INCREMENTAL ENCODER

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

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

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

EL - ER 30 E / H

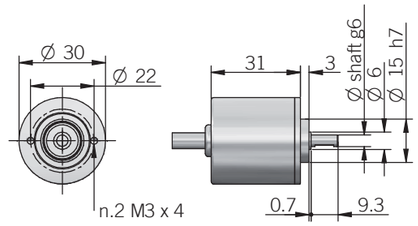
SOLID SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

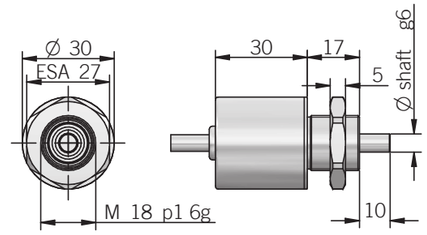
- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 220 kHz output frequency
- Cable output, connectors available on cable end
- Solid shaft diameter up to 6 mm
- Mounting by clamping or threaded flange

30 E (axial output)



recommended mating shaft tolerance H7
dimensions in mm

30 H (axial output)



ORDERING CODE

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

SERIES
incremental encoder series EL
incremental encoder series ER

MODEL
clamping flange ø 15 mm 30E
M18 threaded flange 30H

RESOLUTION
ppr from 1 to 2500
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

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
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 2500 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW max
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	100 kHz EL series 220 kHz ER series
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 4 / 6 mm
Enclosure rating	IP 54 (IEC 60529)
Max rotation speed	3000 rpm
Max shaft load[3]	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 (1,2 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,005 Nm (0,71 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[4,5]	-10° ... +60°C (+14° ... +140°F) EL series -25° ... +85°C (-13°... +185°F) ER series
Storage temperature[5]	-25°... +85°C (-13° ... +185°F)
Weight	70 g (2,47 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] maximum load for static usage
[4] measured on the transducer flange
[5] condensation not allowed

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

EH 38 A / B / D

SOLID SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 1024 ppr
- Power supply up to +30 V DC with several electrical interfaces available
- Up to 105 kHz output frequency
- Cable output, 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 | 5/28 | P | 6 | X | 3 | PR | .XXX

SERIES
incremental encoder series EH

MODEL
clamping flange ø 20 mm 38A
square flange □ 36,5 mm 38B
square flange □ 32 mm 38D

RESOLUTION
ppr from 50 to 1024
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

SHAFT DIAMETER
mm 6

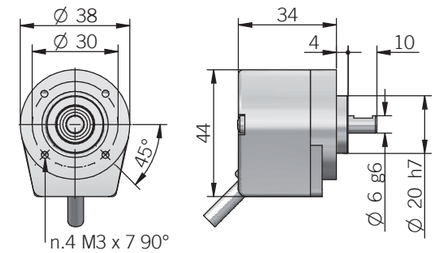
ENCLOSURE RATING
IP 54 X

MAX ROTATION SPEED
3000 rpm 3

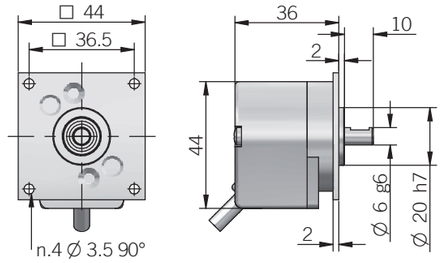
OUTPUT TYPE
radial cable (standard length 0,5 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

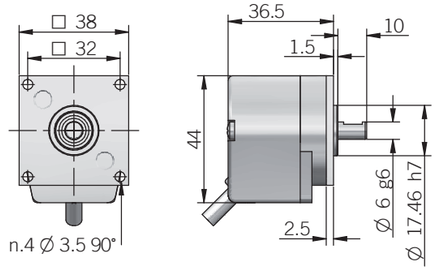
38 A



38 B



38 D



recommended mating shaft tolerance H7
dimensions in mm

RESOLUTIONS

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

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

ELECTRICAL SPECIFICATIONS

Resolution	from 50 to 1024 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Current consumption without load	100 mA max
Max load current	C / P = 50 mA / channel L = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 6 mm
Enclosure rating	IP 54 (IEC 60529)
Max rotation speed	3000 rpm
Max shaft load[3]	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 (1,2 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin)
Bearing stage material	aluminum UNI 5076
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[4,5]	-20° ... +70°C (-4° ... +158°F)
Storage temperature[5]	-20° ... +70°C (-4° ... +158°F)
Weight	150 g (5,29 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] maximum load for static usage
[4] measured on the transducer flange
[5] condensation not allowed

CONNECTIONS

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

EL - ER 40
A / B / C / H / I / N / X
SOLID SHAFT INCREMENTAL ENCODER

MAIN FEATURES

Miniaturized ø 42 mm encoder series for general factory automation applications.

- 3 channel encoder (A / B / Z) up to 14400 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable output, connectors available on cable end
- Solid shaft diameter 6 mm or 8 mm
- Mounting by clamping, threaded or synchronous flange

ORDERING CODE	ER	40A	100	S	5/28	P	6	X	6	P	R	.XXX

SERIES
incremental encoder series EL
incremental encoder series ER

MODEL
clamping flange ø 20 mm 40A
square flange □ 36,5 mm 40B
clamping flange ø 17,46 mm 40C
M18 threaded flange 40H
M20 threaded flange 40I
synchronous flange ø 21 mm 40N
synchronous flange ø 30 mm 40X

RESOLUTION
(mod. A / B) ppr from 1 to 14400
(mod. C / H / I / N / X) ppr from 1 to 2500
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

SHAFT DIAMETER
(mod. A / B / C / H / I / N) mm 6
(mod. X) mm 8

ENCLOSURE RATING
IP 54 X
(mod. A / B / H) IP 66 S

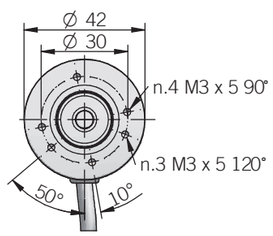
MAX ROTATION SPEED
(IP 66) 3000 rpm 3
(IP 54) 6000 rpm 6

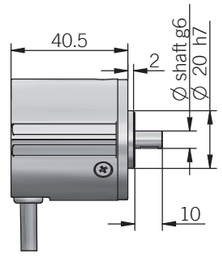
OUTPUT TYPE
cable (standard length 0,5 m) P
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)

DIRECTION TYPE
(mod. A / B / C / H / I / N) axial A
radial R

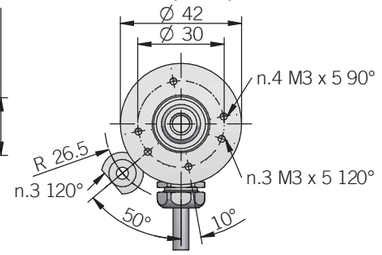
VARIANT
custom version XXX

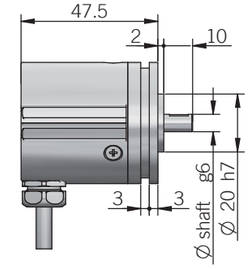
40 A (IP54)





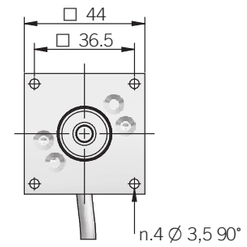
40 A (IP 66)

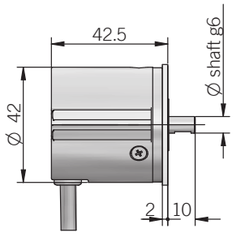




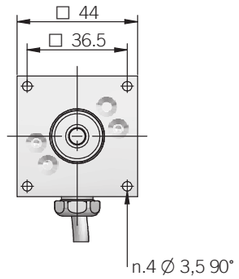
for fixing clamps please refer to Accessories

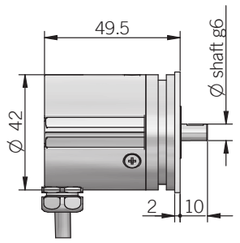
40 B (IP54)



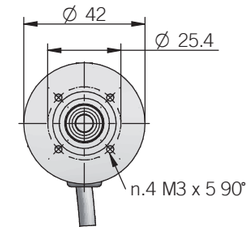


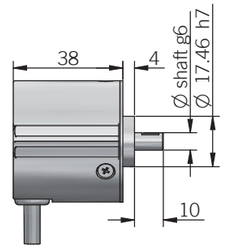
40 B (IP 66)



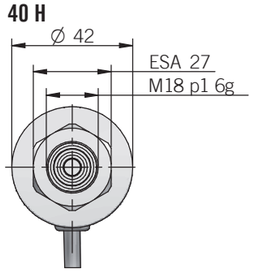


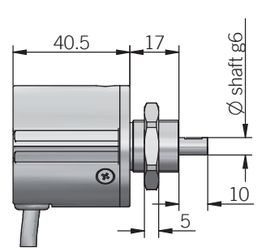
40 C



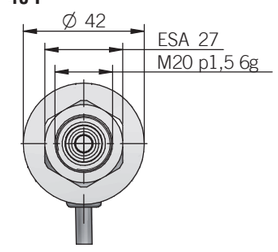


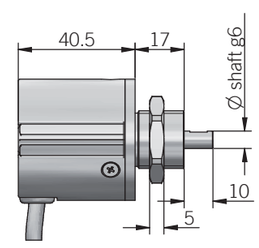
40 H



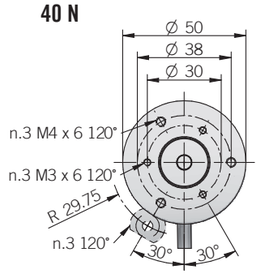


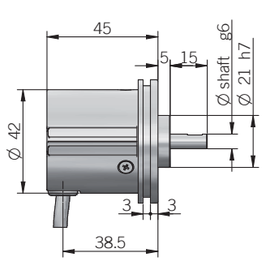
40 I





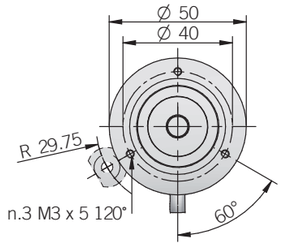
40 N

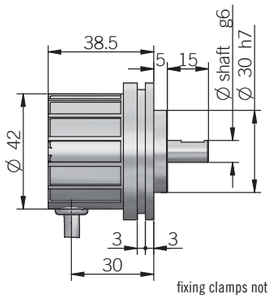




fixing clamps not included, please refer to the Accessories

40 X

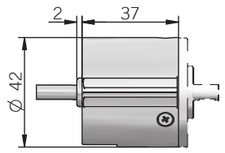




recommended mating shaft tolerance H7
dimensions in mm

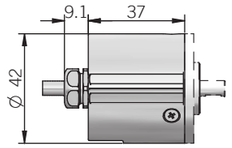
fixing clamps not included, please refer to the Accessories

40 (axial output)



dimensions in mm

40 (IP 66 axial output)



ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 14400 ppr (mod. A / B) from 1 to 2500 ppr (mod. C / H / I / N / X)
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW max
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	EL series 150 kHz ER series 250 kHz up to 3600 ppr 500 kHz from 4000 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 6 / 8 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	IP 54 - 6000 rpm IP 66 - 3000 rpm
Max shaft load[3]	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 (2,4 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin) IP 54 < 0,05 Nm (7,10 Ozin) IP 66
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[4, 5]	-10° ... +60°C (+14° ... +140°F) EL series -25° ... +85°C (-13° ... +185°F) ER series
Storage temperature[5]	-25° ... +70°C (-13° ... +158°F)
Weight	100 g (3,52 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] maximum load for static usage
[4] measured on the transducer flange
[5] condensation not allowed

EL SERIES RESOLUTIONS

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 30 - 32 - 40 - 50 - 70 - 80 - 90 - 750 - 1500

ER SERIES RESOLUTIONS

100 - 120 - 128 - **150** - **200** - 240 - 250 - 256 - **300** - **360** - **400** - 480 - **500** - **512** - **600** - 625 - **720** - 800 - 900 - **1000** - **1024** - **1200** - 1250 - **1440** - 1600 - 1800 - **2000** - **2048** - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 7200 - 8000 - 8192 - 10000 - 12000 - 14400

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

EL - ER 58 B / C / H / T

SOLID SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 24000 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable or connector output
- Available with metal cover for heavy duty applications
- Solid shaft diameter up to 12 mm
- Mounting by synchronous, clamping or coupling flange

ORDERING CODE

ER | 58C | M* | 500 | S | 5/28 | P | 8 | X | 6 | M | R | .162 | +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 metal cover M

RESOLUTION
ppr from 1 to 24000
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

SHAFT DIAMETER
(mod. B) mm 6
(mod. C) mm 8
(mod. B / C / H) (3/8") mm 9,52
mm 10
(mod. T) mm 12

ENCLOSURE RATING
IP 54 X
(mod. B / C / T) IP 66 S

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

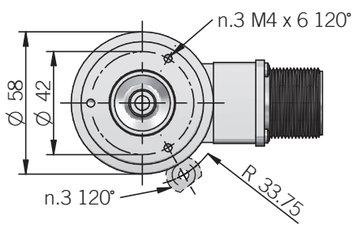
OUTPUT TYPE
cable (standard length 1,5 m) P
preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)
MIL male connector M
JIS-C-5432 male connector J
M12 male connector M12
M23 male connector H
M16 male connector C

DIRECTION TYPE
axial A
radial R

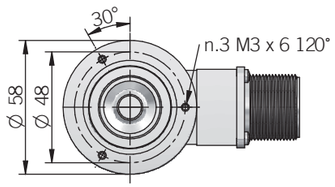
MATING CONNECTOR
mating connector not included .162
to be reported only with connector output (eg. MR.162), for mating connector see Accessories

