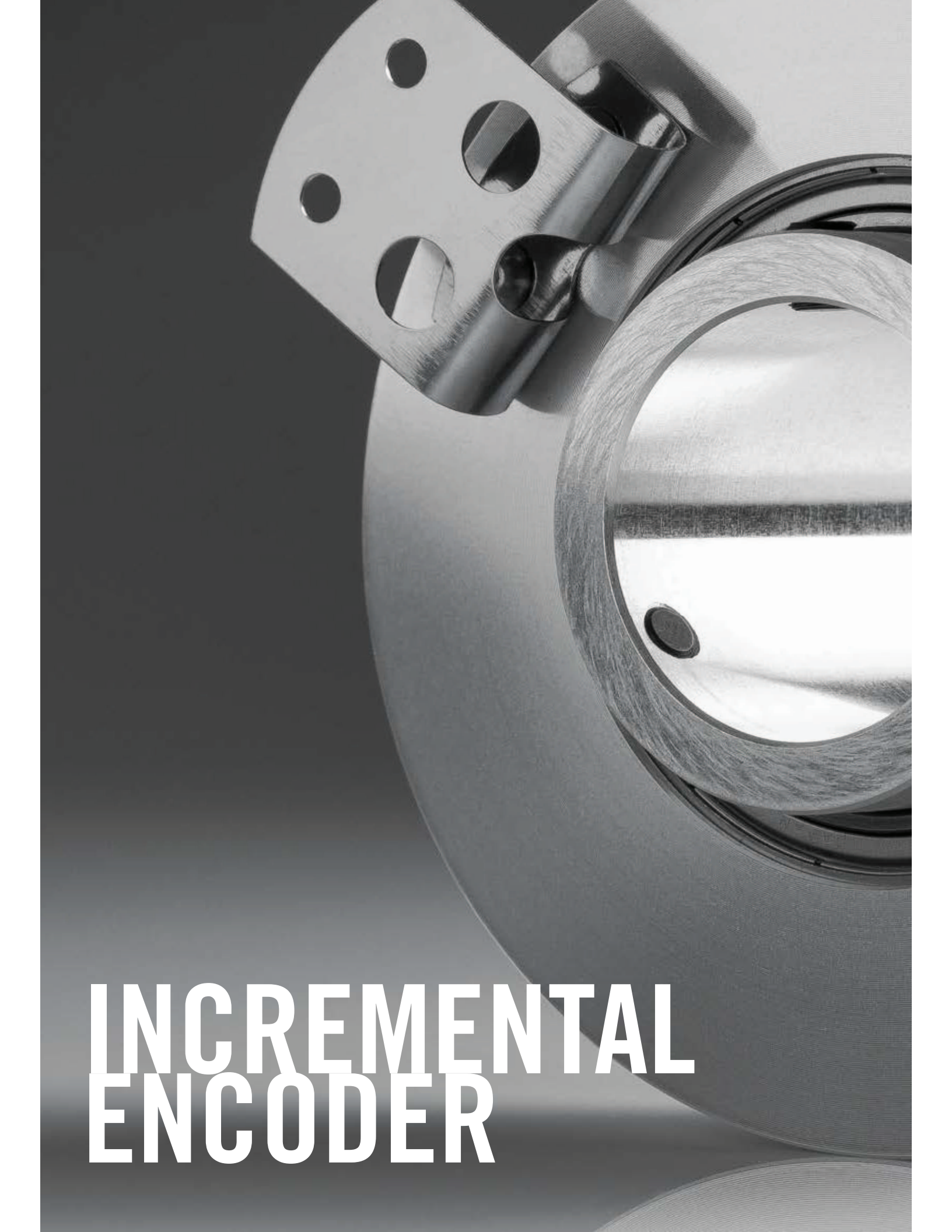




INCREMENTAL ENCODER

A high-contrast, black and white photograph showing a close-up of a metal encoder. The image focuses on the circular flange on the left, which has a central hole and a smaller hole below it. To the right, a shaft with a hexagonal nut is visible. The lighting creates strong highlights and shadows, emphasizing the metallic texture and geometric shapes.

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

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

ELTRA brand encoders offers a complete range of encoders with resolution up to 24000 pulses per turn (ppr) with a wide flange choice and several electronic interfaces. Shaft, blind hollow shaft and through hollow shaft up to a diameter of 60 mm (2.36") are available.

MAIN FEATURES

Miniaturized $\varnothing$ 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 VDC with several electronic interfaces available
- Up to 220 kHz output frequency
- Cable output, connectors available on cable end
- Solid shaft diameter up to 6 mm
- Mounting by clamping or threaded flange



ORDERING CODE

EL 30E 50 S 5/28 N 4 X 3 PA .XXX

SERIES
 incremental encoder series **EL**
 incremental encoder series **ER**

MODEL
 clamping flange $\varnothing$ 15 mm **30E**
 M18 threaded flange **30H**

RESOLUTION
 ppr from 1 to 2500
 see table for pulses availability

ZERO PULSE
 without zero pulse **S**
 with zero pulse **Z**

POWER SUPPLY
 (with L electronic interface) 5 V DC **5**
 (with L or PC electronic interface) 8 ... 24 V DC **8/24**
 5 ... 28 V DC **5/28**

ELECTRONIC INTERFACE
 NPN **N**
 NPN open collector **C**
 push-pull **P**
 push-pull protected (AEIC-7272) **PC**
 line driver **L**
 power supply 5/28V - output RS-422 **RS**

SHAFT DIAMETER
 (mod. E) mm **4**
 mm **6**

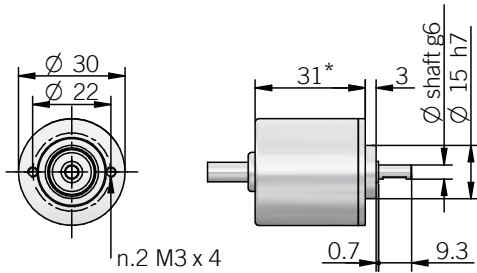
ENCLOSURE RATING
 IP 54 **X**

MAX ROTATION SPEED
 3000 rpm **3**

OUTPUT TYPE
 axial cable (standard length 0,5 m) **PA**
 radial cable (standard length 0,5 m) **PR**

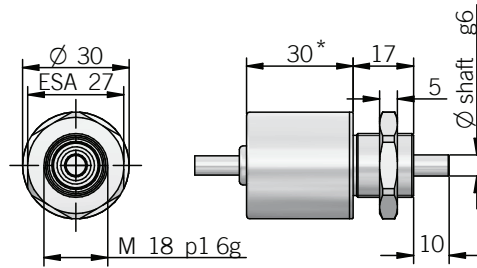
VARIANT
 custom version **XXX**

EL - ER 30 E (axial output)



dimensions in mm

EL - ER 30 H (axial output)



* radial output + 2,3

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 2500 ppr
Power supply	5 = 4,5 ... 5,5 V DC 5/28 = 4,75 ... 28,6 V DC 8/24 = 7,6 ... 25,2 V DC (reverse polarity protection)
Power draw without load	800 mW
Max load current	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	100 kHz EL series 220 kHz ER series
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

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

CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
⏏	shield	shield

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 4 / 6 mm
Enclosure rating	IP 54 (IEC 60529)
Max rotation speed	3000 rpm
Max shaft load	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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,005 Nm
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-10° ... +60°C (+14° ... +140°F) EL series -25° ... +85°C (-13° ... +185°F) ER series
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Weight	70 g (2,47 oz)

MAIN FEATURES

Miniaturized $\varnothing$ 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 +24 VDC with several electronic interfaces available
- Up to 100 kHz output frequency
- Cable output, connectors available on cable end
- Solid shaft diameter up to 6 mm
- Mounting by clamping or centering square flange



ORDERING CODE

EH 38A 500 S 8/24 P 6 X 3 PR .XXX

SERIES
 incremental encoder series **EH**

MODEL
 clamping flange $\varnothing$ 20 mm **38A**
 centering square flange $\varnothing$ 20 mm **38B**
 centering square flange $\varnothing$ 17,46 mm **38D**

RESOLUTION
 ppr from 50 to 1024
 see table for pulses availability

ZERO PULSE
 without zero pulse **S**
 with zero pulse **Z**

POWER SUPPLY
 5 V DC **5**
 8 ... 24 V DC **8/24**

ELECTRONIC INTERFACE
 NPN **N**
 NPN open collector **C**
 push-pull **P**
 push-pull protected (AEIC-7272) **PC**
 line driver **L**

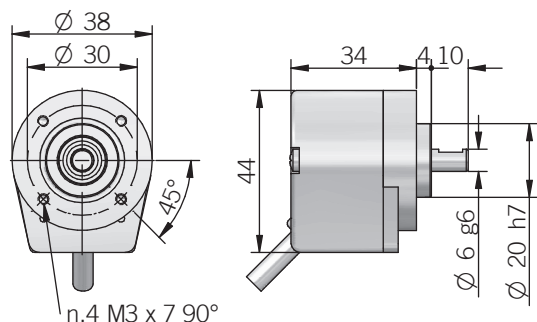
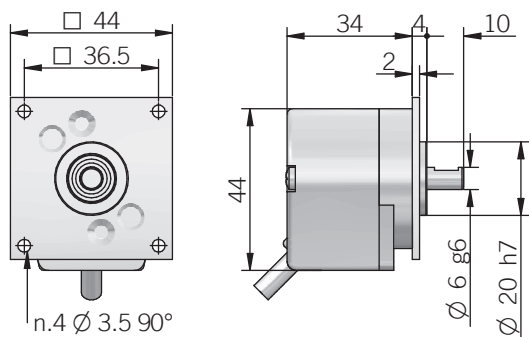
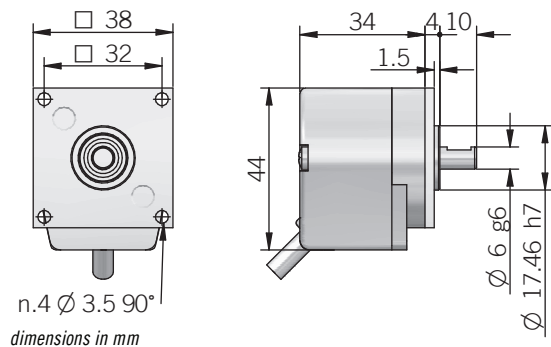
SHAFT DIAMETER
 mm **6**

ENCLOSURE RATING
 IP 54 **X**

MAX ROTATION SPEED
 3000 rpm **3**

OUTPUT TYPE
 radial cable (standard length 0,5 m) **PR**

VARIANT
 custom version **XXX**

EH 38 A**EH 38 B****EH 38 D**

dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 50 to 1024 ppr
Power supply	5 = 4,5 ... 5,5 V DC 8/24 = 7,6 ... 25,2 V DC (reverse polarity protection only with PC electronic)
Current consumption without load	100 mA max
Max load current	N / C / P / PC = 50 mA / channel L = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	100 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-1 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

MECHANICAL SPECIFICATIONS

Shaft diameter	$\varnothing 6$ mm
Enclosure rating	IP 54 (IEC 60529)
Max rotation speed	3000 rpm
Max shaft load	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	$0,05 \times 10^{-6}$ kgm ²
Starting torque (at +20°C / +68°F)	< 0,01 Nm
Body material	aluminum UNI 5076
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-20° ... +70°C (-4° ... +158°F)
Storage temperature	-20° ... +70°C (-4° ... +158°F)
Weight	150 g (5,29 oz)

CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
⏏	shield	shield

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

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 14400 ppr
- Power supply up to +28 VDC with several electronic interfaces available
- Up to 220 kHz output frequency
- Cable output, connectors available on cable end
- Solid shaft diameter up to 8 mm
- Mounting by clamping, threaded or synchronous flange



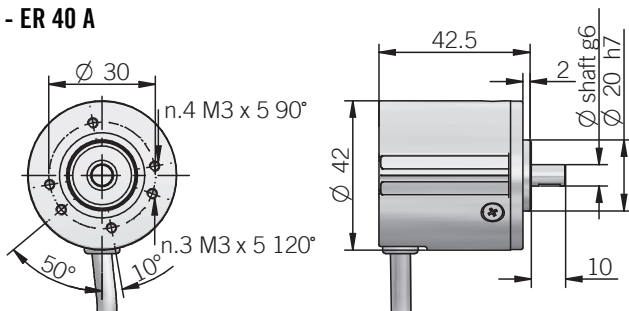
UNI EN ISO 9001:2008



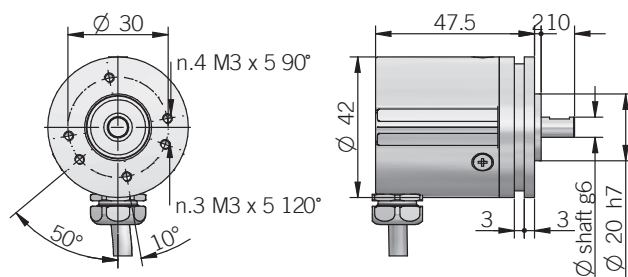
ORDERING CODE

ER	40A	100	S	5/28	N	6	X	6	P	R	.XXX
SERIES incremental encoder series EL incremental encoder series ER											
MODEL clamping flange $\varnothing$ 20 mm 40A square flange $\square$ 36,5 mm 40B clamping flange $\varnothing$ 17,46 mm 40C M18 threaded flange 40H M21 threaded flange 40I synchronous flange $\varnothing$ 21 mm 40N synchronous flange $\varnothing$ 30 mm 40X											
RESOLUTION (mod. A / B) ppr 1 ... 14400 (mod. C / H / I / N / X) ppr 1 ... 2500 <i>see table for pulses availability</i>											
ZERO PULSE without zero pulse S with zero pulse Z											
POWER SUPPLY (with L electronic interface) 5 V DC 5 (with L or PC electronic interface) 8 ... 24 V DC 8/24 5 ... 28 V DC 5/28											
ELECTRONIC INTERFACE (max 2.500 ppr) NPN N (max 2.500 ppr) NPN open collector C push-pull P push-pull protected (AEIC-7272) PC line driver L power supply 5/28V - output RS-422 RS											
SHAFT DIAMETER (mod. C) mm 4 (mod. A / B / C / H / I / N) mm 6 (mod. X) mm 8											
ENCLOSURE RATING IP 54 X (mod. A / B) IP 66 S											
MAX ROTATION SPEED (IP 66) 3000 rpm 3 (IP 54) 6000 rpm 6											
OUTPUT TYPE cable (standard length 0,5 m) P											
DIRECTION TYPE (mod. A / B / C / H / I / N) axial A radial R											
VARIANT custom version XXX											

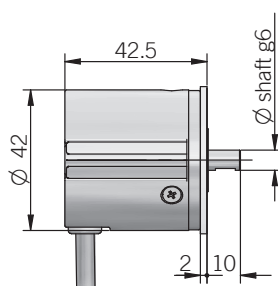
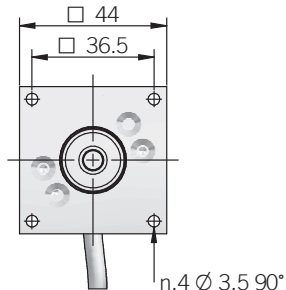
EL - ER 40 A



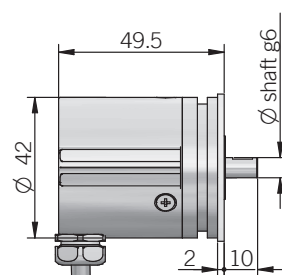
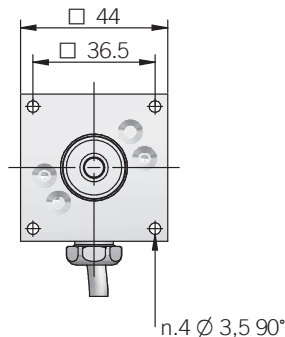
EL - ER 40 A (IP 66)



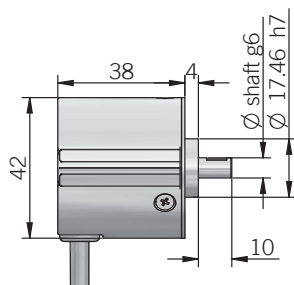
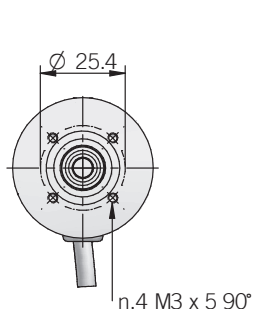
EL - ER 40 B



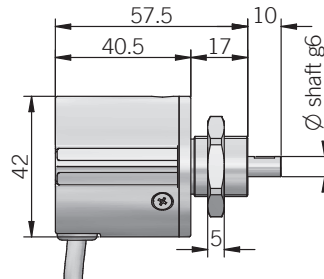
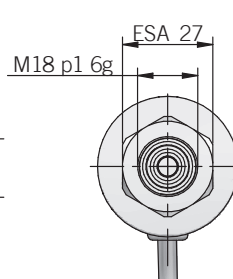
EL - ER 40 B (IP 66)



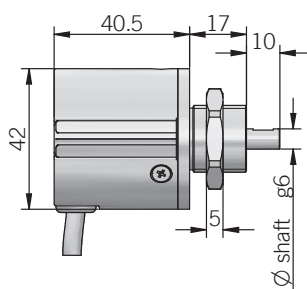
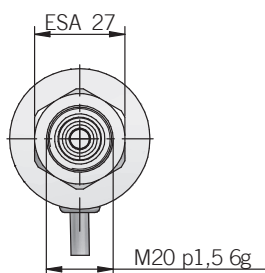
EL - ER 40 C



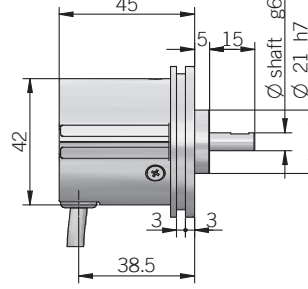
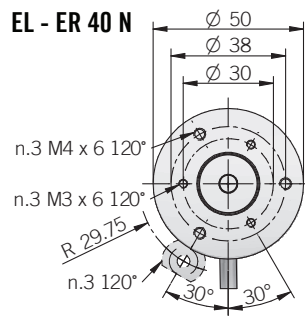
EL - ER 40 H



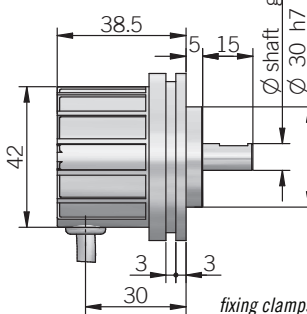
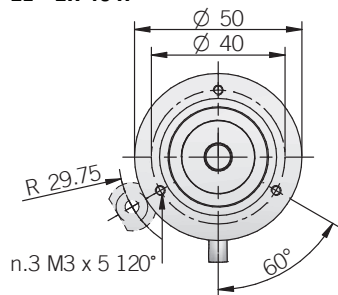
EL - ER 40 I



EL - ER 40 N



EL - ER 40 X

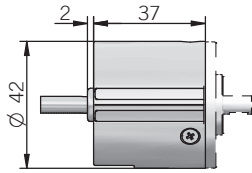


fixing clamps not included

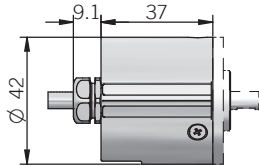
fixing clamps not included

dimensions in mm

EL - ER 40 (axial output)

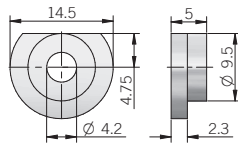


EL - ER 40 (IP 66 axial output)



ACCESSORIES

set n.3 fixing clamps for model 40 X / 40 N
P/N 94080001



MECHANICAL SPECIFICATIONS

Shaft diameter	Ø 4 / 6 / 8 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	3000 rpm (IP 66) 6000 rpm (IP 54)
Max shaft load	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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,01 Nm (IP 54) < 0,05 Nm (IP 66)
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-10° ... +60°C (+14° ... +140°F) EL series -25° ... +85°C (-13° ... +185°F) ER series
Storage temperature	-25° ... +70°C (-13° ... +158°F)
Weight	100 g (3,52 oz)

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 14400 ppr (mod. A/B) from 1 to 2500 ppr (mod. C/H/I/N/X)
Power supply	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)
Power draw without load	800 mW
Max load current	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	150 kHz EL series 220 kHz ER series
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
⏏	shield	shield

EL SERIES RESOLUTIONS

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 30 - 32 - 40 - 50 - 70 - 80 - 90 - 3000 - 3600
- 4000 - 4096 - 5000 - 6000 - 7200 - 8000 - 8192 - 10000 - 12000 - 14400

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - 360 - 400 - 480 - 500 - 512
- 600 - 625 - 720 - 750 - 800 - 900 - 1000 - 1024 - 1200 - 1250 - 1440 - 1500
- 1600 - 1800 - 2000 - 2048 - 2500

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

MAIN FEATURES

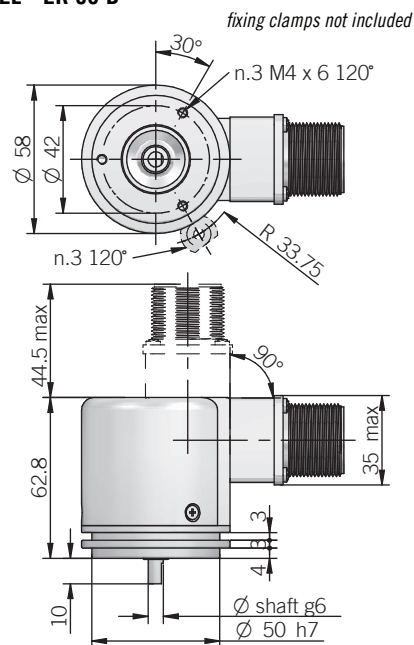
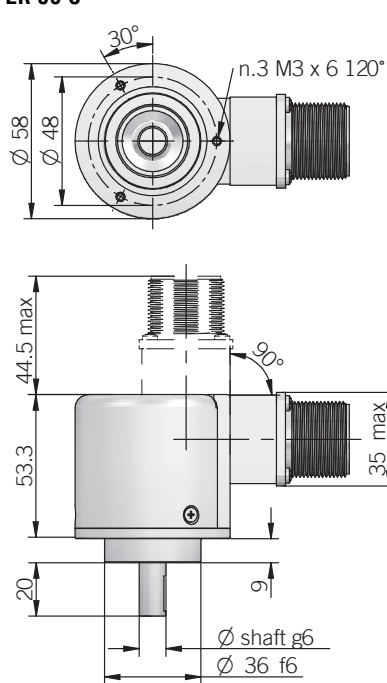
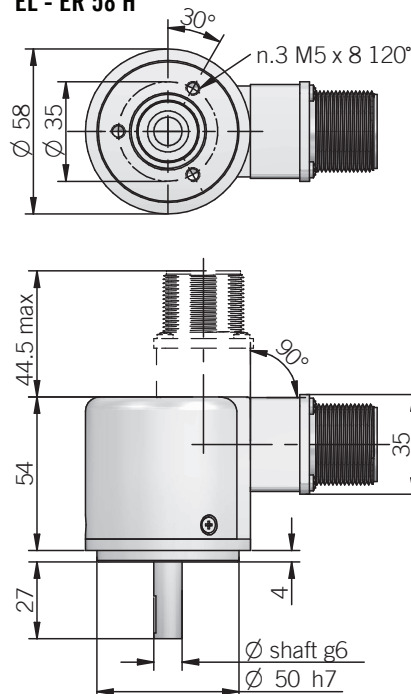
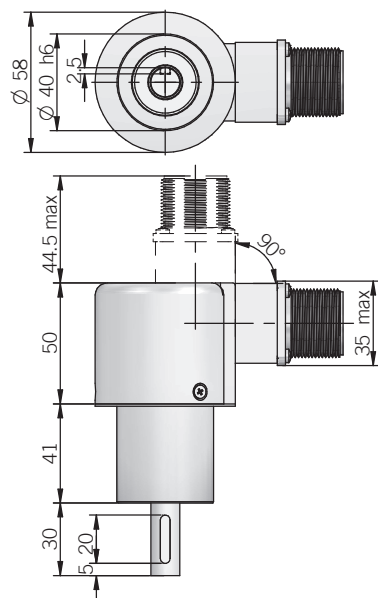
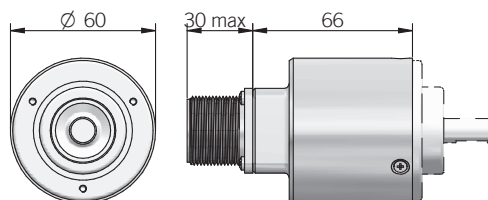
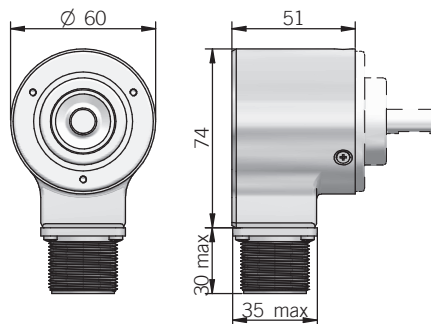
Standard ø 58 mm encoder series for industrial applications with high mechanical resistance requirements. These encoders are designed to support high radial and axial shaft load and they can be mounted by means of flanges or fixing clamps.

