IP 66) 30	000 rpm 3			
preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)  MIL connector M  JIS-C-5432 connector J  M12 connector M12  M23 connector H  IP40 IEC 60130-9 connector C  female connector included, without female please add 162 as variant code  DIRECTION TYPE  axial A											(IP 54) OU	-			
MIL connector M  JIS-C-5432 connector J  M12 connector M12  M23 connector H  IP40 IEC 60130-9 connector C  female connector included, without female please add 162 as variant code  DIRECTION TYPE  axial A						nreferi	red cable ler	oths 2 / 3	' 5 / 10 m to	n he added					
M12 connector M12 M23 connector H IP40 IEC 60130-9 connector C female connector included, without female please add 162 as variant code  DIRECTION TYPE axial A						protott	.00 00010 101	.g / 0 /	0 / 20, 0	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		MIL co	nnector M		
IP40 IEC 60130-9 connector C female connector included, without female please add 162 as variant code  DIRECTION TYPE axial A												M12 conn	ector M12		
DIRECTION TYPE  axial A												0130-9 co	nnector C		
axial A							female c	onnector in	cluded, with	out female	please add	162 as vari		INN TYPF	
													DINEUI		







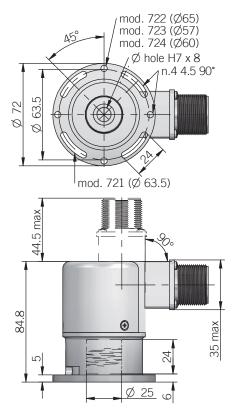


custom version XXX

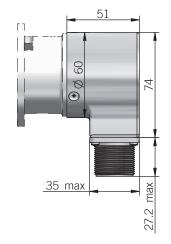
VARIANT

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# 721 A

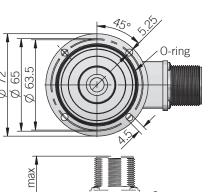


# Dimensions with metal cover radial output



dimensions in mm

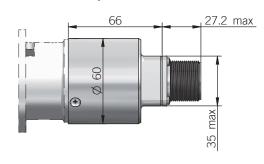
# 721 A IP 66



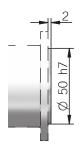


Dimensions with metal cover axial output

oring is included



# 72 B flange version



# **Resolution** from 1 to 24000 ppr $5 = 4,5 \dots 5,5 \text{ V DC}$ Power supply<sup>1</sup> $5/28 = 4.5 \dots 30 \text{ V DC}$ (reverse polarity protection) Power draw without load | 800 mW max $\overline{C/P} = 50 \text{ mA/channel}$ Max load current L/RS = 20 mA/channelNPN 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) Electrical interface<sup>2</sup> 250 kHz up to 6000 ppr 500 kHz from 7200 ppr Max output frequency **Counting direction** A leads B clockwise (shaft view)

# **EL SERIES RESOLUTIONS**

Electromagnetic compatibility

**ELECTRICAL SPECIFICATIONS** 

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 25 - 30 - 32 - 40 - 50 - 60 - 70 - 80 - 90 - 100\* -160 - 180 - 240\* - 250\* - 350 - 450 - 500\* - 660 - 700 - 750 - 900\* - 1000\* - 1024\* - 1250\* - 1300\* - 1500 - 1800\* - 2000\* - 2048\* - 2500\*

UL / CSA | certificate n. E212495

according to 2014/30/EU directive **RoHS** | according to 2015/863/EU directive

# **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 - 9000 - **10000** - 10240 - 12000 - **14400** - 16000 - 16384 - 18000 - **20000** -

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

MECHANICAL SPECIFICATIONS				
Bore diameter	ø6/8/10 mm			
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)			
Max rotation speed	IP 54 - 6000 rpm IP 66 - EL 3000 rpm / 60° C ER 3000 rpm / 70° C - 2000 rpm / 85° C			
Shock	50 G, 11 ms (IEC 60068-2-27)			
Vibration	10 G, 10 2000 Hz (IEC 60068-2-6)			
Moment of inertia	3,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (83 x 10 <sup>-6</sup> lbft <sup>2</sup> )			
Starting torque (at +20°C / +68°F)	< 0,02 Nm (2,83 Ozin) IP 54 < 0,04 Nm (5,66 Ozin) IP 66			
Bearing stage material	EN-AW 2011 aluminum			
Shaft material	1.4305 / AISI 303 stainless steel			
Housing material	PA66 glass fiber reinforced / painted aluminum			
Bearings	n.2 ball bearings			
Bearings life	10 <sup>9</sup> revolutions			
Operating temperature <sup>3, 4</sup>	-10° +60°C (+14° +140°F) EL series -25° +85°C (-13° +185°F) ER series			
Storage temperature <sup>4</sup>	-25° +70°C (-13° +158°F)			
Weight	400 g (14,11 oz)			

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

# CUNNECTIONS

CONNEC	IIUNS												
Function	Cable C / P	Cable L / RS	7 pin J C / P	7 pin J L / RS no Zero	7 pin M C / P	7 pin M L / RS no Zero	10 pin J L / RS with Zero	10 pin M L / RS with Zero	5 pin M12 C / P	8 pin M12 L / RS	12 pin H	5 pin C C / P	8 pin C L / RS
+V DC	red	red	6	4	F	D	4 - 5	D - E	2	7	12	5	7
0 V	black	black	1	6	A	F	6	F	4	1	10	1	8
A+	green	green	3	1	С	А	1	А	3	6	5	2	1
A-	/	brown or grey	/	3	/	С	7	G	/	5	6	/	2
B+	yellow	yellow	5	2	E	В	2	В	1	4	8	4	3
B-	/	orange	/	5	/	Е	8	Н	/	3	1	/	4
Z+	blue	blue	4	/	D	/	3	С	5	2	3	3	5
Z-	/	white	/	/	/	/	9	I	/	8	4	/	6
÷	shield	shield	7	7	G	G	10	J	housing	housing	9	/	/