VARIANT
custom version +XXX

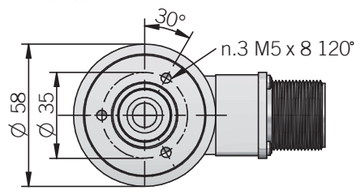
58 B

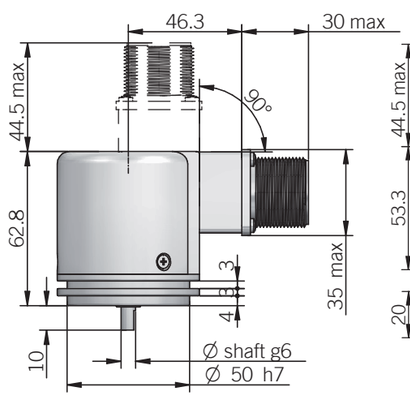


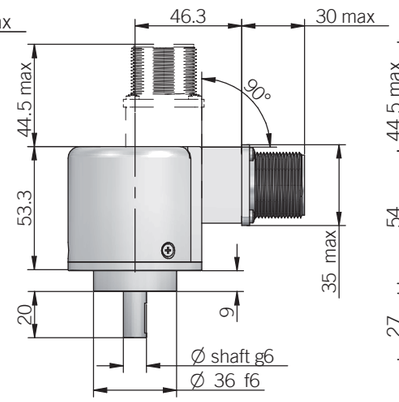
58 C

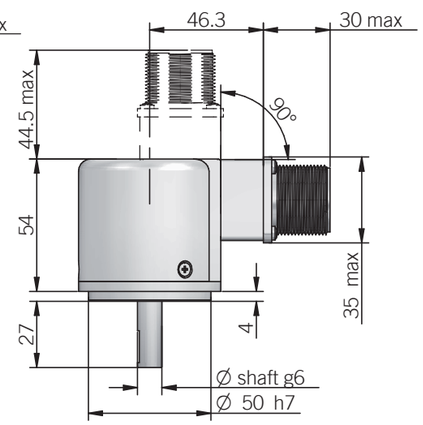


58 H



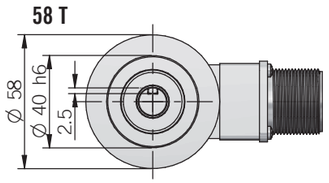


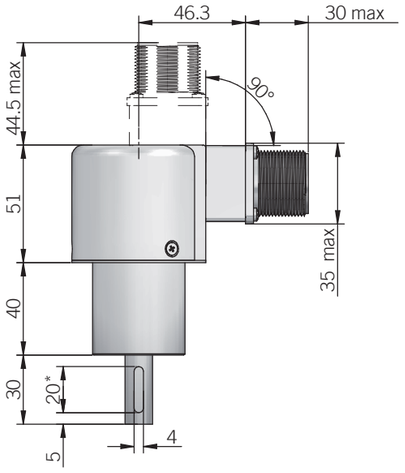




fixing clamps not included, please refer to Accessories

58 T



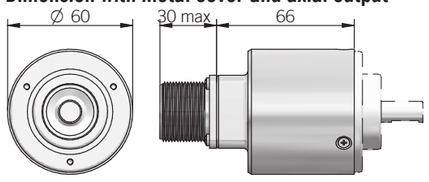


* slot only with 12mm shaft diameter

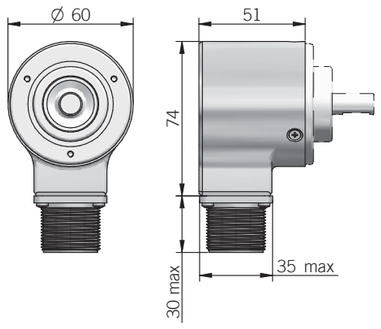
recommended mating shaft tolerance H7

dimensions in mm

Dimension with metal cover and axial output



Dimension with metal cover and radial output



ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 24000 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW max
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

EL SERIES RESOLUTIONS

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - **600** - 625 - **720** - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1600 - 1800 - **2000** - **2048** - **2500** - 3000 - **3600** - 4000 - 4096 - **5000** - 6000 - **7200** - 8000 - 8192 - 9000 - **10000** - 10240 - 12000 - **14400** - 16000 - 16384 - 18000 - **20000** - 20480 - 24000

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

MECHANICAL SPECIFICATIONS

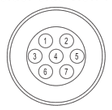
Shaft diameter	ø 6 / 8 / 9,52 (3/8") / 10 / 12 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	IP 54 - 6000 rpm IP 66 - EL 3000 rpm / 60° C ER 3000 rpm / 70° C - 2000 rpm / 85° C
Max shaft load[3]	10 N axial / 20 N radial with ø6 mm shaft 200 N axial / radial
Shock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

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] maximum load for static usage
[4] measured on the transducer flange
[5] condensation not allowed

CONNECTIONS

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

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



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

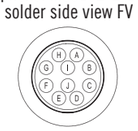
M12 connector (5 pin)
M12 A coded
solder side view FV

C connector (5 pin)
Amphenol C091 M16
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)
Amphenol C091 IEC 60130-9
solder side view FV

EL - ER 63 A / D / E

SOLID SHAFT INCREMENTAL ENCODER

MAIN FEATURES

Standard ø 63 mm encoder series for industrial applications with high mechanical resistance requirements. These encoders are designed to support high radial and axial shaft load and they can be mounted by means of flanges or fixing clamps.

- 3 channel encoder (A / B / Z) up to 24000 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable or connector output
- Available with metal cover for heavy duty applications
- Solid shaft diameter up to 10 mm
- Mounting by synchronous or centering 2,5" square flange

ORDERING CODE	ER	63A	M*	500	S	5/28	P	8	X	6	M	R	.162	+XXX

SERIES
incremental encoder series EL
incremental encoder series ER

MODEL
synchronous flange ø 31,75 mm 63A
centering square flange ø 31,75 mm 63D
centering square flange ø 50 mm 63E

METAL COVER
* add for metal cover M

RESOLUTION
ppr from 1 to 24000
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

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

ENCLOSURE RATING
IP 54 X
IP 66 S

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

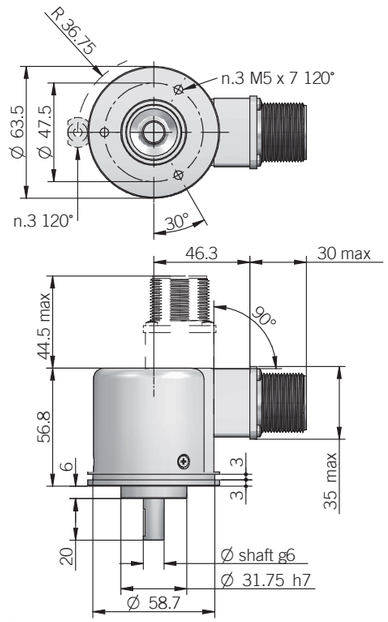
OUTPUT TYPE
cable (standard length 1,5 m) P
preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)
MIL male connector M
JIS-C-5432 male connector J
M12 male connector M12
M23 male connector H
M16 male connector C

DIRECTION TYPE
axial A
radial R

MATING CONNECTOR
mating connector not included .162
to be reported only with connector output (eg. MR.162), for mating connector see Accessories

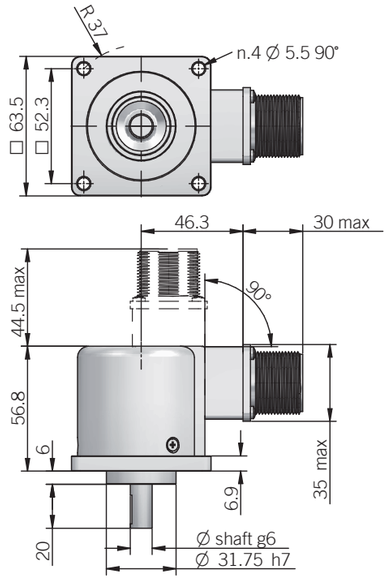
VARIANT
custom version +XXX

63 A

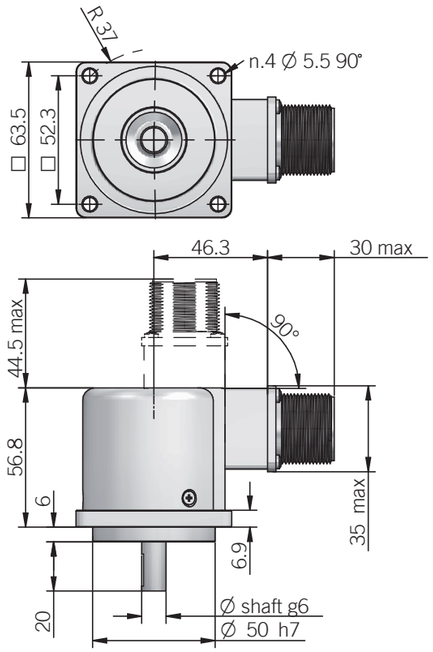


fixing clamps not included, please refer to Accessories

63 D

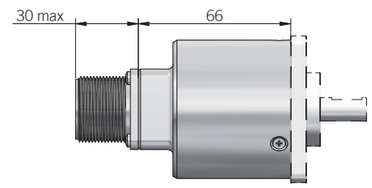


63 E

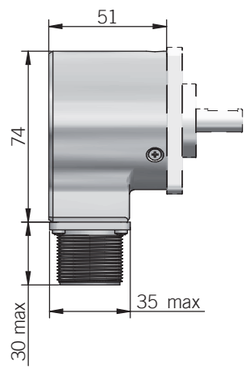


recommended mating shaft tolerance H7
dimensions in mm

Dimension with metal cover and axial output



Dimension with metal cover and radial output



ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 24000 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW max
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

EL SERIES RESOLUTIONS

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - **600** - 625 - **720** - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1600 - 1800 - **2000** - **2048** - **2500** - 3000 - **3600** - 4000 - 4096 - **5000** - 6000 - **7200** - 8000 - 8192 - 9000 - **10000** - 10240 - 12000 - **14400** - 16000 - 16384 - 18000 - **20000** - 20480 - 24000

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

MECHANICAL SPECIFICATIONS

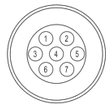
Shaft diameter	ø 8 / 9,52 (3/8") / 10 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	IP 54 - 6000 rpm IP 66 - EL 3000 rpm / 60° C ER 3000 rpm / 70° C - 2000 rpm / 85° C
Max shaft load[3]	200 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	1,5 x 10^{-6} kgm^2 (36 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,02 Nm (2,83 Ozin) IP 54 < 0,06 Nm (8,50 Ozin) IP 66
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced / painted aluminum
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[4, 5]	-10° ... +60°C (+14° ... +140°F) EL series -25° ... +85°C (-13° ... +185°F) ER series
Storage temperature[5]	-25° ... +70°C (-13° ... +158°F)
Weight	350 g (12,35 oz) 450 g (15,87 oz) with metal cover

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] maximum load for static usage
[4] measured on the transducer flange
[5] condensation not allowed

CONNECTIONS

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

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



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)
circular M16
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)
M16 IEC 60130-9
solder side view FV

EX 80 A / D

EXPLOSION PROOF ATEX INCREMENTAL ENCODER

MAIN FEATURES

Explosion proof encoder for applications within explosive and hazardous areas.

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

EX CLASSIFICATION

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

- EN 60079-0:2012+A11:2013
- EN 60079-1:2014
- EN 60079-31:2014

The UE declaration is available on www.eltra.it

ORDERING CODE

EX | 80A | 500 | S | 5/28 | P | 10 | X | 3 | PR | . XXX

SERIES
explosion proof encoder series EX

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

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

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

SHAFT DIAMETER
mm 10

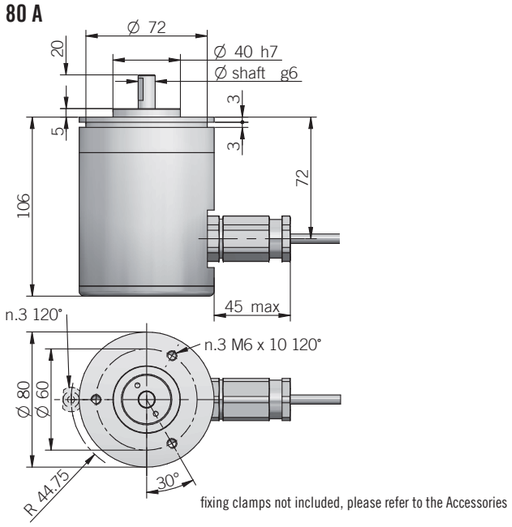
ENCLOSURE RATING
IP 65 X

MAX ROTATION SPEED
3000 rpm 3

OUTPUT TYPE
radial cable (standard length 1,5 m) PR
preferred cable lengths 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

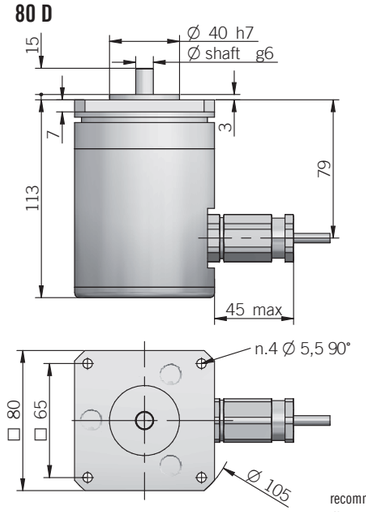
VARIANT
custom version XXX

80 A



fixing clamps not included, please refer to the Accessories

80 D



recommended mating shaft tolerance H7
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 100 to 10000 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Current consumption without load	80 mA max
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] maximum load for static usage
[4] measured on the transducer flange
[5] condensation not allowed

EPL MARKING

II 2GD
Ex db 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 db IIC T6 Gb
Ex db: 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[3]	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 (36 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,06 Nm (8,50 Ozin)
Bearing stage material	anodized aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	anodized aluminum
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[4, 5]	-20° ... +50°C (-4° ... +122°F)
Storage temperature[5]	-20° ... +70°C (-4° ... +158°F)
Weight	1200 g (42,33 oz)

CONNECTIONS

Function	Cable C / P	Cable L / RS
+V DC	brown	brown
0 V	gray	gray
A+	green	green
A-	/	red
B+	yellow	yellow
B-	/	pink
Z+	white	blue
Z-	/	white
⏚	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

EH 90 A - EH 115 A / R

SOLID SHAFT INCREMENTAL ENCODER

MAIN FEATURES

Encoder series for harsh enviroments 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 encoder with double output and / or double resolutions
- Power supply up to +24 V DC with several electrical interfaces available
- Up to 105 kHz output frequency
- Solid shaft diameter up to 11 mm
- Mounting by syncronous or REO-444 flange
- Model 115R available with centrifugal relay

ORDERING CODE EH 90A 500 S 8/24 P 1000 Z 8/24 P 8 X 6 M R .162 +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
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
8 ... 24 V DC 8/24

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L

RESOLUTION

ZERO PULSE

POWER SUPPLY

ELECTRICAL INTERFACE

SHAFT DIAMETER
(mod. 90A) mm 8
(mod. 90A) (3/8") mm 9,52
mm 10
(mod. 115A - 115R) 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
preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)
MIL male connector M
JIS-C-5432 male connector J

DIRECTION TYPE
axial A
radial R

MATING CONNECTOR
mating connector not included .162
to be reported only with connector output (eg. MR.162), for mating connector see Accessories

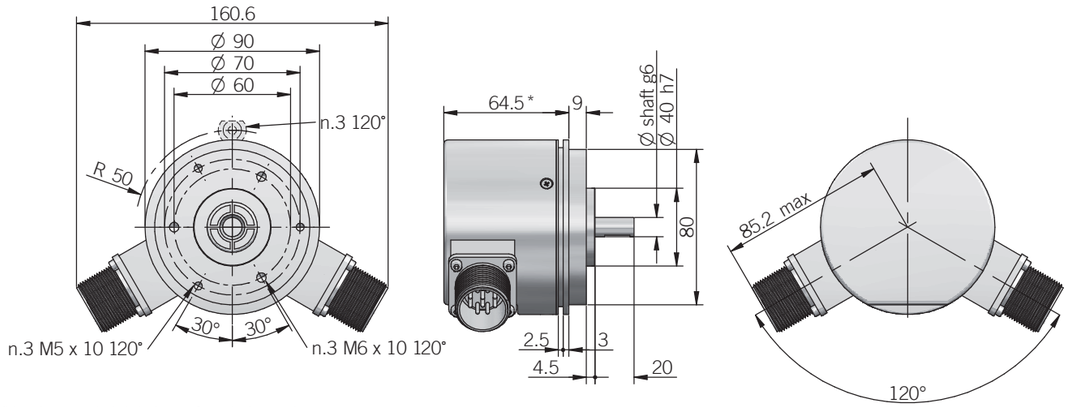
VARIANT
custom version +XXX

RELAY INTERVENTION SPEED
(mod. 115R) from 600 to 4300
for other speeds please contact our offices directly

