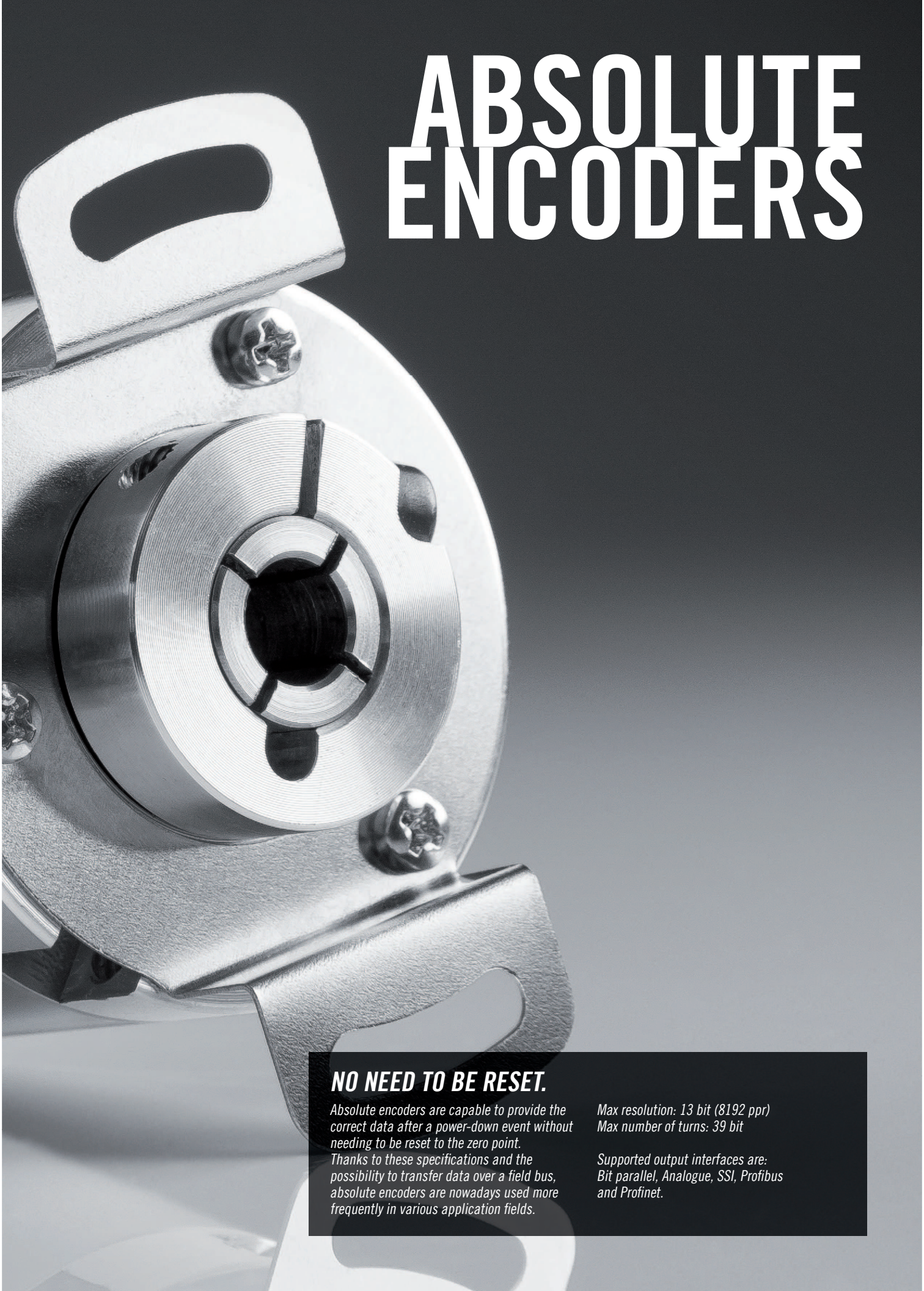
ABSOLUTE ENCODERS



NO NEED TO BE RESET.

Absolute encoders are capable to provide the correct data after a power-down event without needing to be reset to the zero point.
Thanks to these specifications and the possibility to transfer data over a field bus, absolute encoders are nowadays used more frequently in various application fields.

Max resolution: 13 bit (8192 ppr)
Max number of turns: 39 bit

Supported output interfaces are:
Bit parallel, Analogue, SSI, Profibus and Profinet.

EA 58 B / C - 63 A / D / E
BIT PARALLEL - SSI
SOLID SHAFT SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard singleturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC)
- Resolution up to 13 bit (8192 ppr)
- Power supply up to +28 V DC with Bit Parallel or SSI as electrical interface
- Code reset for easy setup
- Cable or connector output
- Solid shaft diameter up to 10 mm
- Mounting by synchronous, clamping or centering 2,5" square flange

ORDERING CODE BIT PARALLEL

EA	63A	256	G	8/28	P	P	X	10	X	6	PD	R	. XXX

SERIES
singleturn absolute encoder EA

MODEL
synchronous flange ø 31.75 mm 63A
synchronous flange ø 50 mm 58B
clamping flange ø 36 mm 58C
centering square flange ø 31.75 mm 63D
centering square flange ø 50 mm 63E

RESOLUTION
(powers of 2) ppr from 2 to 8192
(multiples and submultiples of 360) ppr from 90 to 3600

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

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
push pull P

LOGIC
negative N
positive P

OPTIONS
latch L
(binary code) strobe S
to be reported if not used X

SHAFT DIAMETER
(mod. 58 B) mm 6
(mod. 63 A / D) (3/8") 9,52 mm 9
(mod. 58 C - 63 A / D / E) 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) PD
(with option "latch") cable (standard length 1,5 m) PE
19 pin MIL connector MA
female connector included, without female please add 162 as variant code

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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ORDERING CODE SSI	EA	63A	4096	G	8/28	S	X	X	10	X	6	PC	R	. XXX

SERIES
singleturn absolute encoder EA

MODEL
synchronous flange ø 31.75 mm 63A
synchronous flange ø 50 mm 58B
clamping flange ø 36 mm 58C
centering square flange ø 31.75 mm 63D
centering square flange ø 50 mm 63E

RESOLUTION
ppr 360 / 720 / 1440 / 2880 / 3600 / 4096 / 8192
please directly contact our offices for other pulses

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

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
to be reported X

OPTIONS
to be reported if not used X
reset ZE

SHAFT DIAMETER
(mod. 58 B) mm 6
(mod. 63 A / D) (3/8") 9,52 mm 9
(mod. 58 C - 63 A / D / E) 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) PC
7 pin MIL connector MC
(with option RESET) 10 pin MIL connector MD
12 pin M23 connector HA
8 pin M12 connector M12
female connector included, without female please add 162 as variant code

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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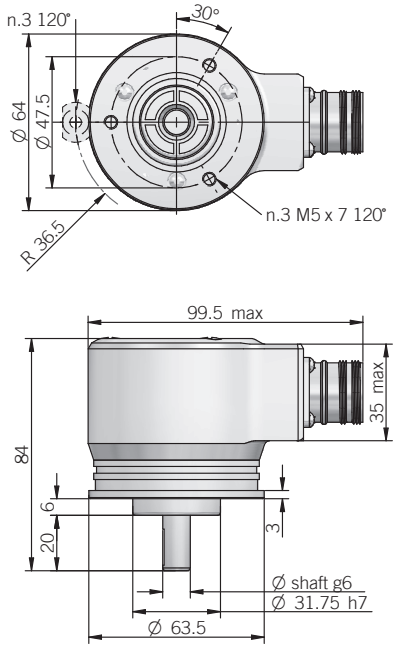
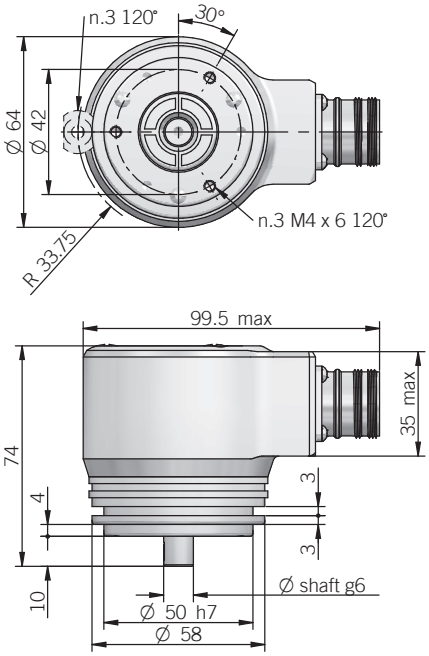
63 A