J connector (7 pin) JIS-C-5432 Size 16 solder side view FV



M12 connector (5 pin) Amphenol MS3102-E-16-S M12 A coded solder side view FV



M12 connector (8 pin) M12 A coded



C connector (5 pin) IEC 60130-9 solder side view FV



C connector (8 pin) IEC 60130-9 solder side view FV H connector (12 pin) - M23 CCW Hummel 7.410.000000 -7.002.912.603 solder side view FV





J connector (10 pin)

JIS-C-5432 Size 16



M connector (10 pin) Amphenol MS3102-E-18-1

solder side view FV

M connector (7 pin)

solder side view FV









<sup>\*</sup> only with model EL721 / EL722 with "S" enclosure rating



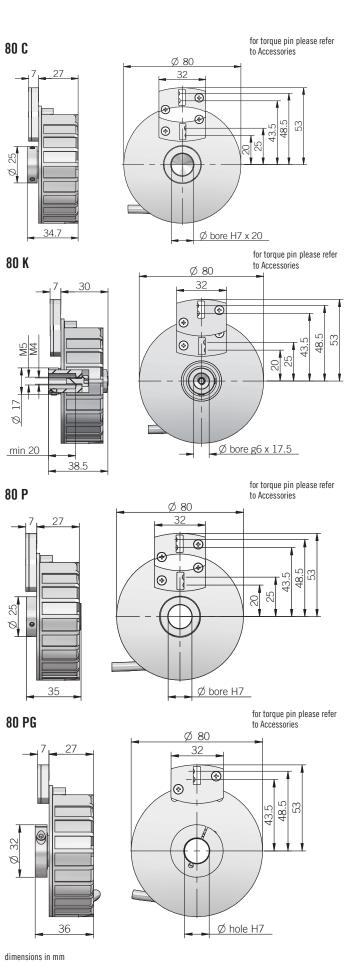
# MAIN FEATURES

ø 80 mm encoder series recommended in feedback control systems on AC servomotors.

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +30 V DC with several electric interfaces available
- Up to 105 kHz output frequency
- Cable output, connector available on cable end
- Through or blind hollow shaft diameter up to 15 mm
- Shaft fixing by grain or collar clamping







ELECTRICAL SPECIFICATIONS					
Resolution	from 1 to 2048 ppr				
Power supply <sup>1</sup>	$5 = 4.5 \dots 5.5 \text{ V DC}$ $5/28 = 4.5 \dots 30 \text{ V DC}$ (reverse polarity protection)				
Power draw without load	800 mW max				
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	105 kHz				
Counting direction	A leads B clockwise (shaft view)				
Electromagnetic compatibility	according to 2014/30/EU directive				
RoHS	according to 2015/863/EU directive				
UL / CSA	certificate n. E212495				

MECHANICAL SPECIFICA	ATIONS			
Bore diameter	ø8/10/12/14/15 mm			
Enclosure rating	IP 64 (IEC 60529)			
Max rotation speed	3000 rpm (mod.P / PG) 6000 rpm (mod.C / K)			
Shock	50 G, 11 ms (IEC 60068-2-27)			
Vibration	20 G, 10 2000 Hz (IEC 60068-2-6)			
Moment of inertia	4 x 10 <sup>-6</sup> kgm <sup>2</sup> (95 x 10 <sup>-6</sup> lbft <sup>2</sup> )			
Starting torque (at +20°C / +68°F)	< 0,04 Nm (5,66 Ozin)			
Bearing stage material	PA66 glass fiber reinforced			
Shaft material	EN-AW 2011 aluminum (mod. C / K) 1.4305 / AISI 303 stainless steel (mod.P / PG)			
Housing material	PA66 glass fiber reinforced			
Bearings	n.2 ball bearings			
Bearings life	10 <sup>9</sup> revolutions			
Operating temperature <sup>3, 4</sup>	-20° +85 °C (-4° +185°F) -20° +100°C (-4° +212°F) on demand			
Storage temperature <sup>4</sup>	-25° +85 °C (-13° +185°F)			
Weight	250 g (8,82 oz)			
1.10 1. 1. 20 1. 11. 0				

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

<sup>4</sup> condensation not allowed

CUNNECTIONS		
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
<u></u>	shield	shield

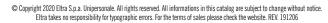
# RESOLUTIONS

100\* - **200** - 250 - 256 - 360 - 400 - **500** - 512 - 600 - **1000** - **1024** - **2000** - **2048** 

\*available without zero pulse please directly contact our offices for other pulses, preferred resolutions in bold

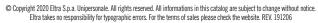
















<sup>&</sup>lt;sup>2</sup> for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

<sup>&</sup>lt;sup>3</sup> measured on the transducer flange



# MAIN FEATURES

ø 88 mm through hollow shaft encoder designed for middle size asyncronous motors.