To be indicated in the models 90A - 115A 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...**

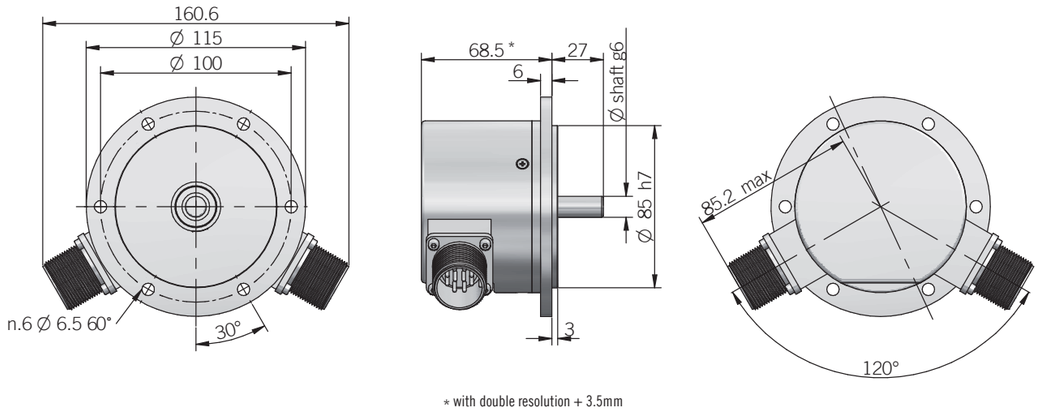
90 A with double output / resolution



fixing clamps not included, please refer to the Accessories

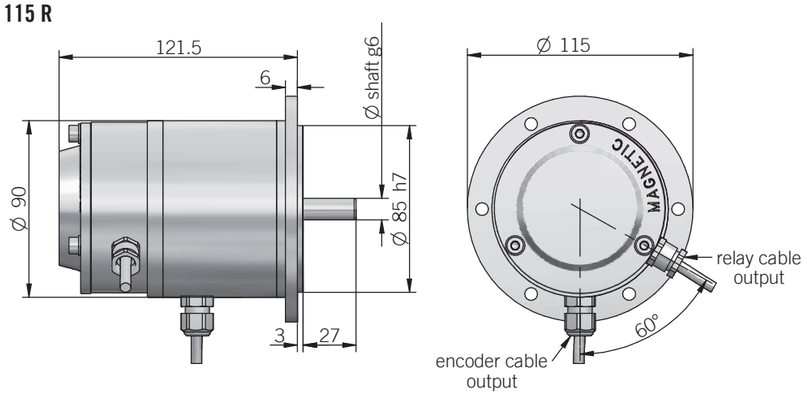
* with double resolution + 3.5mm

115 A with double output / resolution



* with double resolution + 3.5mm

115 R



recommended mating shaft tolerance H7
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 200 to 2048 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 8/24 = 4,5 ... 30 V DC (reverse polarity protection)
Current consumption without load	100 mA max
Max load current	C / P = 50 mA / channel L = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

RESOLUTIONS

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

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

RELAY CHARACTERISTICS

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

MECHANICAL SPECIFICATIONS

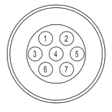
Shaft diameter	ø 8 / 9,52 (3/8") / 10 / 11 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	IP 54 - 6000 rpm IP 66 - 3000 rpm
Max shaft load[3]	200 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	3,5 x 10^{-6} kgm^2 (83 x 10^{-6} lbft^2)
Starting torque **(at +20°C / +68°F)**	< 0,02 Nm (2,8 Ozln) IP 54 < 0,06 Nm (8,5 Ozln) IP 66
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	painted aluminum
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[4, 5]	-10° ... +60°C (+14° ... +140°F)
Storage temperature[5]	-25° ... +70°C (-13° ... +158°F)
Weight	750 g (26,46 oz) 1050 g (37,04 oz) with relay

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] maximum load for static usage
[4] measured on the transducer flange
[5] condensation not allowed

CONNECTIONS

Function	Cable C / P	Cable L	7 pin J C / P	7 pin J L no Zero	7 pin M C / P	7 pin M L / RS no Zero	10 pin J L with Zero	10 pin M L with Zero
+V DC	red	red	6	4	F	D	4 - 5	D - E
0 V	black	black	1	6	A	F	6	F
A+	green	green	3	1	C	A	1	A
A-	/	brown or grey	/	3	/	C	7	G
B+	yellow	yellow	5	2	E	B	2	B
B-	/	orange	/	5	/	E	8	H
Z+	blue	blue	4	/	D	/	3	C
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

EL - ER 90 A
EL - ER 115 A

SOLID SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

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

ORDERING CODE	ER	90A	500	S	5/28	P	8	X	6	M	R	.162	+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
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

SHAFT DIAMETER
(mod. 90) mm 8
(mod. 90) (3/8") mm 9,52
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

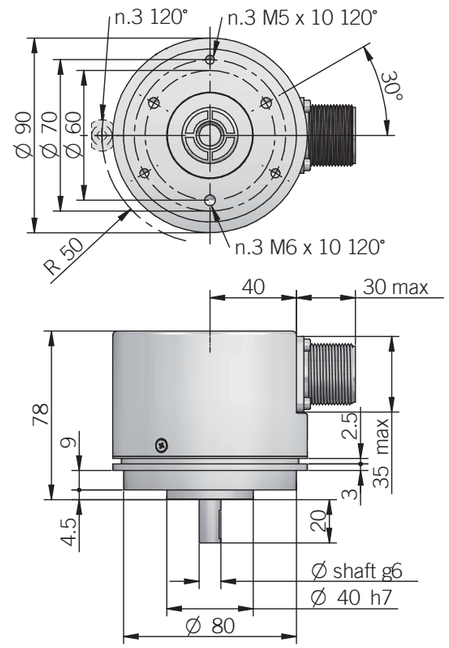
OUTPUT TYPE
cable (standard length 1.5 m) P
preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)
MIL male connector M
JIS-C-5432 male connector J

DIRECTION TYPE
axial A
radial R

MATING CONNECTOR
mating connector not included .162
to be reported only with connector output (eg. MR.162), for mating connector see Accessories

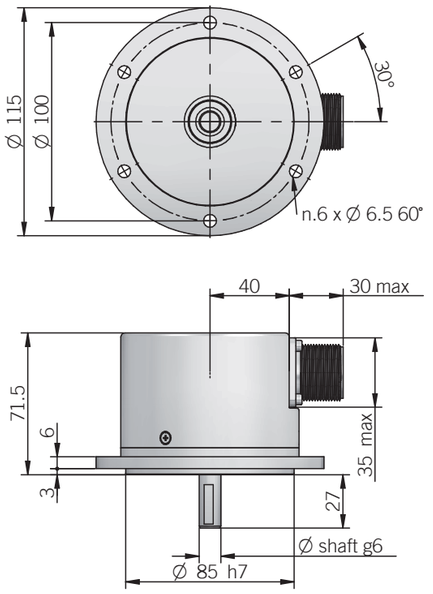
VARIANT
custom version XXX

90 A

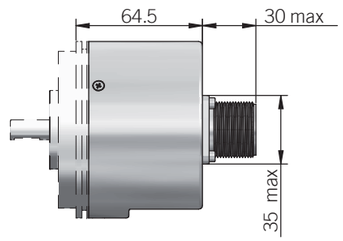


fixing clamps not included, please refer to Accessories

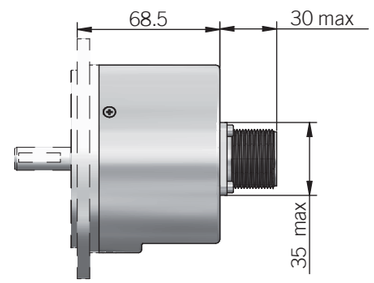
115 A



90 A axial output



115 A axial output



recommended mating shaft tolerance H7
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 10000 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

EL SERIES RESOLUTIONS

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - **600** - 625 - **720** - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1600 - 1800 - **2000** - **2048** - **2500** - 3000 - **3600** - 4000 - 4096 - **5000** - 6000 - **7200** - 8000 - 8192 - 9000 - **10000**

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

MECHANICAL SPECIFICATIONS

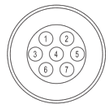
Shaft diameter	ø 8 / 9,52 (3/8") / 10 / 11 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	IP 54 - 6000 rpm IP 66 - EL 3000 rpm / 60° C ER 3000 rpm / 70° C - 2000 rpm / 85° C
Max shaft load[3]	200 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	3,5 x 10^{-6} kgm^2 (83 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,02 Nm (2,83 Ozin) IP 54 < 0,06 Nm (8,50 Ozin) IP 66
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced / painted aluminum
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[4, 5]	-10° ... +60°C (+14° ... +140°F) EL series -25° ... +85°C (-13° ... +185°F) ER series
Storage temperature[5]	-25° ... +70°C (-13° ... +158°F)
Weight	350 g (12,35 oz) 450 g (15,87 oz) with metal cover

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] maximum load for static usage
[4] measured on the transducer flange
[5] condensation not allowed

CONNECTIONS

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

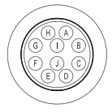
J connector (7 pin)
JIS-C-5432 Size 16
solder side view FV



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



EH 17 - 30 M
INCREMENTAL KIT ENCODER

MAIN FEATURES

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

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

ORDERING CODE

EH	30M	500	S	5/30	P	6	X	6	PR	.XXX

SERIES
incremental encoder series EH

MODEL
kit encoder with flange 17M
kit encoder 30M

RESOLUTION
ppr from 50 to 1024
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

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

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/30V - output RS-422 RS

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

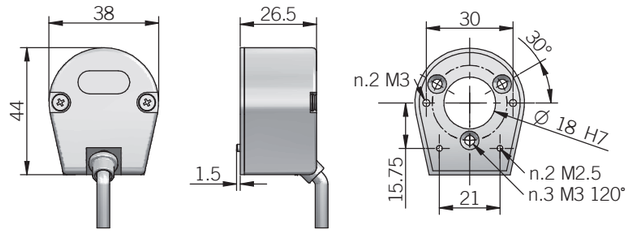
ENCLOSURE RATING
(mod. 17M) IP40 - (mod. 30M) IP 54 X

MAX ROTATION SPEED
6000 rpm 6

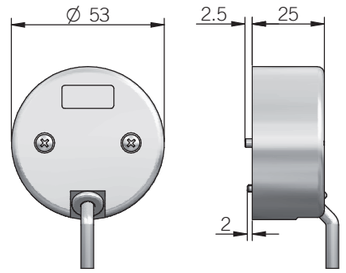
OUTPUT TYPE
radial cable (standard length 0,5 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

17 M

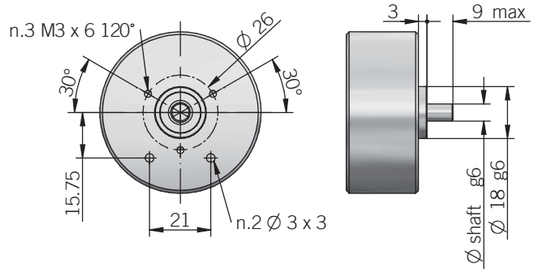


30 M

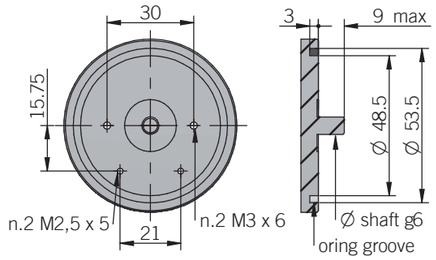


RECOMMENDED INTERFACE FLANGE DESIGN

17 M



30 M



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 50 to 1024 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/30 = 4,5 ... 30 V DC (reverse polarity protection)
Current consumption without load	50 mA (2 channels A / B) 100 mA (3 channels A / B / Z)
Max load current	C / P = 50 mA / channel L = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL SPECIFICATIONS

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

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

RESOLUTIONS

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

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

EH 17 - 30 MH
INCREMENTAL KIT ENCODER

MAIN FEATURES

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

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

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

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

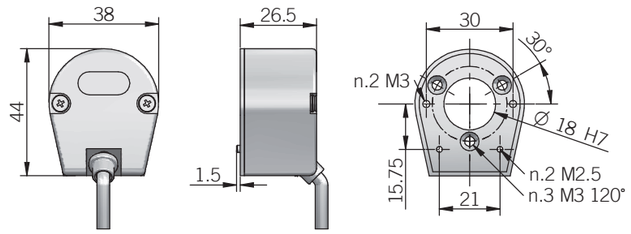
ENCLOSURE RATING
(mod. 17MH) IP40 - (mod. 30MH) IP 54 X

OPTION
to be reported X

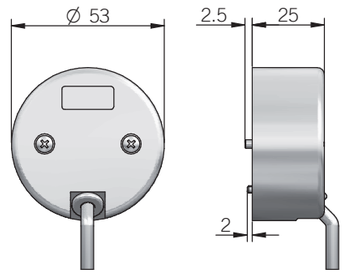
OUTPUT TYPE
radial cable (standard length 0,5 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

17 MH

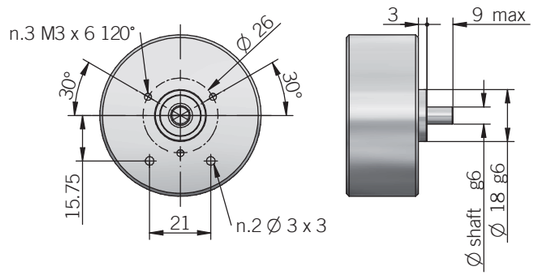


30 MH

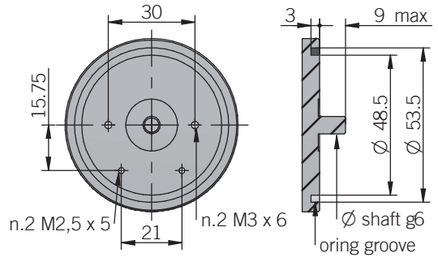


RECOMMENDED INTERFACE FLANGE DESIGN

17 MH



30 MH



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	2000 - 2048 - 2500 - 4096 - 5000 ppr
Power supply[1]	4,5 ... 30 V DC (reverse polarity protection)
Current consumption without load	60 mA max
Max load current	20 mA / channel
Electrical interface[2]	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	500 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL SPECIFICATIONS

Bore diameter	ø 6 / 6,35 (1/4") mm
Enclosure rating IEC 60529	mod. 17 IP 40 mod. 30 IP 54 when properly installed with oring kit (not supplied, please refer to the Accessories)
Max rotation speed	6000 rpm (limited by output frequency)
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,5 x 10^{-6} kgm^2 (12 x 10^{-6} lbft^2)
Flange material (mod. 17)	aluminium
Hub material	EN-AW 2011 aluminium
Cover material	PA66 glass fiber reinforced
Shaft radial play allowed	± 0,04 mm
Shaft axial play allowed	± 0,1 mm
Operating temperature[3, 4]	-20° ... +85°C (-4° ... +185°F)
Storage temperature[4]	-20° ... +85°C (-4° ... +185°F)
Weight	50 g (1,76 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