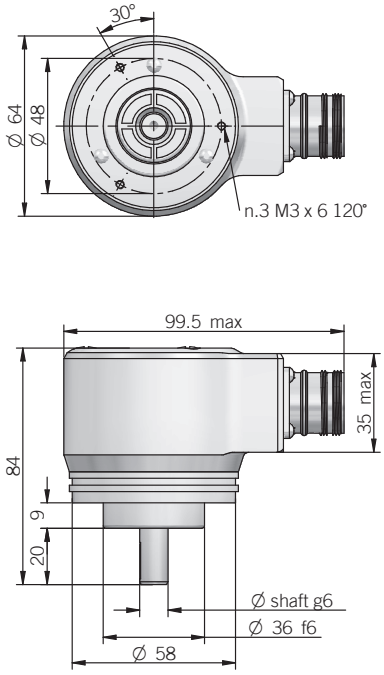
fixing clamps not included, please refer to Accessories section

58 B

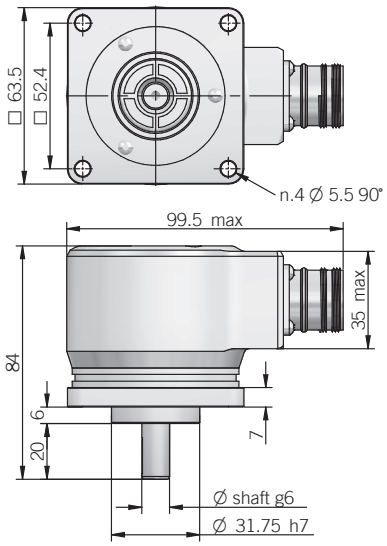


fixing clamps not included, please refer to Accessories section

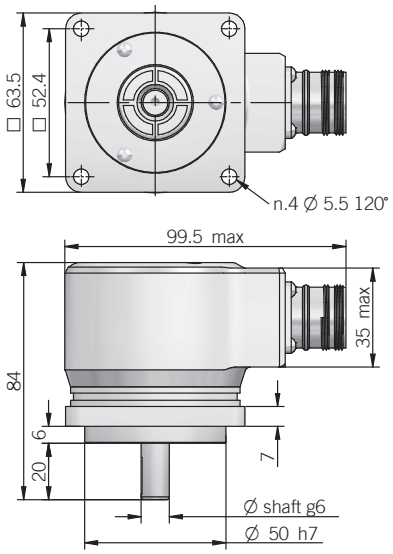
58 C



63 D

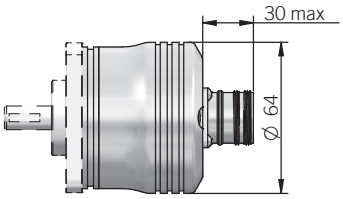


63 E



dimensions in mm

Dimensions with axial output



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ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 8192 ppr
Power supply	7,6 ... 29,4 V DC
Current consumption without load	100 mA
Max load current	20 mA / channel
Output type*	P = push-pull (iC-HD2) S = RS-422 (LTC1690 or equivalent)
Auxiliary inputs (U/D - Latch - Reset)	active high (+V DC) connect to 0 V if not used / Reset - Latch tmin 150 ms
Max frequency	output: 25 kHz LSB (Bit Parallel) clock input: 100 kHz ... 1 MHz (SSI)
SSI monostable time (Tm)	18 µs
SSI pause time (Tp)	> 35 µs
SSI frame	(MSB ... LSB) 13 bit data length
Accuracy	± 1/2 LSB
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

BIT PARALLEL CONNECTIONS

Function	Binary / Gray	Cable PD	Cable PE	19 pin MA
bit 1 (LSB)	B^0 / G^0	green	green	A
bit 2	B^1 / G^1	yellow	yellow	B
bit 3	B^2 / G^2	blue	blue	C
bit 4	B^3 / G^3	brown	brown	D
bit 5	B^4 / G^4	orange or pink	orange or pink	E
bit 6	B^5 / G^5	white	white	F
bit 7	B^6 / G^6	grey	grey	G
bit 8	B^7 / G^7	purple	purple	H
bit 9	B^8 / G^8	gray / pink	gray / pink	J
bit 10	B^9 / G^9	white / green	white / green	K
bit 11	B^{10} / G^{10}	brown / green	brown / green	L
bit 12	B^{11} / G^{11}	white / yellow	white / yellow	M
bit 13	B^{12} / G^{12}	yellow / brown	yellow / brown	N
STROBE	/	/	green / blue	P
LATCH	/	/	yellow / grey	R
0 V	/	black	black	T
U / D	/	red / blue	red / blue	U
+ V DC	/	red	red	V
⏚	/	shield	shield	S

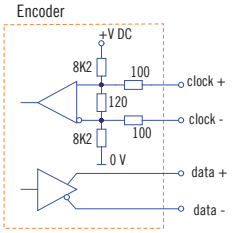
MECHANICAL SPECIFICATIONS

Shaft diameter	ø 6 / 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 - 3000 rpm
Max shaft load	10 N axial / 20 N radial with ø6 shaft 100 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	painted aluminum
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Weight	500 g (17,64 oz)

SSI CONNECTIONS

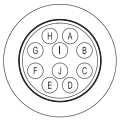
Function	Cable PC	7 pin MC	10 pin MD	12 pin HA	8 pin M12
+ V DC	red	G	G	8	8
0 V	black	F	F	1	5
data +	green	C	C	2	3
data -	brown	D	D	10	2
clock +	yellow	A	A	3	4
clock -	orange or pink	B	B	11	6
RESET	white	/	H	4	1
U / D	red / blue	E	E	5	7
⏚	shield	housing	J	9	housing

SSI SCHEMATICS



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

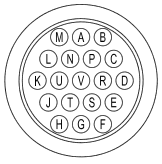
MD connector (10 pin)
Amphenol MS3102-E-18-1
solder side view FV



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

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

MA connector (19 pin)
Amphenol 62IN 12E 14-19 P
solder side view FV



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EA 58 F - 63 F / G
BIT PARALLEL - SSI
BLIND HOLLOW SHAFT SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard singleturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC)
- Resolution up to 13 bit (8192 ppr)
- Power supply up to +28 V DC with Bit Parallel or SSI as electrical interface
- Code reset for easy setup
- Cable or connector output
- Blind hollow shaft diameter up to 15 mm
- Mounting by stator coupling, spring or torque pin

ORDERING CODE BIT PARALLEL

EA	63G	256	G	8/28	P	P	X	8	X	3	PD	R	. XXX

SERIES
singleturn absolute encoder EA

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

RESOLUTION
(powers of 2) ppr from 2 to 8192
(multiples and submultiples of 360) ppr from 90 to 3600

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

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
push pull P

LOGIC
negative N
positive P

OPTIONS
latch L
(binary code) strobe S
to be reported if not used X

BORE DIAMETER
mm 8
(3/8") 9,52 mm 9
mm 10
mm 12
mm 14
mm 15

ENCLOSURE RATING
IP 54 X

MAX ROTATION SPEED
3000 rpm 3

OUTPUT TYPE
cable (standard length 1,5 m) PD
(with option "latch") cable (standard length 1,5 m) PE
19 pin MIL connector MA
female connector included, without female please add 162 as variant code

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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ORDERING CODE SSI	EA	63G	4096	G	8/28	S	X	X	8	X	3	PC	R	. XXX

SERIES
singleturn absolute encoder EA

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

RESOLUTION
ppr 360 / 720 / 1440 / 2880 / 3600 / 4096 / 8192
please directly contact our offices for other pulses

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

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
to be reported X

OPTIONS
to be reported if not used X
reset ZE

BORE DIAMETER
mm 8
(3/8") 9,52 mm 9
mm 10
mm 12
mm 14
mm 15

ENCLOSURE RATING
IP 54 X

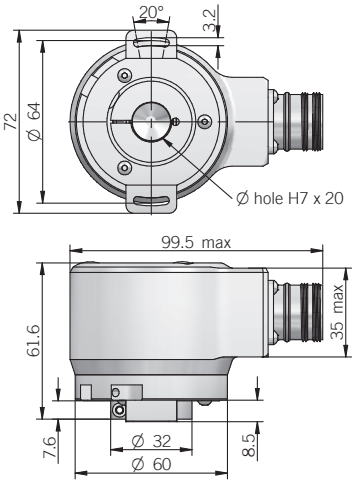
MAX ROTATION SPEED
3000 rpm 3

OUTPUT TYPE
cable (standard length 1,5 m) PC
7 pin MIL connector MC
(with option "reset") 10 pin MIL connector MD
12 pin M23 connector HA
8 pin M12 connector M12
female connector included, without female please add 162 as variant code