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 105 kHz output frequency
- Cable output, connector available on cable end
- Sturdy mechanic
- 25 or 30 mm bore diameter, others on request
- Shaft fixing with grub screws



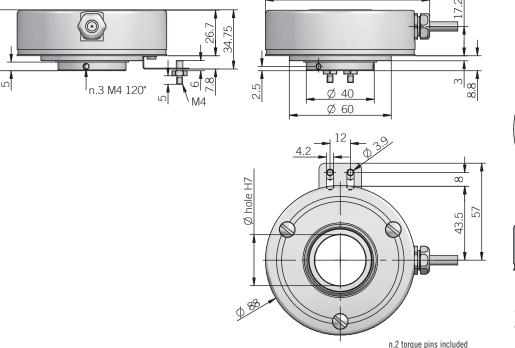






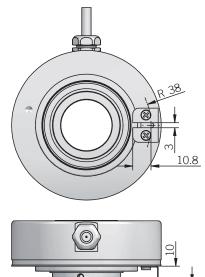
ORDERING CODE	EH 88P	1024	S	5/28	P	30	S	3	PR	. XXX
	SERIES									
	ental encoder series EH nental encoder series EL									
IIICIEII	MODEL									
through holl	ow shaft with torque stop slot 88P									
		OLUTION								
	(mod. EH) max p (mod. EL) max									
	refer to the available									
			O PULSE							
	V	vithout zer with zer	o pulse S o pulse Z							
				SUPPLY						
			l interface)							
	(with L electric	ai interrace		DC 5/28						
				TRICAL IN						
			NI	PN open co	ollector C sh-pull P					
				lin	e driver L					
	(mod. EH) į	power sup	ply 5/28V -	output R						
					SHAFT D	mm 25				
						mm 30				
		please o	lirectly conta	act our offic						
					E	NCLOSUR	IP 65 S			
						MA	X ROTATIO	N SPEED		
							30	00 rpm 3		
						radial o	abla (stand	OUTP ard length 0	UT TYPE	
		preferred o	able lengths	s 1,5 / 2 / 3	/ 5 / 10 m,			JT TYPE (eg.		

88 P



96.6

# OPTIONAL TORQUE STOP SLOT



for torque stop slot and torque pin please refer to Accessories

dimensions in mm

ELECTRICAL SPECIFICATIONS					
Resolution	from 250 to 2500 ppr (EH series) from 2 to 2048 ppr (EL series)				
Power supply <sup>1</sup>	$5 = 4,5 \dots 5,5 \text{ V DC}$ $5/28 = 4,75 \dots 29,4 \text{ V DC}$ $8/24 = 7,6 \dots 25,2$ (reverse polarity protection)				
Current consumption without load	100 mA max				
Max load current	C/P = 50  mA/channel L/RS = 20  mA/channel				
Electrical interface <sup>2</sup>	NPN open collector (pullup max +30V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)				
Max output frequency	105 kHz				
Counting direction	A leads B clockwise (shaft view)				
Electromagnetic compatibility	according to 2014/30/EU directive				
RoHS	according to 2015/863/EU directive				
UL / CSA	certificate n. E212495				

CUNNECTIONS		
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
<u></u>	shield	shield

Shaft diameter	ø 25/30 mm
Enclosure rating	IP 65 (IEC 60529)
Max rotation speed	3000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 2000 Hz (IEC 60068-2-6)
Moment of inertia	45 x 10 <sup>-6</sup> kgm <sup>2</sup> (10,68 x 10 <sup>-4</sup> lbft <sup>2</sup> )
Starting torque (at +20°C / +68°F)	< 0,1 Nm (14,16 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	n.2 ball bearings
Bearings life	10 <sup>9</sup> revolutions
Operating temperature <sup>3, 4</sup>	-10° +70°C (+14° +158°F)

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

MECHANICAL SPECIFICATIONS

# **EH SERIES RESOLUTIONS**

250 - 256 - 500 - **512** - 700 - 720 - **1000** - **1024** - 1440 - 2500

**Storage temperature**<sup>4</sup> | -25° ... +85°C (-13° ... +185°F)

**Weight** 350 g (12,35 oz)

# **EL SERIES RESOLUTIONS**

**2** - 5 - 90 - 100 - 200 - **360** - 400 - 600 - 900 - **2000** - 2048

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











VARIANT

custom version XXX

www.eltra.it

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

<sup>&</sup>lt;sup>3</sup> measured on the transducer flange



# EH 88 PE / PET THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

# MAIN FEATURES

Cost effective encoder for asynchronous motors, suitable for elevators and stage machinery.

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 105 kHz output frequency
- Cable output, connector available on cable end
- Sturdy mechanic
- Up to 40 mm bore diameter
- Shaft fixing by collar clamping

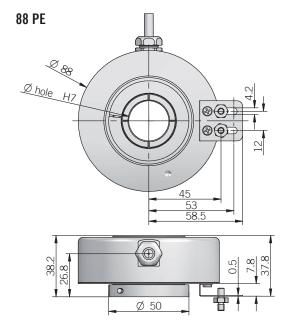




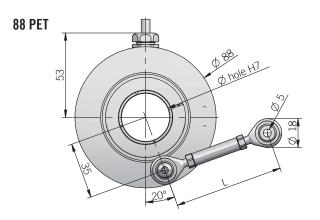




ORDERING CODE	EH 88F	PE 1024	S	5/28	P	30	X	3	PR	. XXX
	SERIES									
increment	al encoder series EH	251								
through hollow sha	MOD aft with torque stop slot 88 aft for torque arm fixing 88P refer to Accessories for torque a	BPE PET arm								
		RESOLUTION 1 500 to 2500								
	refer to the availa	able pulses list								
		without zer	o pulse S o pulse Z							
			POWER	SUPPLY						
		(with L electrica		DC 5/28						
			ELEC	TRICAL IN	Sh-pull P					
		power sup	ply 5/28V -	İin	e driver L					
					BORE D	IAMETER mm 25				
					/ 1.0	mm 30				
					(mod. Pl	E) mm 35 E) mm 38				
						E) mm 40 E <b>nclosure</b>	PATING			
							IP 54 X			
						MAX	<b>ROTATION</b> 3000	SPEED rpm 3		
								OUTP	JT TYPE	
		preferred o	able length:	s 1,5 / 2 / 3	/5/10 m,		able (standa after OUTPUT			