- 3 channel encoder (A / B / Z) up to 24000 ppr
- Power supply up to +28 VDC with several electronic 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

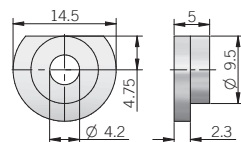
ER	58C	M*	500	S	5/28	N	8	X	6	P	R	.XXX
SERIES incremental encoder series EL incremental encoder series ER												
MODEL synchronous flange ø 50 mm 58B clamping flange ø 36 mm 58C clamping flange ø 50 mm 58H coupling flange ø 40 mm 58T												
METAL COVER * add for the metal cover M												
RESOLUTION ppr from 1 to 24000 see table for pulses availability												
ZERO PULSE without zero pulse S with zero pulse Z												
POWER SUPPLY (with L electronic interface) 5 V DC 5 (with L or PC electronic interface) 8 ... 24 V DC 8/24 5 ... 28 V DC 5/28												
ELECTRONIC INTERFACE NPN N NPN open collector C push-pull P push-pull protected (AEIC-7272) PC line driver L power supply 5/28V - output RS-422 RS												
SHAFT DIAMETER (mod. B) mm 6 (mod. C) mm 8 (mod. B / C / H) 9,52 (3/8") mm 9 mm 10 (mod. T) mm 12												
ENCLOSURE RATING IP 54 X 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 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 radial R												
VARIANT custom version XXX												

EL - ER 58 B**EL - ER 58 C****EL - ER 58 H****EL - ER 58 T****Dimension with metal cover axial output****Dimension with metal cover radial output**

dimensions in mm

ACCESSORIES

set n.3 fixing clamps for model 58 B
P/N 94080001



ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 24000 ppr
Power supply	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)
Power draw without load	800 mW
Max load current	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - **600** - 625 - **720** - 750 - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1500 - 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

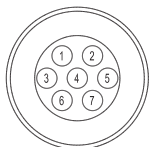
MECHANICAL SPECIFICATIONS

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

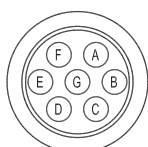
CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver	7 pin J output N / C / P / PC	7 pin J output Line Driver no Zero	7 pin M output N / C / P / PC	7 pin M output Line Driver no Zero	10 pin J output Line Driver with Zero	10 pin M output Line Driver with Zero	5 pin M12 output N / C / P / PC	8 pin M12 output Line Driver	12 pin H output CCW	5 pin C output N / C / P / PC	8 pin C output Line Driver
+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
Ch. A	green	green	3	1	C	A	1	A	3	6	5	2	1
Ch. A-	/	brown	/	3	/	C	7	G	/	5	6	/	2
Ch. B	yellow	yellow	5	2	E	B	2	B	1	4	8	4	3
Ch. B-	/	orange	/	5	/	E	8	H	/	3	1	/	4
Ch. Z	blue	blue	4	/	D	/	3	C	5	2	3	3	5
Ch. Z-	/	white	/	/	/	/	9	I	/	8	4	/	6
⏏	shield	shield	7	7	G	G	10	J	housing	housing	9	/	/

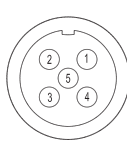
J connector (7 pin)
JIS-C-5432 Size 16
solder side view FV



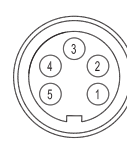
M connector (7 pin)
Amphenol MS3102-E-16-S
solder side view FV



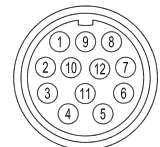
M12 connector (5 pin)
M12 A coded
solder side view FV



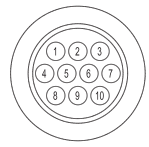
C connector (5 pin)
IEC 60130-9
solder side view FV



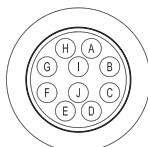
H connector (12 pin) - M23 CCW
Hummel 7.410.000000 -
7.002.912.603
solder side view FV



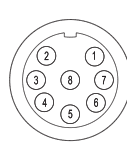
J connector (10 pin)
JIS-C-5432 Size 16
solder side view FV



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



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



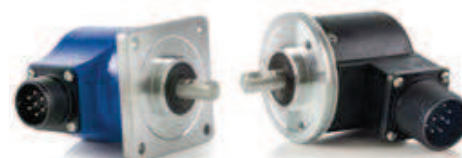
C connector (8 pin)
IEC 60130-9
solder side view FV



MAIN FEATURES

Standard $\varnothing$ 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 VDC with several electronic 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

ER 63A M* 500 S 5/28 N 8 X 6 P R .XXX

SERIES
 incremental encoder series **EL**
 incremental encoder series **ER**

MODEL
 synchronous flange $\varnothing$ 31,75 mm **63A**
 centering square flange $\varnothing$ 31,75 mm **63D**
 centering square flange $\varnothing$ 50 mm **63E**

METAL COVER
 * add for the metal cover **M**

RESOLUTION
 ppr from 1 to 24000
 see table for pulses availability

ZERO PULSE
 without zero pulse **S**
 with zero pulse **Z**

POWER SUPPLY
 (with L electronic interface) 5 V DC **5**
 (with L or PC electronic interface) 8 ... 24 V DC **8/24**
 5 ... 28 V DC **5/28**

ELECTRONIC INTERFACE
 NPN **N**
 NPN open collector **C**
 push-pull **P**
 push-pull protected (AEIC-7272) **PC**
 line driver **L**
 power supply 5/28V - output RS-422 **RS**

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

ENCLOSURE RATING
 IP 54 **X**
 IP 66 **S**

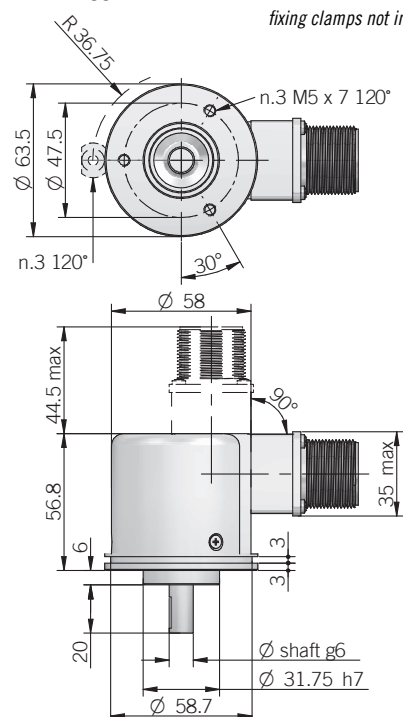
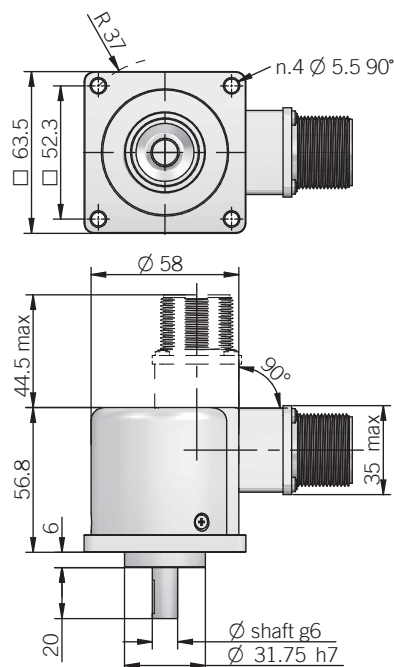
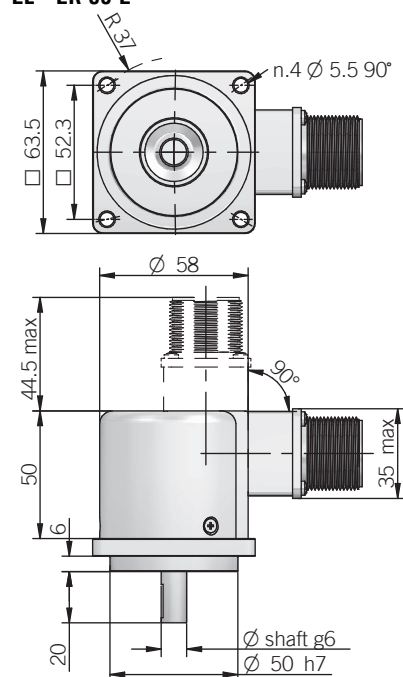
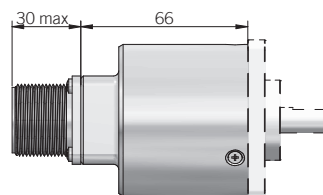
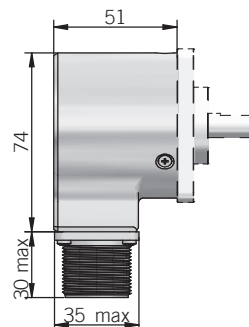
MAX ROTATION SPEED
 (IP 66) 3000 rpm **3**
 (IP 54) 6000 rpm **6**

OUTPUT TYPE
 cable (standard length 1,5 m) **P**
 MIL connector **M**
 JIS-C-5432 connector **J**
 M12 connector **M12**
 M23 connector **H**
 IP40 IEC 60130-9 connector **C**

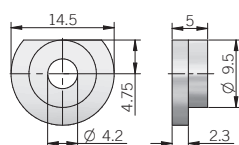
female connector included, without female please add 162 as variant code

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

VARIANT
 custom version **XXX**

EL - ER 63 A*fixing clamps not included***EL - ER 63 D****EL - ER 63 E****Dimension with metal cover axial output****Dimension with metal cover radial output***dimensions in mm***ACCESSORIES**

set n.3 fixing clamps for model 63 A
P/N 94080001



ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 24000 ppr
Power supply	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)
Power draw without load	800 mW
Max load current	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - **600** - 625 - **720** - 750 - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1500 - 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

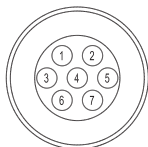
MECHANICAL SPECIFICATIONS

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

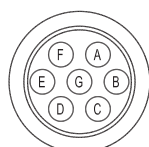
CONNECTIONS

Function	Cable output	Cable output	7 pin J output	7 pin J output	7 pin M output	7 pin M output	10 pin J output	10 pin M output	5 pin M12 output	8 pin M12 output	12 pin H output	5 pin C output	8 pin C output
	N / C / P / PC	Line driver	N / C / P / PC	Line Driver no Zero	N / C / P / PC	Line Driver no Zero	Line Driver with Zero	Line Driver with Zero	N / C / P / PC	Line Driver	CCW	N / C / P / PC	Line Driver
+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
Ch. A	green	green	3	1	C	A	1	A	3	6	5	2	1
Ch. A-	/	brown	/	3	/	C	7	G	/	5	6	/	2
Ch. B	yellow	yellow	5	2	E	B	2	B	1	4	8	4	3
Ch. B-	/	orange	/	5	/	E	8	H	/	3	1	/	4
Ch. Z	blue	blue	4	/	D	/	3	C	5	2	3	3	5
Ch. Z-	/	white	/	/	/	/	9	I	/	8	4	/	6
≡	shield	shield	7	7	G	G	10	J	housing	housing	9	/	/

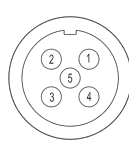
J connector (7 pin)
JIS-C-5432 Size 16
solder side view FV



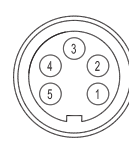
M connector (7 pin)
Amphenol MS3102-E-16-S
solder side view FV



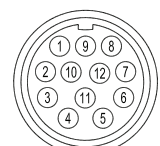
M12 connector (5 pin)
M12 A coded
solder side view FV



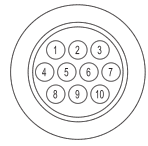
C connector (5 pin)
IEC 60130-9
solder side view FV



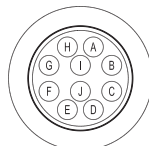
H connector (12 pin) - M23 CCW
Hummel 7.410.000000 -
7.002.912.603
solder side view FV



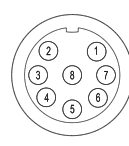
J connector (10 pin)
JIS-C-5432 Size 16
solder side view FV



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



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



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



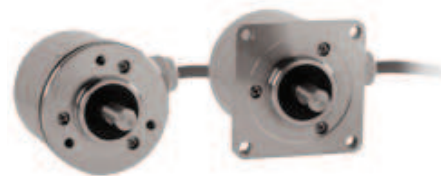
MAIN FEATURES

Thanks to the stainless steel enclosure, this encoder is suitable for food and beverage machinery, cranes and winches for ships, offshore applications, washing systems and for all those environments where high corrosion resistance is required.

- 3 channel encoder (A / B / Z) up to 24000 ppr
- Power supply up to +28 VDC with several electronic interfaces available
- Up to 500 kHz output frequency
- Solid shaft diameter up to 10 mm
- Mounting by clamping or centering 2,5" square flange



UNI EN ISO 9001:2008

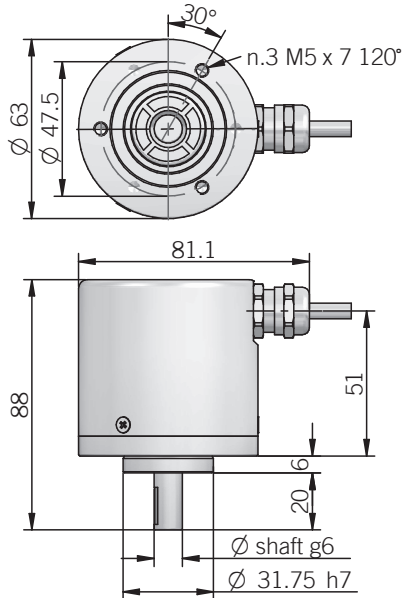


ORDERING CODE

ER 63DX 500 S 5/28 N 8 S 3 PR .XXX

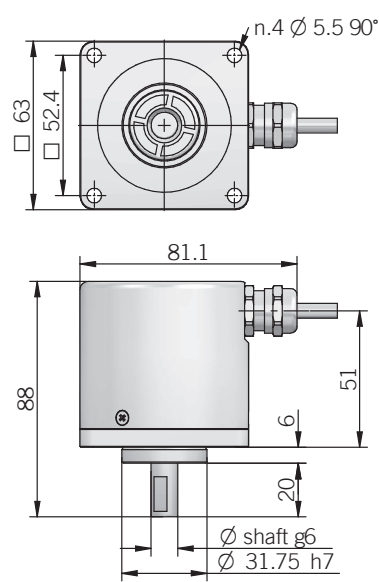
SERIES												
incremental encoder series EL												
incremental encoder series ER												
MODEL												
clamping flange ø 31,75 mm 63AX												
centering square flange ø 31,75 mm 63DX												
RESOLUTION												
ppr from 1 to 24000												
see table for pulses availability												
ZERO PULSE												
without zero pulse S												
with zero pulse Z												
POWER SUPPLY												
(with L electronic interface) 5 V DC 5												
(with L or PC electronic interface) 8 ... 24 V DC 8/24												
5 ... 28 V DC 5/28												
ELECTRONIC INTERFACE												
NPN N												
NPN open collector C												
push-pull P												
push-pull protected (AEIC-7272) PC												
line driver L												
power supply 5/28V - output RS-422 RS												
SHAFT DIAMETER												
9,52 (3/8") mm 9												
mm 10												
ENCLOSURE RATING												
IP 66 S												
MAX ROTATION SPEED												
3000 rpm 3												
OUTPUT TYPE												
radial cable (standard length 1,5 m) P												
VARIANT												
custom version XXX												

EL - ER 63 AX



dimensions in mm

EL - ER 63 DX



ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 24000 ppr
Power supply	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)
Power draw without load	800 mW
Max load current	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - **600** - 625 - **720** - 750 - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1500 - 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 SPECIFICATIONS

Shaft diameter	Ø 9,52 (3/8") / 10 mm
Enclosure rating	S = IP 66 (IEC 60529)
Max rotation speed	EL 3000 rpm / 60° C ER 3000 rpm / 70° C - 2000 rpm / 85° C
Max shaft load	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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,06 Nm
Body material	1.4305 / AISI 303 stainless steel
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	1.4305 / AISI 303 stainless steel
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-10° ... +60°C (+14° ... +140°F) EL series -25° ... +85°C (-13° ... +185°F) ER series
Storage temperature	-25° ... +70°C (-13° ... +158°F)
Weight	650 g (22,92 oz)

CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
⏏	shield	shield

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 VDC with several electronic interfaces available
- Up to 500 kHz output frequency
- 10 mm solid shaft diameter
- Mounting by synchronous 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 60079-1:2007
- EN 60079-31:2014

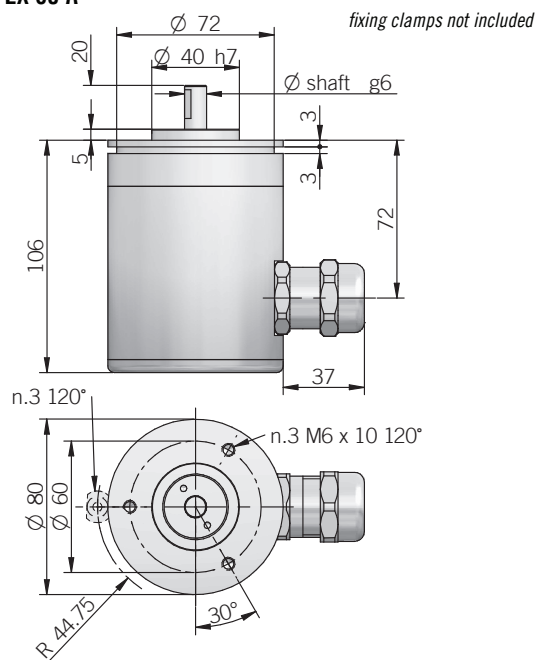
Declaration of conformity and CE declaration are available for download from Eltra website www.eltra.it



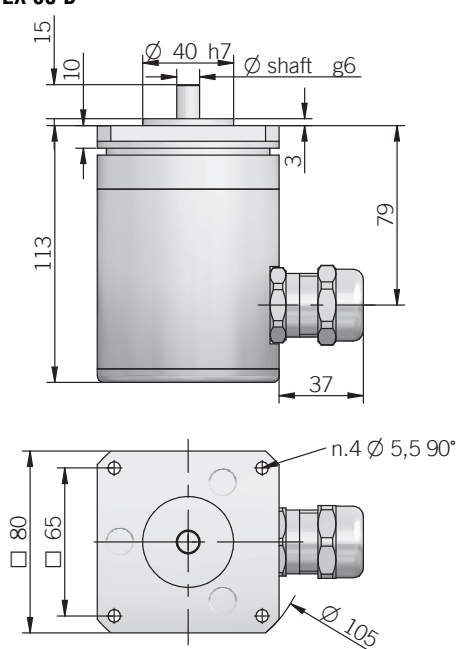
ORDERING CODE

EX	80A	500	S	5/28	N	10	X	3	PR	.XXX
SERIES explosion proof encoder series EX										
MODEL synchronous flange ø 40 mm 80A centering square flange ø 40 mm 80D										
RESOLUTION ppr from 100 to 10000 <i>see table for pulses availability</i>										
ZERO PULSE without zero pulse S with zero pulse Z										
POWER SUPPLY (with L electronic interface) 5 V DC 5 (with L or PC electronic interface) 8 ... 24 V DC 8/24 5 ... 28 V DC 5/28										
ELECTRONIC INTERFACE NPN N NPN open collector C push-pull P push-pull protected (AEIC-7272) PC line driver L power supply 5/28V - output RS-422 RS										
SHAFT DIAMETER mm 10										
ENCLOSURE RATING IP 65 X										
MAX ROTATION SPEED 3000 rpm 3										
OUTPUT TYPE radial cable (standard length 1,5 m) PR										
VARIANT custom version XXX										

EX 80 A



EX 80 D



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 100 to 10000 ppr
Power supply	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	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-1 IEC 61000-6-3

*output levels according to power supply, for further details please see under Technical basics section

ATEX MARKING

II 2GD
Ex d IIC T6 Gb
Ex tb IIIC T85°C Db
IP 65

II 2GD

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

MECHANICAL SPECIFICATIONS

Shaft diameter	Ø 10 mm
Enclosure rating	IP 65 (IEC 60529)
Max rotation speed	3000 rpm
Max shaft load	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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,03 Nm
Body material	anodized aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	anodized aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-20° ... +50°C (-4° ... +122°F)
Storage temperature	-20° ... +70°C (-4° ... +158°F)
Weight	1200 g (42,33 oz)

CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver
+V DC	brown	brown
0 V	gray	gray
Ch. A	green	green
Ch. A-	/	red
Ch. B	yellow	yellow
Ch. B-	/	pink
Ch. Z	white	blue
Ch. Z-	/	white
≡	shield	shield

RESOLUTIONS

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

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.