EF 36 K

BLIND HOLLOW SHAFT INCREMENTAL ENCODER

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 (2 poles pair) 4
6 poles (3 poles pair) 6
8 poles (4 poles pair) 8

ELECTRICAL INTERFACE FOR COMMUTATION SIGNALS
NPN open collector C
line driver RS-422 L

INCREMENTAL RESOLUTION
ppr from 500 to 1024
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
5 V DC 5

ELECTRICAL INTERFACE FOR INCREMENTAL SIGNALS
line driver RS-422 L

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

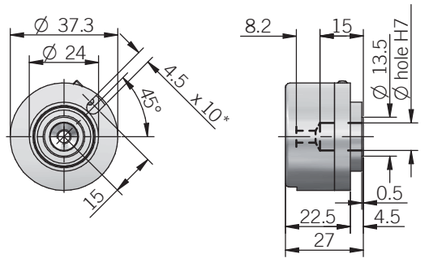
ENCLOSURE RATING
IP 40 X

MAX ROTATION SPEED
6000 rpm 6

OUTPUT TYPE
radial cable (standard length 0,3 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

36 K



* ø 4 mm torque pin min 0.5mm from bottom end

for size 15 Resolver flange please refer to Accessories

recommended mating shaft tolerance g6
dimensions in mm

ELECTRICAL SPECIFICATIONS

Incremental resolution	from 500 to 1024 ppr
Power supply[1]	4,5 ... 5,5 V DC
Current consumption without load	150 mA max
Max load current	20 mA / channel (line driver RS-422) 30 mA / channel (NPN open collector)
Electrical interface for incremental signals[2]	line driver RS-422 (AELT-5000 or equivalent)
Electrical interface for Hall phases[2]	NPN open collector (pull-up max +30V DC) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	150 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL 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 (12 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[3, 4]	-10° ... +85°C (+14° ... +185°F)
Storage temperature[4]	-25° ... +85°C (-13° ... +185°F)
Weight	150 g (5,29 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

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

EM - ER 38 F / G

BLIND HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 14400 ppr
- Power supply up to +30 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable output, 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 torque pin

ORDERING CODE

ER | 38F | 500 | S | 5/30 | P | 10 | X | X | PR | .XXX

SERIES
incremental encoder series EM
incremental encoder series ER

MODEL
blind hollow shaft with stator coupling 38F
blind hollow shaft with torque pin 38G

RESOLUTION
ppr from 1 ... 14400
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 30 V DC 5/30

ELECTRICAL INTERFACE
NPN open collector C
push-pull 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

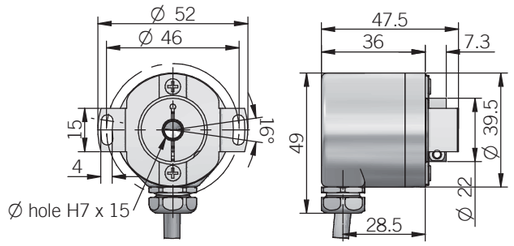
ENCLOSURE RATING
IP 65 X

OPTION
to be reported X

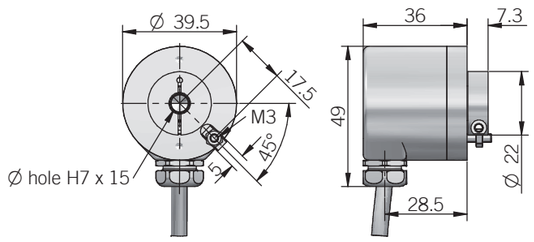
OUTPUT TYPE
radial cable (standard length 0,5 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

38 F



38 G



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

recommended mating shaft tolerance g6
dimensions in mm

ELECTRICAL SPECIFICATIONS

Sensing principle	magnetic Asic (EM) / reflective OptoAsic (ER)
Resolution	from 1 to 14400 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/30 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	5 = 200 mW typical 5/30 = 800 mW typical
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	250 kHz up to 3600 ppr / 500 kHz from 4000 ppr
Counting direction	A leads B clockwise (shaft view)
Startup time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL SPECIFICATIONS

Bore diameter	ø 6* / 6,35 (1/4") / 8* / 10 mm * with supplied shaft adapter
Enclosure rating	IP 65 (IEC 60529)
Max rotation speed	6000 rpm
Max shaft load[3]	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 (19 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Shaft adapter material	CuSn12 / CC483K bronze
Housing material	painted aluminum
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[4, 5]	-25° ... +85°C (-13° ... +185°F)
Storage temperature[5]	-25° ... +85°C (-13° ... +185°F)
Weight	150 g (5,29 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] maximum load for static usage
[4] measured on the transducer flange
[5] condensation not allowed

EM SERIES RESOLUTIONS

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - 600 - 625 - 720 - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1600 - 1800 - **2000** - **2048** - **2500** - 3000 - **3600** - 4000 - 4096 - **5000** - 6000 - **7200** - 8000 - 8192 - 10000 - 12000 - 14400

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

EL 48 C / P

THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +24 V DC with several electrical interfaces available
- Up to 150 kHz output frequency
- Cable output, 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
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
8 ... 24 V DC 8/24

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L

BORE DIAMETER
mm 6
mm 8

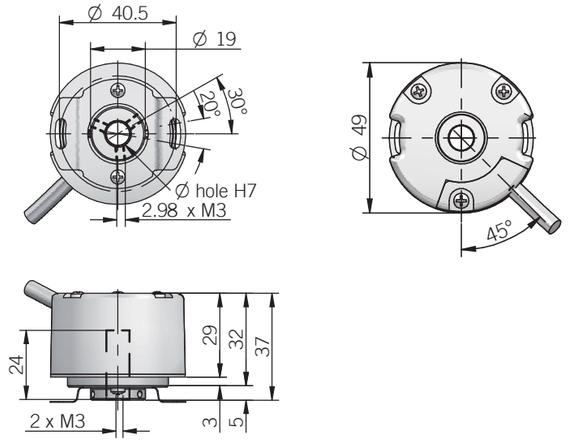
ENCLOSURE RATING
IP 40 X

MAX ROTATION SPEED
6000 rpm 6

OUTPUT TYPE
radial cable (standard length 0,3 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

48 C / P



model C without hole on cover

recommended mating shaft tolerance g6
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 100 to 2048 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 8/24 = 7,6 ... 25,2 V DC
Current consumption without load	100 mA max
Max load current	C / P = 30 mA / channel L = 20 mA / channel
Electrical interface[2]	NPN open collector (pull-up max +30V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	150 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL 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 x 10^{-6} kgm^2 (59 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA 66 glass fiber reinforced
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[3,4]	-20° ... +85 °C (-4° ... +185°F)
Storage temperature[4]	-25° ... +85°C (-13° ... +185°F)
Weight	100 g (3,53 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

RESOLUTIONS

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

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

EL 49 C / P

THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +24 V DC with several electrical interfaces available
- Up to 150 kHz output frequency
- Cable output, connectors available on cable end
- Through hollow shaft diameter up to 12,7 mm (1/2")
- Interchangeable with size 19 Resolver

ORDERING CODE

EL | 49C | 500 | S | 5 | L | 8 | X | 6 | PR | .XXX

SERIES
incremental encoder EL

MODEL
blind hollow shaft 49C
through hollow shaft 49P

RESOLUTION
ppr from 100 to 2048
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
8 ... 24 V DC 8/24

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L

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

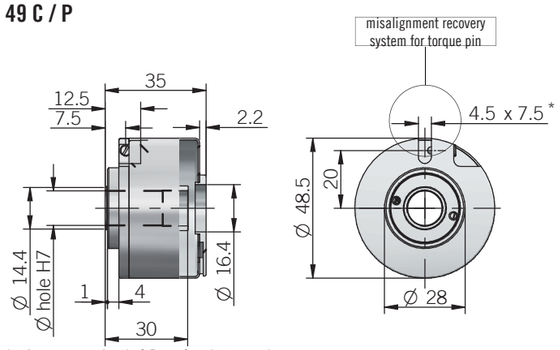
ENCLOSURE RATING
IP 40 X

MAX ROTATION SPEED
6000 rpm 6

OUTPUT TYPE
radial cable (standard length 0,3 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

49 C / P



* ø 4 mm torque pin min 0.5 mm from bottom end

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

recommended mating shaft tolerance g6
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 100 to 2048 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 8/24 = 7,6 ... 25,2 V DC
Current consumption without load	100 mA max
Max load current	20 mA / channel
Electrical interface[2]	NPN open collector (pull-up max +30V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	150 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL SPECIFICATIONS

Bore diameter	ø 6 / 8 / 9,52 (3/8") / 10 / 12 / 12,7 (1/2") mm
Enclosure rating	IP 40 (IEC 60529)
Max rotation speed	6000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	2 x 10^{-6} kgm^2 (47 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	nickel plated brass
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[3, 4]	-20° ... +85 °C (-4° ... +185°F) -10° ... +100°C (+14° ... +212°F) on demand
Storage temperature[4]	-25° ... +85 °C (-13° ... +185°F)
Weight	150 g (5,29 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

RESOLUTIONS

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

please directly contact our offices for other pulses

EF 49 C / P

THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

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

ORDERING CODE

EF 49C 6 L 500 S 5 L 8 X 6 PR .XXX

SERIES
incremental encoder with Hall phases EF

MODEL
blind hollow shaft 49C
through hollow shaft 49P

MOTOR POLES
4 poles (2 poles pair) 4
6 poles (3 poles pair) 6
8 poles (4 poles pair) 8

ELECTRICAL INTERFACE FOR COMMUTATION SIGNALS
NPN open collector C
line driver RS-422 L

INCREMENTAL RESOLUTION
ppr from 100 to 2048
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
5 V DC 5

ELECTRICAL INTERFACE FOR INCREMENTAL SIGNALS
line driver L

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

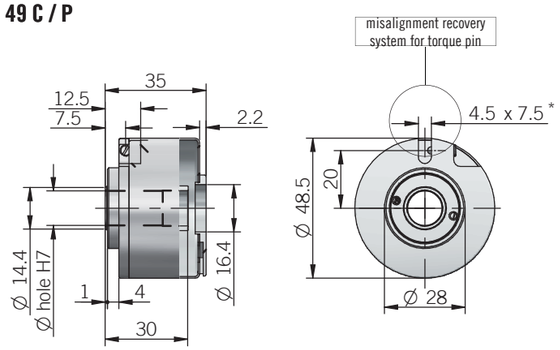
ENCLOSURE RATING
IP 40 X

MAX ROTATION SPEED
6000 rpm 6

OUTPUT TYPE
radial cable (standard length 0,3 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

49 C / P



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

recommended mating shaft tolerance g6
dimensions in mm

ELECTRICAL SPECIFICATIONS

Incremental resolution	from 100 to 2048 ppr
Power supply[1]	4,5 ... 5,5 V DC
Current consumption without load	150 mA max
Max load current	20 mA / channel
Electrical interface for incremental signals[2]	line driver RS-422 (AELT-5000 or equivalent)
Electrical interface for Hall phases[2]	NPN open collector (pull-up max +30V DC) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	150 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHs	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL SPECIFICATIONS

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

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

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

EH 50 FA / FP

THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

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

ORDERING CODE

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

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
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

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

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

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

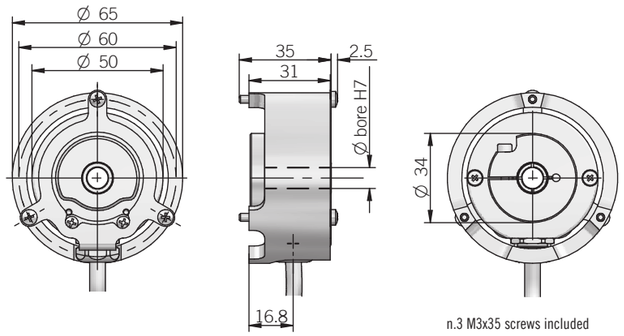
ENCLOSURE RATING
IP 65 X

MAX ROTATION SPEED
6000 rpm 6

OUTPUT TYPE
radial cable (standard length 0,5 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

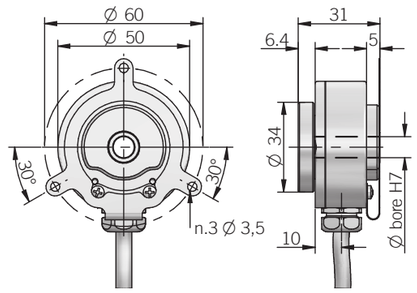
50 FA



n.3 M3x35 screws included

recommended mating shaft tolerance g6
dimensions in mm

50 FP



ELECTRICAL SPECIFICATIONS

Resolution	from 100 to 1024 ppr
Power supply[1]	4,5 ... 30 V DC (with reverse polarity protection)
Power draw without load	800 mW max
Max load current	20 mA / channel
Electrical interface[2]	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

RESOLUTIONS

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

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

CONNECTIONS

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

MECHANICAL 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} kgm² (12 x 10^{-6} lbft²)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[3, 4]	-40° ... +100 °C (-40° ... +212°F)
Storage temperature[4]	-40° ... +100 °C (-40° ... +212°F)
Weight	150 g (5,29 oz) mod.FP 200 g (7,05 oz) mod.FA

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

EH 53 A / B

BLIND HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

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

ORDERING CODE

EH	53A	500	S	8/24	P	8	X	6	PR.N	XXX

SERIES
incremental encoder series EH

MODEL
adjustable flange model 53A
adjustable flange model 53B

RESOLUTION
ppr from 50 to 1024
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
8 ... 24 V DC 8/24

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L

BORE DIAMETER
mm 6
mm 8
mm 10

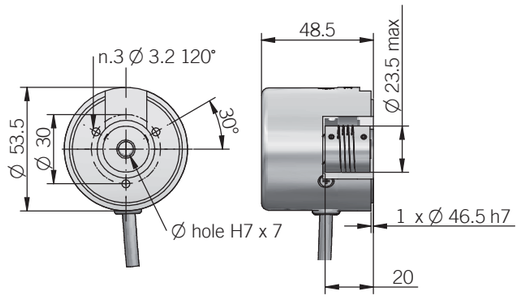
ENCLOSURE RATING
IP 54 X

MAX ROTATION SPEED
6000 rpm 6

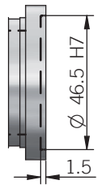
OUTPUT TYPE
radial cable (standard length 0,5 m) PR.N
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

53 A



53 B interface



recommended mating shaft tolerance g6
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 100 to 1024 ppr
Power supply[1]	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	C / P = 50 mA / channel L = 20 mA / channel
Electrical interface[2]	NPN open collector (pull-up max +30V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	150 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL SPECIFICATIONS

Bore diameter	ø 6 / 8 / 10 mm
Enclosure rating	IP 54 (IEC 60529)
Max rotation speed	6000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	1 x 10^{-6} kgm² (24 x 10^{-6} lbft²)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA66 glass fiber reinforced
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[3, 4]	-10° ... +60°C (+14° ... +140°F)
Storage temperature[4]	-25° ... +70°C (-13° ... +158°F)
Weight	150 g (5,29 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

RESOLUTIONS

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

please directly contact our offices for other pulses

EL - ER 53 A / B

BLIND HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 10000 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable or connector output
- Available with metal cover for heavy duty applications
- Integrated elastic couplig up to 10 mm bore diameter