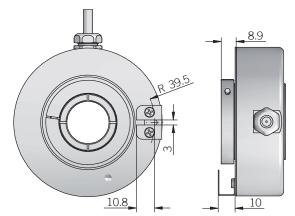


for torque pin please refer to Accessories



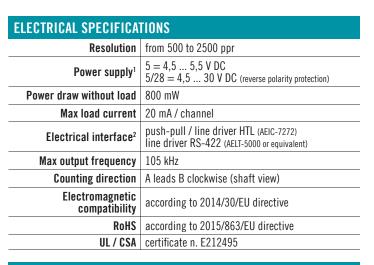


**OPTIONAL TORQUE STOP SLOT** 



for torque stop slot and torque pin please refer to Accessories

dimensions in mm



MECHANICAL SPECIFICA	ATIONS
Bore diameter	ø 25 / 30 / 35 / 38 / 40 mm
Enclosure rating	IP 54 (IEC 60529)
Max rotation speed	3000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 2000 Hz (IEC 60068-2-6)
Moment of inertia	45 x 10 <sup>-6</sup> kgm <sup>2</sup> (10,68 x 10 <sup>-4</sup> lbft <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	up to ø 38 mm: EN-AW 2011 aluminum ø 40 mm: 1.4305/AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	n.2 ball bearings
Bearings life	109 revolutions
Operating temperature <sup>3, 4</sup>	-30° +85°C (-22° +185°F)
Storage temperature <sup>4</sup>	-30° +85°C (-22° +185°F)
Weight	350 g (12,35 oz)

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

# RESOLUTIONS

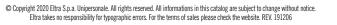
500 - 512 - 720 - **1000** - **1024** - 1440 - 2500

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

DNNECTIONS		
Function	Cable 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









VARIANT custom version XXX

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

<sup>&</sup>lt;sup>3</sup> measured on the transducer flange 4 condensation not allowed

WITH TORQUE ARM

for torque arm please refer to Accessories

# THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

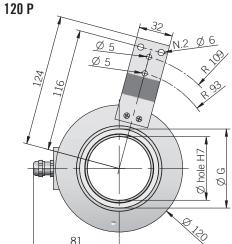
# MAIN FEATURES

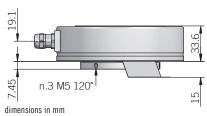
- ø 120 mm through hollow shaft encoder designed for medium / big size motors.
- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +24 V DC with several electrical interfaces available
- Up to 105 kHz output frequency
- Cable output, connector available on cable end
- Through hollow shaft diameter up to 60 mm
- Shaft fixing by grub screws





ORDERING CODE	EL	120P	1024	S	5/28	P	50	X	3	PR	. XXX
incremental	SERIES encoder series EL Illow shaft with sprii ppr refer to the	MODEL ng 120P RES r from 400 e available V	OLUTION O to 2048 pulses list ZEF vithout zer with zer	RO PULSE o pulse S o pulse Z POWEF al interface) 2) 8 24 V 5 28 V	R SUPPLY 5 V DC 5 / DC 8/24 / DC 5/28 ETRICAL IN PN open c pu	ITERFACE Ollector C sh-pull P e driver L BORE [	NAMETER mm 40 mm 50 mm 60 ENCLOSUR	E RATING IP 54 X IX ROTATIO	N SPEED 00 rpm 3		. XXX
			preferred o	able length	s 1,5/2/3	/5/10 m,		able (stand Lafter OUTP			





$ \begin{array}{c} \emptyset 5 \\ \emptyset 5 \end{array} $ $ \begin{array}{c} \emptyset 5 \\ \emptyset 5 \end{array} $ $ \begin{array}{c} \emptyset 8 \\ \emptyset 9 \end{array} $
Ø hole H7
81

	SHAFT DIAMETER	G
	ø 40	ø 65
	ø 50	ø 65
arity protection) -	ø 60	ø 75

<b>ELECTRICAL SPECIFICA</b>	TIONS
Resolution	from 400 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	100 mA max
Max load current	C / P = 50 mA / channel L = 20 mA / channel
Electrical interface <sup>2</sup>	NPN open collector (pullup max +30V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHs	according to 2015/863/EU directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICA	ATIONS		
Bore diameter	ø 40/50/60 mm		
Enclosure rating	IP 54 (IEC 60529)		
Max rotation speed	3000 rpm		
Shock	50 G, 11 ms (IEC 60068-2-27)		
Vibration	10 G, 10 2000 Hz (IEC 60068-2-6)		
Moment of inertia	approx 215 x 10 <sup>-6</sup> kgm <sup>2</sup> (51 x 10 <sup>-4</sup> lbft <sup>2</sup> )		
Starting torque (at +20°C / +68°F)	< 0,05 Nm (7 Ozin)		
Bearing stage material	EN-AW 2011 aluminum		
Shaft material	EN-AW 2011 aluminum		
Housing material	EN-AW 2011 aluminum		
Bearings	n.2 ball bearings		
Bearings life	10 <sup>9</sup> revolutions		
Operating temperature <sup>3, 4</sup>	0° +60 °C (+32° +140°F)		
Storage temperature <sup>4</sup>	-25° +70 °C (-13° +158°F)		
Weight	750 g (26,46 oz)		
as measured at the transducer without cable influences			