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Redundancy with double electronics and / or double resolutions
- Power supply up to +24 VDC with several electronic interfaces available
- Up to 100 kHz output frequency
- Solid shaft diameter up to 11 mm
- Mounting by synchronous or REO-444 flange
- Model 115R available with centrifugal relay



ORDERING CODE	EH	90A	500	S	8/24	N	1000	Z	8/24	N	8	X	6	P	R	.XXX + 2000
SERIES																
incremental encoder series	EH															
MODEL																
synchronous flange ø 40 mm		90A														
flange REO-444		115A														
flange REO-444 with centrifugal relay		115R														
RESOLUTION																
ppr from		200	to	2048												
see table for pulses availability																
ZERO PULSE																
without zero pulse				S												
with zero pulse				Z												
POWER SUPPLY																
(with L electronic interface) 5 V DC				5												
8 ... 24 V DC				8/24												
ELECTRONIC INTERFACE																
NPN				N												
NPN open collector				C												
PUSH PULL				P												
protected push-pull (AEIC-7272)				PC												
line driver				L												
RESOLUTION																
ZERO PULSE																
POWER SUPPLY																
ELECTRONIC INTERFACE																
SHAFT DIAMETER																
(mod. 90) mm							8									
(mod. 90) 9,52 (3/8")							9									
mm							10									
(mod. 115) mm							11									
ENCLOSURE RATING																
IP 54							X									
(mod. 90) 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									
MIL connector							M									
JIS-C-5432 connector							J									
female connector included, without female please add 162 as variant code																
DIRECTION TYPE																
axial							A									
radial							R									
VARIANT																
custom version							XXX									
RELAY INTERVENTION SPEED																
from							600	to	4300							
for other speeds please contact our offices directly																

To be indicated only in the models "A" for double electronics and double resolution.
 See examples:

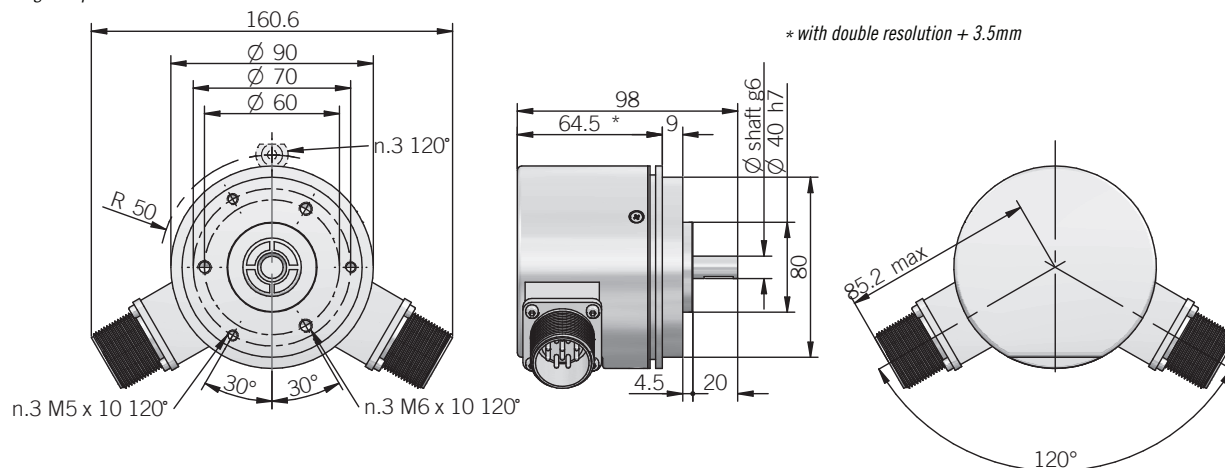
Double resolution and double electronics: **EH90A1024Z5L-2048Z8/24L10X...**

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

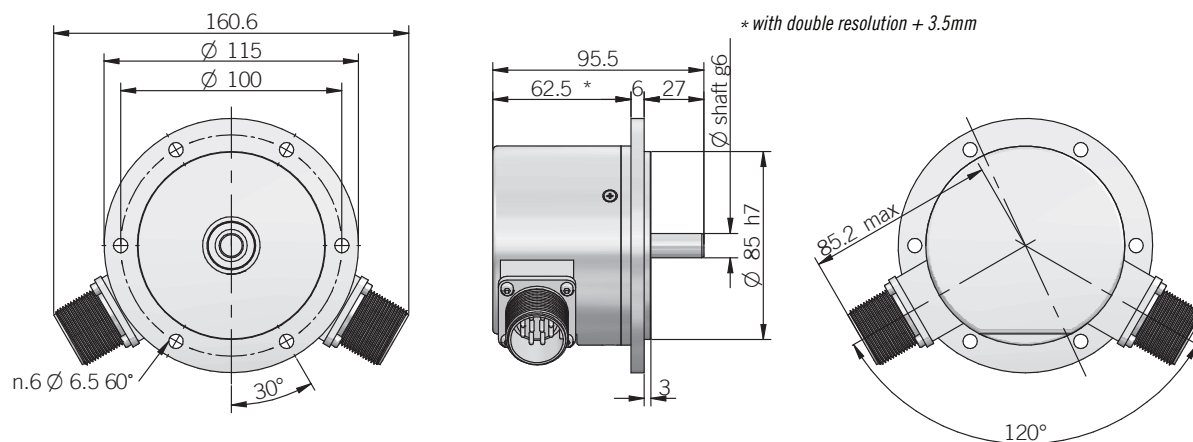
Same resolution and double electronics: **EH90A1024Z5L-Z8/24L10X...**

EH 90 A with double electronics / resolutions

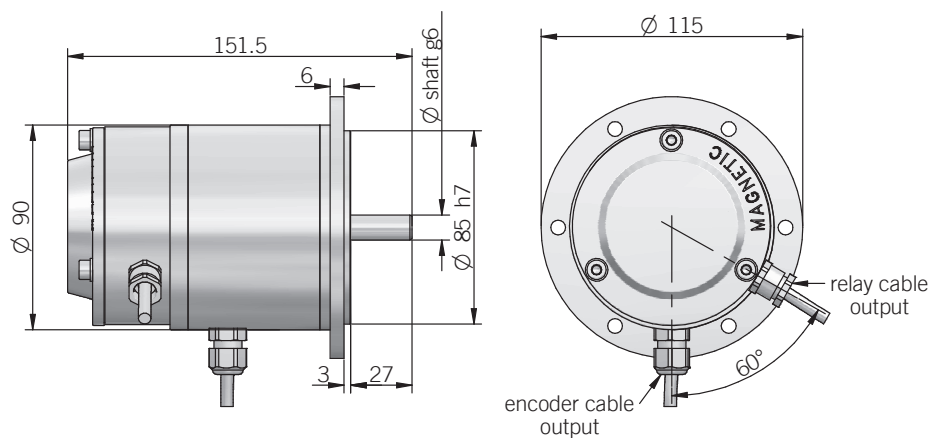
fixing clamps not included



EH 115 A with double electronics / resolutions



EH 115 R with centrifugal relay



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 200 to 2048 ppr
Power supply	5 = 4,5 ... 5,5 V DC 8/24 = 7,6 ... 25,2 V DC (reverse polarity protection)
Current consumption without load	100 mA max
Max load current	N / C / P / PC = 50 mA / channel L = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	100 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-1 IEC 61000-6-3

*output levels according to power supply, for further details please see under Technical basics section

RESOLUTIONS

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

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

RELAY CHARACTERISTICS

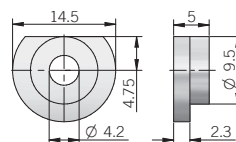
Intervention speed	from 600 to 4300 rpm
Accuracy	± 3 %
Contact capacity	2 A / 250 V AC 3,3 A / 125 V AC
Type of contact	Normally Closed (NC)

MECHANICAL 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	X = 6000 rpm S = 3000 rpm
Max shaft load	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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,02 Nm (IP 54) < 0,06 Nm (IP 66)
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	painted aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-10° ... +60°C (+14° ... +140°F)
Storage temperature	-25° ... +70°C (-13° ... +158°F)
Weight	750 g (26,46 oz) 1050 g (37,04 oz) with relay

ACCESSORIES

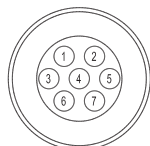
set n.3 fixing clamps for model 90 A
P/N 94080001



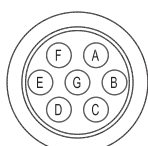
CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver	7 pin J output N / C / P / PC	7 pin J output Line Driver no Zero	7 pin M output N / C / P / PC	7 pin M output Line Driver no Zero	10 pin J output Line Driver with Zero	10 pin M output Line Driver with Zero
+V DC	red	red	6	4	F	D	4 - 5	D - E
0 V	black	black	1	6	A	F	6	F
Ch. A	green	green	3	1	C	A	1	A
Ch. A-	/	brown	/	3	/	C	7	G
Ch. B	yellow	yellow	5	2	E	B	2	B
Ch. B-	/	orange	/	5	/	E	8	H
Ch. Z	blue	blue	4	/	D	/	3	C
Ch. Z-	/	white	/	/	/	/	9	I
⏏	shield	shield	7	7	G	G	10	J

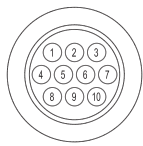
J connector (7 pin)
JIS-C-5432 Size 16
solder side view FV



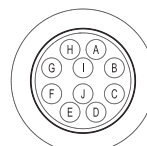
M connector (7 pin)
Amphenol MS3102-E-16-S
solder side view FV



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



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 VDC with several electronic 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



UNI EN ISO 9001:2008


ORDERING CODE
ER 90A 500 S 5/28 N 8 X 6 P R .XXX

SERIES
 incremental encoder series **EL**
 incremental encoder series **ER**

MODEL
 synchronous flange ø 40 mm **90A**
 flange REO-444 **115A**

RESOLUTION
 ppr from **1** to **10000**
 see table for pulses availability

ZERO PULSE
 without zero pulse **S**
 with zero pulse **Z**

POWER SUPPLY
 (with L electronic interface) 5 V DC **5**
 (with L or PC electronic interface) 8 ... 24 V DC **8/24**
 5 ... 28 V DC **5/28**

ELECTRONIC INTERFACE
 NPN **N**
 NPN open collector **C**
 push-pull **P**
 push-pull protected (AEIC-7272) **PC**
 line driver **L**
 power supply 5/28V - output RS-422 **RS**

SHAFT DIAMETER
 (mod. 90) mm **8**
 (mod. 90) 9,52 (3/8") mm **9**
 mm **10**
 (mod. 115) mm **11**

ENCLOSURE RATING
 IP 54 **X**
 (mod. 90) IP 66 **S**

MAX ROTATION SPEED
 (IP 66) 3000 rpm **3**
 (IP 54) 6000 rpm **6**

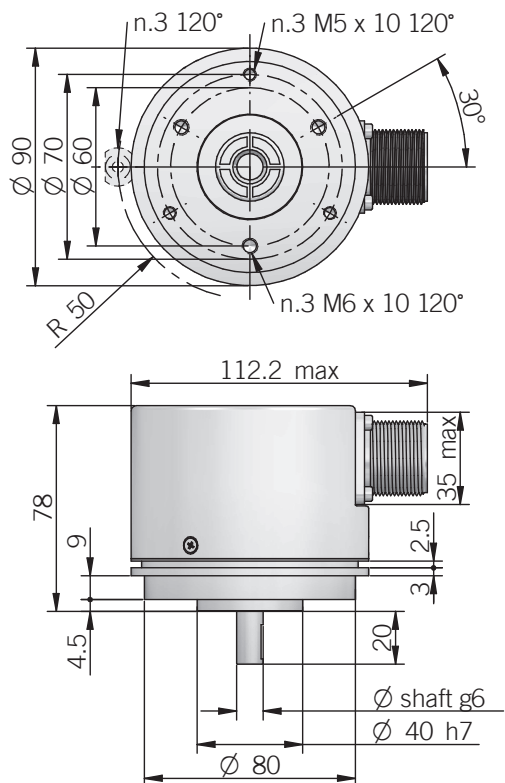
OUTPUT TYPE
 cable (standard length 1.5 m) **P**
 MIL connector **M**
 JIS-C-5432 connector **J**
female connector included, without female please add 162 as variant code

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

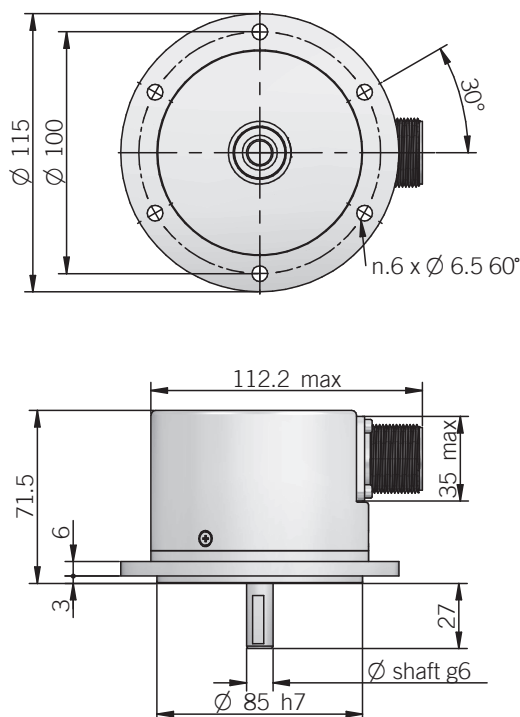
VARIANT
 custom version **XXX**

EL - ER 90 A

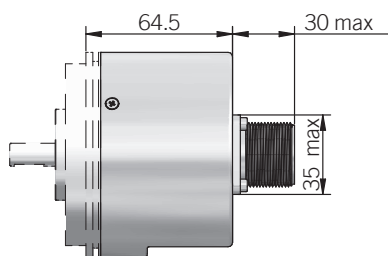
fixing clamps not included



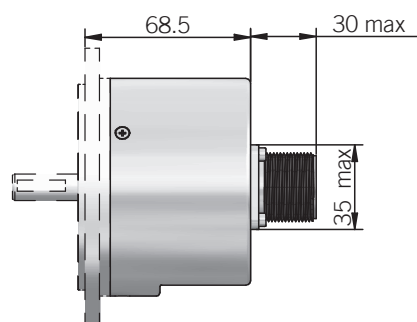
EL - ER 115 A



EL - ER 90 A axial output



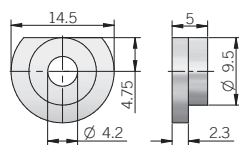
EL - ER 115 A axial output



dimensions in mm

ACCESSORIES

set n.3 fixing clamps for model 90 A
P/N 94080001



ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 10000 ppr
Power supply	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)
Power draw without load	800 mW
Max load current	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - **600** - 625 - **720** - 750 - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1500 - 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

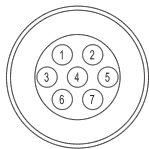
MECHANICAL SPECIFICATIONS

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	X = 6000 rpm S = EL 3000 rpm / 60° C ER 3000 rpm / 70° C - 2000 rpm / 85° C
Max shaft load	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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,02 Nm (IP 54) < 0,06 Nm (IP 66)
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	painted aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-10° ... +60°C (+14° ... +140°F) EL series -25° ... +85°C (-13° ... +185°F) ER series
Storage temperature	-25° ... +70°C (-13° ... +158°F)
Weight	750 g (26,46 oz)

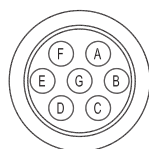
CONNECTIONS

Function	Cable output	Cable output	7 pin J output	7 pin J output	7 pin M output	7 pin M output	10 pin J output	10 pin M output
	N / C / P / PC	Line driver	N / C / P / PC	Line Driver no Zero	N / C / P / PC	Line Driver no Zero	Line Driver with Zero	Line Driver with Zero
+V DC	red	red	6	4	F	D	4 - 5	D - E
0 V	black	black	1	6	A	F	6	F
Ch. A	green	green	3	1	C	A	1	A
Ch. A-	/	brown	/	3	/	C	7	G
Ch. B	yellow	yellow	5	2	E	B	2	B
Ch. B-	/	orange	/	5	/	E	8	H
Ch. Z	blue	blue	4	/	D	/	3	C
Ch. Z-	/	white	/	/	/	/	9	I
⏏	shield	shield	7	7	G	G	10	J

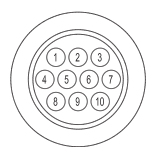
J connector (7 pin)
JIS-C-5432 Size 16
solder side view FV



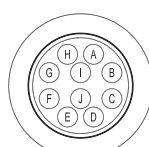
M connector (7 pin)
Amphenol MS3102-E-16-S
solder side view FV



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



MAIN FEATURES

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

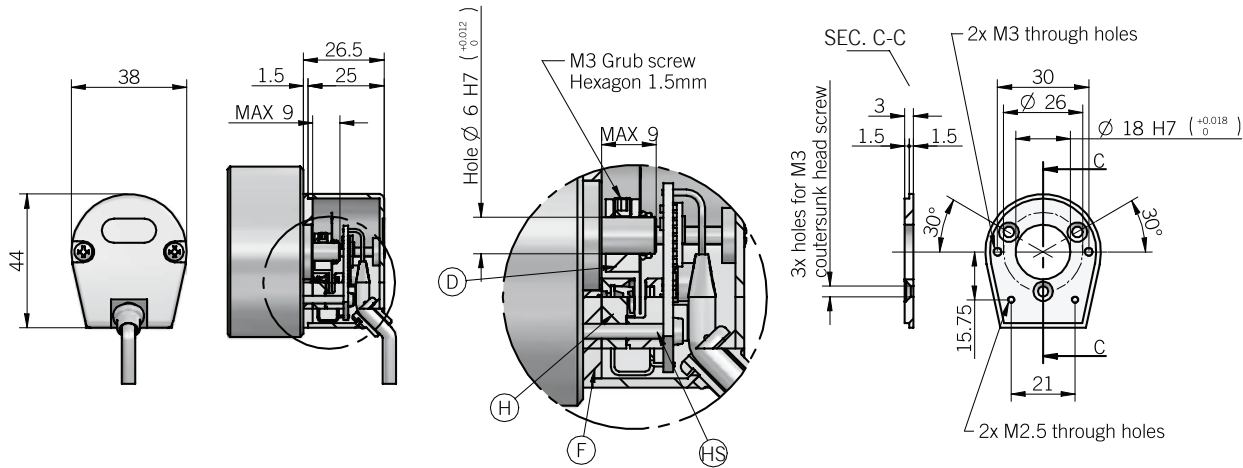
- 3 channel encoder (A / B / Z) up to 1024 ppr
- Power supply up to +24 VDC with several electronic interfaces available
- Up to 100 kHz output frequency
- No wear due to absense of bearings
- Easy assembly
- Compact size



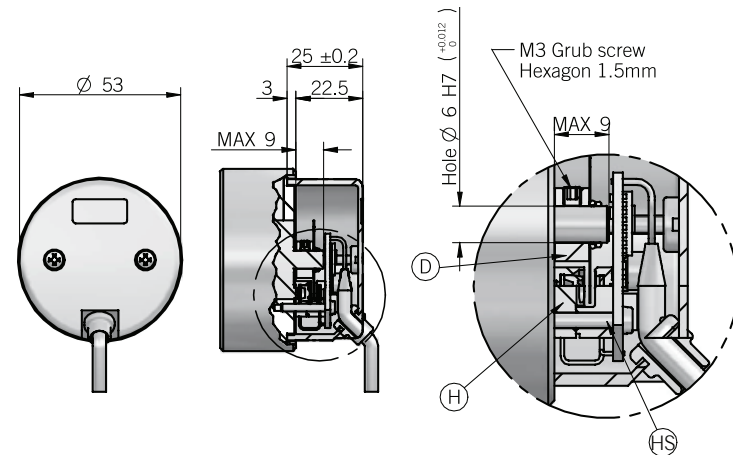
ORDERING CODE

EH	30M	500	S	8/24	P	6	X	6	PR	.XXX
SERIES incremental encoder series EH										
MODEL kit encoder 17M kit encoder 30M										
RESOLUTION ppr from 50 to 1024 <i>see table for pulses availability</i>										
ZERO PULSE without zero pulse S with zero pulse Z										
POWER SUPPLY 5 V DC 5 8 ... 24 V DC 8/24										
ELECTRONIC INTERFACE NPN N NPN open collector C push-pull P line driver L										
BORE DIAMETER mm 6 (1/4") mm 6,35										
ENCLOSURE RATING IP40 mod. 17 / IP 54 mod. 30 X										
MAX ROTATION SPEED 6000 rpm 6										
OUTPUT TYPE radial cable (standard length 0,5 m) PR										
VARIANT custom version XXX										

EH 17 M



EH 30 M



dimensions in mm

CONNECTIONS

Function	Cable output N / C / P	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
⏏	shield	shield

ELECTRICAL SPECIFICATIONS

Resolution	from 50 to 1024 ppr
Power supply	5 = 4,5 ... 5,5 V DC 8/24 = 7,6 ... 25,2 V DC
Current consumption without load	50 mA bidirectional 100 mA bidirectional with zero
Max load current	N / C / P = 50 mA / channel L = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-1 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