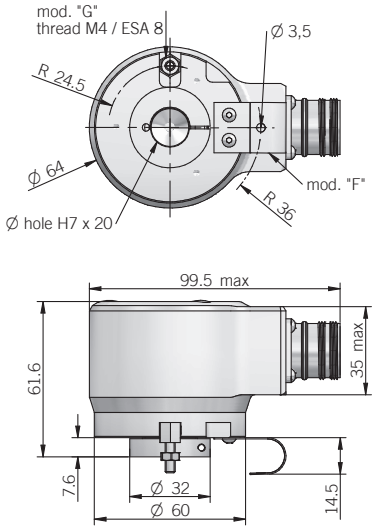
DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

58 F

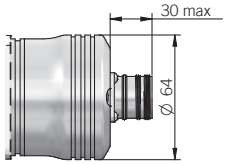


63 F - G



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

Dimensions with axial output



dimensions in mm

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ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 8192 ppr
Power supply	7,6 ... 29,4 V DC
Current consumption without load	100 mA
Max load current	20 mA / channel
Output type*	P = push-pull (iC-HD2) S = RS-422 (LTC1690 or equivalent)
Auxiliary inputs (U/D - Latch - Reset)	active high (+V DC) connect to 0 V if not used / Reset - Latch tmin 150 ms
Max frequency	output: 25 kHz LSB (Bit Parallel) clock input: 100 kHz ... 1 MHz (SSI)
SSI monostable time (Tm)	18 µs
SSI pause time (Tp)	> 35 µs
SSI frame	(MSB ... LSB) 13 bit data length
Accuracy	± 1/2 LSB
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

BIT PARALLEL CONNECTIONS

Function	Binary / Gray	Cable PD	Cable PE	19 pin MA
bit 1 (LSB)	B^0 / G^0	green	green	A
bit 2	B^1 / G^1	yellow	yellow	B
bit 3	B^2 / G^2	blue	blue	C
bit 4	B^3 / G^3	brown	brown	D
bit 5	B^4 / G^4	orange or pink	orange or pink	E
bit 6	B^5 / G^5	white	white	F
bit 7	B^6 / G^6	grey	grey	G
bit 8	B^7 / G^7	purple	purple	H
bit 9	B^8 / G^8	gray / pink	gray / pink	J
bit 10	B^9 / G^9	white / green	white / green	K
bit 11	B^{10} / G^{10}	brown / green	brown / green	L
bit 12	B^{11} / G^{11}	white / yellow	white / yellow	M
bit 13	B^{12} / G^{12}	yellow / brown	yellow / brown	N
STROBE	/	/	green / blue	P
LATCH	/	/	yellow / grey	R
0 V	/	black	black	T
U / D	/	red / blue	red / blue	U
+ V DC	/	red	red	V
⏚	/	shield	shield	S

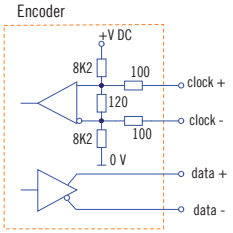
MECHANICAL SPECIFICATIONS

Shaft diameter	ø 8* / 9* / 10* / 12* / 14 / 15 mm * with supplied adapter shaft
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	5 x 10^{-6} kgm^2 (119 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
Housing material	painted aluminum
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Fixing torque for collar clamping	1,5 Nm (212 Ozin) recommended
Weight	450 g (15,87 oz)

SSI CONNECTIONS

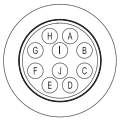
Function	Cable PC	7 pin MC	10 pin MD	12 pin HA	8 pin M12
+ V DC	red	G	G	8	8
0 V	black	F	F	1	5
data +	green	C	C	2	3
data -	brown	D	D	10	2
clock +	yellow	A	A	3	4
clock -	orange or pink	B	B	11	6
RESET	white	/	H	4	1
U / D	red / blue	E	E	5	7
⏚	shield	housing	J	9	housing

SSI SCHEMATICS



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

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



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

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

MA connector (19 pin)
Amphenol 62IN 12E 14-19 P
solder side view FV

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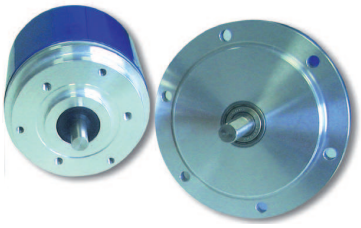
EA 90 A - 115 A
BIT PARALLEL - SSI
SOLID SHAFT SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard singleturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC)
- Resolution up to 13 bit (8192 ppr)
- Power supply up to +28 V DC with Bit Parallel or SSI as electrical interface
- Code reset for easy setup
- Cable or connector output
- Solid shaft diameter up to 11 mm
- Mounting by synchronous or REO-444 flange



ORDERING CODE BIT PARALLEL

EA	90A	256	G	8/28	P	P	X	10	X	6	PD	R	. XXX

SERIES
singleturn absolute encoder EA

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

RESOLUTION
(powers of 2) ppr from 2 to 8192
(multiples and submultiples of 360) ppr from 90 to 3600

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

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
push pull P

LOGIC
negative N
positive P

OPTIONS
latch L
(binary code) strobe S
to be reported if not used X

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

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

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

OUTPUT TYPE
cable (standard length 1,5 m) PD
(with option "latch") cable (standard length 1,5 m) PE
19 pin MIL connector MA
female connector included, without female please add 162 as variant code

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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ORDERING CODE SSI	EA	90A	4096	G	8/28	S	X	X	10	X	6	PC	R	. XXX

SERIES
singleturn absolute encoder EA

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

RESOLUTION
ppr 360 / 720 / 1440 / 2880 / 3600 / 4096 / 8192
please directly contact our offices for other pulses

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

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
to be reported X

OPTIONS
to be reported if not used X
reset ZE

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

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

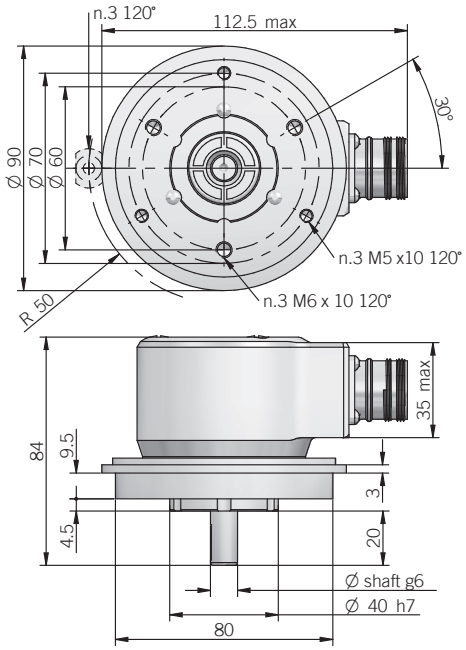
MAX ROTATION SPEED
(IP 66) 3000 rpm 3
(IP 54) 6000 rpm 6

OUTPUT TYPE
cable (standard length 1,5 m) PC
7 pin MIL connector MC
(with option "reset") 10 pin MIL connector MD
12 pin M23 connector HA
8 pin M12 connector M12
female connector included, without female please add 162 as variant code

DIRECTION TYPE
axial A
radial R

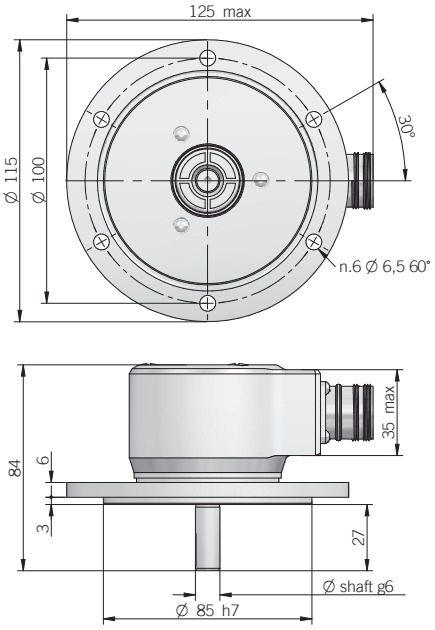
VARIANT
custom version XXX

90 A

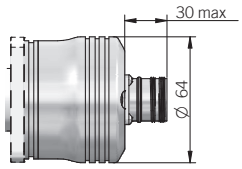


fixing clamps not included, please refer to Accessories section

115 A



Dimensions with axial output



dimensions in mm

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ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 8192 ppr
Power supply	7,6 ... 29,4 V DC
Current consumption without load	100 mA
Max load current	20 mA / channel
Output type*	P = push-pull (iC-HD2) S = RS-422 (LTC1690 or equivalent)
Auxiliary inputs (U/D - Latch - Reset)	active high (+V DC) connect to 0 V if not used / Reset - Latch tmin 150 ms
Max frequency	output: 25 kHz LSB (Bit Parallel) clock input: 100 kHz ... 1 MHz (SSI)
SSI monostable time (Tm)	18 µs
SSI pause time (Tp)	> 35 µs
SSI frame	(MSB ... LSB) 13 bit data length
Accuracy	± 1/2 LSB
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