	ECT	
W W		

Cable C / P	Cable L
red	red
black	black
green	green
/	brown or grey
yellow	yellow
/	orange
blue	blue
/	white
shield	shield
	red black green / yellow / blue

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

<sup>3</sup> measured on the transducer flange

4 condensation not allowed

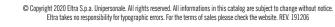
# RESOLUTIONS

**400** - 800 - 1000 - **1024** - 1440 - 1600 - 2000 - **2048** 

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



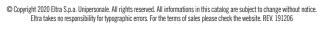






VARIANT custom version XXX







# 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)



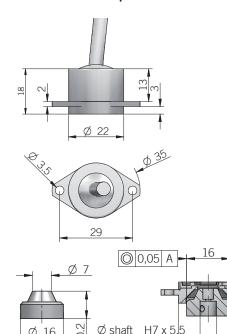




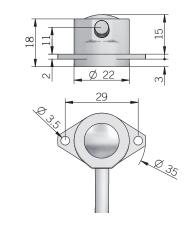


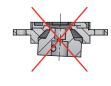
URDERING CODE	EMI	22A	1024	L	5	P	6	8	10	P	R	. XXX
	SERIES											
	magnetic incremental encoder series EMI											
		MODEL										
	clamping flange ø 22 for anodized version please directly contact	mm 22A										
	for anoutzed version please directly contact		OLUTION									
		ppr from										
		e available										
				RO PULSE								
		V	vithout zer	o pulse S								
			with zer	o pulse Z								
				POWER	SUPPLY 5 V DC 5							
					TRICAL IN							
				LLLU	INICAL IN	sh-pull P						
				I	ine driver	RS-422 L						
				MAGNE	T-ACTUATO	OR BORE D						
							mm 6					
						(3/8")	mm 8 mm 9,52					
						(3/0 )	mm 10					
							NCLOSUR					
								IP 67 S				
							MA	X ROTATIO	IN SPEED			
								1000	00 rpm 10			
										PUT TYPE		
			nrafarrad ca	hla lanaths	15/2/3/	5 / 10 m t			ndard lengt TION TYPE (			
			protetted 68	DIG IGHE	1,012131	5 / 10 III, U	o oc auucu	uitei DiitLU	HON III L (	-	ON TYPE	
										DINLOI	axial A	
											radial D	

# 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	$\pm$ 0,35° typical / $\pm$ 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> kgm² (2,4 x 10 <sup>-6</sup> lbft²)				
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 temperature⁴	-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

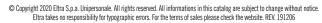
4 condensation allowed

# RESOLUTIONS

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





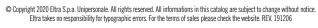




VARIANT custom version XXX



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# MAGNETIC INCREMENTAL KIT ENCODER

# 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





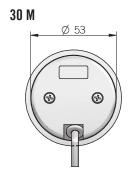


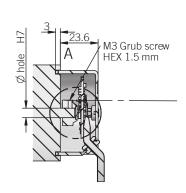


UNDERING GODE	LIIII	JUM	ာ	JU		3/30		<u> </u>	^	^	I K	. ۸۸
	SERIES magnetic incremental encoder series EMI	MODEL										
	kit enc	oder 30M	001/50									
	*	add if withou	COVER									
		add ii withot		OLUTION								
				m 1 to 90								
					RO PULSE							
			V	vithout zei	o pulse S o pulse Z							
				WILL ZCI		SUPPLY						
						5 V DC 5						
						DC 5/30						
						<b>TRICAL IN</b> PN open c						
						pu	sh-pull P					
				nower our	nly 5/20V		e driver L S-422 RS					
				power sup	pry 3/30V	- output K		IAMETER				
								mm 6				
							(1/4") ı	mm 6,35				
								mm 8 mm 10				
							Е	NCLOSURI	RATING			
									IP 54 X			
										OPTION		
									to be re	eported X	IIT TVDE	
								radial c	able (stand	UUTF ) lard length	UT TYPE 0.5 m) PR	
				preferred (	cable length	s 1,5 / 2 / 3	/ 5 / 10 m, t					
												VADIAN

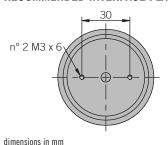
VARIANT custom version XXX

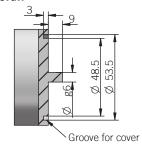
eltra@eltra.it

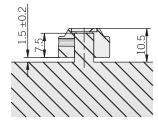




# RECOMMENDED INTERFACE FLANGE DESIGN







ELECTRICAL SPECIFICATIONS					
Resolution	from 1 to 90 ppr				
Power supply <sup>1</sup>	$5 = 4,5 \dots 5,5$ V DC $5/30 = 4,5 \dots 30$ 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	$\pm$ 0,35° typical / $\pm$ 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				

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					
<b>Shock</b> 50 G, 11 ms (IEC 60068-2-27)					
Vibration	n 20 G, 10 2000 Hz (IEC 60068-2-6)				
Moment of inertia	tia 0,1 x 10 <sup>-6</sup> kgm² (2,4 x 10 <sup>-6</sup> lbft²)				
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)				
<b>Storage temperature</b> <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					

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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
<u></u>	shield	shield