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

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 (not supplied)
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 ⁻⁶ kgm ²
Flange material (mod. 17)	Aluminium
Hub material	EN-AW 2011 aluminium
Cover material	PA66 glass fiber reinforced
Operating temperature	-20° ... +60°C (-4° ... +140°F)
Storage temperature	-25° ... +70°C (-13° ... +158°F)
Shaft axial play	± 0,1 mm
Shaft eccentricity (plus radial play)	± 0,04 mm
Fixing torque for grub screws	40 cNm max
Weight	50 g (1,76 oz)

MAIN FEATURES

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 VDC with several electronic interfaces available
- Up to 500 kHz output frequency
- No wear due to absence of bearings
- Easy assembly
- Compact size



ORDERING CODE

EH 30MH 2000 S 5/30 P 6 X X PR .XXX

SERIES
incremental encoder series **EH**

TYPE
high resolution kit encoder **17MH**
high resolution kit encoder **30MH**

RESOLUTION
ppr **2000 / 2048 / 2500 / 4096 / 5000**

ZERO PULSE
without zero pulse **S**
with zero pulse **Z**

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

ELECTRONIC INTERFACE
push-pull **P**
line driver **L**
power supply 5/30V - output RS-422 **RS**

BORE DIAMETER
mm **6**
(1/4") mm **6,35**

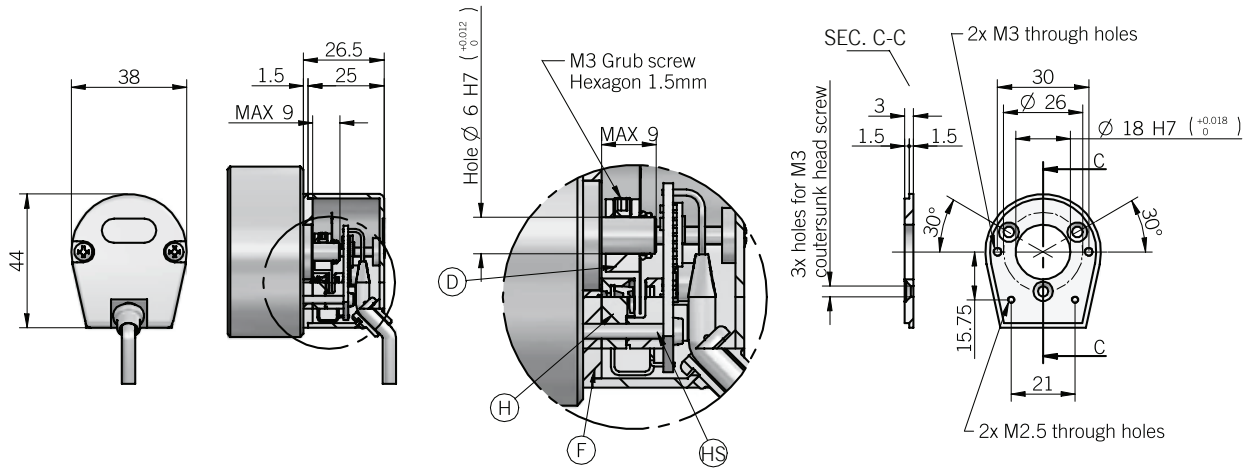
ENCLOSURE RATING
IP40 mod. 17 / IP 54 mod. 30 **X**

OPTION
to be reported **X**

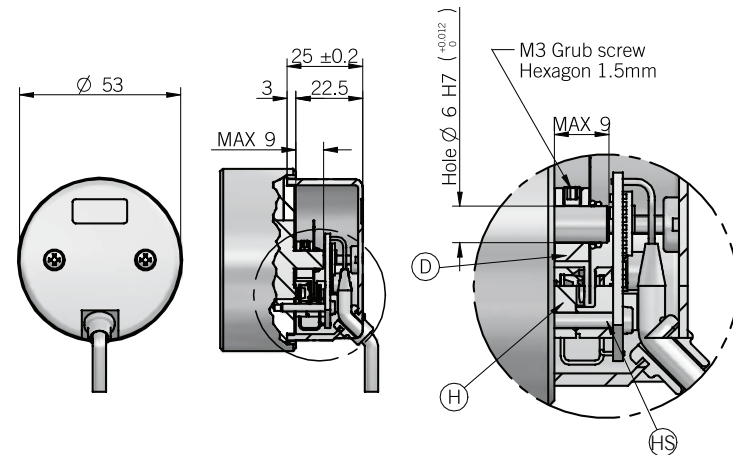
OUTPUT TYPE
radial cable (standard length 0,5 m) **PR**

VARIANT
custom version **XXX**

EH 17 MH



EH 30 MH



dimensions in mm

CONNECTIONS

Function	Cable output Push-pull	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
⊥	shield	shield

ELECTRICAL SPECIFICATIONS

Resolution	from 2000 to 5000 ppr
Power supply	5/30 = 4,5 ... 30 V DC (reverse polarity protection)
Current consumption without load	60 mA max
Max load current	20 mA / channel
Output type*	push-pull / line driver
Max output frequency	500 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-1 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

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 (not supplied)
Max rotation speed	6000 prpm
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 ⁻⁶ kgm ²
Flange material (mod. 17)	aluminium
Hub material	EN-AW 2011 aluminium
Cover material	PA66 glass fiber reinforced
Operating temperature	-20° ... +85°C (-4° ... +185°F)
Storage temperature	-20° ... +85°C (-4° ... +185°F)
Shaft axial play	± 0,1 mm
Shaft eccentricity (plus radial play)	± 0,04 mm
Fixing torque for grub screws	40 cNm max
Weight	50 g (1,76 oz)

MAIN FEATURES

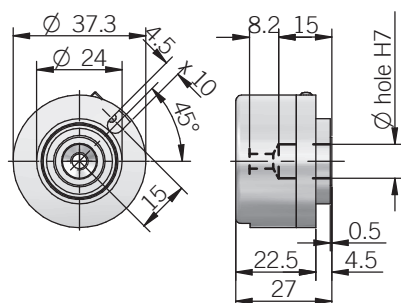
ø 36 mm encoder series recommended in feedback control systems on AC servomotors, interchangeable with size 15 Resolver in the back of the motor.

- 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	X	6	PR	.XXX
SERIES incremental encoder with Hall phases EF													
MODEL blind hollow shaft with rear fixing 36K													
MOTOR POLES 4 poles 4 6 poles 6 8 poles 8													
ELECTRONIC INTERFACE FOR COMMUTATION SIGNALS NPN open collector C line driver RS-422 L													
RESOLUTION ppr from 500 to 1024 see table for pulses availability													
ZERO PULSE without zero pulse S with zero pulse Z													
POWER SUPPLY 5 V DC 5													
ELECTRONIC INTERFACE line driver RS-422 L													
BORE DIAMETER mm 8 9,52 mm (3/8") mm 9 mm 10													
ENCLOSURE RATING IP 40 X													
MAX ROTATION SPEED 6000 rpm 6													
OUTPUT TYPE radial cable (standard length 0,3 m) PR													
VARIANT custom version XXX													

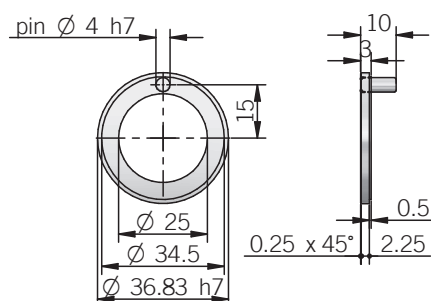
EF 36 K



dimensions in mm

ACCESSORIES

size 15 Resolver flange ordering code: **FL6004** (P/N 94010076)



for mounting instruction please refer to product installation notes

ELECTRICAL SPECIFICATIONS

Incremental resolution	from 500 to 1024 ppr
Power supply	5 = 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)
Output type for incremental signals	line driver RS-422
Output type for Hall phases	NPN open collector (pull-up max +30V DC) line driver RS-422
Max output frequency	150 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-1 IEC 61000-6-3

MECHANICAL SPECIFICATIONS

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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,01 Nm
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-10° ... +85°C (+14° ... +185°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Fixing torque for shaft fixing	1,5 Nm max
Weight	150 g (5,29 oz)

CONNECTIONS

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

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 +28 VDC with several electronic interfaces available
- Up to 220 kHz output frequency
- Cable output, connectors available on cable end
- Metal cover for high IP enclosure rating
- Blind hollow shaft diameter up to 10 mm
- Mounting by stator coupling or anti-rotation pin

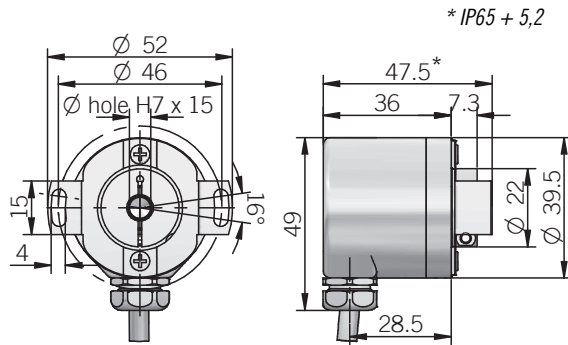


ORDERING CODE

ER 38F 500 S 5/28 P 6 X 3 PR .XXX

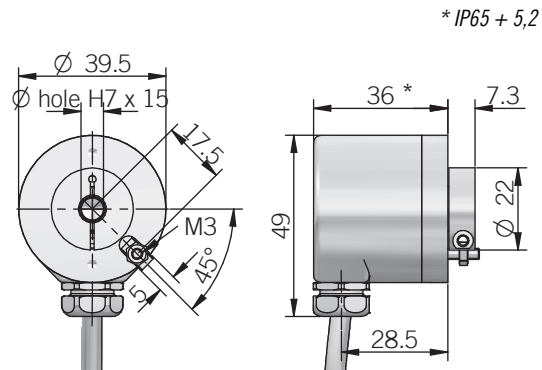
SERIES incremental encoder series EL incremental encoder series ER											
MODEL blind hollow shaft with stator coupling 38F blind hollow shaft with anti-rotation pin 38G											
RESOLUTION ppr from 1 to 14400 <i>see table for pulses availability</i>											
ZERO PULSE without zero pulse S with zero pulse Z											
POWER SUPPLY (with L electronic interface) 5 V DC 5 (with L or PC electronic interface) 8 ... 24 V DC 8/24 5 ... 28 V DC 5/28											
ELECTRONIC INTERFACE (max 2500 ppr) NPN N (max 2500 ppr) NPN open collector C push-pull P push-pull protected (AEIC-7272) PC line driver L power supply 5/30V - output RS-422 RS											
BORE DIAMETER mm 6 mm 8 9,52 (3/8") mm 9 mm 10											
ENCLOSURE RATING IP 64 X IP 65 S											
MAX ROTATION SPEED 3000 rpm 3											
OUTPUT TYPE radial cable (standard length 0,5 m) PR											
VARIANT custom version XXX											

EL - ER 38 F



dimensions in mm

EL - ER 38 G



anti-rotation pin is included in model G, for mounting instruction please refer to product installation notes

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 14400 ppr
Power supply	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	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	150 kHz EL series 220 kHz ER series
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

EL SERIES RESOLUTIONS

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 30 - 32 - 40 - 50 - 70 - 80 - 90 - 250 - 300 - 600 - 2880 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 7200 - 8000 - 8192 - 10000 - 12000 - 14400

ER SERIES RESOLUTIONS

100 - 120 - 128 - 200 - 240 - 256 - **360** - 400 - 480 - **500** - **512** - 625 - 720 - 750 - 900 - **1000** - **1024** - 1250 - 1440 - 1500 - 1800 - **2000** - **2048** - **2500**

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

CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
≡	shield	shield

MECHANICAL SPECIFICATIONS

Bore diameter	ø 6* / 8* / 9,52 (3/8") / 10 mm
Enclosure rating	IP 64 (IEC 60529) IP 65 (IEC 60529)
Max rotation speed	3000 rpm
Max shaft load	5 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,8 x 10 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,01 Nm (IP 64) < 0,06 Nm (IP 65)
Fixing torque for collar clamping	0,6 Nm recommended
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	painted aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-10° ... +60°C (+14° ... +140°F) EL series -20° ... +85°C (-4° ... +185°F) ER series
Storage temperature	-25° ... +70°C (-13° ... +158°F)
Weight	150 g (5,29 oz)

* with supplied adapter shaft

MAIN FEATURES

Hollow shaft $\varnothing$ 48 mm encoder series recommended for motor feedback.

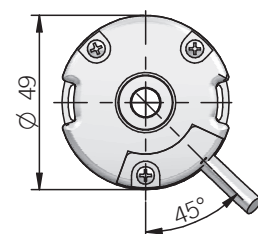
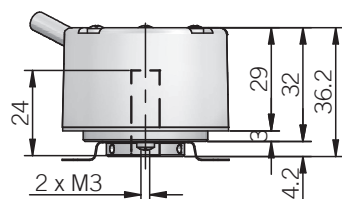
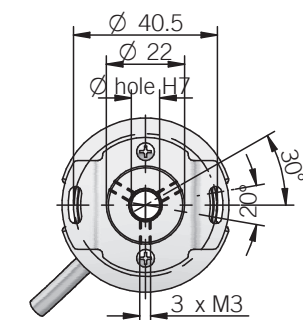
- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +24 VDC with several electronic interfaces available
- Up to 150 kHz output frequency
- Cable output, connectors available on cable end
- Through hollow shaft diameter up to 8 mm
- Mounting by stator coupling



ORDERING CODE

EL	48C	500	S	5	L	8	X	6	PR	.XXX
SERIES incremental encoder series EL										
MODEL blind hollow shaft 48C through hollow shaft 48P										
RESOLUTION ppr from 100 to 2048 <i>see table for pulses availability</i>										
ZERO PULSE without zero pulse S with zero pulse Z										
POWER SUPPLY 5 V DC 5 8 ... 24 V DC 8/24										
ELECTRONIC INTERFACE NPN N NPN open collector C push-pull P push-pull protected (AEIC-7272) PC line driver L										
BORE DIAMETER mm 6 mm 8										
ENCLOSURE RATING IP 40 X										
MAX ROTATION SPEED 6000 rpm 6										
OUTPUT TYPE radial cable (standard length 0,3 m) PR										
VARIANT custom version XXX										

EL 48 C / P



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 100 to 2048 ppr
Power supply	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	N / C / P / PC = 30 mA / channel L = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	150 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-1 IEC 61000-6-3

*output levels according to power supply, for further details please see under Technical basics section

MECHANICAL SPECIFICATIONS

Bore diameter	ø 6 / 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	$2,5 \times 10^{-6} \text{ kgm}^2$
Starting torque (at +20°C / +68°F)	< 0,01 Nm
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA 66 glass fiber reinforced
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-20° ... +85 °C (-4° ... +185°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Weight	100 g (3,53 oz)

CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
≡	shield	shield

RESOLUTIONS

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

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

MAIN FEATURES

∅ 49 mm encoder recommended in feedback control systems on AC servomotors, interchangeable with size 19 Resolver.

- Easy mechanical mounting
- Small dimensions
- Wide range of resolutions available
- High temperature resistance

EL series

Basic version with 3 channels incremental outputs. Several output types available

EF series

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 X 6 PR .XXX

SERIES
incremental encoder **EL**
incremental encoder with Hall phases **EF**

MODEL
blind hollow shaft **49C**
through hollow shaft **49P**

EF MOTOR POLES
4 poles **4**
6 poles **6**
8 poles **8**

EF ELECTRONIC INTERFACE FOR COMMUTATION SIGNALS
NPN open collector **C**
line driver RS-422 **L**

RESOLUTION
ppr from 100 to 2048
see table for pulses availability

ZERO PULSE
without zero pulse **S**
with zero pulse **Z**

POWER SUPPLY
5 V DC **5**
(mod. EL) 8 ... 24 V DC **8/24**

ELECTRONIC INTERFACE
(mod. EL) NPN **N**
(mod. EL) NPN open collector **C**
(mod. EL) push-pull **P**
line driver **L**

BORE DIAMETER
mm **6**
mm **8**
9,52 mm (3/8") **9**
mm **10**
mm **12**
12,7 mm (1/2") **12.7**

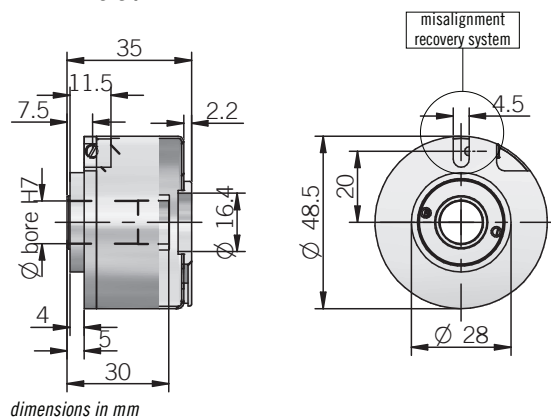
ENCLOSURE RATING
IP 40 **X**

MAX ROTATION SPEED
6000 rpm **6**

OUTPUT TYPE
radial cable (standard length 0,3 m) **PR**

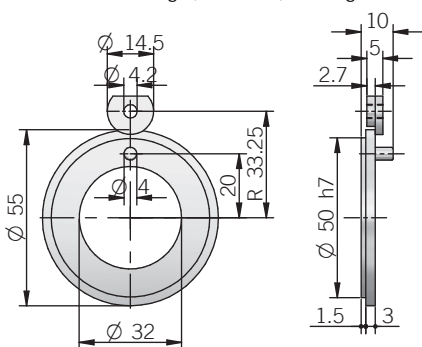
VARIANT
custom version **XXX**

EL - EF 49 C / P

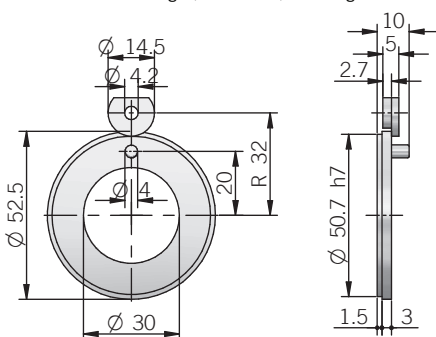


ACCESSORIES

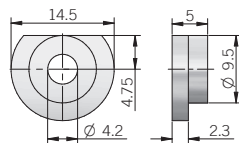
Size 19 resolver flange (01 version) ordering code: **FL6000** (P/N 94010087)



Size 19 resolver flange (14 version) ordering code: **FL6001** (P/N 94010065)



Set n.3 fixing clamps (P/N 94080001)



for mounting instruction please refer to product installation notes

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

ELECTRICAL SPECIFICATIONS

Resolution	from 100 to 2048 ppr (see table)
Max load current	N / C / P = 30 mA / channel L = 20 mA / channel
Max output frequency	150 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-1 IEC 61000-6-3

ELECTRICAL SPECIFICATIONS EL SERIES

Power supply	5 = 4,5 ... 5,5 V DC 8/24 = 7,6 ... 25,2 V DC
Current consumption without load	100 mA max
Output type	NPN / NPN open collector / push-pull / line driver

*output levels according to power supply, for further details please see under Technical basics section

ELECTRICAL SPECIFICATIONS EF SERIES

Power supply	5 = 4,5 ... 5,5 V DC
Current consumption without load	150 mA max
Output type for incremental signals	line driver RS-422
Output type for Hall phases	NPN open collector (max pullup +30V DC) line driver RS-422

MECHANICAL SPECIFICATIONS

Bore diameter	Ø 6 / 8 / 9,52 / 10 / 12 / 12,7 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	$2 \times 10^{-6} \text{ kgm}^2$
Starting torque (at +20°C / +68°F)	< 0,01 Nm
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	nickel plated brass
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-20° ... +85 °C (-4° ... +185°F) -10° ... +100°C (+14° ... +212°F) on demand
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Weight	150 g (5,29 oz)

CONNECTIONS

Function	EL cable output	EL cable output	EF cable output
	N / C / P	Line driver	
+V DC	red	red	red
0 V	black	black	black
Ch. A	green	green	green
Ch. B	yellow	yellow	yellow
Ch. Z	blue	blue	blue
Ch. A-	/	brown	brown
Ch. B-	/	orange	orange or pink
Ch. Z-	/	white	white
Ch. U	/	/	grey
Ch. V	/	/	violet
Ch. W	/	/	grey-pink
Ch. U-	/	/	red-blue
Ch. V-	/	/	white-green
Ch. W-	/	/	brown-green
—	shield	shield	shield

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 1024 ppr
- Highly integrated optical ASIC
- Wide power supply up to +30 VDCC
- 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

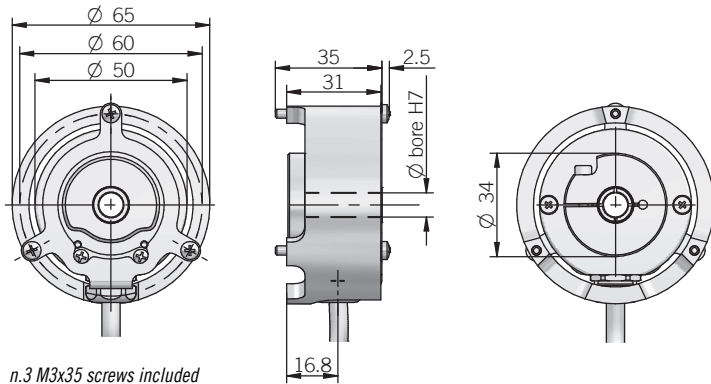


ORDERING CODE

EH 50FP 1024 S 5/30 P 6 X 6 PR .XXX

SERIES incremental encoder series EH											
MODEL through hollow shaft with front fixing 50FA through hollow shaft with rear fixing 50FP											
RESOLUTION ppr from 100 to 1024 <i>see table for pulses availability</i>											
ZERO PULSE without zero pulse S with zero pulse Z											
POWER SUPPLY 5 ... 30 V DC 5/30											
ELECTRONIC INTERFACE push-pull P universal line driver TTL/HTL L power supply 5/30V - output RS-422 RS											
BORE DIAMETER mm 6 mm 8 9,52 mm (3/8") 9 10 mm 10											
ENCLOSURE RATING IP 65 X											
MAX ROTATION SPEED 6000 rpm 6											
OUTPUT TYPE cable radial (standard length 0,5 m) PR											
VARIANT custom version XXX											