BIT PARALLEL CONNECTIONS

Function	Binary / Gray	Cable PD	Cable PE	19 pin MA
bit 1 (LSB)	B^0 / G^0	green	green	A
bit 2	B^1 / G^1	yellow	yellow	B
bit 3	B^2 / G^2	blue	blue	C
bit 4	B^3 / G^3	brown	brown	D
bit 5	B^4 / G^4	orange or pink	orange or pink	E
bit 6	B^5 / G^5	white	white	F
bit 7	B^6 / G^6	grey	grey	G
bit 8	B^7 / G^7	purple	purple	H
bit 9	B^8 / G^8	gray / pink	gray / pink	J
bit 10	B^9 / G^9	white / green	white / green	K
bit 11	B^{10} / G^{10}	brown / green	brown / green	L
bit 12	B^{11} / G^{11}	white / yellow	white / yellow	M
bit 13	B^{12} / G^{12}	yellow / brown	yellow / brown	N
STROBE	/	/	green / blue	P
LATCH	/	/	yellow / grey	R
0 V	/	black	black	T
U / D	/	red / blue	red / blue	U
+ V DC	/	red	red	V
⏚	/	shield	shield	S

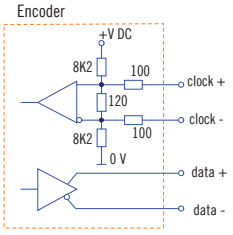
MECHANICAL SPECIFICATIONS

Shaft diameter	ø 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	100 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	painted aluminum
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Weight	650 g (22,93 oz)

SSI CONNECTIONS

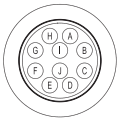
Function	Cable PC	7 pin MC	10 pin MD	12 pin HA	8 pin M12
+ V DC	red	G	G	8	8
0 V	black	F	F	1	5
data +	green	C	C	2	3
data -	brown	D	D	10	2
clock +	yellow	A	A	3	4
clock -	orange or pink	B	B	11	6
RESET	white	/	H	4	1
U / D	red / blue	E	E	5	7
⏚	shield	housing	J	9	housing

SSI SCHEMATICS



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

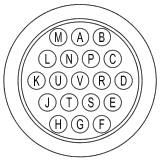
MD connector (10 pin)
Amphenol MS3102-E-18-1
solder side view FV



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

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

MA connector (19 pin)
Amphenol 62IN 12E 14-19 P
solder side view FV



EA 58 B / C - 63 A / D / E PROFIBUS

SOLID SHAFT SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard singleturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC)
- Resolution up to 13 bit (8192 ppr)
- Power supply up to +28 V DC with Profibus DP as electrical interface
- Cable gland or M12 connector output
- Solid shaft diameter up to 10 mm
- Mounting by synchronous, clamping or centering 2,5" square flange

ORDERING CODE

EA | 63A | 4096 | B | 12/28 | FXX | 10 | X | 6 | P3R | . XXX

SERIES
singleturn absolute encoder EA

MODEL
synchronous flange ø 31.75 mm 63A
synchronous flange ø 50 mm 58B
clamping flange ø 36 mm 58C
centering square flange ø 31.75 mm 63D
centering square flange ø 50 mm 63E

RESOLUTION
ppr 4096 / 8192

CODE TYPE
binary B

POWER SUPPLY
12 ... 28 V DC 12/28

ELECTRICAL INTERFACE
PROFIBUS DP V0 CLASS 2 FXX

SHAFT DIAMETER
(mod. 58 B) mm 6
(mod. 63 A / D) (9,52mm 3/8") mm 9
(mod. 58 C - 63 A / D / E) 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
terminal box - radial cable glands P3R
radial M12 connector M12R
female connector included, without female please add 162 as variant code

VARIANT
custom version XXX

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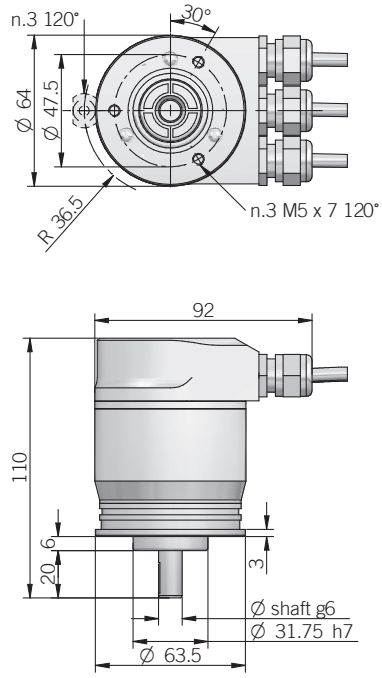
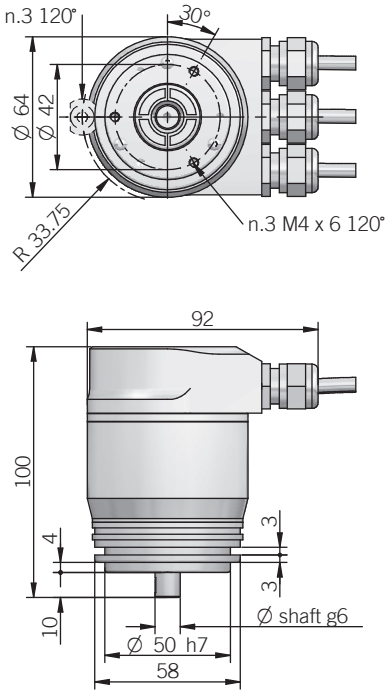
63 A



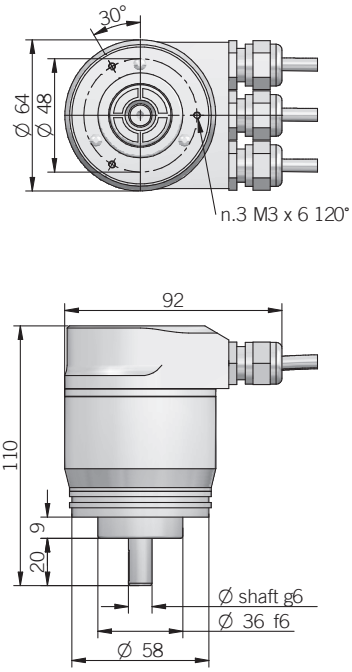
fixing clamps not included, please refer to Accessories section

58 B

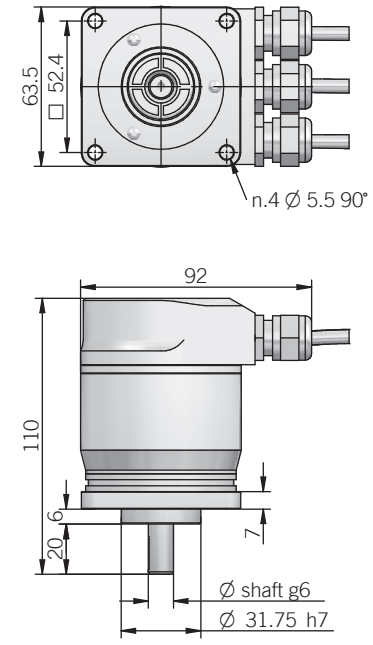


fixing clamps not included, please refer to Accessories section

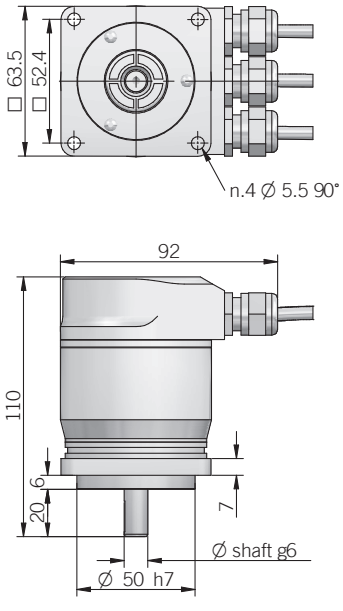
58 C



63 D



63 E



dimensions in mm

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ELECTRICAL SPECIFICATIONS

Resolution	2 ... 4096 / 2 ... 8192 ppr programmable during commissioning
Power supply	11,4 ... 29,4 V DC
Current consumption without load	300 mA
Output type	RS 485 galvanically isolated
Max bus frequency	12 Mbaud
Diagnostic features	frequency warning position warning / alarm please refer to installation manual for more informations
Max frequency	max 25 kHz LSB
Accuracy	± 1/2 LSB
Counting direction	programmable during commissioning
Start-up time	500 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

CONNECTIONS

Function	Pin M12A male	Pin M12B female	Pin M12B male
+ V DC	2		
0 V	4		
signal A (out)		2	
signal B (out)		4	
signal A (in)			2
signal B (in)			4