<sup>4</sup> condensation not allowed

# MAGNETIC INCREMENTAL BLIND HOLLOW SHAFT ENCODER

# 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)



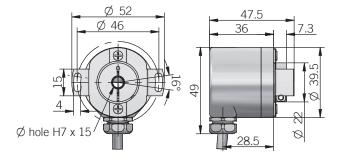


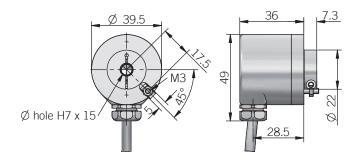




ORDERING CODE	EMI	38F	1024	Z	5	L	6	X	6	PR	. XXX
	SERIES										
magnetic incremental encode	r series EMI										
blind hollow shaft wit	th atatar agu	MODEL									
blind hollow shar											
			SOLUTION								
		ppr from	2 to 2048 pulses list								
	reier to tii	ie available		RO PULSE							
		١	without zer	o pulse S							
			with zer	o pulse Z							
		(wit	h L electrica		S V DC 5						
	(w		cal interface	e) 8 24 \	/ DC 8/24						
					/ DC 5/28						
				ELEC	TRICAL IN	ITERFACE Ish-pull P					
						e driver L					
						SHAFT D					
						(1/4")	mm 6 mm 6,35				
							mm 8				
						(3/8")	mm 9,52 mm 10				
						F	NCLOSURE	RATING			
						_		IP 64 X			
								IP 66 S	W 00550		
								(IP 66) 300			
								(IP 64) 600			
							and the Land	. h.l		UT TYPE	
			preferred o	ahle length	s 1 5 / 2 / 3	/5/10 m, t			ard length (		
			p. 5. 511 64 6	asio iongtii	0 1,0 / 2 / 0	, 5, 10 111,	20 34404		,, ,,, E (0g.		VARIANT

38 G





dimensions in mm

38 F

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

ELECTRICAL SPECIFICATIONS					
Resolution	from 2 to 2048 ppr				
Power supply <sup>1</sup>	$5 = 4.5 \dots 5.5 \text{ V DC}$ $5/28 = 4.75 \dots 29.4 \text{ V DC}$ $8/24 = 7.6 \dots 25.2 \text{ V DC}$ (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	$\pm$ 0,35° typical / $\pm$ 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 load³	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> lbft <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° 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)								

as measured at the transducer without cable influences <sup>2</sup> for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

# RESOLUTIONS

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









<sup>&</sup>lt;sup>3</sup> maximum load for static usage

<sup>&</sup>lt;sup>4</sup> measured on the transducer flange

<sup>&</sup>lt;sup>5</sup> condensation not allowed

# MAGNETIC INCREMENTAL SOLID SHAFT ENCODER

# 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)



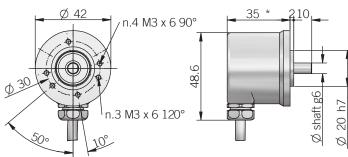


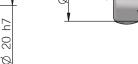




ORDERING CODE	EMI	40A	1024	Z	5	L	6	X	3	P	R	. XXX
magnetic incrementa	SERIES Il encoder series EMI clamping flange ø 20	MODEL mm 40A										
	ļ	opr from 2	OLUTION 2 to 2048									
	refer to the	available <sub>l</sub>		RO PULSE								
		W	ithout zer									
				POWE	SUPPLY							
	(wit			al interface) e) 8 24 V	DC 8/24							
					DC 5/28 Trical in	  Terface						
					pu	sh-pull P e driver L						
							IAMETER					
							mm 4 mm 6					
						ı	NCLOSUR	E RATING IP 64 X				
							M	IP 66 S I <b>X rotatio</b>	N CDEED			
								(IP 66) 30	00 rpm 3			
								(IP 64) 60	OUTF	OUT TYPE		
		ŗ	oreferred ca	ble lengths	1,5/2/3/	′5/10 m, t		ble (stand after DIREC				
										DIRECT	ION TYPE axial A	
											radial R	VADIANT
												VARIANT

# 40 A radial cable output





40A axial cable output

\* IP66 + 7mm

Ø 20 h7

dimensions in mm

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 / 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	$\pm$ 0,35° typical / $\pm$ 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								
Shaft diameter	ø 4 / 6 mm							
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	0,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (12 x 10 <sup>-6</sup> lbft <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>&</sup>lt;sup>1</sup> as measured at the transducer without cable influences

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







custom version XXX

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

<sup>&</sup>lt;sup>3</sup> maximum load for static usage <sup>4</sup> measured on the transducer flange

<sup>&</sup>lt;sup>5</sup> condensation not allowed

# MAGNETIC INCREMENTAL KIT ENCODER

# 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)

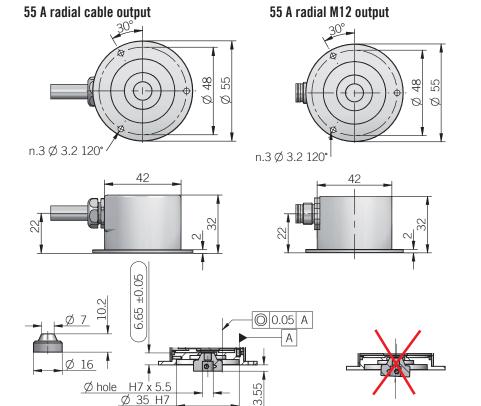




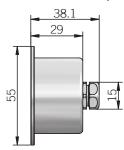




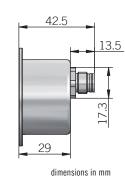
ORDERING CODE	EMI	55A	512	Z	5/28	P	10	X	10	P	R	. XXX
magnetic incremental encode fixi for anodized version please d	ng holes ø 48 irectly contact	our offices	OLUTION 2 to 2048									
		ie available	pulses list	NO DILLOF								
		W	ithout zer	o pulse S o pulse Z								
		(witl		POWEI al interface)	SUPPLY 5 V DC 5 / DC 5/28							
					TRICAL IN							
				J., E /20 V	İin	sh-pull P e driver L						
		р	ower supp	-	- output R T <b>ACTUAT</b> (		IAMETER					
						(0.(0!))	mm 6 mm 8					
						(3/8")	mm 9,52 mm 10					
						E	ENCLOSUR	IP 64 X IP 67 S				
							MA	X <b>ROTATIO</b> 1000	N SPEED 0 rpm 10			
								cable (sta	OUTI	PUT TYPE		
		ļ	oreferred ca	ble lengths	1,5 / 2 / 3 /	5 / 10 m, t	o be added	after DIRECT		eg. PR5)		
			1	emale conn	ector includ	led, without	female plea	ase add 162		code		
										DIRECT	ION TYPE	



# 55 A axial cable output



# 55 A axial M12 output



		-,
	7/1	4
	MI.	