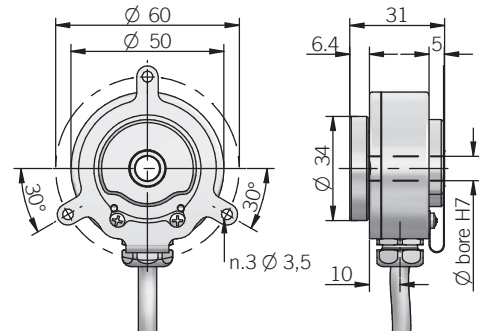
EH 50 FA



n.3 M3x35 screws included

dimensions in mm

EH 50 FP



ELECTRICAL SPECIFICATIONS

Resolution	from 100 to 1024 ppr
Power supply	4,5 ... 30 V DC (with reverse polarity protection)
Power draw without load	600 mW
Max load current	20 mA / channel
Output type*	push-pull / line driver
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

CONNECTIONS

Function	Cable output Line driver	Cable output Push-pull
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	grey or brown	/
Ch. B	yellow	yellow
Ch. B-	orange	/
Ch. Z	blue	blue
Ch. Z-	white	/
⏏	shield	shield

RESOLUTIONS

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

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

MECHANICAL SPECIFICATIONS

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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,01 Nm
Fixing torque for collar clamping	1 Nm recommended
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-40° ... +100 °C (-40° ... +212°F)
Storage temperature	-40° ... +100 °C (-40° ... +212°F)
Weight	150 g (5,29 oz) mod.FP 200 g (7,05 oz) mod.FA

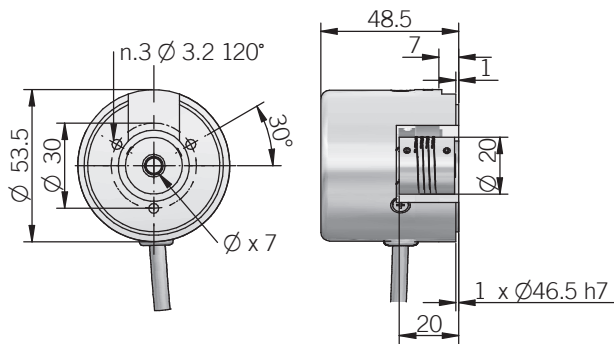
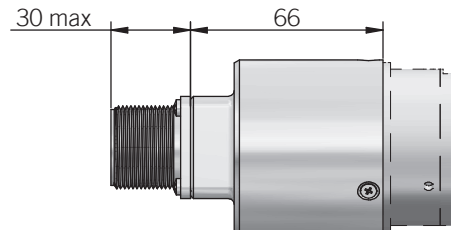
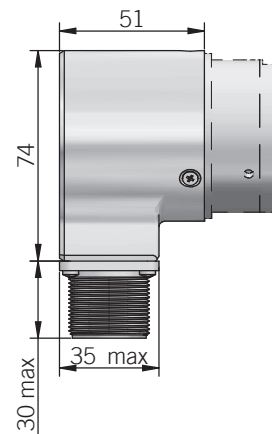
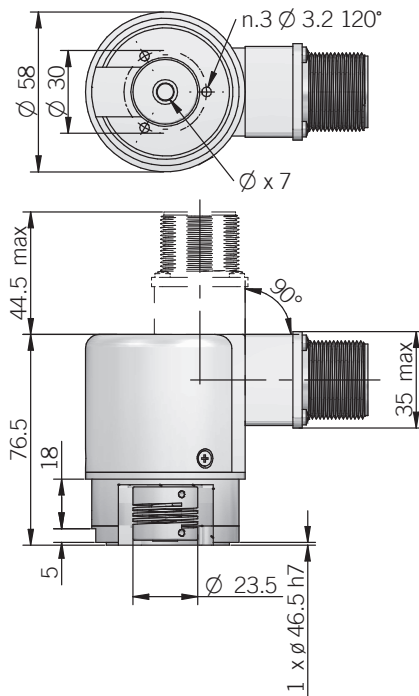
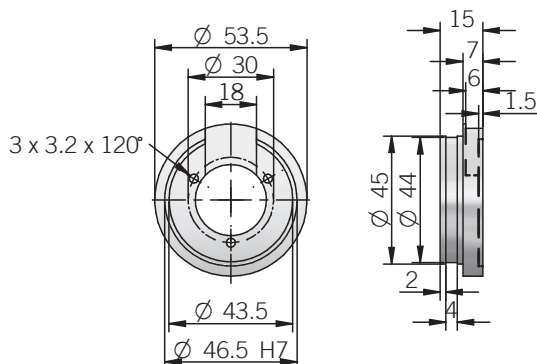
MAIN FEATURES

Encoder series designed to be mounted directly on motors.
 Integrated elastic coupling allows radial and axial play compensation.

- 3 channel encoder (A / B / Z) up to 10000 ppr
- Power supply up to +28 VDC with several electronic 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	EH	53A	M*	500	S	8/24	N	8	X	6	P	R	.N	XXX
SERIES incremental encoder series EH incremental encoder series EL incremental encoder series ER														
MODEL adjustable flange model 53A adjustable flange model 53B														
METAL COVER * add for the metal cover (mod. EL) M														
RESOLUTION ppr from 1 to 10000 see table for pulses availability														
ZERO PULSE without zero pulse S with zero pulse Z														
POWER SUPPLY (with L electronic interface) 5 V DC 5 (with L or PC electronic interface) 8 ... 24 V DC 8/24 (mod. EL / ER) 5 ... 28 V DC 5/28														
ELECTRONIC INTERFACE NPN N NPN open collector C push-pull P push-pull protected (AEIC-7272) PC line driver L (mod. EL / ER) power supply 5/28V - output RS-422 RS														
BORE DIAMETER mm 6 mm 8 mm 10														
ENCLOSURE RATING IP 54 X (mod. EL / ER) IP 64 S														
MAX ROTATION SPEED (IP 64) 3000 rpm 3 (IP 54) 6000 rpm 6														
OUTPUT TYPE cable (standard length mod. EL / ER 1,5 m - mod. EH 0,5 m)) P (mod. EL / ER) MIL connector M (mod. EL / ER) JIS-C-5432 connector J (mod. EL / ER) M12 connector M12 (mod. EL / ER) M23 connector H (mod. EL / ER) IP40 IEC 60130-9 connector C female connector included, without female please add 162 as variant code														
DIRECTION TYPE (mod. EL - ER) axial A radial R please add for mod. EH .N														
VARIANT custom version XXX														

EH 53 A**Dimensions with metal cover axial output****Dimensions with metal cover radial output****EL - ER 53 A****53 B flange**

dimensions in mm

EH SERIES RESOLUTIONS

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

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - 512 - 600 - 625 - **720** - 750 - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1500 - 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

ELECTRICAL SPECIFICATIONS (EL - ER SERIES)

Resolution	from 1 to 10000 ppr
Power supply	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)
Power draw without load	800 mW
Max load current	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	250 kHz up to 6.000 ppr 500 kHz from 7.200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

ELECTRICAL SPECIFICATIONS (EH SERIES)

Resolution	from 100 to 1024 ppr
Power supply	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	N / C / P / PC = 50 mA / channel L = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	150 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

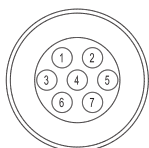
MECHANICAL SPECIFICATIONS

Bore diameter	ø 6 / 8 / 10 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 64 (IEC 60529)
Max rotation speed	3000 rpm (IP64) 6000 rpm (IP54)
Max shaft load	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 x 10 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,01 Nm
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced / painted aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-10° ... +60°C (+14° ... +140°F) -25° ... +85°C (-13° ... +185°F) ER series
Storage temperature	-25° ... +70°C (-13° ... +158°F)
Weight	150 g (5,29 oz) mod. EH 350 g (12,35 oz) mod. EL

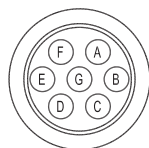
CONNECTIONS

Function	Cable output	Cable output	7 pin J output	7 pin J output	7 pin M output	7 pin M output	10 pin J output	10 pin M output	5 pin M12 output	8 pin M12 output	12 pin H output	5 pin C output	8 pin C output
	N / C / P / PC	Line driver	N / C / P / PC	Line Driver no Zero	N / C / P / PC	Line Driver no Zero	Line Driver with Zero	Line Driver with Zero	N / C / P / PC	Line Driver	CCW	N / C / P / PC	Line Driver
+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
Ch. A	green	green	3	1	C	A	1	A	3	6	5	2	1
Ch. A-	/	brown	/	3	/	C	7	G	/	5	6	/	2
Ch. B	yellow	yellow	5	2	E	B	2	B	1	4	8	4	3
Ch. B-	/	orange	/	5	/	E	8	H	/	3	1	/	4
Ch. Z	blue	blue	4	/	D	/	3	C	5	2	3	3	5
Ch. Z-	/	white	/	/	/	/	9	I	/	8	4	/	6
⊥	shield	shield	7	7	G	G	10	J	housing	housing	9	/	/

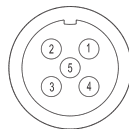
J connector (7 pin)
JIS-C-5432 Size 16
solder side view FV



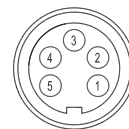
M connector (7 pin)
Amphenol MS3102-E-16-S
solder side view FV



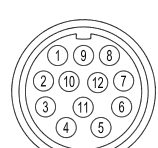
M12 connector (5 pin)
M12 A coded
solder side view FV



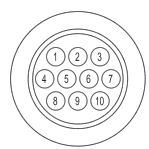
C connector (5 pin)
IEC 60130-9
solder side view FV



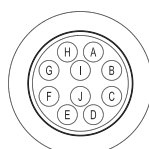
H connector (12 pin) - M23 CCW
Hummel 7.410.000000 -
7.002.912.603
solder side view FV



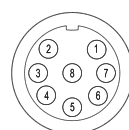
J connector (10 pin)
JIS-C-5432 Size 16
solder side view FV



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



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



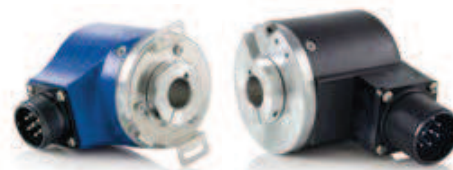
C connector (8 pin)
IEC 60130-9
solder side view FV



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 VDC with several electronic 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, spring or anti-rotation pin


ORDERING CODE
ER 58G M* 500 S 5/28 N 8 X 3 P R .XXX
SERIES

incremental encoder series **EL**
 incremental encoder series **ER**

MODEL

blind hollow shaft with stator coupling **58F**
 blind hollow shaft with anti-rotation pin **58G**
 blind hollow shaft with spring **63F**
 blind hollow shaft with anti-rotation pin **63G**

METAL COVER

* add for metal cover **M**

RESOLUTION

ppr from **1** to **24000**
 see table for pulses availability

ZERO PULSE

without zero pulse **S**
 with zero pulse **Z**

POWER SUPPLY

(with L electronic interface) 5 V DC **5**
 (with L or PC electronic interface) 8 ... 24 V DC **8/24**
 5 ... 28 V DC **5/28**

ELECTRONIC INTERFACE

NPN **N**
 NPN open collector **C**
 push-pull **P**
 push-pull protected (AEIC-7272) **PC**
 line driver **L**
 power supply 5/28V - output RS-422 **RS**

BORE DIAMETER

mm **8**
 mm **10**
 mm **12**
 mm **14**
 mm **15**

ENCLOSURE RATING

IP 54 **X**
 IP 66 **S**

MAX ROTATION SPEED

3000 rpm **3**

OUTPUT TYPE

cable (standard length 1,5 m) **P**
 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

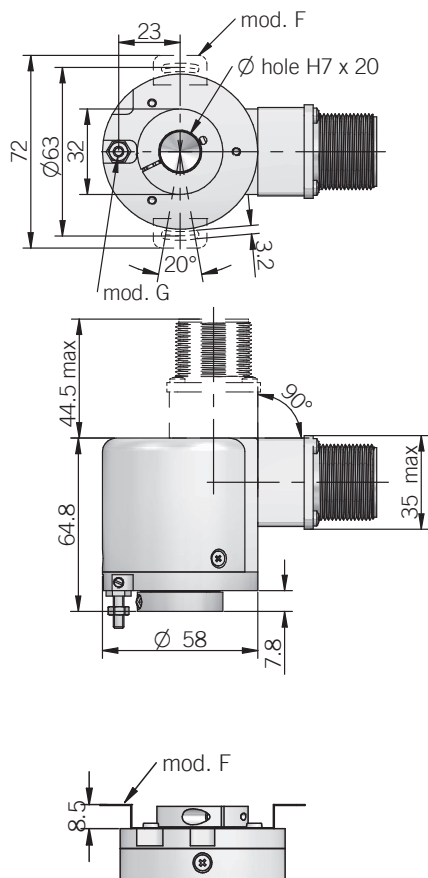
DIRECTION TYPE

axial **A**
 radial **R**

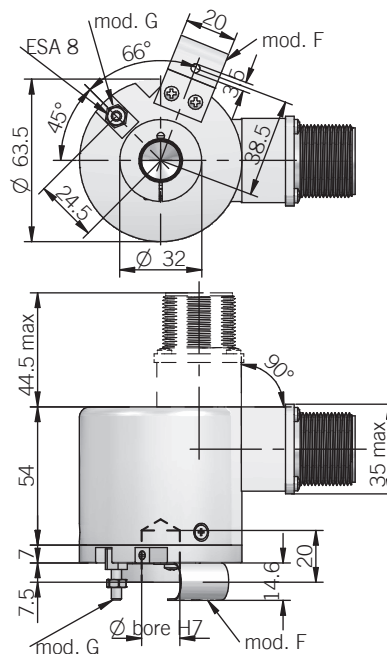
VARIANT

custom version **XXX**

EL - ER 58 F / G

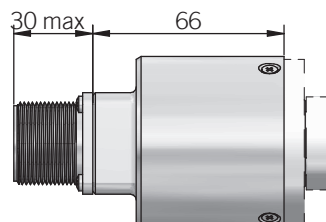


EL - ER 63 F / G

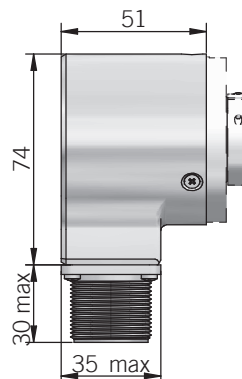


anti-rotation pin is included in model G, for mounting instruction please refer to product installation notes

Dimensions with metal cover axial output



Dimensions with metal cover radial output



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 2500 ppr (58 G) from 1 to 24000 ppr (58 F - 63 F / G)
Power supply	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)
Power draw without load	800 mW
Max load current	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - **600** - 625 - **720** - 750 - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1500 - 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

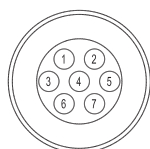
MECHANICAL SPECIFICATIONS

Bore diameter	ø 8 / 10 / 12 / 14 / 15 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 64 (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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,02 Nm (IP 54) < 0,06 Nm (IP 66)
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced / painted aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-10° ... +60°C (+14° ... +140°F) EL series -20° ... +70°C (-4° ... +158°F) ER series
Storage temperature	-25° ... +70°C (-13° ... +158°F)
Fixing torque for collar clamping	1,5 Nm recommended
Weight	350 g (12,35 oz)

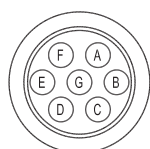
CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver	7 pin J output N / C / P / PC	7 pin J output Line Driver no Zero	7 pin M output N / C / P / PC	7 pin M output Line Driver no Zero	10 pin J output Line Driver with Zero	10 pin M output Line Driver with Zero	5 pin M12 output N / C / P / PC	8 pin M12 output Line Driver	12 pin H output CCW	5 pin C output N / C / P / PC	8 pin C output Line Driver
+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
Ch. A	green	green	3	1	C	A	1	A	3	6	5	2	1
Ch. A-	/	brown	/	3	/	C	7	G	/	5	6	/	2
Ch. B	yellow	yellow	5	2	E	B	2	B	1	4	8	4	3
Ch. B-	/	orange	/	5	/	E	8	H	/	3	1	/	4
Ch. Z	blue	blue	4	/	D	/	3	C	5	2	3	3	5
Ch. Z-	/	white	/	/	/	/	9	I	/	8	4	/	6
⏏	shield	shield	7	7	G	G	10	J	housing	housing	9	/	/

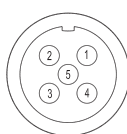
J connector (7 pin)
JIS-C-5432 Size 16
solder side view FV



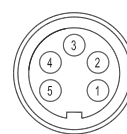
M connector (7 pin)
Amphenol MS3102-E-16-S
solder side view FV



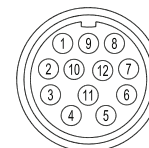
M12 connector (5 pin)
M12 A coded
solder side view FV



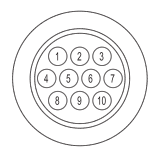
C connector (5 pin)
IEC 60130-9
solder side view FV



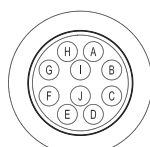
H connector (12 pin) - M23 CCW
Hummel 7.410.000000 -
7.002.912.603
solder side view FV



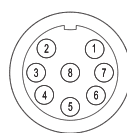
J connector (10 pin)
JIS-C-5432 Size 16
solder side view FV



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



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



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



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 VDC with several electronic 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

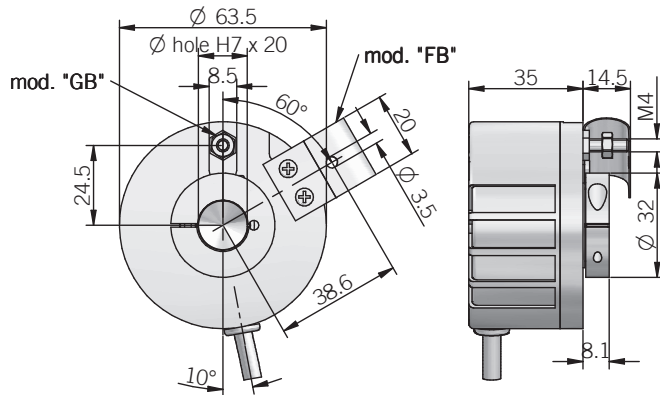


ORDERING CODE

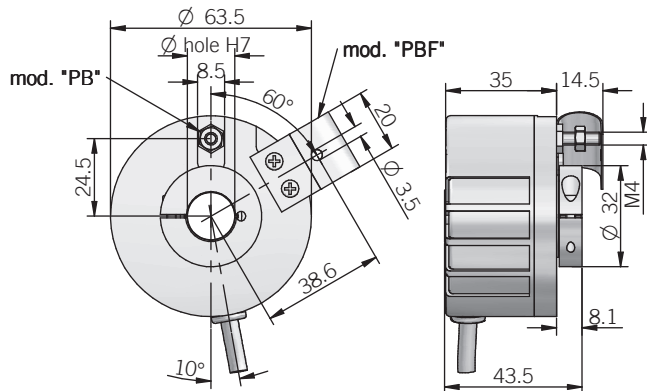
EL 63GB 500 S 5/28 N 8 X 3 P .XXX

SERIES incremental encoder EL											
MODEL blind hollow shaft with spring 63FB blind hollow shaft with antirotation pin 63GB through hollow shaft with antirotation pin 63PB through hollow shaft with spring 63PBF rear fixing shaft with antirotation pin 63PC rear fixing shaft with spring 63PCF											
RESOLUTION ppr from 1 to 2500 see table for pulses availability											
ZERO PULSE without zero pulse S with zero pulse Z											
POWER SUPPLY (with L electronic interface) 5 V DC 5 (with L or PC electronic interface) 8 ... 24 V DC 8/24 5 ... 28 V DC 5/28											
ELECTRONIC INTERFACE NPN N NPN open collector C push-pull P (AEIC-7272) protected push-pull PC line driver L power supply 5/28V - output RS-422 RS											
BORE DIAMETER mm 8 mm 10 mm 12 mm 14 mm 15											
ENCLOSURE RATING IP 54 X											
MAX ROTATION SPEED 3000 rpm 3											
OUTPUT TYPE radial cable (standard length 1,5 m) PR											
VARIANT custom version XXX											

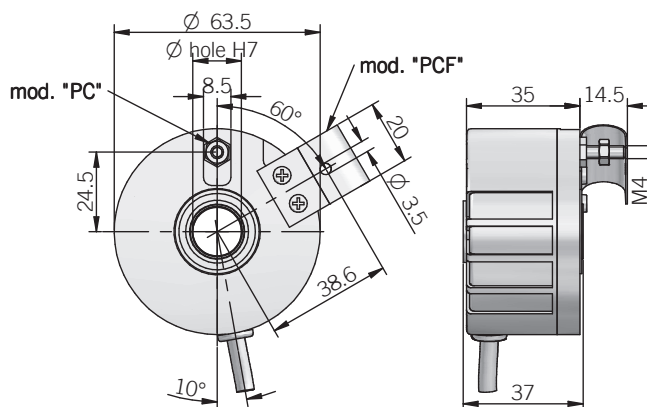
EL 63 FB / GB



EL 63 PB / PBF



EL 63 PC / PCF



anti-rotation pin is included in model GB / PB / PC, for mounting instruction please refer to product installation notes

dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 2500 ppr
Power supply	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)
Power draw without load	800 mW
Max load current	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	300 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

MECHANICAL SPECIFICATIONS

Bore diameter	ø 8 / 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	$4 \times 10^{-6} \text{ kgm}^2$
Starting torque (at +20°C / +68°F)	< 0,04 Nm
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA 66 glass fiber reinforced
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-10° ... +60 °C (+14° ... +140°F)
Storage temperature	-25° ... +70 °C (-13° ... +158°F)
Fixing torque for collar clamping	1,5 Nm recommended
Weight	350 g (12,35 oz)

CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
⊥	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

MAIN FEATURES

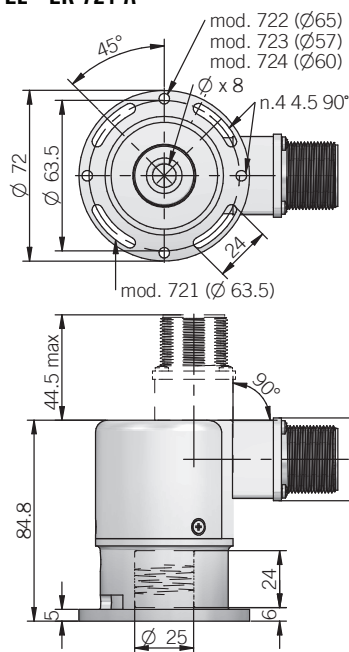
Standard encoder series for industrial environments with high mechanical resistance requirements. Specifically designed for direct mounting on motors or tachometric dynamos thanks to integrated elastic coupling which allows radial and / or axial motor shaft play.