ORDERING CODE

ER | 53A | M* | 500 | S | 5/28 | P | 8 | X | 6 | M | R | .162 | +XXX

SERIES
incremental encoder series EL
incremental encoder series ER

MODEL
adjustable flange model 53A
adjustable flange model 53B

METAL COVER
* add for metal cover M

RESOLUTION
ppr from 1 to 10000
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

BORE DIAMETER
mm 6
mm 8
mm 10

ENCLOSURE RATING
IP 54 X
IP 64 S

MAX ROTATION SPEED
(IP 64) 3000 rpm 3
(IP 54) 6000 rpm 6

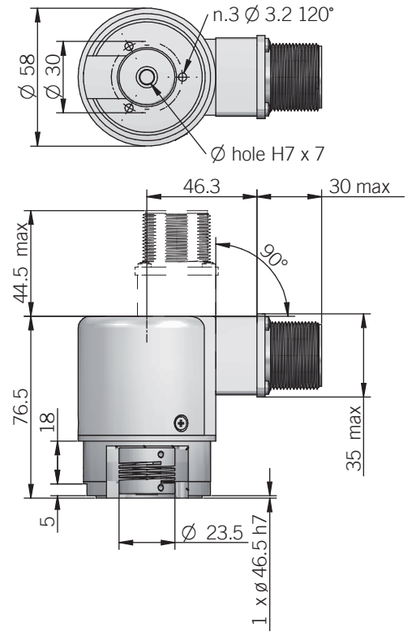
OUTPUT TYPE
cable (standard length 1,5 m) P
preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)
MIL male connector M
JIS-C-5432 male connector J
M12 male connector M12
M23 male connector H
M16 male connector C

DIRECTION TYPE
axial A
radial R

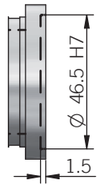
MATING CONNECTOR
mating connector not included .162
to be reported only with connector output (eg. MR.162), for mating connector see Accessories

VARIANT
custom version XXX

53 A

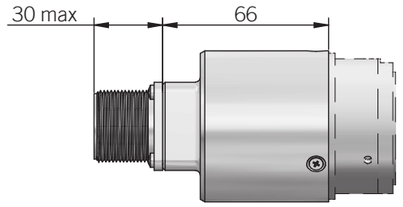


53 B interface

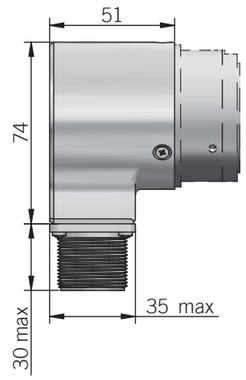


recommended mating shaft tolerance g6
dimensions in mm

Dimensions with metal cover and axial output



Dimensions with metal cover and radial output



ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 10000 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

EL SERIES RESOLUTIONS

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - **600** - 625 - **720** - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1600 - 1800 - **2000** - **2048** - **2500** - 3000 - **3600** - 4000 - 4096 - **5000** - 6000 - **7200** - 8000 - 8192 - 9000 - **10000**

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

MECHANICAL SPECIFICATIONS

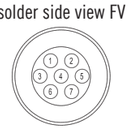
Bore diameter	ø 6 / 8 / 10 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 64 (IEC 60529)
Max rotation speed	IP 64 - 3000 rpm IP 54 - 6000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	1 x 10^{-6} kgm^2 (24 x 10^{-6} lbft^2)
Starting torque (at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

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

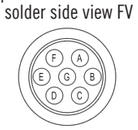
CONNECTIONS

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

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



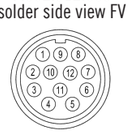
M connector (7 pin)
Amphenol MS3102-E-16-S
solder side view FV



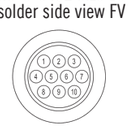
M12 connector (5 pin)
M12 A coded
solder side view FV

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

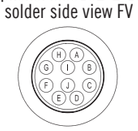
H connector (12 pin) - M23 CCW
Hummel 7.410.000000 -
7.002.912.603
solder side view FV



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

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

BLIND HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 24000 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable or connector output
- Available with metal cover for heavy duty applications
- Blind hollow shaft diameter up to 15 mm
- Mounting by stator coupling, torque stop slot or torque pin

ORDERING CODE	ER	58F	M*	500	S	5/28	P	8	X	3	M	R	.162	+XXX

SERIES
incremental encoder series EL
incremental encoder series ER

MODEL
blind hollow shaft with stator coupling 58F
blind hollow shaft with torque pin 58G
blind hollow shaft with torque stop slot 63F
blind hollow shaft with torque pin 63G

METAL COVER
* add for metal cover M

RESOLUTION
ppr from 1 to 24000
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

BORE 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

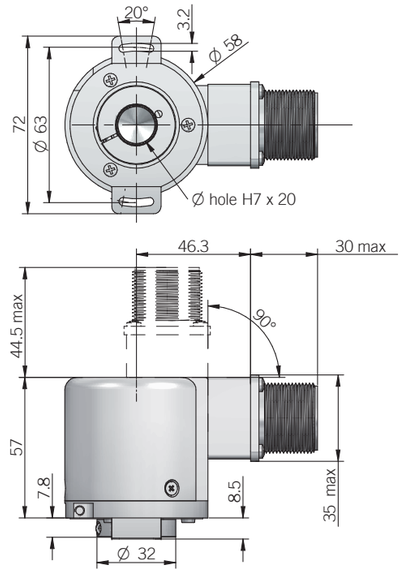
OUTPUT TYPE
cable (standard length 1,5 m) P
preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)
MIL male connector M
JIS-C-5432 male connector J
M12 male connector M12
M23 male connector H
M16 male connector C

DIRECTION TYPE
axial A
radial R

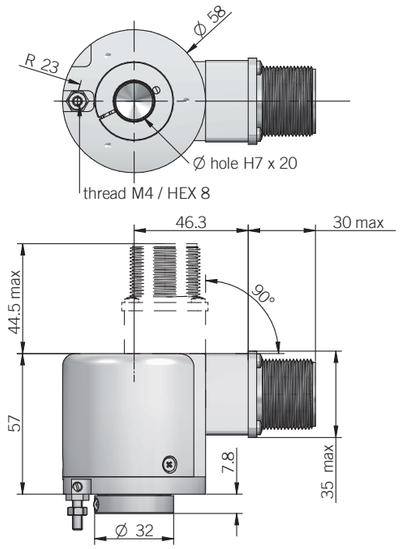
MATING CONNECTOR
mating connector not included .162
to be reported only with connector output (eg. MR.162), for mating connector see Accessories

VARIANT
custom version XXX

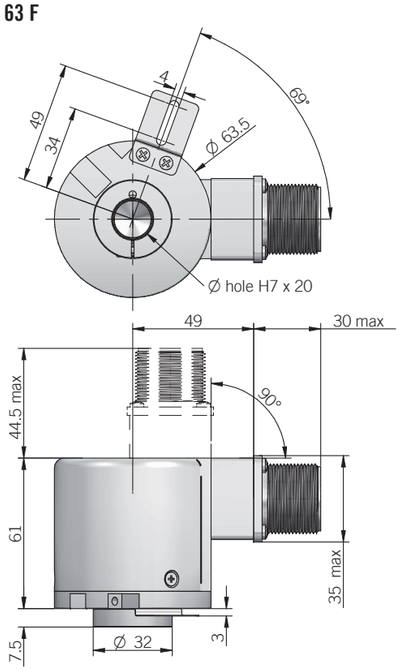
58 F



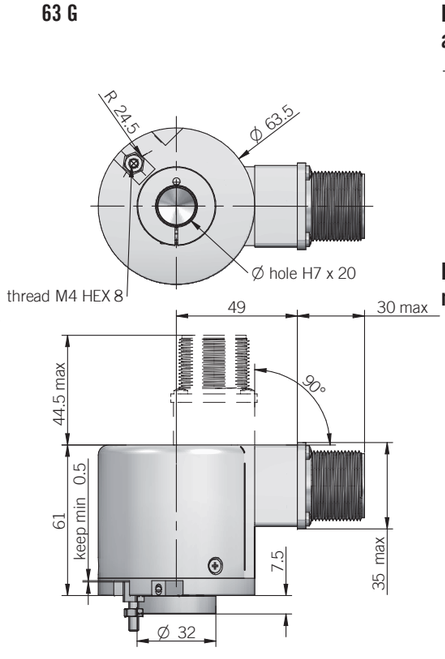
58 G



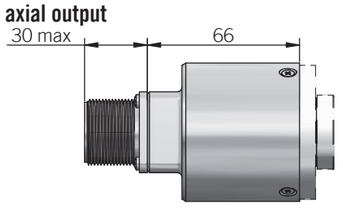
63 F



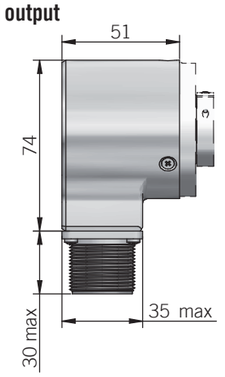
63 G



Dimensions with metal cover and axial output



Dimensions with metal cover and radial output



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

recommended mating shaft tolerance g6
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[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW max
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

EL SERIES RESOLUTIONS

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

ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - **600** - 625 - **720** - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1600 - 1800 - **2000** - **2048** - **2500** - 3000 - **3600** - 4000 - 4096 - **5000** - 6000 - **7200** - 8000 - 8192 - 9000 - **10000** - 10240 - 12000 - **14400** - 16000 - 16384 - 18000 - **20000** - 20480 - 24000

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

MECHANICAL SPECIFICATIONS

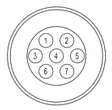
Bore diameter	ø 8* / 10* / 12* / 14 / 15 mm * with supplied shaft adapter (valid for resolution ≥ 3000 ppr)
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	3000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	4 x 10^{-6} kgm^2 (95 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,02 Nm (2,83 Ozin) IP 54 < 0,06 Nm (8,50 Ozin) IP 66
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Shaft adapter material	CuSn12 / CC483K bronze
Housing material	PA66 glass fiber reinforced / painted aluminum
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[3, 4]	-10° ... +60°C (+14° ... +140°F) EL series -20° ... +70°C (-4° ... +158°F) ER series
Storage temperature[4]	-25° ... +70°C (-13° ... +158°F)
Fixing torque for collar clamping	1,5 Nm (212 Ozin) recommended
Weight	350 g (12,35 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

CONNECTIONS

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

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



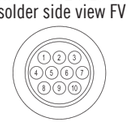
M connector (7 pin)
Amphenol MS3102-E-16-S
solder side view FV

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

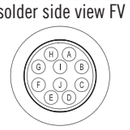
C connector (5 pin)
circular M16
solder side view FV

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

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

BLIND / THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 300 kHz output frequency
- Cable output, connectors 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 | P | 8 | X | 3 | PR | .XXX

SERIES
incremental encoder EL

MODEL
blind hollow shaft with torque stop slot 63FB
blind hollow shaft with torque pin 63GB
through hollow shaft with torque pin 63PB
through hollow shaft with torque stop slot 63PBF
rear fixing shaft with torque pin 63PC
rear fixing shaft with torque stop slot 63PCF

RESOLUTION
ppr from 1 to 2500
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

BORE DIAMETER
mm 8
mm 10
mm 12
mm 14
mm 15

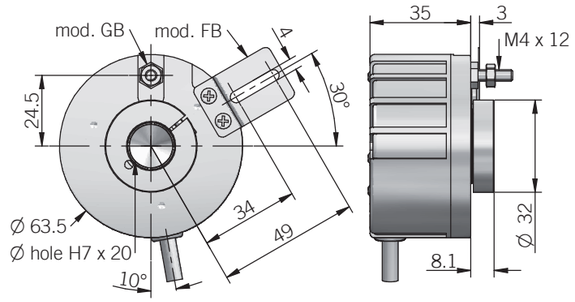
ENCLOSURE RATING
IP 54 X

MAX ROTATION SPEED
3600 rpm 3

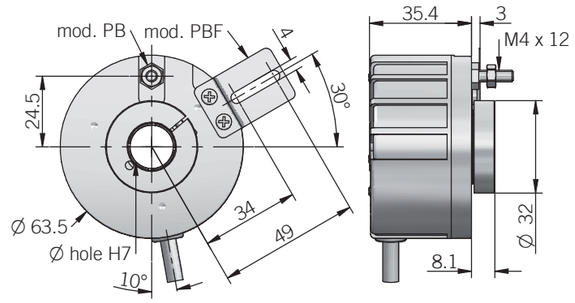
OUTPUT TYPE
radial cable (standard length 1,5 m) PR
preferred cable lengths 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

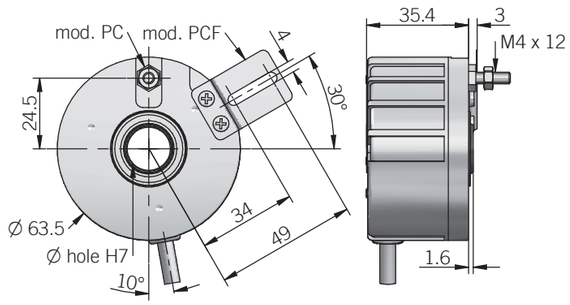
63 FB / GB



63 PB / PBF

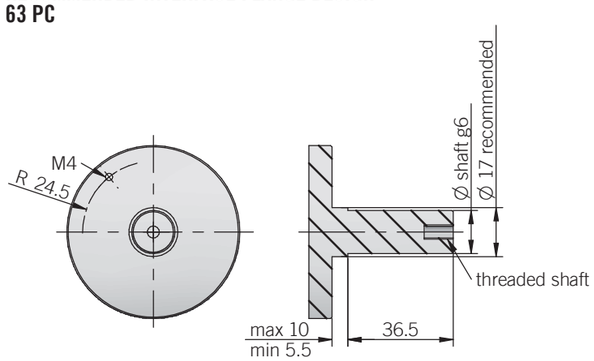


63 PC / PCF



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

RECOMMENDED INTERFACE FLANGE DESIGN
63 PC



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 2500 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW max
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	300 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

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

CONNECTIONS

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

MECHANICAL SPECIFICATIONS

Bore diameter	ø 8 / 10 / 12 / 14 / 15 mm
Enclosure rating	IP 54 (IEC 60529)
Max rotation speed	3600 rpm continuous / 4000 rpm peak
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 (95 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,04 Nm (5,66 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	PA 66 glass fiber reinforced
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[3, 4]	-10° ... +60 °C (+14° ... +140°F)
Storage temperature[4]	-25° ... +70 °C (-13° ... +158°F)
Weight	350 g (12,35 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

EL - ER 72 A / B

BLIND HOLLOW SHAFT INCREMENTAL ENCODER

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 V DC with several electrical interfaces available
- Up to 500 kHz output frequency
- Cable or connector output
- Available with metal cover for heavy duty applications
- Integrated elastic couplig up to 10 mm bore diameter

ORDERING CODE	ER	721	A	M*	500	S	5/28	P	8	X	6	M	R	.162	+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 metal cover M

RESOLUTION
ppr from 1 to 24000
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