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 6 / 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 - 3000 rpm
Max shaft load	10 N axial / 20 N radial with ø6 shaft 100 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	painted aluminium
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Weight	650 g (22,93 oz)

S3 connector
(M12 5 pins A coded)
power supply - male
view solder side FV

S3 connector
(M12 5 pins B coded)
line out - female
view solder side FV

S3 connector
(M12 5 pins B coded)
line in - male
view solder side MV

EA 58 F - 63 F / G
PROFIBUS
BLIND HOLLOW SHAFT SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard singleturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC)
- Resolution up to 13 bit (8192 ppr)
- Power supply up to +28 V DC with Profibus DP as electrical interface
- Cable gland or M12 connector output
- Blind hollow shaft diameter up to 15 mm
- Mounting by stator coupling, spring or torque pin

ORDERING CODE	EA	58F	4096	B	12/28	FXX	10	X	3	P3R	. XXX

SERIES
singleturn absolute encoder EA

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

RESOLUTION
ppr 4096 / 8192

CODE TYPE
binary B

POWER SUPPLY
12 ... 28 V DC 12/28

ELECTRICAL INTERFACE
PROFIBUS DP V0 CLASS 2 FXX

BORE DIAMETER
mm 8
(3/8") 9,52 mm 9
mm 10
mm 12
mm 14
mm 15

ENCLOSURE RATING
IP 54 X

MAX ROTATION SPEED
3000 rpm 3

OUTPUT TYPE
terminal box - radial cable glands P3R
radial M12 connector M12R
female connector included, without female please add 162 as variant code

VARIANT
custom version XXX

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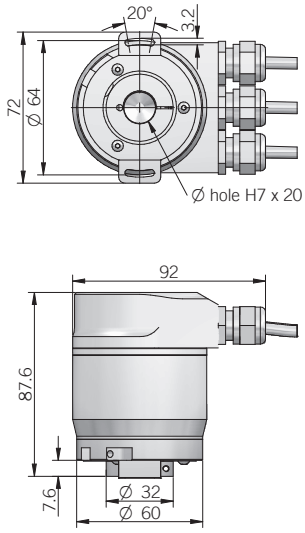
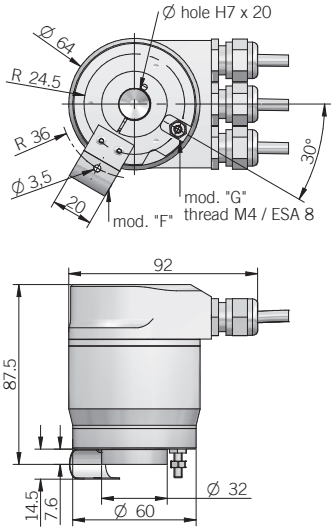
58 F



63 F - G



dimensions in mm

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

ELECTRICAL SPECIFICATIONS

Resolution	2 ... 4096 / 2 ... 8192 ppr programmable during commissioning
Power supply	11,4 ... 29,4 V DC
Current consumption without load	300 mA
Output type	RS 485 galvanically isolated
Max bus frequency	12 Mbaud
Diagnostic features	frequency warning position warning / alarm please refer to installation manual for more informations
Max frequency	max 25 kHz LSB
Accuracy	± 1/2 LSB
Counting direction	programmable during commissioning
Start-up time	500 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICATIONS

Bore diameter	ø 8* / 9,52 (3/8")* / 10* / 12* / 14 / 15 mm * with supplied adapter shaft
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	5 x 10^{-6} kgm^2 (119 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
Housing material	painted aluminium
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Fixing torque for collar clamping	1,5 Nm (212 Ozin) recommended
Weight	650 g (22,93 oz)

CONNECTIONS

Function	Pin M12A male	Pin M12B female	Pin M12B male
+ V DC	2		
0 V	4		
signal A (out)		2	
signal B (out)		4	
signal A (in)			2
signal B (in)			4

S3 connector
(M12 5 pins A coded)
power supply
view solder side FV

S3 connector
(M12 5 pins B coded)
line out - female
view solder side FV

S3 connector
(M12 5 pins B coded)
line in - male
view solder side MV

EA 90 A - 115 A
PROFIBUS
SOLID SHAFT SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard singleturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC)
- Resolution up to 13 bit (8192 ppr)
- Power supply up to +28 V DC with Profibus DP as electrical interface
- Cable gland or M12 connector output
- Solid shaft diameter up to 11 mm
- Mounting by synchronous or REO-444 flange

ORDERING CODE	EA	90A	4096	B	12/28	FXX	10	X	6	P3R	. XXX

SERIES
singleturn absolute encoder EA

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

RESOLUTION
ppr 4096 / 8192

CODE TYPE
binary B

POWER SUPPLY
12 ... 28 V DC 12/28

ELECTRICAL INTERFACE
PROFIBUS DP V0 CLASS 2 FXX

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

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

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

OUTPUT TYPE
terminal box - radial cable glands P3R
radial M12 connector M12R
female connector included, without female please add 162 as variant code

VARIANT
custom version XXX

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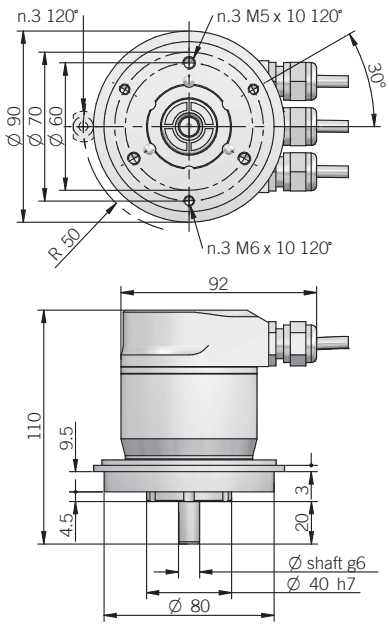
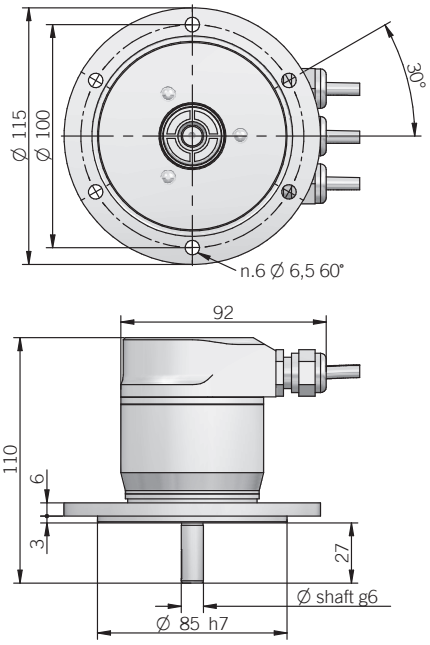
90 A



fixing clamps not included, please refer to Accessories section

dimensions in mm

115 A



ELECTRICAL SPECIFICATIONS

Resolution	2 ... 4096 / 2 ... 8192 ppr programmable during commissioning
Power supply	11,4 ... 29,4 V DC
Current consumption without load	300 mA
Output type	RS 485 galvanically isolated
Max bus frequency	12 Mbaud
Diagnostic features	frequency warning position warning / alarm please refer to installation manual for more informations
Max frequency	max 25 kHz LSB
Accuracy	± 1/2 LSB
Counting direction	programmable during commissioning
Start-up time	500 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 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	100 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	painted aluminium
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Weight	750 g (26,46 oz)

CONNECTIONS

Function	Pin M12A male	Pin M12B female	Pin M12B male
+ V DC	2		
0 V	4		
signal A (out)		2	
signal B (out)		4	
signal A (in)			2
signal B (in)			4

S3 connector
(M12 5 pins A coded)
power supply
view solder side FV

S3 connector
(M12 5 pins B coded)
line out - female
view solder side FV

S3 connector
(M12 5 pins B coded)
line in - male
view solder side MV

EAX 80 A / D
SSI

EXPLOSION PROOF ATEX SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Explosion proof encoder for applications within explosive and hazardous areas.