- 3 channel encoder (A / B / Z) up to 24000 ppr
- Power supply up to +28 VDC with several electronic 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
- Encoder can be mounted on tachometric dynamo



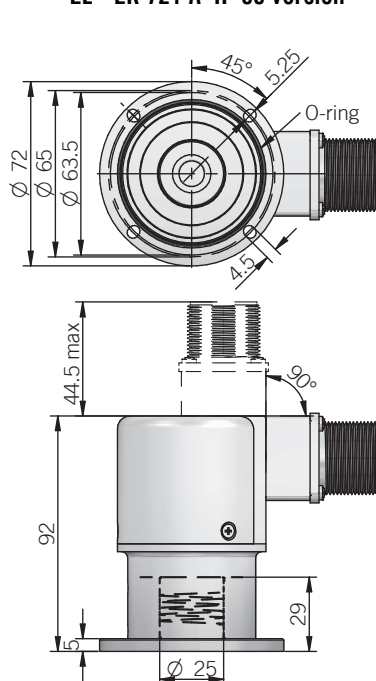
ORDERING CODE	ER	721	A	M*	500	S	5/28	N	8	X	6	P	R	.XXX
SERIES incremental encoder series EL incremental encoder series ER														
MODEL fixing holes ø 63,5 mm 721 fixing holes ø 65 mm 722 fixing holes ø 57 mm 723 fixing holes ø 60 mm 724														
FLANGE TYPE flange type A flange type B														
METAL COVER * add for the metal cover M														
RESOLUTION ppr from 1 to 24000 see table for pulses availability														
ZERO PULSE without zero pulse S with zero pulse Z														
POWER SUPPLY (with L electronic interface) 5 V DC 5 (with L or PC electronic interface) 8 ... 24 V DC 8/24 5 ... 28 V DC 5/28														
ELECTRONIC INTERFACE NPN N NPN open collector C push-pull P push-pull protected (AEIC-7272) PC 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 66) 3000 rpm 3 (IP 54) 6000 rpm 6														
OUTPUT TYPE cable (standard length 1,5 m) P 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 radial R														
VARIANT custom version XXX														

EL - ER 721 A

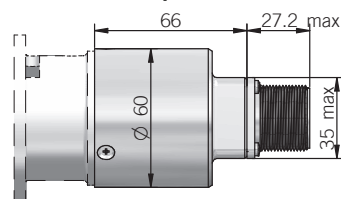


dimensions in mm

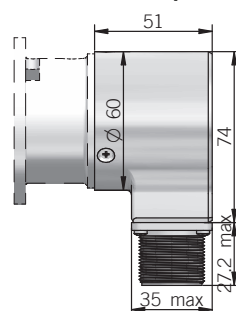
EL - ER 721 A IP 66 version



Dimensions with metal cover axial output



Dimensions with metal cover radial output



72 B flange version



ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 24000 ppr
Power supply	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)
Power draw without load	800 mW
Max load current	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	250 kHz up to 6'000 ppr 500 kHz from 7'200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

EL SERIES RESOLUTIONS

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 - 900* - 1000* - 1024*
 - 1250* - 1300* - 1800* - 2000* - 2048* - 2500*

* only with model EL721 / EL722 with "S" enclosure rating

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512**
 - **600** - 625 - **720** - 750 - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1500
 - 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

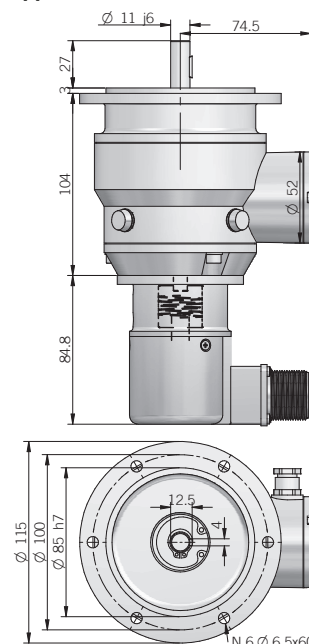
MECHANICAL SPECIFICATIONS

Bore diameter	Ø 6 / 8 / 10 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	X = 6000 rpm S = EL 3000 rpm / 60° C ER 3000 rpm / 70° C - 2000 rpm / 85° C
Max shaft load	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	$3,5 \times 10^{-6} \text{ kgm}^2$
Starting torque (at +20°C / +68°F)	< 0,02 Nm (IP 54) < 0,04 Nm (IP 66)
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced / painted aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-10° ... +60°C (+14° ... +140°F) EL series -25° ... +85°C (-13° ... +185°F) ER series
Storage temperature	-25° ... +70°C (-13° ... +158°F)
Weight	400 g (14,11 oz)

TECHNICAL SPECIFICATIONS FOR TACHOMETRIC DYNAMO

Peak to peak ripple	≤ 1%	
Effective value ripple	≤ 0,4%	
Linearity error	≤ 0,2%	
Reversibility error	± 0,1%	
Voltage tolerance	± 3%	
Voltage variation with temperature	-0,02% for °C	
Insulation class	B	
N. of poles	4	
N. of slots	33	
N. of laminas	33	
Field excitation by magnets	ALNICO	
Winding	60V / 1000 rpm	20V / 1000 rpm
Nominal voltage at 1000 rpm	60 V	20 V
Load - free voltage at 1000 rpm	61,2 V	20,3 v
Max current admitted	70 mA	200 mA
Nom. current	5 mA	10 mA
Max speed	5000 rpm	6000 rpm
Armature resistance at 25°C	240 Ω	26 Ω
Electric time constant	0,7 ms	0,7 ms
Enclosure rating	IP 55 (IEC 60529)	
Weight	2,35 Kg (82,89 oz)	
Moment of inertia	2 x 10 ⁻⁶ kgm ²	

Application with tachometric dynamo



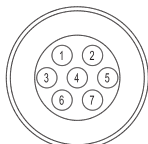
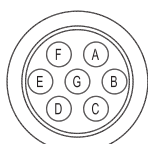
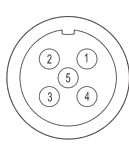
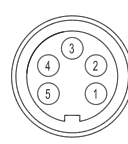
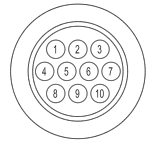
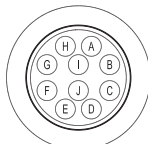
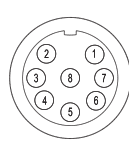
dimensions in mm

ACCESSORIES

Description	P/N
Dynamo 60 V / 1000 rpm	22130001
Dynamo 20 V / 1000 rpm	22130002

CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver	7 pin J output N / C / P / PC	7 pin J output Line Driver no Zero	7 pin M output N / C / P / PC	7 pin M output Line Driver no Zero	10 pin J output Line Driver with Zero	10 pin M output Line Driver with Zero	5 pin M12 output N / C / P / PC	8 pin M12 output Line Driver	12 pin H output CCW	5 pin C output N / C / P / PC	8 pin C output Line Driver
+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
Ch. A	green	green	3	1	C	A	1	A	3	6	5	2	1
Ch. A-	/	brown	/	3	/	C	7	G	/	5	6	/	2
Ch. B	yellow	yellow	5	2	E	B	2	B	1	4	8	4	3
Ch. B-	/	orange	/	5	/	E	8	H	/	3	1	/	4
Ch. Z	blue	blue	4	/	D	/	3	C	5	2	3	3	5
Ch. 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 FVM connector (7 pin)
Amphenol MS3102-E-16-S
solder side view FVM12 connector (5 pin)
M12 A coded
solder side view FVC connector (5 pin)
IEC 60130-9
solder side view FVH connector (12 pin) - M23 CCW
Hummel 7.410.000000 -
7.002.912.603
solder side view FVJ connector (10 pin)
JIS-C-5432 Size 16
solder side view FVM connector (10 pin)
Amphenol MS3102-E-18-1
solder side view FVM12 connector (8 pin)
M12 A coded
solder side view FVC connector (8 pin)
IEC 60130-9
solder side view FV

MAIN FEATURES

ø 80 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

EL series

Basic version with 3 channels incremental outputs. Several output types available

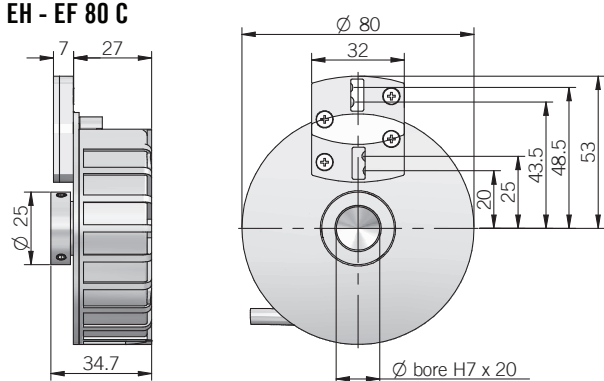
EF series

6 channels encoder with optical generation of "Hall effect phases" (commutation signals)
Signal transmission by bit parallel bus

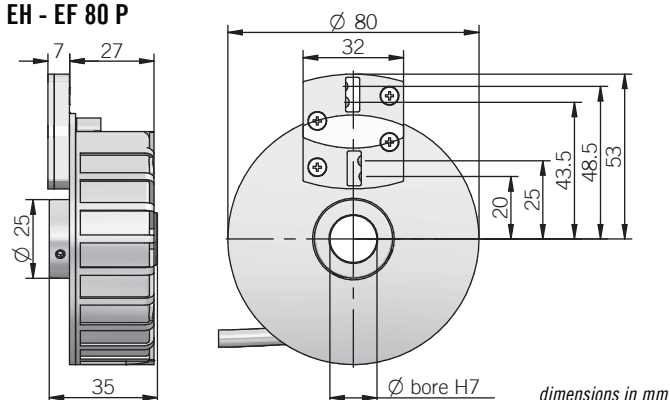


ORDERING CODE	EF	80C	6	L	500	S	5	L	8	X	3	PR	.XXX
SERIES													
incremental encoder	EH												
incremental encoder with Hall phases	EF												
MODEL													
blind hollow shaft	80C												
through hollow shaft	80P												
blind hollow shaft with rear fixing	80K												
MOD.EF - MOTOR POLES													
4 poles (2 poles pair)	4												
6 poles (3 poles pair)	6												
8 poles (4 poles pair)	8												
MOD. EF - ELECTRONIC INTERFACE FOR COMMUTATION SIGNALS													
NPN open collector	C												
line driver RS-422	L												
RESOLUTION													
ppr from	200												
to	2048												
see table for pulses availability													
ZERO PULSE													
without zero pulse	S												
with zero pulse	Z												
POWER SUPPLY													
(with L electronic interface) 5 V DC	5												
(mod. EH, with L or PC electronic interface) 8 ... 24 V DC	8/24												
(mod. EH) 5 ... 28 V DC	5/28												
ELECTRONIC INTERFACE													
(mod. EH) NPN	N												
(mod. EH) NPN open collector	C												
(mod. EH) push-pull	P												
line driver	L												
(mod. EH) power supply 5/28V - output RS-422	RS												
BORE DIAMETER													
mm	8												
mm	10												
mm	14												
mm	15												
ENCLOSURE RATING													
IP	54												
MAX ROTATION SPEED													
(mod. P) 3000 rpm	3												
6000 rpm	6												
OUTPUT TYPE													
radial cable (standard length 0,3 m)	PR												
VARIANT													
custom version	XXX												

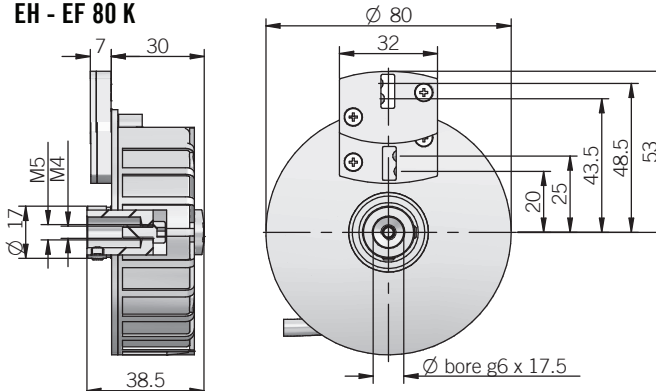
EH - EF 80 C



EH - EF 80 P



EH - EF 80 K



ELECTRICAL SPECIFICATIONS

Resolution	from 200 to 2048 ppr
Power supply	5 = 4,5 ... 5,5 V DC 5/28 = 4,75 ... 29,4 V DC (EH series) 8/24 = 7,6 ... 25,2 V DC (reverse polarity protection EH series)
Current consumption without load	100 mA max (EH series) 200 mA max (EF series)
Max load current	20 mA / channel
Output type (EH series)*	NPN / NPN open collector / push-pull / line driver
Output type for incremental signals (EF series)	line driver RS-422
Output type for Hall phases	NPN open collector (pullup max +30V DC) line driver RS-422
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

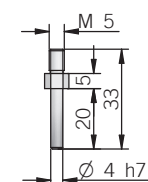
*output levels according to power supply, for further details please see under Technical basics section

CONNECTIONS

Function	EH cable output N / C / P	EH cable output Line driver	EF cable output
+V DC	red	red	red
0 V	black	black	black
Ch. A	green	green	green
Ch. B	yellow	yellow	yellow
Ch. Z	blue	blue	blue
Ch. A-	/	brown	brown
Ch. B-	/	orange	orange or pink
Ch. Z-	/	white	white
Ch. U	/	/	gray
Ch. V	/	/	violet
Ch. W	/	/	gray-pink
Ch. U-	/	/	red-blue
Ch. V-	/	/	white-green
Ch. W-	/	/	brown-green
⏏	shield	shield	shield

ACCESSORIES

Antirotation pin



Description	P/N	Thread	HEX
Antirotation pin	23240008	M5	7

MECHANICAL SPECIFICATIONS

Bore diameter	ø 8 / 10 / 14 / 15 mm
Enclosure rating	IP 54 (IEC 60529)
Max rotation speed	3000 rpm (mod.P) 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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,04 Nm
Body material	PA66 glass fiber reinforced
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-20° ... +85 °C (-4° ... +185°F) -20° ... +100°C (-4° ... +212°F) on demand
Storage temperature	-25° ... +85 °C (-13° ... +185°F)
Fixing torque for grub screws	max 0,75 Nm
Weight	250 g (8,82 oz)

RESOLUTIONS

200 6 poles	1000 4 / 6 poles
250 6 poles	1024 4 / 6 / 8 poles
500 4 / 6 / 8 poles	2000 6 poles
512 6 poles	2048 6 poles

MAIN FEATURES

Sturdy, incremental encoder series recommended in feedback control systems on medium size AC servomotor.

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Universal electronic
- Adaptable to the diameter of the motor shaft
- Extremely versatile
- Compact size
- Through hollow shaft diameter up to 15 mm with collar clamping shaft fixing

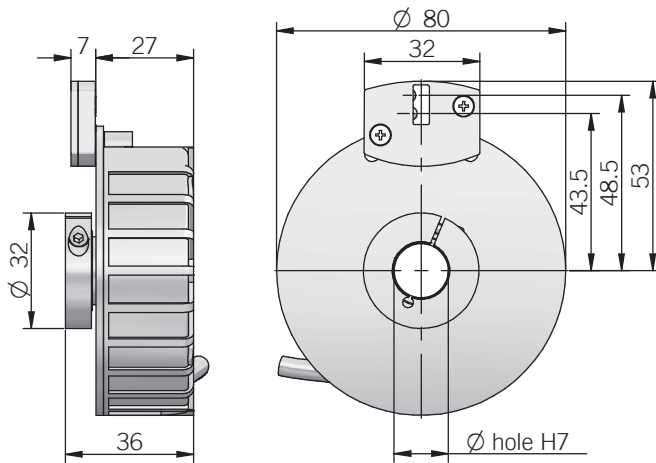


ORDERING CODE

EH 80PU 1024 Z 5/30 L 15 X 3 PR .XXX

SERIES incremental encoder series EH											
MODEL through hollow shaft with collar clamping 80PU											
RESOLUTION ppr 1000 / 1024 / 2000 / 2048 <i>please directly contact our offices for other pulses</i>											
ZERO PULSE with zero pulse Z											
POWER SUPPLY 5 ... 30 V DC 5/30											
ELECTRONIC INTERFACE line driver TTL/HTL L											
BORE DIAMETER mm 14 mm 15 <i>for 12 mm or 10 mm shaft see accessories</i>											
ENCLOSURE RATING IP 54 X											
MAX ROTATION SPEED 3000 rpm 3											
OUTPUT TYPE radial cable output (standard length 0,3 m) PR											
VARIANT custom version XXX											

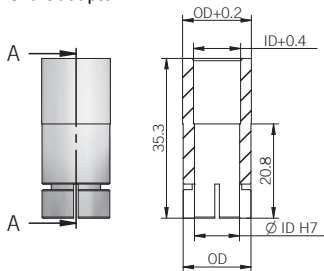
EH 80 PU



dimensions in mm

ACCESSORIES

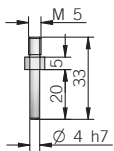
Shaft adapter



Description	P/N	ID (mm)	OD (mm)
Shaft adapter 15/10	41890366	10	15
Shaft adapter 15/12	41890367	12	15
Shaft adapter 14/10	41890371	10	15
Shaft adapter 14/12	41890372	12	14

For further shaft adapter diameters please directly contact our offices

Antirotation pin



Description	P/N	Thread	HEX
Antirotation pin	23240008	M5	7

ELECTRICAL SPECIFICATIONS

Resolution	from 1000 to 2048 ppr
Power supply	4,5 ... 30 V DC (with reverse polarity protection)
Power draw without load	800 mW
Max load current	20 mA / channel
Output type*	line driver TTL/HTL with +5 Vdc power supply output is compatible with RS-422 levels
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

MECHANICAL SPECIFICATIONS

Bore diameter	14 / 15 mm (10 / 12 mm with shaft adapter)
Enclosure rating	IP 54 (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	$4 \times 10^{-6} \text{ kgm}^2$
Starting torque (at +20°C / +68°F)	< 0,04 Nm
Body material	PA66 glass fiber reinforced
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-20° ... +85°C (-4° ... +185°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Fixing torque for collar clamping	1 Nm recommended
Weight	250 g (8,82 oz)

CONNECTIONS

Function	Cable output Line driver
+V DC	red
0 V	black
Ch. A	green
Ch. A-	gray or brown
Ch. B	yellow
Ch. B-	orange
Ch. Z	blue
Ch. Z-	white
⏏	shield

MAIN FEATURES

∅ 88 mm through hollow shaft encoder designed for middle size asynchronous motors.