BORE DIAMETER
mm 6
mm 8
mm 10

ENCLOSURE RATING
IP 54 X
(mod. EL721 / EL722) IP 66 S

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

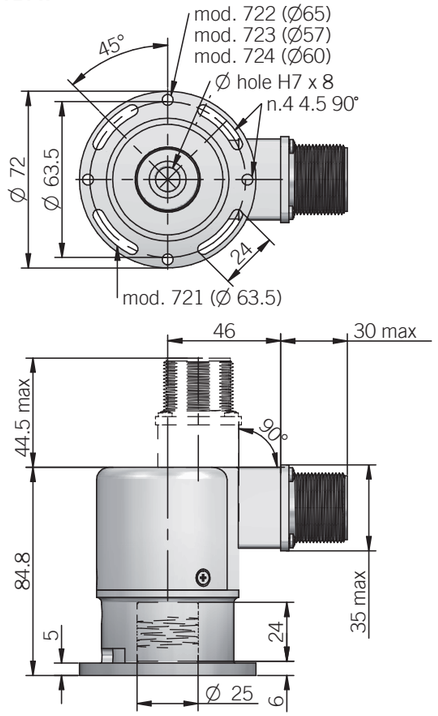
OUTPUT TYPE
cable (standard length 1,5 m) P
preferred cable lengths 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)
MIL male connector M
JIS-C-5432 male connector J
M12 male connector M12
M23 male connector H
M16 male connector C

DIRECTION TYPE
axial A
radial R

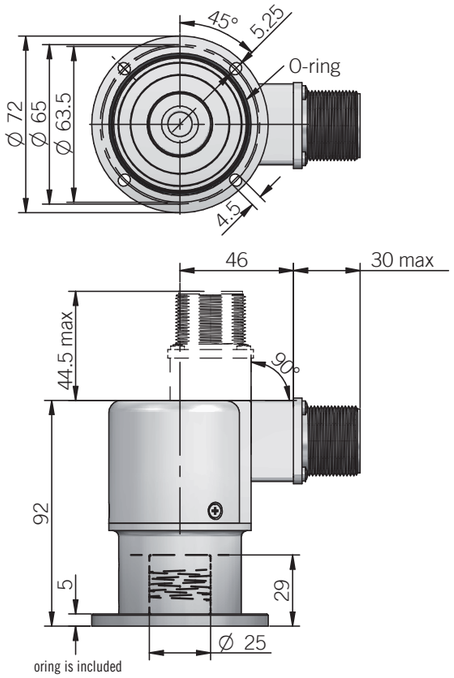
MATING CONNECTOR
mating connector not included .162
to be reported only with connector output (eg. MR.162), for mating connector see Accessories

VARIANT
custom version XXX

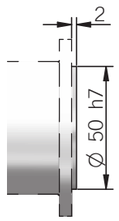
721 A



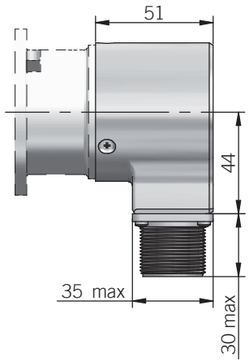
721 A IP 66



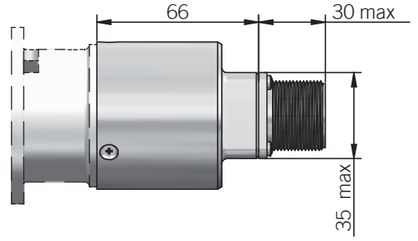
72 B flange version



Dimensions with metal cover radial output



Dimensions with metal cover axial output



recommended mating shaft tolerance g6
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 24000 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW max
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	250 kHz up to 6000 ppr 500 kHz from 7200 ppr
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

EL SERIES RESOLUTIONS

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 25 - 30 - 32 - 40 - 50 - 60 - 70 - 80 - 90 - 100* - 160 - 180 - 240* - 250* - 350 - 450 - 500* - 660 - 700 - 750 - 900* - 1000* - 1024* - 1250* - 1300* - 1500 - 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** - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1600 - 1800 - **2000** - **2048** - **2500** - 3000 - **3600** - 4000 - 4096 - **5000** - 6000 - **7200** - 8000 - 8192 - 9000 - **10000** - 10240 - 12000 - **14400** - 16000 - 16384 - 18000 - **20000** - 20480 - 24000

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

MECHANICAL SPECIFICATIONS

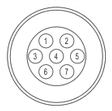
Bore diameter	ø 6 / 8 / 10 mm
Enclosure rating	X = IP 54 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	IP 54 - 6000 rpm IP 66 - EL 3000 rpm / 60° C ER 3000 rpm / 70° C - 2000 rpm / 85° C
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	3,5 x 10^{-6}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

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

CONNECTIONS

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

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



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

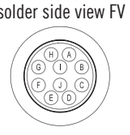
M12 connector (5 pin)
M12 A coded
solder side view FV

C connector (5 pin)
circular M16
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

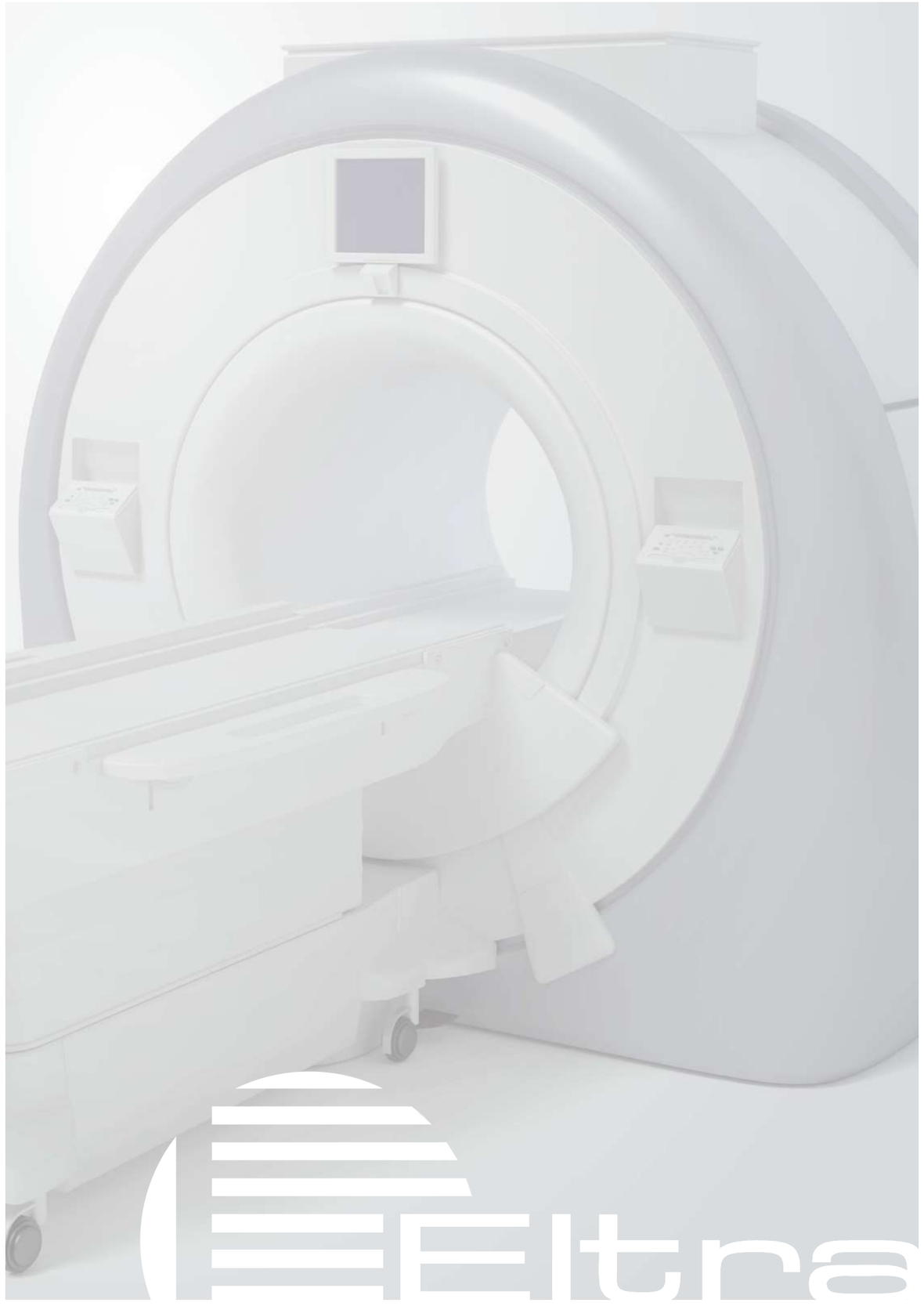
M connector (10 pin)
Amphenol MS3102-E-18-1
solder side view FV



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

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

eltra@eltra.it



EH 80 C / P / PG / K

BLIND / THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

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

ORDERING CODE

EH	80C	500	S	5	L	8	X	6	PR	.XXX

SERIES
incremental encoder EH

MODEL
blind hollow shaft 80C
blind hollow shaft with rear fixing 80K
through hollow shaft 80P
through hollow shaft with collar clamping 80PG

RESOLUTION
ppr from 1 to 2048
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L
power supply 5/28V - output RS-422 RS

BORE DIAMETER
(mod. C - P) mm 8
mm 10
(mod. C - P) mm 12
(mod. C - P - PG) mm 14
(mod. C - P - PG) mm 15

ENCLOSURE RATING
IP 64 X

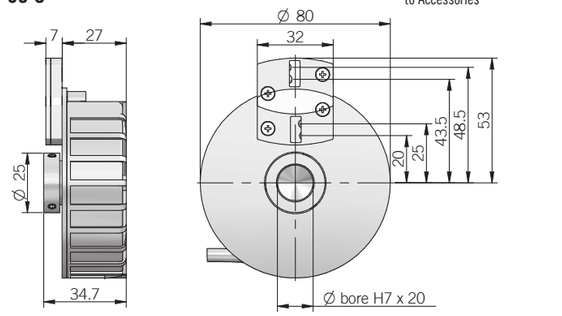
MAX ROTATION SPEED
(mod. P - PG) 3000 rpm 3
(mod. C - K) 6000 rpm 6

OUTPUT TYPE
radial (standard length 0,3 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

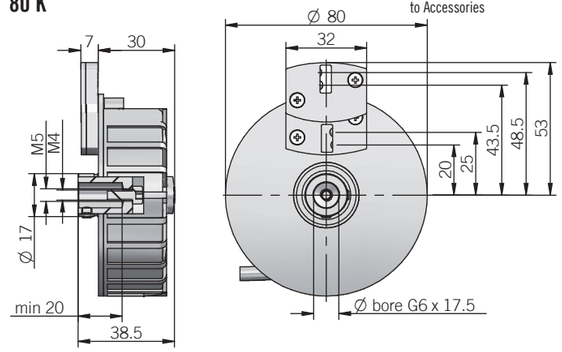
80 C

for torque pin please refer to Accessories



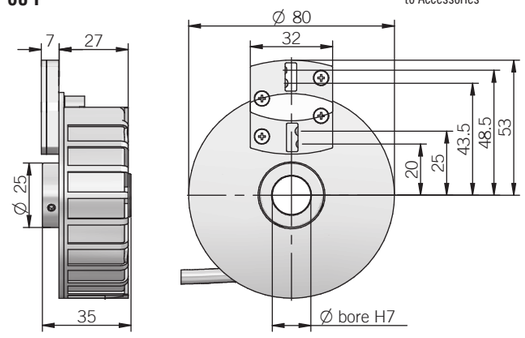
80 K

for torque pin please refer to Accessories



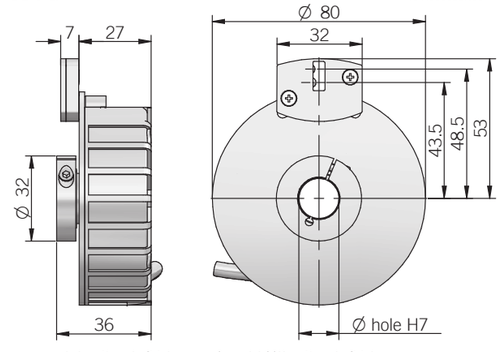
80 P

for torque pin please refer to Accessories



80 PG

for torque pin please refer to Accessories



recommended mating shaft tolerance g6, model 80K mating shaft tolerance ...
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 2048 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW max
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICATIONS

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

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

CONNECTIONS

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

RESOLUTIONS

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

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

EH - EL 88 P

THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 105 kHz output frequency
- Cable output, connectors 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 torque stop slot 88P

RESOLUTION
(mod. EH) max ppr 2500
(mod. EL) max ppr 2048
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
(with L electrical interface) 8 ... 24 V DC 8/24
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
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

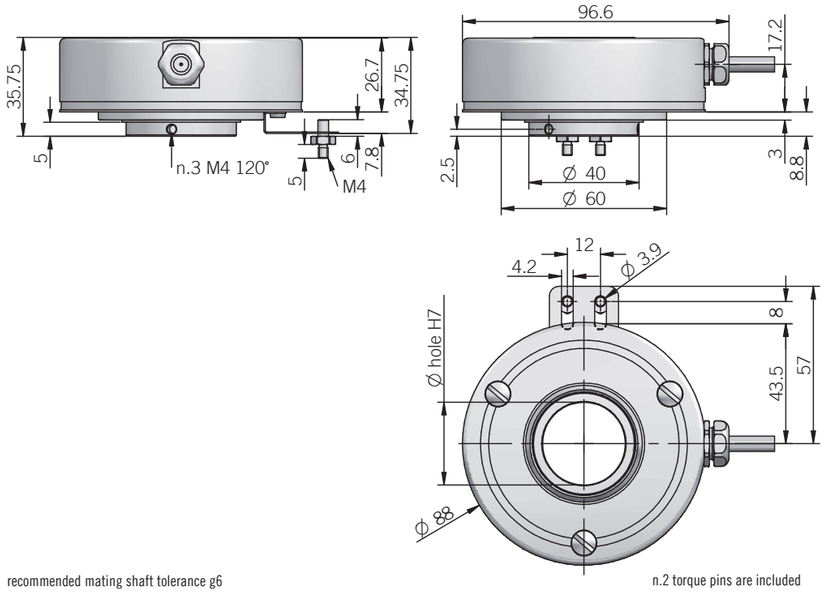
ENCLOSURE RATING
IP 65 S

MAX ROTATION SPEED
3000 rpm 3

OUTPUT TYPE
radial cable (standard length 0,5 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

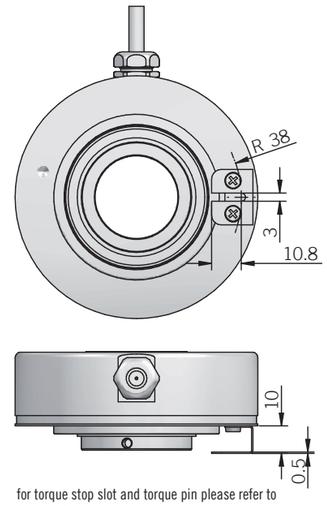
88 P



recommended mating shaft tolerance g6
dimensions in mm

n.2 torque pins are included

OPTIONAL TORQUE STOP SLOT



for torque stop slot and torque pin please refer to Accessories

ELECTRICAL SPECIFICATIONS

Resolution	from 250 to 2500 ppr (EH series) from 2 to 2048 ppr (EL series)
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,75 ... 29,4 V DC 8/24 = 7,6 ... 25,2 (reverse polarity protection)
Current consumption without load	100 mA max
Max load current	C / P = 50 mA / channel L / RS = 20 mA / channel
Electrical interface[2]	NPN open collector (pullup max +30V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL SPECIFICATIONS