- Optical sensor technology (OptoASIC)
- Resolution up to 13 bit (8192 ppr)
- Power supply up +28 V DC with SSI as electrical interface
- Code reset for easy setup
- 10mm solid shaft diameter
- Cable output
- Mounting by syncronous or centering square flange

EX CLASSIFICATION

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

- EN 60079-0:2012+A11:2013
- EN 60079-1:2007
- EN 60079-31:2014

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

ORDERING CODE

EAX	80A	256	G	8/28	S	X	X	10	X	3	PR	.XXX

SERIES
singleturn absolute flameproof encoder EAX

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

RESOLUTION
ppr 360 / 720 / 1440 / 2880 / 3600 / 4096 / 8192
please directly contact our offices for other pulses

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

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
to be reported X

OPTIONS
to be reported if not used X
reset ZE

SHAFT DIAMETER
mm 10

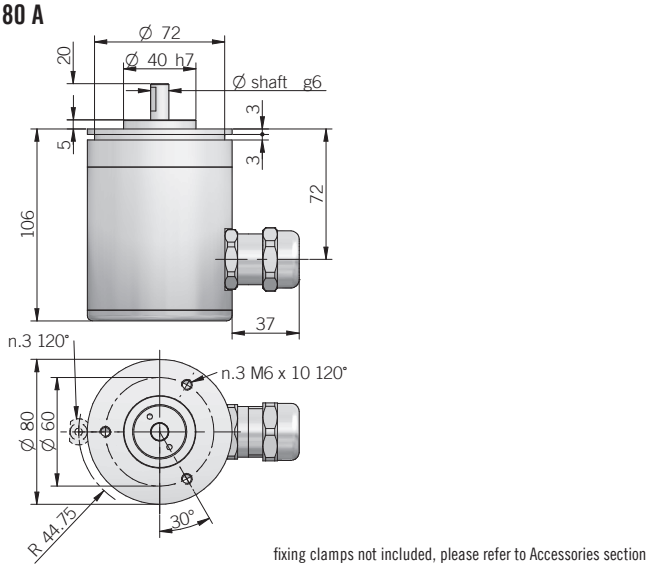
ENCLOSURE RATING
IP 65 X

MAX ROTATION SPEED
3000 rpm 3

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

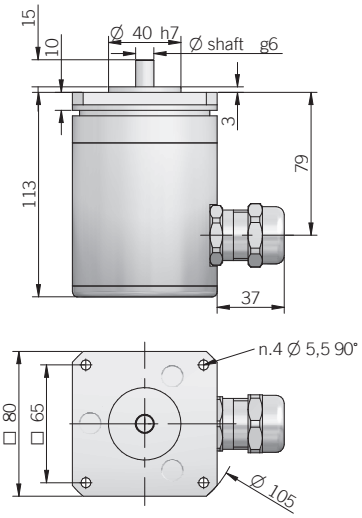
VARIANT
custom version XXX

80 A



fixing clamps not included, please refer to Accessories section

80 D



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 360 to 8192 ppr
Power supply	7,6 ... 29,4 V DC
Current consumption without load	100 mA
Output type*	RS-422 (LTC1690 or equivalent)
Auxiliary inputs (U/D - Reset)	active high (+V DC) connect to 0 V if not used / Reset tmin 150 ms
Clock frequency	100 kHz ... 1 MHz
SSI monostable time (Tm)	18 µs
SSI pause time (Tp)	> 35 µs
SSI frame	(MSB ... LSB) 13 bit data length
Accuracy	± 1/2 LSB
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

CONNECTIONS

Function	Cable
+ V DC	red
0 V	grey
data +	green
data -	brown
clock +	yellow
clock -	pink
U / D	blue
RESET	white
⏚	shield

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 10 mm
Enclosure rating	IP 65 (IEC 60529)
Max rotation speed	3000 rpm
Max shaft load	200 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	1,5 x 10^{-6} kgm² (36 x 10^{-6} lbft²)
Starting torque (at +20°C / +68°F)	< 0,03 Nm (4,25 Ozin)
Bearing stage material	anodized aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	anodized aluminum
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +50°C (+32° ... +122°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Weight	1200 g (42,33 oz)

ATEX MARKING

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

II 2GD

II: group II: different than mines
2: category 2: high level of protection
GD: areas containing gas (G) and dust (D)

Ex d IIC T6 Gb

Ex d: flameproof enclosure for explosive atmospheres with gases, vapours and mists
IIC: group of gas IIC
T6: max surface temperature +85°C of the device for atmospheres with gas
Gb: product with a high level of protection

Ex tb IIIC T85°C Db

Ex tb: flameproof enclosure safety type
IIIC: group of dust combustibles IIIC
T85°C: max surface temperature +85°C of the device in the presence of dust
Db: product with a high level of protection

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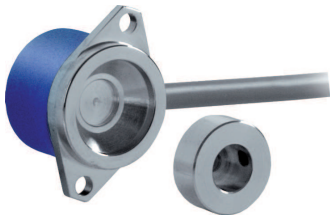
EMA 22 A SSI

MAGNETIC SINGLETURN ABSOLUTE KIT ENCODER

MAIN FEATURES

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

- Resolution up to 13 bit (8192 ppr) with SSI as electrical interface
- Cable output, connector available on cable end
- 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	EMA	22A	1024	B	5	S	P	X	6	S	10	P	R	.XXX

SERIES
magnetic singleturn absolute encoder EMA

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

RESOLUTION
ppr from 8 to 8192
see table for pulses availability

CODE TYPE
binary B
gray G

POWER SUPPLY
5 V DC 5

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
positive P

OPTIONS
to be reported X

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

ENCLOSURE RATING
IP 67 S

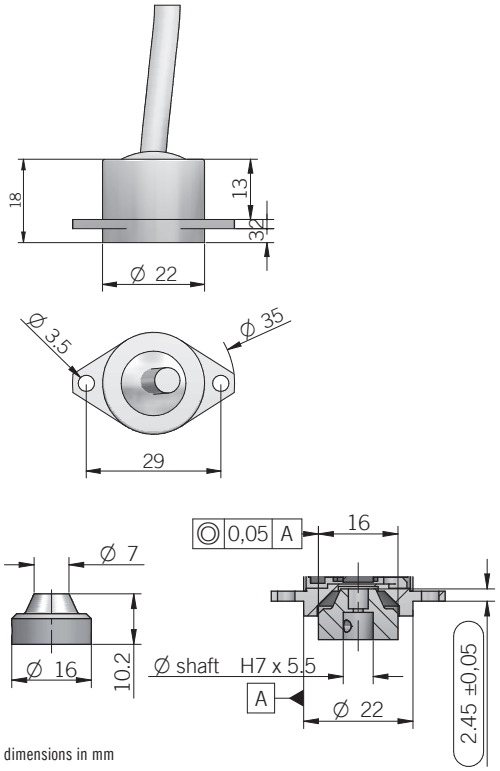
MAX ROTATION SPEED
10000 rpm 10

OUTPUT TYPE
cable (standard length 0,5 m) P

DIRECTION TYPE
axial A
radial R

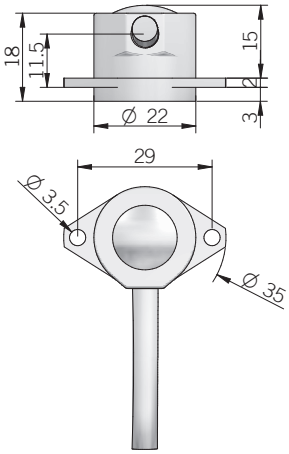
VARIANT
custom version XXX

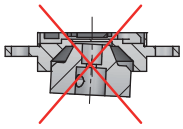
22 A with axial cable output



dimensions in mm

22 A with radial cable output





ELECTRICAL SPECIFICATIONS

Resolution	from 8 to 8192 ppr
Power supply	4,75 ... 5,25 V DC
Current consumption without load	100 mA max
Output type*	RS-422 (SN65LBC179Q or equivalent)
SSI output code	binary or gray
Clock frequency	100 kHz ... 1 MHz
SSI monostable time (Tm)	20 µs
SSI frame	(MSB ... LSB) 13 bit data length
Accuracy	± 0,35° typical / ± 0,50° max
Counting direction	decreasing clockwise (magnet actuator view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

CONNECTIONS

Function	Cable
+ V DC	red
0 V	black
data +	green
data -	brown
clock +	yellow
clock -	orange
⏚	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} kgm^2 (2,4 x 10^{-6} lbft^2)
Bearing stage material	EN-AW 2011 aluminum
Housing material	EN-AW 2011 aluminum
Magnet-actuator material	EN-AW 2011 aluminum
Operating temperature	-40° ... +125°C (-40° ... +257°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Weight	30 g (1,06 oz)
Magnet actuator mounting tolerances (to get best electrical performances)	± 0,2 mm (axial) ± 0,1 mm (radial)

RESOLUTIONS

8 - 16 - 25 - 32 - 40 - 50 - 64 - 80 - 100 - 125 - 128 - 160 - 200 - 250 - 256 - 320 - 400 - 500 - 512 - 800 - 1000 - 1024 - 1600 - 2000 - 2048 - 4096 - 8192

EA 36 A
SSI

SOLID SHAFT MAGNETIC SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Miniaturized singleturn absolute encoder for limited size applications.