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +28 VDC with several electronic 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
 incremental encoder series **EH**
 incremental encoder series **EL**

MODEL
 through hollow shaft with spring **88P**

RESOLUTION
 (mod. EH) max ppr **2500**
 (mod. EL) max ppr **2048**
see table for pulses availability

ZERO PULSE
 without zero pulse **S**
 with zero pulse **Z**

POWER SUPPLY
 (with L electronic interface) 5 V DC **5**
 (with L or PC electronic interface) 8 ... 24 V DC **8/24**
 5 ... 28 V DC **5/28**

ELECTRONIC INTERFACE
 NPN **N**
 NPN open collector **C**
 push-pull **P**
 push-pull protected (AEIC-7272) **PC**
 line driver **L**
 (mod. EH) power supply 5/28V - output RS-422 **RS**

SHAFT DIAMETER
 mm **25**
 mm **30**
please directly contact our offices for other diameters

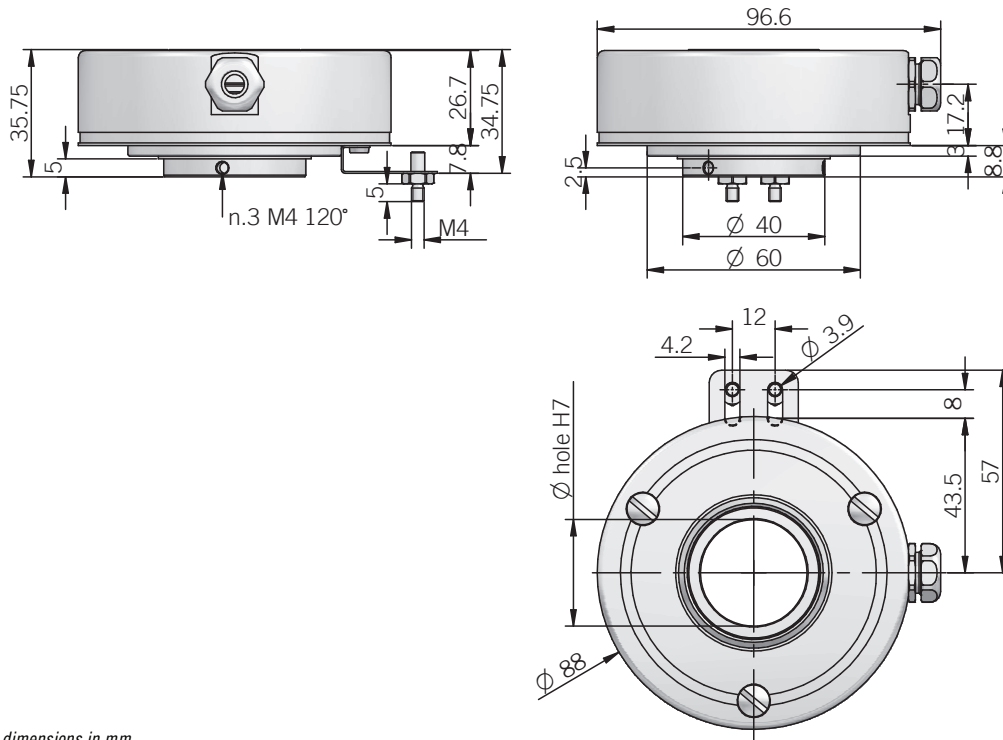
ENCLOSURE RATING
 IP 65 **S**

MAX ROTATION SPEED
 3000 rpm **3**

OUTPUT TYPE
 radial cable (standard length 0,5 m) **PR**

VARIANT
 custom version **XXX**

EH - EL 88 P



dimensions in mm

n.2 anti-rotation pins are included

ELECTRICAL SPECIFICATIONS

Resolution	from 250 to 2500 ppr (EH series) from 2 to 2048 ppr (EL series)
Power supply	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	N / C / P / PC = 50 mA / channel L / RS = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
⏏	shield	shield

MECHANICAL SPECIFICATIONS

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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,1 Nm
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-10° ... +70°C (+14° ... +158°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Fixing torque for grub screws	max 0,75 Nm
Weight	350 g (12,35 oz)

EH SERIES RESOLUTIONS

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

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

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 VDC with several electronic 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

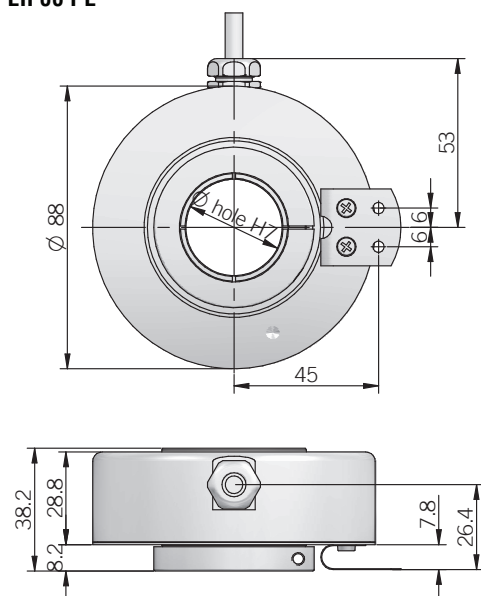


ORDERING CODE

EH 88PE 1024 S 5/28 P 30 X 3 PR .XXX

SERIES incremental encoder series EH												
MODEL through hollow shaft with spring 88PE through hollow shaft for torque arm fixing 88PET <i>see accessories for torque arm ordering codes</i>												
RESOLUTION ppr from 500 to 2500 <i>see table for pulses availability</i>												
ZERO PULSE without zero pulse S with zero pulse Z												
POWER SUPPLY (with L electronic interface) 5 V DC 5 (with L or PC electronic interface) 8 ... 24 V DC 8/24 5 ... 28 V DC 5/28												
ELECTRONIC INTERFACE push-pull P push-pull protected (AEIC-7272) PC line driver L power supply 5/28V - output RS-422 RS												
BORE DIAMETER mm 25 mm 30 (mod. PE) mm 35 (mod. PE) mm 38 (mod. PE) mm 40												
ENCLOSURE RATING IP 54 X												
MAX ROTATION SPEED 3000 rpm 3												
OUTPUT TYPE radial cable (standard length 0,5 m) PR												
VARIANT custom version XXX												

EH 88 PE



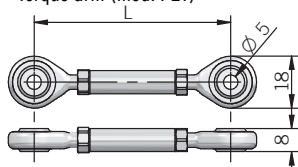
dimensions in mm

MECHANICAL SPECIFICATIONS

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	$45 \times 10^{-6} \text{ kgm}^2$
Starting torque (at +20°C / +68°F)	< 0,02 Nm
Body material	EN-AW 2011 aluminum
Shaft material	up to 38 mm: EN-AW 2011 aluminum 40 mm: 1.4305/AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-30° ... +85°C (-22° ... +185°F)
Storage temperature	-30° ... +85°C (-22° ... +185°F)
Fixing torque for collar clamping	1 Nm recommended
Weight	350 g (12,35 oz)

ACCESSORIES

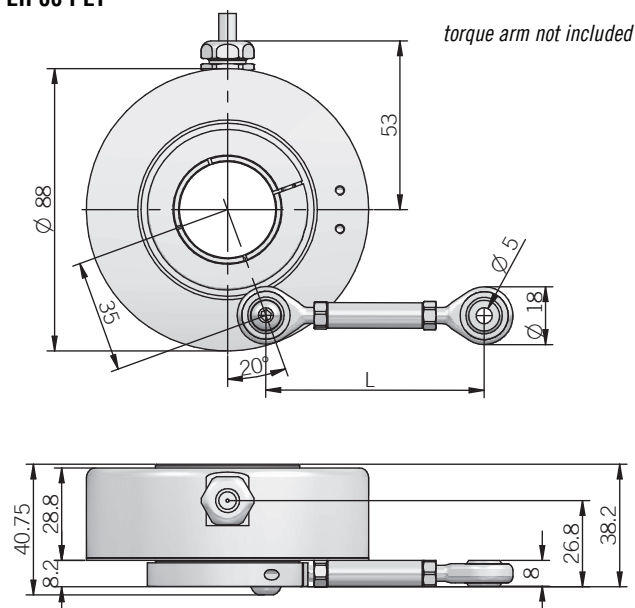
Torque arm (mod. PET)



Length	Ordering code
L = 80 ± 10mm	SN5A30 (P/N 94010061)
L = 110 ± 10mm	SN5A60 (P/N 94010070)
L = 140 ± 10mm	SN5A90 (P/N 94010071)

With torque arm n. 2 M5 x 12 UNI ISO 7380 are included

EH 88 PET



ELECTRICAL SPECIFICATIONS

Resolution	from 500 to 2500 ppr
Power supply	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)
Power draw without load	800 mW
Max load current	20 mA / channel
Output type*	push-pull / line driver
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-3

*output levels according to power supply, for further details please see under Technical basics section

CONNECTIONS

Function	Cable output push-pull	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
⏏	shield	shield

RESOLUTIONS

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

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

MAIN FEATURES

Encoder suitable for heavy duty applications like windmill generators, paper mills, rubber machines, cranes.

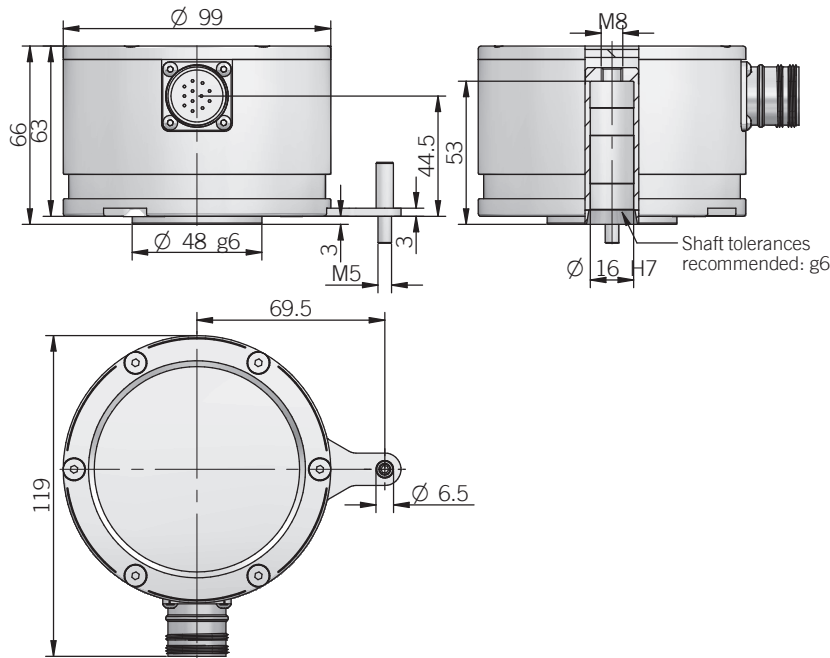
- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +30 VDC
- Up to 105 kHz output frequency
- Sturdy mechanic with anodized housing
- Up to IP 67 as enclosure rating
- Insulated bearings
- Blind hollow shaft with straight or tapered shaft
- Installation by tether or torque arm
- Operating temperature -40° ... +85°C (-40° ... +185°F)



ORDERING CODE

EH	99P	F	1024	Z	5	L	16	X	3	PR	.XXX
SERIES incremental encoder series EH											
MODEL blind hollow shaft 99P											
TYPE tether fixing F for torque arm fixing T											
RESOLUTION ppr 1000 / 1024 / 2000 / 2048 <i>please directly contact our offices for pulses availability</i>											
ZERO PULSE without zero pulse S with zero pulse Z											
POWER SUPPLY 5 V DC 5 8 ... 30 V DC 8/30											
ELECTRONIC INTERFACE push-pull P line driver L											
BORE DIAMETER mm 12 mm 16 tapered mm T17											
ENCLOSURE RATING IP 66 X IP 67 S											
MAX ROTATION SPEED 3000 rpm 3											
OUTPUT TYPE radial cable (standard length 0,5 m) PR M23 radial connector HR radial with terminal block PGR <i>female connector included, without female please add 162 as variant code</i>											
VARIANT custom version XXX											

EH 99 PF



dimensions in mm

ELECTRICAL SPECIFICATIONS

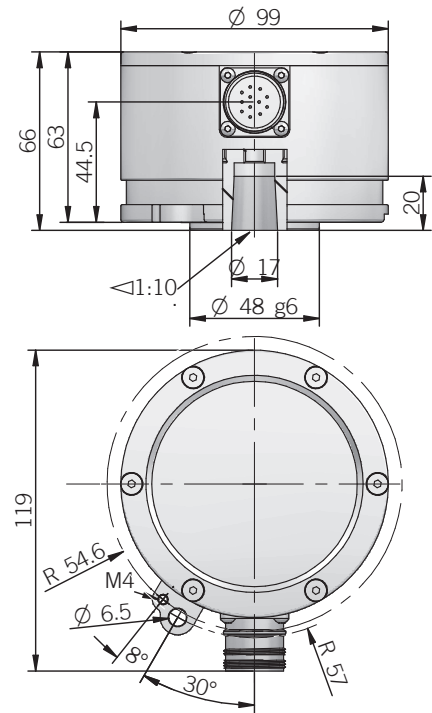
Resolution	from 1000 to 2048 ppr
Power supply	5 = 4,5 ... 5,5 V DC 8/30 = 7,6 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW
Max load current	20 mA / channel
Output type*	push-pull / line driver
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

CONNECTIONS

Function	Cable output	12 pin H output (CCW)
+V DC	red	12
0 V	grey	10
Ch. A	green	5
Ch. A-	brown	6
Ch. B	yellow	8
Ch. B-	pink	1
Ch. Z	blue	3
Ch. Z-	white	4
⏏	shield	9

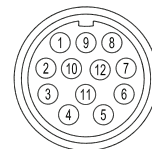
EH 99 PT



MECHANICAL SPECIFICATIONS

Bore diameter	ø 12 / 16 / T17 (tapered hollow shaft)
Enclosure rating	X = IP 66 (IEC 60529) S = IP 67 (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)
Body material	EN-AW 6026 anodized anticorrosion aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 6026 anodized anticorrosion aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	-40° ... +85°C (-40° ... +185°F)
Storage temperature	-40° ... +85°C (-40° ... +185°F)
Weight	1200 g (42,33 oz)

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



MAIN FEATURES

∅ 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 VDC with several electronic 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

SERIES
incremental encoder series **EL**

MODEL
through hollow shaft with spring **120P**

RESOLUTION
ppr from **400** to **2048**
see table for pulses availability

ZERO PULSE
without zero pulse **S**
with zero pulse **Z**

POWER SUPPLY
(with L electronic interface) 5 V DC **5**
(with L or PC electronic interface) 8 ... 24 V DC **8/24**
5 ... 28 V DC **5/28**

ELECTRONIC INTERFACE
NPN **N**
NPN open collector **C**
push-pull **P**
push-pull protected (AEIC-7272) **PC**
line driver **L**

BORE DIAMETER
mm **40**
mm **50**
mm **60**

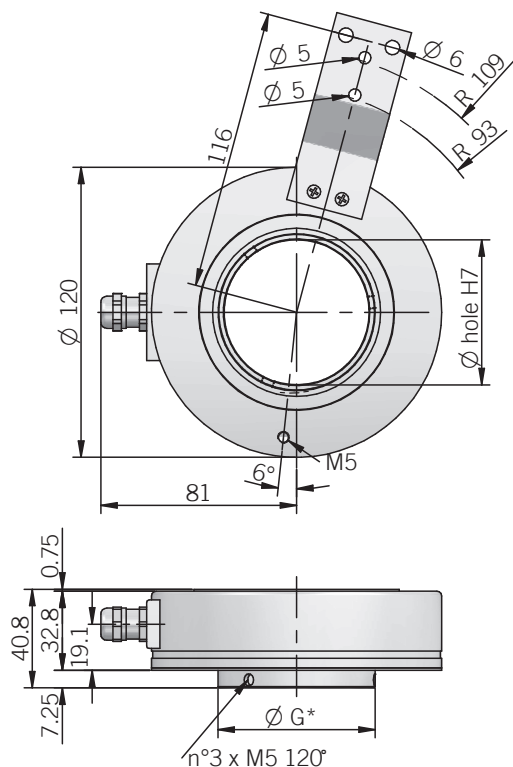
ENCLOSURE RATING
IP 54 **X**

MAX ROTATION SPEED
3000 rpm **3**

OUTPUT TYPE
radial cable (standard length 0,5 m) **PR**

VARIANT
custom version **XXX**

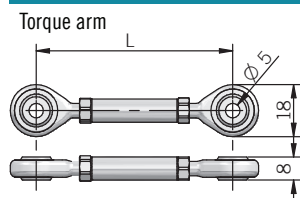
EL 120 P



SHAFT DIAMETER	*G
Ø 40	Ø 65
Ø 50	Ø 65
Ø 60	Ø 75

dimensions in mm

ACCESSORIES



Length	Ordering code
L = 80 ± 10mm	SN5A30 (P/N 94010061)
L = 110 ± 10mm	SN5A60 (P/N 94010070)
L = 140 ± 10mm	SN5A90 (P/N 94010071)

With torque arm n. 2 M5 x 12 UNI ISO 7380 are included

ELECTRICAL SPECIFICATIONS

Resolution	from 400 to 2048 ppr
Power supply	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	N / C / P / PC = 50 mA / channel L = 20 mA / channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

MECHANICAL SPECIFICATIONS

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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,05 Nm
Body material	EN-AW 2011 aluminum
Shaft material	EN-AW 2011 aluminum
Housing material	EN-AW 2011 aluminum
Bearings	2 ball bearings
Bearings life	10 ⁹ revolutions
Operating temperature	0° ... +60 °C (+32° ... +140°F)
Storage temperature	-25° ... +70 °C (-13° ... +158°F)
Fixing torque for grub screws	max 0,75 Nm
Weight	750 g (26,46 oz)

CONNECTIONS

Function	Cable output N / C / P / PC	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
≡	shield	shield

RESOLUTIONS

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

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

MAIN FEATURES

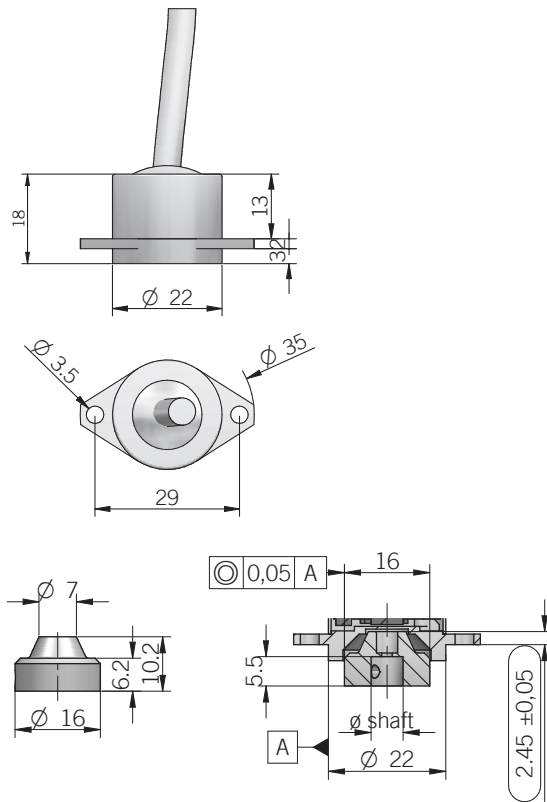
EMI series encoders are suitable for several application fields like electric motors marine industry, iron and steel industry, textile machines, wood-working, paper-working, glass working, marble-working machinery and, more generally, automation and process control fields.

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



ORDERING CODE	EMI	22A	1024	Z	5	P	6	S	10	P	R	.XXX
SERIES magnetic incremental encoder series EMI												
MODEL clamping flange ø 22 mm 22A <i>for anodized version please directly contact our offices</i>												
RESOLUTION ppr from 2 to 2048 <i>see table for pulses availability</i>												
ZERO PULSE without zero pulse S with zero pulse Z												
POWER SUPPLY 5 V DC 5												
ELECTRONIC INTERFACE push-pull P line driver RS-422 L												
MAGNET-ACTUATOR BORE DIAMETER mm 6 mm 8 9,52 (3/8") mm 9 mm 10												
ENCLOSURE RATING IP 67 S												
MAX ROTATION SPEED 10000 rpm 10												
OUTPUT TYPE cable (standard length 0,5 m) P												
DIRECTION TYPE axial A radial R												
VARIANT custom version XXX												

EMI 22 axial cable output



dimensions in mm

ELECTRICAL SPECIFICATIONS

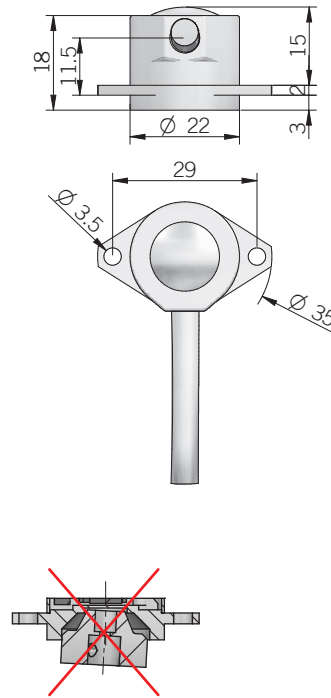
Resolution	from 2 to 2048 ppr
Power supply	5 = 4,5 ... 5,5 V DC
Current consumption without load	100 mA max
Max load current	15 mA / channel
Output type*	push-pull / line driver RS-422
Max output frequency	205 kHz
Counting direction	A leads B with clockwise rotation (magnet-actuator view)
Accuracy	± 0,35° typical / ± 0,50° max
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-3

*output levels according to power supply, for further details please see under Technical basics section

CONNECTIONS

Function	Cable output Push-pull	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
⊥	shield	shield

EMI 22 radial cable output



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 ⁻⁶ kgm ²
Body material	EN-AW 2011 aluminum
Shaft material	EN-AW 2011 aluminum
Housing material	EN-AW 2011 aluminum
Operating temperature	-40° ... +125°C (-40° ... +257°F)
Storage temperature	-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)

RESOLUTIONS

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

MAIN FEATURES

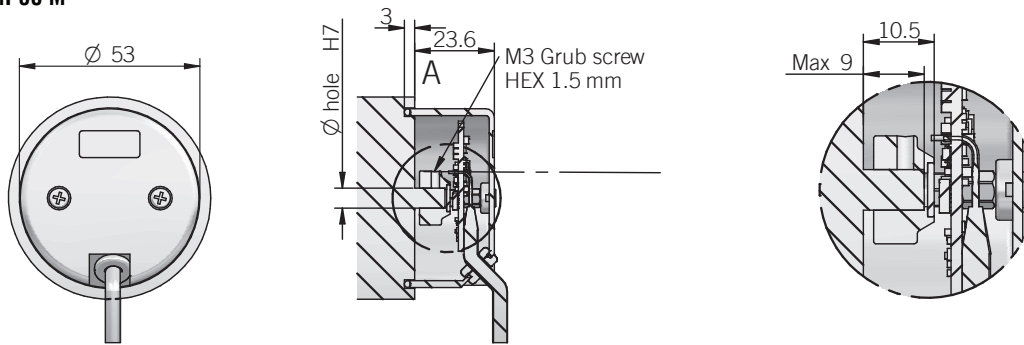
Series of miniaturized encoders for integration on small size AC/DC motors, stepper motors or for limited size applications.