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 (10,68 x 10^{-4} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,1 Nm (14,16 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[3, 4]	-10° ... +70°C (+14° ... +158°F)
Storage temperature[4]	-25° ... +85°C (-13° ... +185°F)
Weight	350 g (12,35 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

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

EH 88 PE / PET

THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 2500 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 105 kHz output frequency
- Cable output, connectors 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 torque stop slot 88PE
through hollow shaft for torque arm fixing 88PET
please refer to Accessories for torque arm

RESOLUTION
ppr from 500 to 2500
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
push-pull P
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

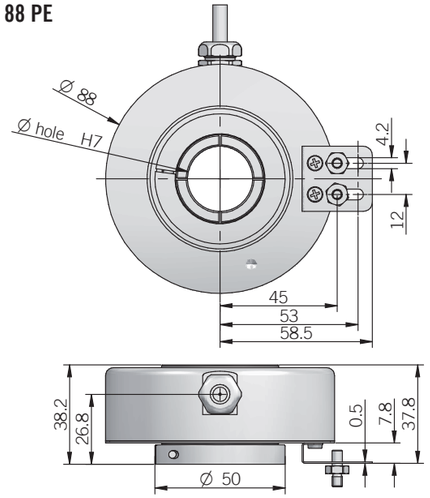
ENCLOSURE RATING
IP 54 X

MAX ROTATION SPEED
3000 rpm 3

OUTPUT TYPE
radial cable (standard length 0,5 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

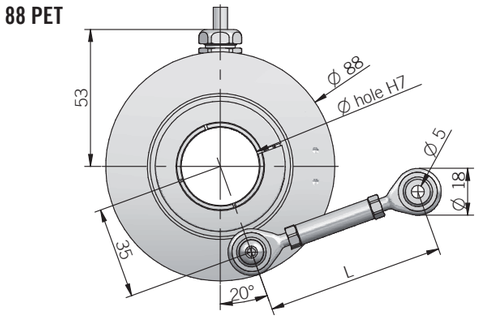
VARIANT
custom version XXX

88 PE



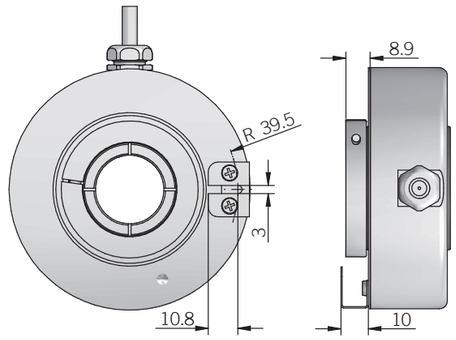
for torque pin please refer to Accessories

88 PET



torque arm not included, please refer to Accessories

OPTIONAL TORQUE STOP SLOT



for torque stop slot and torque pin please refer to Accessories

recommended mating shaft tolerance g6
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 500 to 2500 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW
Max load current	20 mA / channel
Electrical interface[2]	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

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 x 10^{-6} kgm² (10,68 x 10^{-4} lbft²)
Starting torque (at +20°C / +68°F)	< 0,02 Nm (2,83 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	up to ø 38 mm: EN-AW 2011 aluminum ø 40 mm: 1.4305/AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[3, 4]	-30° ... +85°C (-22° ... +185°F)
Storage temperature[4]	-30° ... +85°C (-22° ... +185°F)
Weight	350 g (12,35 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

RESOLUTIONS

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

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

CONNECTIONS

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

EL 120 P

THROUGH HOLLOW SHAFT INCREMENTAL ENCODER

MAIN FEATURES

ø 120 mm through hollow shaft encoder designed for medium / big size motors.

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +24 V DC with several electrical interfaces available
- Up to 105 kHz output frequency
- Cable output, connectors 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
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
(with L electrical interface) 8 ... 24 V DC 8/24
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
NPN open collector C
push-pull P
line driver L

BORE DIAMETER
mm 40
mm 50
mm 60

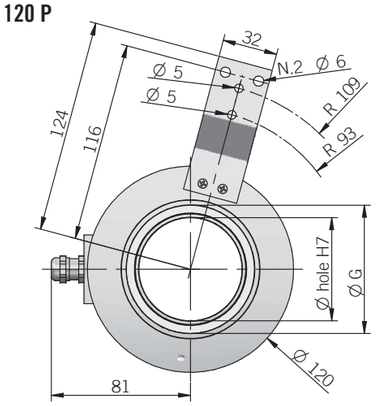
ENCLOSURE RATING
IP 54 X

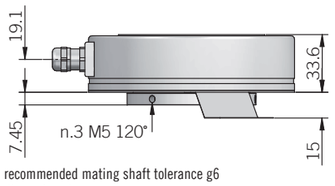
MAX ROTATION SPEED
3000 rpm 3

OUTPUT TYPE
radial cable (standard length 0,5 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

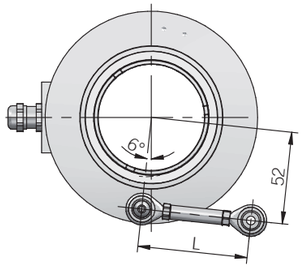
120 P





recommended mating shaft tolerance g6
dimensions in mm

WITH TORQUE ARM



for torque arm please refer to Accessories

ELECTRICAL SPECIFICATIONS

Resolution	from 400 to 2048 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,75 ... 29,4 V DC 8/24 = 7,6 ... 25,2 V DC (reverse polarity protection)
Current consumption without load	100 mA max
Max load current	C / P = 50 mA / channel L = 20 mA / channel
Electrical interface[2]	NPN open collector (pullup max +30V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	105 kHz
Counting direction	A leads B clockwise (shaft view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHs	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

SHAFT DIAMETER	G
ø 40	ø 65
ø 50	ø 65
ø 60	ø 75

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 (51 x 10^{-4} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,05 Nm (7 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	EN-AW 2011 aluminum
Housing material	EN-AW 2011 aluminum
Bearings	n.2 ball bearings
Bearings life	10^9 revolutions
Operating temperature[3, 4]	0° ... +60 °C (+32° ... +140°F)
Storage temperature[4]	-25° ... +70 °C (-13° ... +158°F)
Weight	750 g (26,46 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

RESOLUTIONS

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

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

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EMI 22 A

MAGNETIC INCREMENTAL KIT ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Cable output, 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 22A 1024 Z 5 P 6 S 10 P R .XXX

SERIES
magnetic incremental encoder series EMI

MODEL
clamping flange ø 22 mm 22A
for anodized version please directly contact our offices

RESOLUTION
ppr from 2 to 2048
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
5 V DC 5

ELECTRICAL INTERFACE
push-pull P
line driver RS-422 L

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

ENCLOSURE RATING
IP 67 S

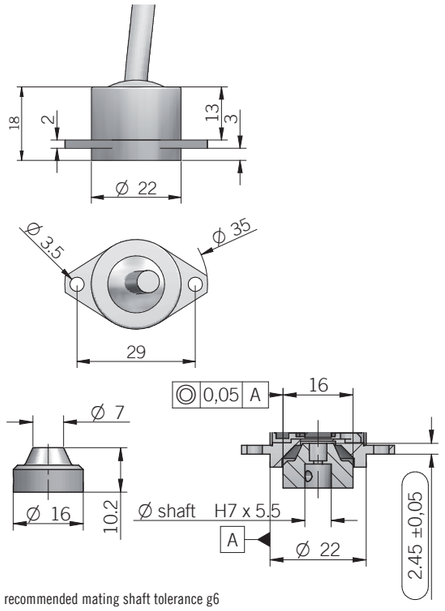
MAX ROTATION SPEED
10000 rpm 10

OUTPUT TYPE
cable (standard length 0,5 m) P
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)

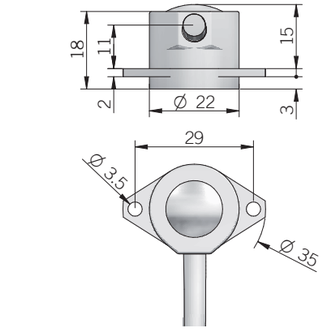
DIRECTION TYPE
axial A
radial R

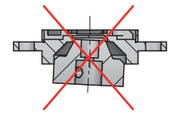
VARIANT
custom version XXX

22 A axial cable output



22 A radial cable output





recommended mating shaft tolerance g6
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 2048 ppr
Power supply[1]	4,5 ... 5,5 V DC
Current consumption without load	100 mA max
Max load current	20 mA / channel
Electrical interface[2]	push pull / line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	205 kHz
Counting direction	A leads B with clockwise rotation (flange view)
Accuracy	± 0,35° typical / ± 0,50° max
Electromagnetic compatibility	according to 2014/30/EU directive
RoHs	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

Function	Cable P	Cable L
+V DC	red	red
0 V	black	black
A+	green	green
A-	/	brown or grey
B+	yellow	yellow
B-	/	orange
Z+	blue	blue
Z-	/	white
⏚	shield	shield

MECHANICAL SPECIFICATIONS

Bore diameter (magnet-actuator)	ø 6 / 8 / 9,52 (3/8") / 10 mm
Enclosure rating	IP 67 (IEC 60529)
Max rotation speed	10000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia (magnet-actuator)	0,1 x 10^{-6} kgm² (2,4 x 10^{-6} lbft²)
Bearing stage material	EN-AW 2011 aluminum
Housing material	EN-AW 2011 aluminum
Magnet-actuator material	EN-AW 2011 aluminum
Operating temperature[3, 4]	-40° ... +125°C (-40° ... +257°F)
Storage temperature[4]	-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)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation allowed

RESOLUTIONS

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

EMI 30 M

MAGNETIC INCREMENTAL KIT ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 90 ppr
- Power supply up to +30 V DC with several electrical interfaces available
- Cable output, connectors 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 . 5/30 . P . 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

ELECTRICAL INTERFACE
NPN open collector C
push-pull 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

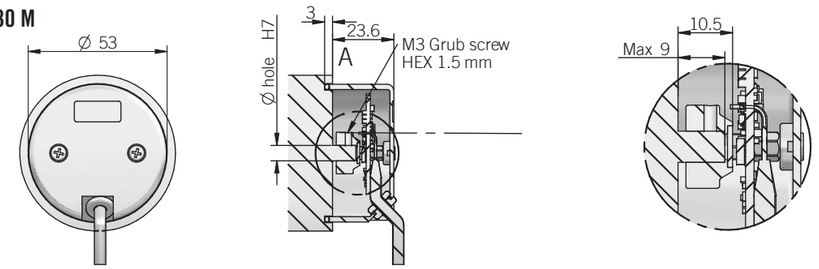
ENCLOSURE RATING
IP 54 X

OPTION
to be reported X

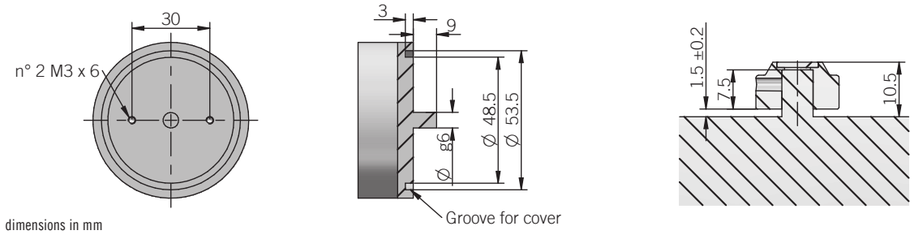
OUTPUT TYPE
radial cable (standard length 0,5 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

30 M



RECOMMENDED INTERFACE FLANGE DESIGN



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 1 to 90 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/30 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	5 = 200 mW typical 5/30 = < 400 mW
Max load current	C / P = 50 mA for channel L / RS = 20 mA per channel
Electrical interface[2]	NPN open collector (AEIC-7273, pull-up max +30 V DC) push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	15 kHz
Counting direction	A leads B clockwise (magnet actuator view)
Accuracy	± 0,35° typical / ± 0,90° max according to mounting tolerances and temperature range
Startup time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHs	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICATIONS

Bore diameter	ø 6 / 6,35 (1/4") / 8 / 10 mm
Enclosure rating	IP 54 (IEC 60529) when properly installed with supplied oring
Max rotation speed	limited only by output frequency
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} kgm² (2,4 x 10^{-6} lbft²)
Magnet-actuator material	EN-AW 2011 aluminium
Cover material	PA66 glass fiber reinforced
Shaft radial play allowed	± 0,25 mm
Shaft axial play allowed	± 0,5 mm
Operating temperature[3, 4]	-20° ... +100°C (-4° ... +212°F)
Storage temperature[4]	-20° ... +100°C (-4° ... +212°F)
Weight	100 g approx (3,5 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

CONNECTIONS

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

EMI 38 F / G

MAGNETIC INCREMENTAL BLIND HOLLOW SHAFT ENCODER

MAIN FEATURES

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

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

ORDERING CODE

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

SERIES
magnetic incremental encoder series EMI

MODEL
blind hollow shaft with stator coupling 38F
blind hollow shaft with torque pin 38G

RESOLUTION
ppr from 2 to 2048
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
(with L electrical interface) 8 ... 24 V DC 8/24
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
push-pull P
line driver L

SHAFT DIAMETER
mm 6
(1/4") mm 6,35
mm 8
(3/8") mm 9,52
mm 10

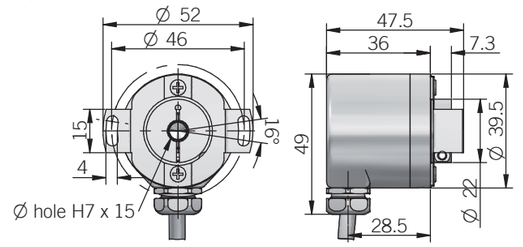
ENCLOSURE RATING
IP 64 X
IP 66 S

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

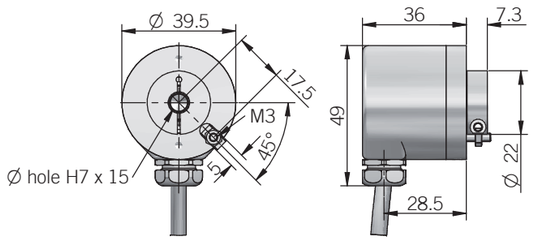
OUTPUT TYPE
radial cable (standard length 0,5 m) PR
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

38 F



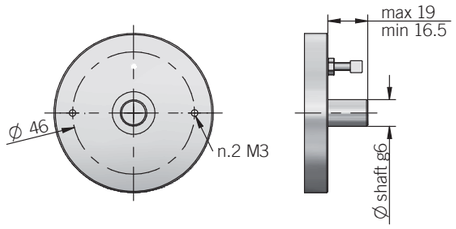
38 G



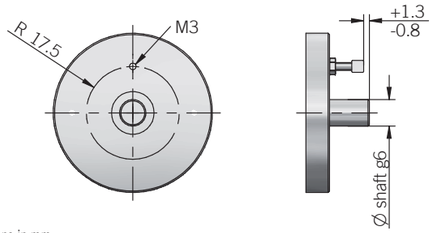
torque pin is included, for mounting instruction please refer to product installation notes