- Magnetic sensor technology without contact (Magnetic ASIC)
- Sturdy construction thanks to separated chambers
- Resolution up to 12 bit (4096 ppr)
- Power supply up to +30 V DC with SSI as electrical interface
- Code reset for easy setup
- Cable output, connector available on cable end
- 6 mm diameter solid shaft
- Mounting by fixing flange

ORDERING CODE	EA	36A	12	G	8/30	S	P	X	6	X	8	P	R	. XXX

SERIES
magnetic singleturn absolute encoder series EA

MODEL
fixing flange screw holes ø 28 mm 36A

SINGLETURN RESOLUTION
from 1 to 12 bit
360 / 720 ppr
please directly contact our offices for other pulses

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

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

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
positive P

OPTIONS
to be reported if not used X
reset ZE

SHAFT DIAMETER
mm 6

ENCLOSURE RATING
IP 67 cover side / IP 65 shaft side X

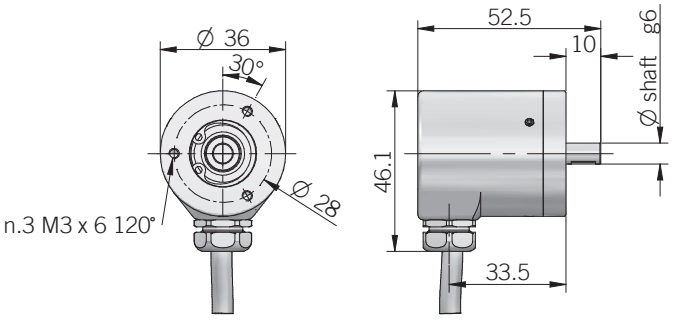
MAX ROTATION SPEED
8000 rpm 8

OUTPUT TYPE
cable (standard length 0,5 m) P

DIRECTION TYPE
radial R

VARIANT
custom version XXX

36 A



dimensions in mm

ELECTRICAL SPECIFICATIONS

Singleturn resolution	from 1 to 12 bit 360 / 720 ppr
Power supply	5 = 4,75 ... 5,25 V DC 8/30 = 7,6 ... 30 V DC (reverse polarity protection)
Power draw without load	< 400 mW
Output type*	RS-422 (SN65LBC179Q or equivalent)
Code type	binary or gray
Auxiliary inputs (U/D - Reset)	active high (+V DC) connect to 0 V if not used / Reset tmin 150 ms
Clock frequency	100 kHz ... 1 MHz
SSI monostable time (Tm)	20 µs
SSI pause time (Tp)	> 35 µs
SSI frame	(MSB ... LSB) 13 bit data length (12ST+'0')
Accuracy	± 0,35° typical
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

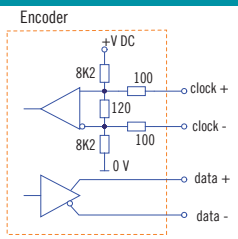
MECHANICAL SPECIFICATIONS

Shaft diameter	ø 6 mm
Enclosure rating	IP 67 cover side / IP 65 shaft side (IEC 60529)
Rotation speed	8000 rpm continuous / 10000 rpm max
Max shaft load	20 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,001 x 10^{-6} kgm^2 (0,02 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	AISI 420 stainless steel
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-20° ... +85°C (-4° ... +185°F)
Storage temperature	-20° ... +85°C (-4° ... +185°F)
Weight	150 g (5,29 oz)

CONNECTIONS

Function	Cable
+ V DC	red
0 V	black
U / D	red / blue
data +	green
data -	brown
clock +	yellow
clock -	orange
RESET	white
⏚	shield

SSI SCHEMATICS

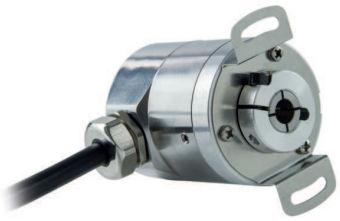


EA 36 F / G
SSI
BLIND HOLLOW SHAFT MAGNETIC SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Miniaturized singleturn absolute encoder for limited size applications.

- Magnetic sensor technology without contact (Magnetic ASIC)
- Sturdy construction thanks to separated chambers
- Resolution up to 12 bit (4096 ppr)
- Power supply up to +30 V DC with SSI as electrical interface
- Code reset for easy setup
- Cable output, connector available on cable end
- 6 mm diameter blind hollow shaft
- Mounting by stator coupling or torque pin



ORDERING CODE	EA	36G	12	G	8/30	S	P	X	6	X	8	P	R	.XXX

SERIES
magnetic singleturn absolute encoder series EA

MODEL
blind hollow shaft with stator coupling 36F
blind hollow shaft with torque pin 36G

SINGLETURN RESOLUTION
from 1 to 12 bit
360 / 720 ppr
please directly contact our offices for other pulses

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

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

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
positive P

OPTIONS
to be reported if not used X
reset ZE

BORE DIAMETER
mm 6

ENCLOSURE RATING
IP 67 cover side / IP 65 shaft side X

MAX ROTATION SPEED
8000 rpm 8

OUTPUT TYPE
cable (standard length 0,5 m) P

DIRECTION TYPE
radial R

VARIANT
custom version XXX

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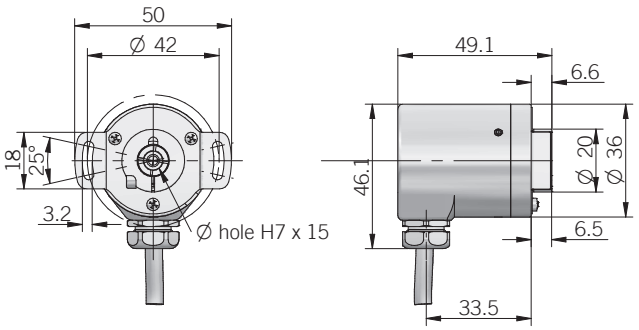
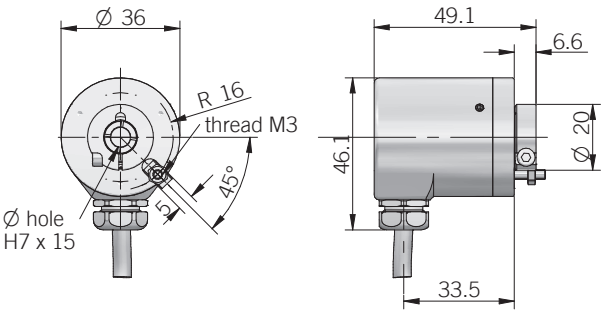
36 F



dimensions in mm

36 G



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

ELECTRICAL SPECIFICATIONS

Singleturn resolution	from 1 to 12 bit 360 / 720 ppr
Power supply	5 = 4,75 ... 5,25 V DC 8/30 = 7,6 ... 30 V DC (reverse polarity protection)
Power draw without load	< 400 mW
Output type	RS-422 (SN65LBC179Q or equivalent)
Code type	binary or gray
Auxiliary inputs (U/D - Reset)	active high (+V DC) connect to 0 V if not used / Reset tmin 150 ms
Clock frequency	100 kHz ... 1 MHz
SSI monostable time (Tm)	20 µs
SSI pause time (Tp)	> 35 µs
SSI frame	(MSB ... LSB) 13 bit data length (12ST+'0')
Accuracy	± 0,35° typical
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

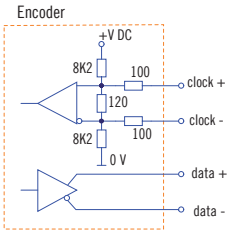
MECHANICAL SPECIFICATIONS

Bore diameter	ø 6 mm
Enclosure rating	IP 67 cover side / IP 65 shaft side (IEC 60529)
Rotation speed	8000 rpm continuous / 10000 rpm max
Max shaft load	20 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,001 x 10^{-6} kgm^2 (0,02 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin)
Bearing stage material	EN-AW 2011 aluminium
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	AISI 420 stainless steel
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-20° ... +100°C (-4° ... +212°F)
Storage temperature	-20° ... +100°C (-4° ... +212°F)
Fixing torque for collar clamping	0,6 Nm (85 Ozin) recommended
Weight	150 g (5,29 oz)

CONNECTIONS

Function	Cable
+ V DC	red
0 V	black
U / D	red/blue
data +	green
data -	brown
clock +	yellow
clock -	orange
RESET	white
⏚	shield

SSI SCHEMATICS



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EMA 50 A / B / BY
BIT PARALLEL - SSI
SOLID SHAFT MAGNETIC SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Singleturn absolute magnetic encoder size 50 mm with solid shaft

- Resolution up to 13 bit (8192 ppr)
- Power supply up to +30 V DC with SSI or Bit Parallel as electrical interface
- Code reset for easy setup
- Cable or M12 output, other connector available on cable end
- Sturdy construction (separated chambers)
- Solid shaft diameter up to 10 mm
- IP 67 enclosure rating
- Mounting by syncronous flange