- 3 channel encoder (A / B / Z) up to 90 ppr
- Power supply up to +30 VDC with several electronic 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

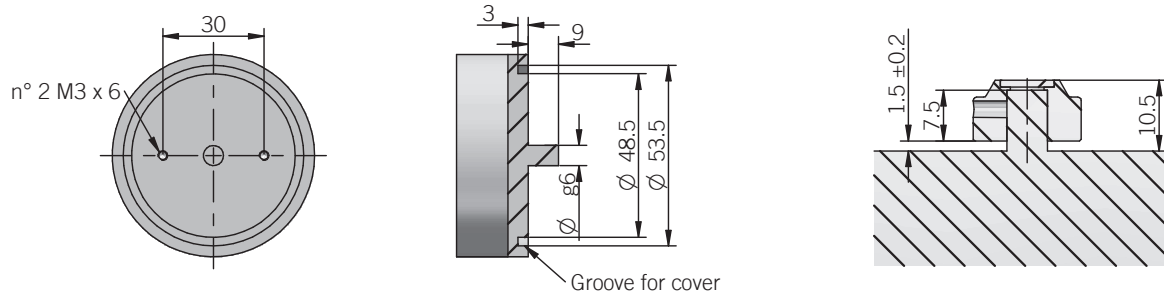


ORDERING CODE	EMI	30M	*S	50	Z	5	N	6	X	X	PR	.XXX
SERIES magnetic incremental encoder series EMI												
MODEL kit encoder 30M												
COVER * add if without cover S												
RESOLUTION ppr from 1 to 90												
ZERO PULSE without zero pulse S with zero pulse Z												
POWER SUPPLY 5 V DC 5 5 ... 30 V DC 5/30												
ELECTRONIC INTERFACE NPN N NPN open collector C push-pull protected (AEIC-7272) P line driver L power supply 5/30V - output RS-422 RS												
BORE DIAMETER mm 6 (1/4") mm 6,35 mm 8 mm 10												
ENCLOSURE RATING IP 54 X												
OPTION to be reported X												
OUTPUT TYPE radial cable (length 0,5 m) PR												
VARIANT custom version XXX												

EMI 30 M



RECOMMENDED INTERFACE FLANGE DESIGN



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 90 ppr
Power supply	5 = 4,5 ... 5,5 V DC 5/30 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	5 = 200 mW typical 5/30 = < 400 mW
Max load current	N / C / P = 50 mA for channel L / RS = 20 mA per channel
Output type*	NPN / NPN open collector / push-pull / line driver
Max output frequency	15 kHz
Counting direction	A leads B clockwise (magnet actuator view)
Accuracy	± 0,35° typical ± 0,60° max <i>according to mounting tolerances and temperature range</i>
Startup time	150 ms
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

CONNECTIONS

Function	Cable output N / C / P	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
⏏	shield	shield

MECHANICAL SPECIFICATIONS

Bore diameter	∅ 6 / 6,35 (1/4") / 8 / 10 mm
Enclosure rating	IP 54 (IEC 60529) when properly installed with supplied oring
Max rotation speed	limited only by output frequency
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,1 x 10 ⁻⁶ kgm ²
Magnet holder material	EN-AW 2011 aluminium
Cover material	PA66 glass fiber reinforced
Operating temperature	-20° ... +100°C (-4° ... +212°F)
Storage temperature	-20° ... +100°C (-4° ... +212°F)
Nominal airgap + shaft axial play	0,75 mm ± 0,5 mm <i>(including mounting tolerances)</i>
PCB fixing holes / shaft eccentricity tolerance	± 0,5 mm
Fixing torque for grub screws	40 cN max
Weight	100 g approx (3,5 oz)

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 VDC with several electronic 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)



UNI EN ISO 9001:2008



ORDERING CODE

EMI 38F 1024 Z 5 L 6 X 6 PR .XXX

SERIES
magnetic incremental encoder series **EMI**

MODEL
blind hollow shaft with stator coupling **38F**
blind hollow shaft with antirotation pin **38G**

RESOLUTION
ppr from **2** to **2048**
see table for pulses availability

ZERO PULSE
without zero pulse **S**
with zero pulse **Z**

POWER SUPPLY
(with L electronic interface) 5 V DC **5**
(with L or PC electronic interface) 8 ... 24 V DC **8/24**
5 ... 28 V DC **5/28**

ELECTRONIC INTERFACE
push-pull **P**
push-pull protected (AEIC-7272) **PC**
line driver **L**

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

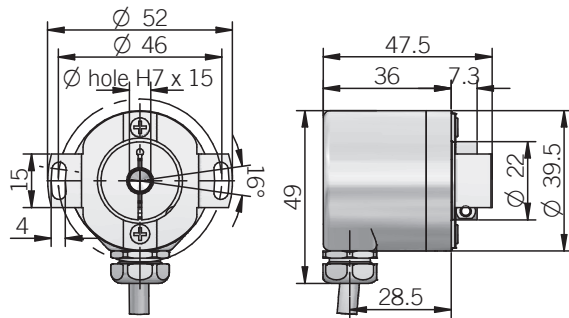
ENCLOSURE RATING
IP 64 **X**
IP 66 **S**

MAX ROTATION SPEED
(IP 66) 3000 rpm **3**
(IP 64) 6000 rpm **6**

OUTPUT TYPE
cable radial (standard length 0,5 m) **PR**

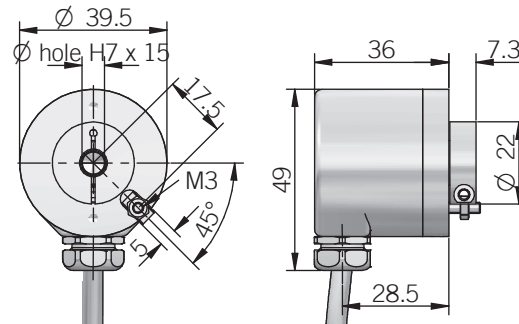
VARIANT
custom version **XXX**

EMI 38 F



dimensions in mm

EMI 38 G



anti-rotation pin is included in model G, for mounting instruction please refer to product installation notes

ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 2048 ppr
Power supply	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	15 mA / channel
Output type*	push-pull / line driver
Max output frequency	205 kHz
Counting direction	A leads B clockwise (shaft view)
Accuracy	$\pm 0,35^\circ$ typical / $\pm 0,50^\circ$ max
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under 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

CONNECTIONS

Function	Cable output Push-pull	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
$\perp$	shield	shield

MECHANICAL SPECIFICATIONS

Shaft diameter	$\varnothing 6^* / 8^* / 9,52 (3/8") / 10$ mm
Enclosure rating	X = IP 64 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	3000 rpm (IP 66) 6000 rpm (IP 64)
Max shaft load	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	$0,25 \times 10^{-6}$ kgm ²
Starting torque (at +20°C / +68°F)	< 0,02 Nm
Fixing torque for collar clamping	0,6 Nm recommended
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	painted aluminum
Bearings	2 ball bearings
Bearing lifetime	10 ⁹ revolutions
Operating temperature	-25° ... +100°C (-13° ... +212°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Weight	150 g (5,29 oz)

* with supplied adapter shaft

MAIN FEATURES

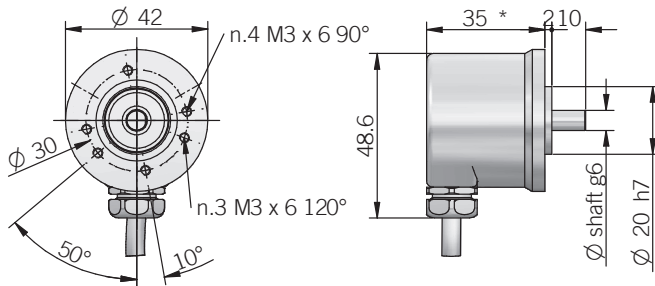
Thanks to the magnetic technology, EMI 40 series is suitable for harsh environment applications such as marble and glass working machines, washing systems and generally for industrial automation.

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +28 VDC with several electronic 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
SERIES magnetic incremental encoder series EMI												
MODEL clamping flange ø 20 mm 40A												
RESOLUTION ppr from 2 to 2048 <i>see table for pulses availability</i>												
ZERO PULSE without zero pulse S with zero pulse Z												
POWER SUPPLY (with L electronic interface) 5 V DC 5 (with L or PC electronic interface) 8 ... 24 V DC 8/24 5 ... 28 V DC 5/28												
ELECTRONIC INTERFACE push-pull P push-pull protected (AEIC-7272) PC line driver L												
SHAFT DIAMETER mm 4 mm 6												
ENCLOSURE RATING IP 64 X IP 66 S												
MAX ROTATION SPEED (IP 66) 3000 rpm 3 (IP 64) 6000 rpm 6												
OUTPUT TYPE cable (standard length 0,5 m) P												
DIRECTION TYPE axial A radial R												
VARIANT custom version XXX												

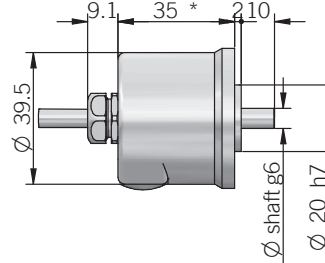
EMI 40 A radial cable output



dimensions in mm

Dimensions with axial cable output

* IP66 + 7mm



ELECTRICAL SPECIFICATIONS	
Resolution	from 2 to 2048 ppr
Power supply	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	15 mA / channel
Output type*	push-pull / line driver
Max output frequency	205 kHz
Counting direction	A leads B clockwise (shaft view)
Accuracy	$\pm 0,35^\circ$ typical / $\pm 0,50^\circ$ max
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under 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	

MECHANICAL SPECIFICATIONS	
Shaft diameter	$\varnothing 4 / 6$ mm
Enclosure rating	X = IP 64 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	3000 rpm (IP 66) 6000 rpm (IP 64)
Max shaft load	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	$0,5 \times 10^{-6}$ kgm ²
Starting torque (at +20°C / +68°F)	< 0,02 Nm
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	painted aluminum
Bearings	2 ball bearings
Bearing lifetime	10 ⁹ revolutions
Operating temperature	-25° ... +100°C (-13° ... +212°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Weight	150 g (5,29 oz)

CONNECTIONS		
Function	Cable output Push-pull	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
$\varnothing$	shield	shield

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 VDC with several electronic interfaces available
- Cable or M12 connector output, other connectors 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

SERIES
magnetic incremental encoder series **EMI**

MODEL
fixing holes ø 48 mm **55A**
fixing holes ø 48 mm anodized **55AY**

RESOLUTION
ppr from **2** to **2048**
see table for pulses availability

ZERO PULSE
without zero pulse **S**
with zero pulse **Z**

POWER SUPPLY
(with L electronic interface) 5 V DC **5**
(with L or PC electronic interface) 8 ... 24 V DC **8/24**
5 ... 28 V DC **5/28**

ELECTRONIC INTERFACE
push-pull **P**
push-pull protected (AEIC-7272) **PC**
line driver **L**
power supply 5/28 V - output RS-422 **RS**

MAGNET ACTUATOR BORE DIAMETER
mm **6**
mm **8**
9,52 (3/8") mm **9**
mm **10**

ENCLOSURE RATING
IP 64 **X**
IP 67 **S**

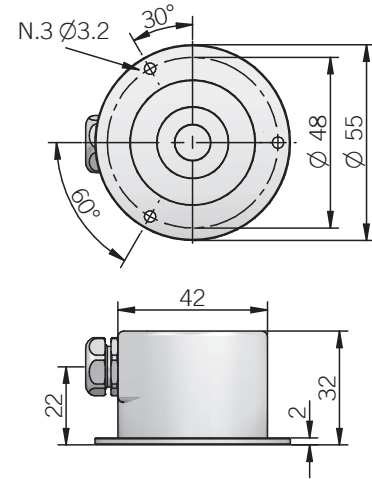
MAX ROTATION SPEED
10000 rpm **10**

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

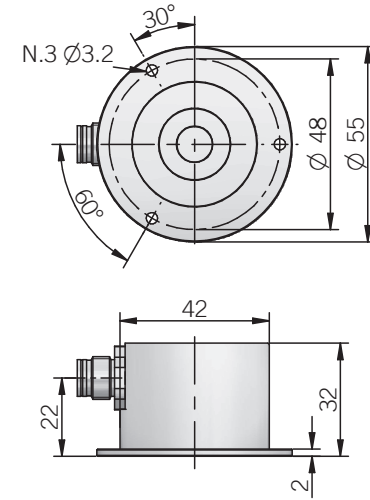
DIRECTION TYPE
axial **A**
radial **R**

VARIANT
custom version **XXX**

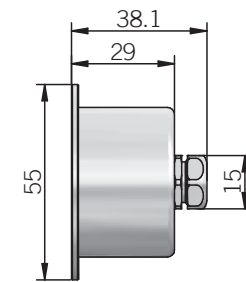
EMI 55 radial cable output



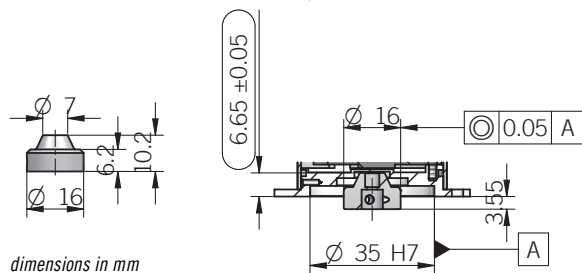
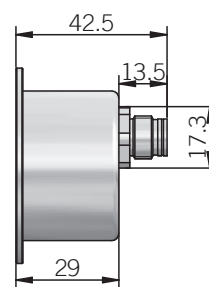
EMI 55 radial M12 output



EMI 55 axial cable output



EMI 55 axial M12 output



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 2048 ppr
Power supply	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)
Power draw without load	800 mW max
Max load current	15 mA / channel
Output type*	push-pull / line driver
Max output frequency	205 kHz
Counting direction	A leads B clockwise (magnet-actuator view)
Accuracy	$\pm 0,35^\circ$ typical / $\pm 0,50^\circ$ max
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

CONNECTIONS

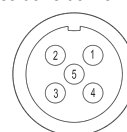
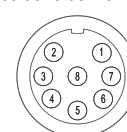
Function	Cable output	5 pin M12 output Push-pull	8 pin M12 output Line Driver
0 Volt	black	4	1
+V DC	red	2	7
Ch. A	green	3	6
Ch. B	yellow	1	4
Ch. Z	blue	5	2
Ch. A-	brown	/	5
Ch. B-	orange	/	3
Ch. Z-	white	/	8
	shield	housing	housing

MECHANICAL SPECIFICATIONS

Bore diameter (magnet-actuator)	$\varnothing 6 / 8 / 9,52 (3/8") / 10$ 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)	$0,1 \times 10^{-6}$ kgm ²
Body material	EN-AW 2011 aluminum
Housing material	painted aluminum
Magnet-actuator material	EN-AW 2011 aluminum
Operating temperature	-40° ... +125°C (-40° ... +257°F) (only for 5 V DC) -40° ... +100°C (-40° ... +212°F)
Storage temperature	-40° ... +125°C (-40° ... +257°F)
Weight	150 g (5,29 oz)
Magnet actuator mounting tolerances (to get best electrical performances)	$\pm 0,2$ mm (axial) $\pm 0,1$ mm (radial)

RESOLUTIONS

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

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

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


MAIN FEATURES

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

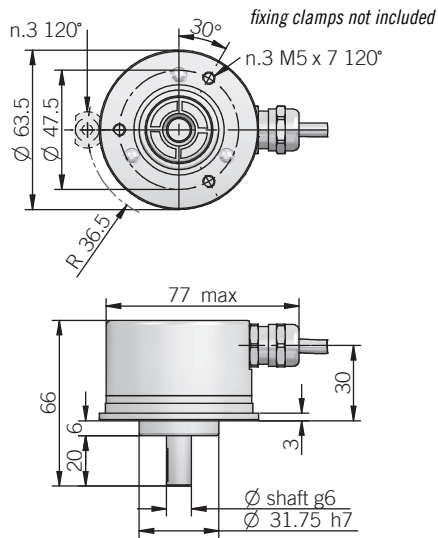
- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +28 VDC with several electronic interfaces available
- Up to 300 kHz output frequency
- Cable or M12 connector output, other connectors available on cable end
- Solid shaft diameter up to 10 mm
- Mounting by synchronous or centering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



ORDERING CODE

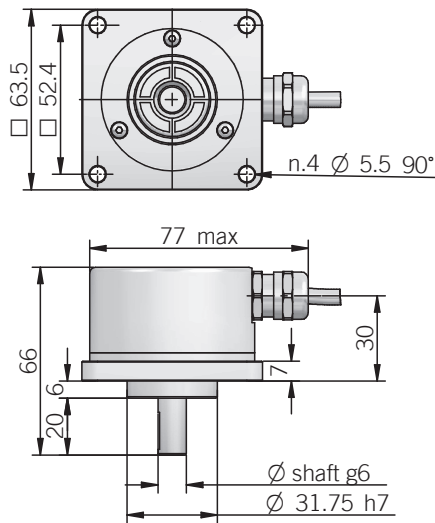
EMI	63A	1024	Z	5	L	10	X	6	P	R	.XXX
SERIES magnetic incremental encoder series EMI											
MODEL synchronous flange ø 31,75 mm 63A centering square flange ø 31,75 mm 63D											
RESOLUTION ppr from 2 to 2048 <i>see table for pulses availability</i>											
ZERO PULSE without zero pulse S with zero pulse Z											
POWER SUPPLY (with L electronic interface) 5 V DC 5 (with L or PC electronic interface) 8 ... 24 V DC 8/24 5 ... 28 V DC 5/28											
ELECTRONIC INTERFACE push-pull P push-pull protected (AEIC-7272) PC line driver L power supply 5/28 V - output RS-422 RS											
SHAFT DIAMETER 9,52 (3/8") mm 9 mm 10											
ENCLOSURE RATING IP 64 X IP 66 S											
MAX ROTATION SPEED (IP 66) 3000 rpm 3 (IP 64) 6000 rpm 6											
OUTPUT TYPE cable (standard length 0,5 m) P M12 connector M12 <i>female connector included, without female please add 162 as variant code</i>											
DIRECTION TYPE axial A radial R											
VARIANT custom version XXX											

EMI 63 A

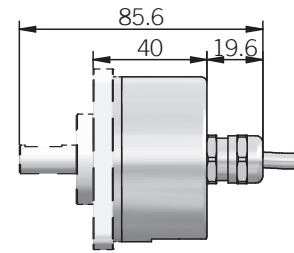


dimensions in mm

EMI 63 D



Dimensions with axial output



ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 2048 ppr
Power supply	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)
Power draw without load	800 mW max
Max load current	15 mA / channel
Output type*	push-pull / line driver
Max output frequency	205 kHz
Counting direction	A leads B clockwise (shaft view)
Accuracy	± 0,35° typical / ± 0,50° max
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

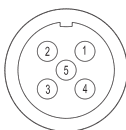
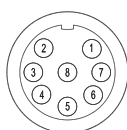
*output levels according to power supply, for further details please see under Technical basics section

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	3000 rpm (IP 66) 6000 rpm (IP 64)
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 ⁻⁶ kgm ²
Starting torque (at +20°C / +68°F)	< 0,01 Nm (IP 64) < 0,08 Nm (IP 66)
Body material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	2 ball bearings
Bearing lifetime	10 ⁹ revolutions
Operating temperature	-25° ... +100°C (-13° ... +212°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Weight	350 g (12,35 oz)

CONNECTIONS

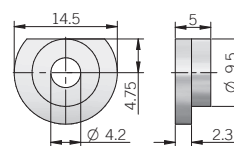
Function	Cable output	5 pin M12 output Push-pull	8 pin M12 output Line Driver
0 Volt	black	4	1
+V DC	red	2	7
Ch. A	green	3	6
Ch. B	yellow	1	4
Ch. Z	blue	5	2
Ch. A-	brown	/	5
Ch. B-	orange	/	3
Ch. Z-	white	/	8
⏏	shield	housing	housing

M12 connector (5 pin)
M12 A coded
solder side view FVM12 connector (8 pin)
M12 A coded
solder side view FV

RESOLUTIONS

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

ACCESSORIES

set n.3 fixing clamps for model 63 A
P/N 94080001

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 VDC with several electronic 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 with star-ring
- Wide operating temperature -20° ... +85°C (-4° ... +185°F)



ORDERING CODE

ETM R 4096 S 5 L 9 S 8 PR .XXX

SERIES
magnetic incremental encoder series **ETM**

MODEL
through hollow ring **R**

RESOLUTION
ppr from **64** to **4096**
see table for pulses availability

ZERO PULSE
without zero pulse **S**

POWER SUPPLY
(with L electronic interface) 5 V DC **5**
(with L or PC electronic interface) 8 ... 24 V DC **8/24**
5 ... 28 V DC **5/28**

ELECTRONIC INTERFACE
push-pull **P**
push-pull protected (AEIC-7272) **PC**
line driver **L**
power supply 5/28 V - output RS-422 **RS**

BORE DIAMETER
mm **9**
(3/8") mm **9,52**
mm **10**
mm **11**
mm **14**
mm **19**
mm **24**
mm **28**

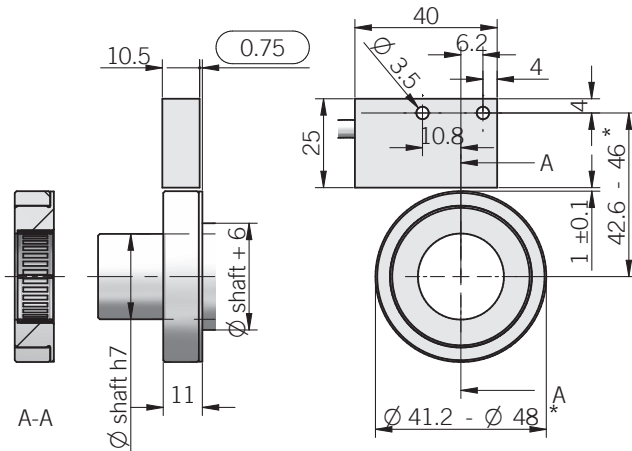
ENCLOSURE RATING
IP 67 **S**

MAX ROTATION SPEED
8000 rpm **8**

OUTPUT TYPE
radial cable (standard length 1,5 m) **PR**

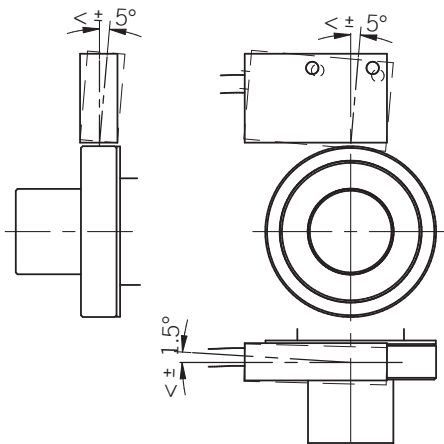
VARIANT
custom version **XXX**

ETMR



* 42,6 / 41,2 for shaft up to $\varnothing$ 19 mm
46 / 48 for shaft from $\varnothing$ 21 to $\varnothing$ 28 mm

Mounting tolerances



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 64 to 4096 ppr (powers of 2)
Power supply	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)
Power draw without load	800 mW max
Max load current	20 mA / channel
Output type*	push-pull / line driver
Max output frequency	350 kHz
Linearity error	$\pm 0,35^\circ$ typical
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

*output levels according to power supply, for further details please see under Technical basics section

MECHANICAL SPECIFICATIONS

Bore diameter	$\varnothing$ 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	$115 \times 10^{-6} \text{ kgm}^2$
Sensor body material	anodized aluminum
Magnet-actuator material	1.4305 / AISI 303 stainless steel
Operating temperature	-20° ... +85°C (-4° ... +185°F)
Storage temperature	-20° ... +85°C (-4° ... +185°F)
Weight	100 g (3,53 oz)
Magnet actuator/ mounting tolerances	$\pm 1 \text{ mm}$ (axial) $\pm 0.1 \text{ mm}$ (radial)

RESOLUTIONS

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

please directly contact our offices for other pulses

CONNECTIONS

Function	Cable output Push-pull	Cable output Line driver
+V DC	red	red
0 V	black	black
Ch. A	green	green
Ch. A-	/	brown
Ch. B	yellow	yellow
Ch. B-	/	orange
Ch. Z	blue	blue
Ch. Z-	/	white
$\equiv$	shield	shield