١	TIONS	MECH
	from 2 to 2048 ppr	
	$5 = 4.5 \dots 5.5 \text{ V DC}$ $5/28 = 4.5 \dots 30 \text{ V DC}$ (reverse polarity protection)	
	800 mW max	
	20 mA / channel	
	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)	
	205 kHz	
	A leads B clockwise (flange view)	
	$\pm$ 0,35° typical / $\pm$ 0,50° max	Be
	according to 2014/30/EU directive	
	according to 2015/863/EU directive	
	certificate n. E212495	0pe
t	cable influences	

as measured at the transducer without cable influences

Electromagnetic compatibility

**ELECTRICAL SPECIFICATIONS** 

Electrical interface<sup>2</sup>

Power supply<sup>1</sup>

Power draw without load 800 mW max

Max output frequency | 205 kHz

Max load current | 20 mA / channel

**Resolution** from 2 to 2048 ppr

**Counting direction** A leads B clockwise (flange view) **Accuracy**  $\pm 0.35^{\circ}$  typical  $/ \pm 0.50^{\circ}$  max

**UL / CSA** certificate n. E212495

according to 2014/30/EU directive **RoHS** according to 2015/863/EU directive

<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

12
g

MECHANICAL SPECIFICATIONS								
Bore diameter (magnet-actuator)	ø 6 / 8 / 9,52 (3/8") / 10 mm							
Enclosure rating	X = IP 64 (IEC 60529) S = 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	painted aluminum							
Magnet-actuator material	EN-AW 2011 aluminum							
Operating temperature <sup>3, 4</sup>	-40° +125°C (-40° +257°F) (with + 5 V DC) -40° +100°C (-40° +212°F)							
Storage temperature⁴	-40° +125°C (-40° +257°F)							
Weight	150 g (5,29 oz)							
Magnet actuator mounting tolerances (to get best electrical performances)	± 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

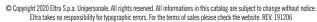
M12 connector (5 pin) M12 A coded solder side view FV

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









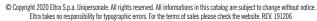


axial A

VARIANT custom version XXX

radial R











# EMI 63 A / D MAGNETIC INCREMENTAL SOLID SHAFT ENCODER

# 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)





RDERING CODE	EMI	63A	1024	Z	5	L	10	X	6	P	R	. XXX	
	SERIES												
	magnetic incremental encoder series EMI												
	cupobranous floras a 21.75	MODEL											
	synchronous flange ø 31,75 centering square flange ø 31,75	mm 63D											
			OLUTION										
		ppr from 2 e available											
	reier to til	e available		RO PULSE									
		V	vithout zer										
			with zer	o pulse Z	R SUPPLY								
		(wit	h L electrica	r over (al interface									
				5 28 \	/ DC 5/28								
				ELEC	TRICAL IN	sh-pull P							
					İin	e driver L							
		p	ower supp	oly 5/28 V	- output R		LAMETER						
							mm 9,52						
							mm 10						
						I	NCLOSUR	E RATING IP 64 X					
								IP 66 S					
							MA	X ROTATIO					
								(IP 66) 300 (IP 64) 600					
								(.1 0-1) 001	•	UT TYPE			
					15/0/0	/ - / 10 .		cable (star					
		I	oreterred ca	ble lengths	1,5/2/3/	5 / 10 m, t	o be added	after DIRECT N	ION TYPE (e; 112 connec				
			1	iemale conn	ector includ	led, without	female ple	ase add 162					
										DIRECTI	ON TYPE		



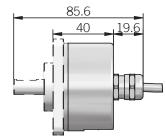


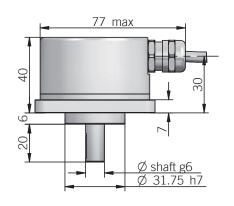
# <sup>1</sup>n.3 M5 x 7 120° 77 max Ø shaft g6 Ø 31.75 h7 fixing clamps not included, please refer to Accessories

63 A

n.3 120°

# Dimensions with axial output





n.4 Ø 5.5 90°

63 D

ELECTRICAL SPECIFICATIONS			
Resolution	from 2 to 2048 ppr		
Power supply <sup>1</sup>	$5 = 4,5 \dots 5,5 \text{ V DC}$ $5/28 = 4,5 \dots 30 \text{ V DC}$ (reverse polarity protection)		
Power draw without load	800 mW max		
Max load current	20 mA / 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	$\pm$ 0,35° typical / $\pm$ 0,50° max		
Electromagnetic compatibility	according to 2014/30/EU directive		
RoHS	according to 2015/863/EU directive		
UL / CSA	certificate n. E212495		