RECOMMENDED INTERFACE FLANGE DESIGN

38 F



38 G



dimensions in mm

CONNECTIONS

Function	Cable P	Cable L
+V DC	red	red
0 V	black	black
A+	green	green
A-	/	brown or grey
B+	yellow	yellow
B-	/	orange
Z+	blue	blue
Z-	/	white
⏚	shield	shield

ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 2048 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,75 ... 29,4 V DC 8/24 = 7,6 ... 25,2 V DC (reverse polarity protection)
Current consumption without load	80 mA max
Max load current	20 mA per channel
Electrical interface[2]	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	205 kHz
Counting direction	A leads B clockwise (shaft view)
Accuracy	± 0,35° typical / ± 0,50° max
Electromagnetic compatibility	according to 2014/30/EU directive
RoHs	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 6* / 6,35 (1/4") / 8* / 9,52 (3/8") / 10 mm * with supplied shaft adapter
Enclosure rating	X = IP 64 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	IP 66 - 3000 rpm IP 64 - 6000 rpm
Max shaft load[3]	5 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,25 x 10^{-6} kgm^2 (6 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,02 Nm (2,83 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Shaft adapter material	CuSn12 / CC483K bronze
Housing material	painted aluminum
Bearings	n.2 ball bearings
Bearing lifetime	10^9 revolutions
Operating temperature[4, 5]	-25° ... +100°C (-13° ... +212°F)
Storage temperature[5]	-25° ... +85°C (-13° ... +185°F)
Weight	150 g (5,29 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] maximum load for static usage
[4] measured on the transducer flange
[5] condensation not allowed

RESOLUTIONS

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

EMI 40 A

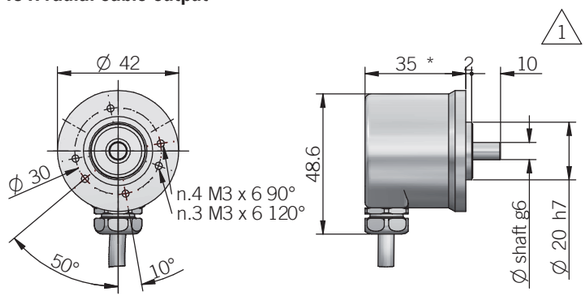
MAGNETIC INCREMENTAL SOLID SHAFT ENCODER

MAIN FEATURES

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

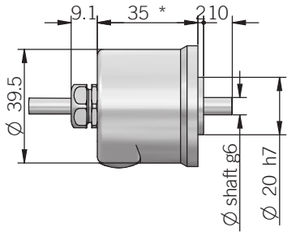
- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Cable output, connectors available on cable end
- Compact dimensions
- Solid shaft diameter up to 6 mm
- Sturdy construction due to separated chambers design
- Wide operating temperature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

40 A radial cable output



recommended mating shaft tolerance H7
dimensions in mm

40A axial cable output



* IP66 + 7 mm

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
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
(with L electrical interface) 8 ... 24 V DC 8/24
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
push-pull P
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
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 2048 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,75 ... 29,4 V DC 8/24 = 7,6 ... 25,2 V DC (reverse polarity protection)
Current consumption without load	80 mA max
Max load current	20 mA / channel
Electrical interface[2]	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	205 kHz
Counting direction	A leads B clockwise (shaft view)
Accuracy	± 0,35° typical / ± 0,50° max
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

Function	Cable P	Cable L
+V DC	red	red
0 V	black	black
A+	green	green
A-	/	brown or grey
B+	yellow	yellow
B-	/	orange
Z+	blue	blue
Z-	/	white
⏚	shield	shield

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 4 / 6 mm
Enclosure rating	X = IP 64 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	IP 66 - 3000 rpm IP 64 - 6000 rpm
Max shaft load[3]	5 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,5 x 10^{-6} kgm^2 (12 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,02 Nm (2,83 Ozin) IP 64 < 0,05 Nm (7,10 Ozin) IP 66
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	painted aluminum
Bearings	n.2 ball bearings
Bearing lifetime	10^9 revolutions
Operating temperature[4, 5]	-25° ... +100°C (-13° ... +212°F)
Storage temperature[5]	-25° ... +85°C (-13° ... +185°F)
Weight	150 g (5,29 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] maximum load for static usage
[4] measured on the transducer flange
[5] condensation not allowed

RESOLUTIONS

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

EMI 55 A

MAGNETIC INCREMENTAL KIT ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Cable or M12 connector output, other 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 | M12 | R | .162 | +XXX

SERIES
magnetic incremental encoder series EMI

MODEL
fixing holes ø 48 mm 55A
for anodized version please directly contact our offices

RESOLUTION
ppr from 2 to 2048
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
push-pull P
line driver L
power supply 5/28 V - output RS-422 RS

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

ENCLOSURE RATING
IP 64 X
IP 67 S

MAX ROTATION SPEED
10000 rpm 10

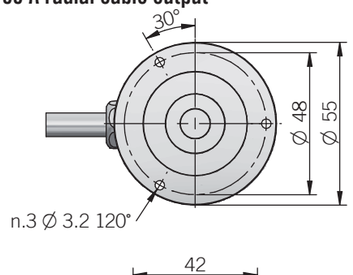
OUTPUT TYPE
cable (standard length 0,5 m) P
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)
M12 male connector M12

DIRECTION TYPE
axial A
radial R

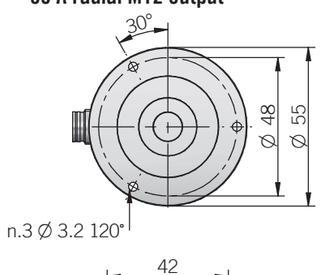
MATING CONNECTOR
mating connector not included .162
to be reported only with connector output (eg. M12.162), for mating connector see Accessories

VARIANT
custom version XXX

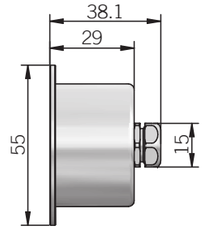
55 A radial cable output



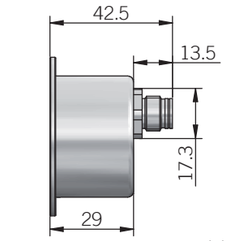
55 A radial M12 output



55 A axial cable output



55 A axial M12 output



recommended mating shaft tolerance g6
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 2048 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW max
Max load current	20 mA / channel
Electrical interface[2]	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	205 kHz
Counting direction	A leads B clockwise (flange view)
Accuracy	± 0,35° typical / ± 0,50° max
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

CONNECTIONS

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

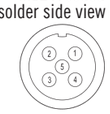
MECHANICAL SPECIFICATIONS

Bore diameter (magnet-actuator)	ø 6 / 8 / 9,52 (3/8") / 10 mm
Enclosure rating	X = IP 64 (IEC 60529) S = IP 67 (IEC 60529)
Max rotation speed	10000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia (magnet actuator)	0,1 x 10^{-6} kgm^2 (2,4 x 10^{-6} lbft^2)
Bearing stage material	EN-AW 2011 aluminum
Housing material	painted aluminum
Magnet-actuator material	EN-AW 2011 aluminum
Operating temperature[3, 4]	-40°... +125°C (-40°... +257°F) (with + 5 V DC) -40°... +100°C (-40°... +212°F) -25° ... +85°C (-13° ... +185°F) with M12 connector
Storage temperature[4]	-40°... +125°C (-40° ... +257°F)
Weight	150 g (5,29 oz)
Magnet actuator mounting tolerances (to get best electrical performances)	± 0,2 mm (axial) ± 0,1 mm (radial)

RESOLUTIONS

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

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



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

EMI 63 A / D

MAGNETIC INCREMENTAL SOLID SHAFT ENCODER

MAIN FEATURES

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

- 3 channel encoder (A / B / Z) up to 2048 ppr
- Power supply up to +28 V DC with several electrical interfaces available
- Up to 300 kHz output frequency
- Cable or M12 connector output, other 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	M12	R	.162	+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
refer to the available pulses list

ZERO PULSE
without zero pulse S
with zero pulse Z

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
push-pull P
line driver L
power supply 5/28 V - output RS-422 RS

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

ENCLOSURE RATING
IP 64 X
IP 66 S

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

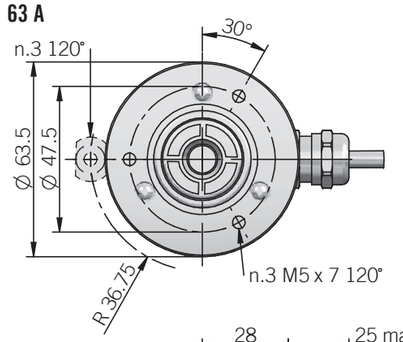
OUTPUT TYPE
cable (standard length 0,5 m) P
preferred cable lengths 1,5 / 2 / 3 / 5 / 10 m, to be added after DIRECTION TYPE (eg. PR5)
M12 male connector M12

DIRECTION TYPE
axial A
radial R

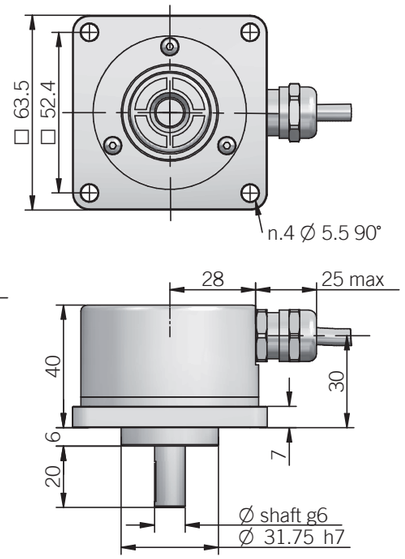
MATING CONNECTOR
mating connector not included .162
to be reported only with connector output (eg. M12R.162), for mating connector see Accessories

VARIANT
custom version XXX

63 A

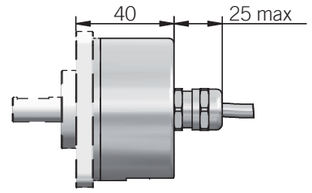


63 D



fixing clamps not included, please refer to Accessories

Dimensions with axial output



recommended mating shaft tolerance H7
dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 2048 ppr
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW max
Max load current	20 mA / channel
Electrical interface[2]	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	205 kHz
Counting direction	A leads B clockwise (shaft view)
Accuracy	± 0,35° typical / ± 0,50° max
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

CONNECTIONS

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

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 9,52 (3/8") / 10 mm
Enclosure rating	X = IP 64 (IEC 60529) S = IP 66 (IEC 60529)
Max rotation speed	IP 66 - 3000 rpm IP 64 - 6000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,5 x 10^{-6} kgm² (12 x 10^{-6} lbft²)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin) (IP 64) < 0,08 Nm (11,33 Ozin) (IP 66)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	n.2 ball bearings
Bearing lifetime	10^9 revolutions
Operating temperature[3, 4]	-25° ... +100°C (-13° ... +212°F) -25° ... +85°C (-13° ... +185°F) with M12 connector
Storage temperature[4]	-25° ... +85°C (-13° ... +185°F)
Weight	350 g (12,35 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation not allowed

RESOLUTIONS

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

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

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

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ETMR A / B

MAGNETIC INCREMENTAL KIT ENCODER

MAIN FEATURES

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

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

ORDERING CODE

ETMR | A | 4096 | S | 5 | L | 9 | S | 8 | PR | . XXX

SERIES
incremental encoder with magnetic ring ETMR

MODEL
bore diameter from 9 ... 19 mm A
bore diameter 24 / 28 mm B

RESOLUTION
ppr from 64 to 4096
refer to the available pulses list

ZERO PULSE
without zero pulse S

POWER SUPPLY
(with L electrical interface) 5 V DC 5
5 ... 28 V DC 5/28

ELECTRICAL INTERFACE
push-pull P
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

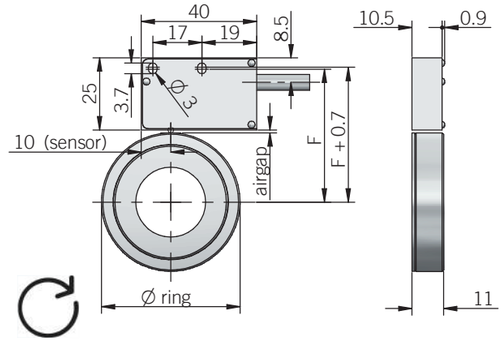
ENCLOSURE RATING
IP 67 S

MAX ROTATION SPEED
8000 rpm 8

OUTPUT TYPE
cable (standard length 1,5 m) PR
preferred cable lengths 2 / 3 / 5 / 10 m, to be added after OUTPUT TYPE (eg. PR5)

VARIANT
custom version XXX

ETMR A / B

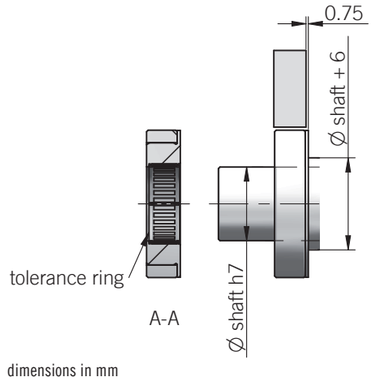


Model	A	B
ø ring	41,2	48
Fixing (F)	41,9	46
Airgap	0,3 ± 0,1	1 ± 0,1

tolerance ring is included
for mounting instruction please refer to product installation notes

MOUNTING TOLERANCES

RECOMMENDED INTERFACE FLANGE DESIGN



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 64 to 4096 ppr (powers of 2)
Pole pitch	model A = 2 mm model B = 5 mm
Power supply[1]	5 = 4,5 ... 5,5 V DC 5/28 = 4,5 ... 30 V DC (reverse polarity protection)
Power draw without load	800 mW max
Max load current	20 mA / channel
Electrical interface[2]	push-pull / line driver HTL (AEIC-7272) line driver RS-422 (AELT-5000 or equivalent)
Max output frequency	350 kHz
Counting direction	A leads B clockwise
Accuracy	± 0,35° typical / ± 0,50° max
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU (01/09/2020) directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICATIONS

Bore diameter	ø 9 / 9,52 (3/8") / 10 / 11 / 14 / 19 / 24 / 28 mm
Enclosure rating	IP 67 (IEC 60529)
Max rotation speed	8000 rpm
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	115 x 10^{-6} kgm² (27,29 x 10^{-4} lbft²)
Sensor body material	anodized aluminum
Magnet-actuator material	1.4305 / AISI 303 stainless steel
Operating temperature[3, 4]	-20° ... +85°C (-4° ... +185°F)
Storage temperature[4]	-20° ... +85°C (-4° ... +185°F)
Weight	100 g (3,53 oz)

[1] as measured at the transducer without cable influences
[2] for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section
[3] measured on the transducer flange
[4] condensation allowed

CONNECTIONS

Function	Cable P	Cable L / RS
+V DC	red	red
0 V	black	black
A+	green	green
A-	/	brown or grey
B+	yellow	yellow
B-	/	orange
⏚	shield	shield

RESOLUTIONS

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

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