CUNNECTIO	NS			
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		
Shaft diameter	ø 9,52 (3/8") / 10 mm	
Enclosure rating	X = IP 64 (IEC 60529) S = IP 66 (IEC 60529)	
Max rotation speed	IP 66 - 3000 rpm IP 64 - 6000 rpm	
Shock	50 G, 11 ms (IEC 60068-2-27)	
Vibration	10 G, 10 2000 Hz (IEC 60068-2-6)	
Moment of inertia	0,5 x 10 <sup>-6</sup> kgm <sup>2</sup> (12 x 10 <sup>-6</sup> lbft <sup>2</sup> )	
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin) (IP 64) < 0,08 Nm (11,33 Ozin) (IP 66)	
Bearing stage material	EN-AW 2011 aluminum	
Shaft material	1.4305 / AISI 303 stainless steel	
Housing material	EN-AW 2011 aluminum	
Bearings	n.2 ball bearings	
Bearing lifetime	10° revolutions	
Operating temperature <sup>3, 4</sup>	-25° +100°C (-13° +212°F)	
Storage temperature <sup>4</sup>	-25° +85°C (-13° +185°F)	
Weight	350 g (12,35 oz)	
1 as measured at the transducer without	cable influences	

as measured at the transducer without cable influences

<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

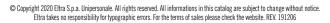
M12 connector (5 pin) M12 A coded solder side view FV

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











axial A

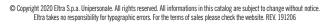
custom version XXX

VARIANT

radial R



www.eltra.it







 $<sup>^{\</sup>rm 2}$  for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

<sup>&</sup>lt;sup>3</sup> measured on the transducer flange



# MAGNETIC INCREMENTAL KIT ENCODER

# MAIN FEATURES

Contactless encoder with through hollow shaft up to 28 mm. The compact size (only 11 mm thickness), the high IP grade and resistance to vibrations make this product an excellent solutions for heavy duty applications.

- 2 channel encoder (A / B) up to 4096 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 350 kHz output frequency
- Cable output, connector available on cable end
- Through hollow shaft diameter up to 28 mm
- Shaft mounting by tolerance ring
- Wide operating temperature -20° ... +85°C (-4° ... +185°F)



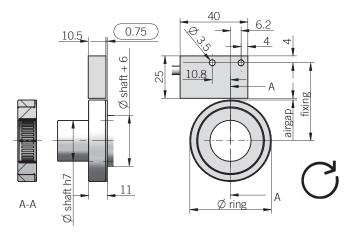




ORDERING CODE	ETMR	A	4096	S	5	L	9	S	8	PR	. XX
incremental encoder with magnetic bore diamete	SERIES ring ETMR er from 9 1 ameter 24 / 2	MODEL 19 mm A 28 mm B RES pr from 64 available v	<b>OLUTION</b> I to 4096 pulses list <b>ZEF</b> vithout zer	RO PULSE o pulse S POWEI al interface) 5 28 \ ELEC	R SUPPLY 5 V DC 5 / DC 5/28 CTRICAL IN IN	ITERFACE ISh-pull P e driver L S-422 RS BORE D (3/8")	MAMETER mm 9 mm 9,52 mm 10 mm 11 mm 14 mm 19 mm 24 mm 28 ENCLOSURE	E RATING IP 67 S			
							MA	<b>ROTATIO</b> 80	00 rpm 8	UT TVDE	
			prefe	rred cable l	engths 2 / 3	/5/10 m,			DUTP lard length 1 UT TYPE (eg.		

VARIANT custom version XXX

# **ETMR**



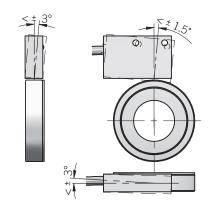
Model	A	В
ø ring	41,2	48
Fixing with 1 mm airgap	42,6	46
Airgap	$1 \pm 0,1$	$1 \pm 0,1$

dimensions in mm

ELECTRICAL SPECIFICA	TIONS
Resolution	from 64 to 4096 ppr (powers of 2)
Pole pitch	
Power supply <sup>1</sup>	$5 = 4.5 \dots 5.5 \text{ V DC}$ $5/28 = 4.5 \dots 30 \text{ V DC}$ (reverse polarity protection)
Power draw without load	800 mW max
Max load current	20 mA / channel
Electrical interface <sup>2</sup>	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	350 kHz
Counting direction	A leads B clockwise
Accuracy	$\pm$ 0,35° typical / $\pm$ 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 / RS
+V DC	red	red
0 V	black	black
A+	green	green
A-	1	brown or grey
B+	yellow	yellow
B-	/	orange
÷	shield	shield

# **Mounting tolerances**



for mounting instruction please refer to product installation notes

MECHANICAL SPECIFICA	ATIONS
Bore diameter	ø 9 / 9,52 (3/8") / 10 / 11 / 14 / 19 / 24 / 28 mm
Enclosure rating	IP 67 (IEC 60529)
Max rotation speed	8000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 2000 Hz (IEC 60068-2-6)
Moment of inertia	115 x 10 <sup>-6</sup> kgm <sup>2</sup> (27,29 x 10 <sup>-4</sup> lbft <sup>2</sup> )
Sensor body material	anodized aluminum
Magnet-actuator material	1.4305 / AISI 303 stainless steel
Operating temperature <sup>3, 4</sup>	-20° +85°C (-4° +185°F)
Storage temperature⁴	-20° +85°C (-4° +185°F)
Weight	100 g (3,53 oz)
Magnet-actuator	± 1 mm (axial)

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

mounting tolerances  $\pm 0.1$  mm (radial)

4 condensation allowed

# RESOLUTIONS

64\* - 128 - 256 - 512 - 1024 - 2048 - 4096

\* available with mod.B; please directly contact our offices for other pulses









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

<sup>&</sup>lt;sup>3</sup> measured on the transducer flange