ORDERING CODE	EMA	50B	1024	G	8/30	N	N	X	6	X	3	P	R	. XXX

SERIES
magnetic singleturn absolute encoder EMA

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

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

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

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

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

LOGIC
negative N
positive P

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

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

ENCLOSURE RATING
IP 65 X
IP 67 S

MAX ROTATION SPEED
3000 rpm 3

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

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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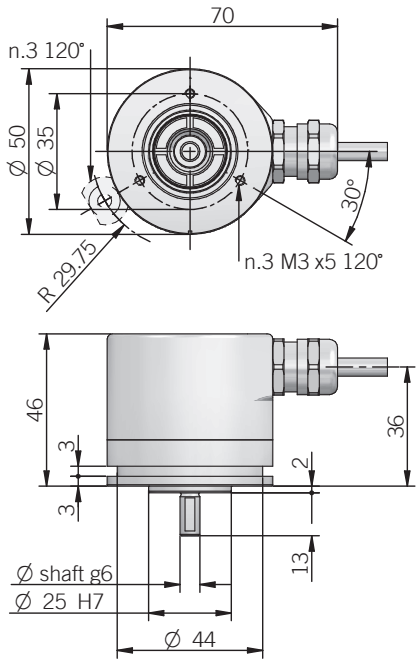
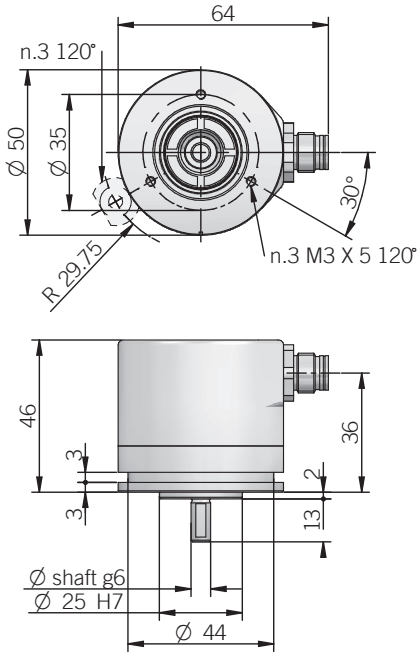
50 A
radial cable output



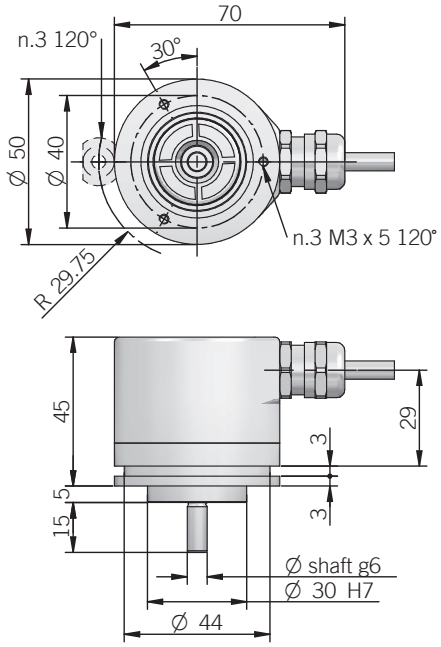
fixing clamps not included, please refer to Accessories section

50 A
radial M12 output



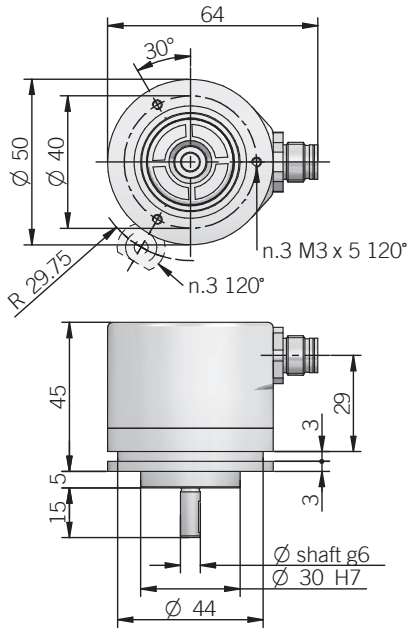
fixing clamps not included, please refer to Accessories section

50 B / BY
radial cable output



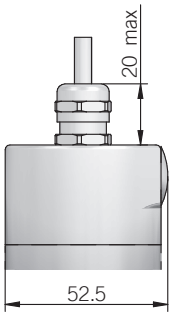
fixing clamps not included, please refer to Accessories section

50 B / BY
radial M12 output



fixing clamps not included, please refer to Accessories section

Axial output



dimensions in mm

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ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 4096 ppr (N / C / P / R / U interface) from 2 to 8192 ppr (S interface)
Power supply	5 = 4,5 ... 5,5 V DC 8/30 = 7,6 ... 31,5 V DC
Current consumption without load	< 100 mA
Max load current	20 mA / channel (push pull) 40 mA / channel (NPN / PNP)
Output type*	NPN / NPN open collector (ULN2003A) PNP / PNP open collector (TD62783) push pull (iC-DL) RS-422 (LTC1690 or equivalent)
Auxiliary inputs (U/D - Reset)	active high (+V DC) connect to 0 V if not used / Reset tmin 150 ms
Max frequency	output: 25 kHz LSB (Bit parallel) clock input: 100 kHz ... 1 MHz (SSI)
SSI monostable time (Tm)	20 µs
SSI pause time (Tp)	> 35 µs
Strobe time	20 µs
Accuracy	± 0,35° typical
SSI frame	(MSB ... LSB) 13 bit data length
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

BIT PARALLEL CONNECTIONS

Function	Gray / Binary	Cable
bit 1 (LSB)	G^0 / B^0	green
bit 2	G^1 / B^1	yellow
bit 3	G^2 / B^2	blue
bit 4	G^3 / B^3	brown
bit 5	G^4 / B^4	orange or pink
bit 6	G^5 / B^5	white
bit 7	G^6 / B^6	grey
bit 8	G^7 / B^7	violet
bit 9	G^8 / B^8	grey / pink
bit 10	G^9/ B^9	white / green
bit 11	G^{10}/ B^{10}	brown / green
bit 12	G^{11}/ B^{11}	white / yellow
0 V	/	black
+ V DC	/	red
U / D	/	red / blue
RESET	/	yellow / brown
STROBE	/	white / grey
⏚	/	shield

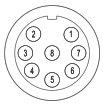
MECHANICAL SPECIFICATIONS

Shaft diameter	ø 6 / 8 / 9,52 (3/8") / 10 mm
Enclosure rating	X = IP 65 (IEC 60529) S = IP 67 (IEC 60529)
Max rotation speed	3000 rpm continuous / 5000 rpm istantaneous
Max shaft load	30 N axial / 50 N radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 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)	< 0,03 Nm (4,25 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-25° ... +85°C (-13° ... +185°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Weight	200 g (7,05 oz)

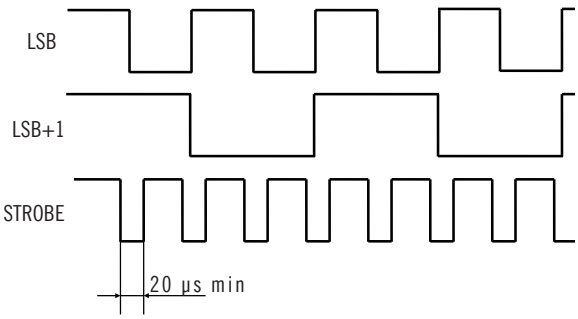
SSI CONNECTIONS

Function	Cable	8 pin M12
+ V DC	red	8
0 V	black	5
data +	green	3
data -	brown	2
clock +	yellow	4
clock -	orange or pink	6
U / D	red / blue	7
RESET	white	1
⏚	shield	housing

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



STROBE TIMING



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EMA 50 F / G
BIT PARALLEL - SSI
BLIND HOLLOW SHAFT MAGNETIC SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Singleturn absolute magnetic encoder size 50 mm with blind hollow shaft

- Resolution up to 13 bit (8192 ppr)
- Power supply up to +30 V DC with SSI or Bit Parallel as electrical interface
- Code reset for easy setup
- Cable or M12 output, other connector available on cable end
- Sturdy construction (separated chambers)
- Blind hollow shaft diameter up to 15 mm
- IP 67 enclosure rating
- Mounting by stator coupling or torque pin

ORDERING CODE	EMA	50F	1024	G	8/30	N	N	X	6	X	3	P	R	. XXX

SERIES
magnetic singleturn absolute encoder EMA

MODEL
blind hollow shaft with stator coupling 50F
blind hollow shaft with torque pin 50G

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

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

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

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

LOGIC
negative N
positive P

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

BORE DIAMETER
mm 6
mm 8
(3/8") 9,52 mm 9
mm 10
mm 12
mm 14
mm 15

ENCLOSURE RATING
IP 65 X
IP 67 S

MAX ROTATION SPEED
3000 rpm 3

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

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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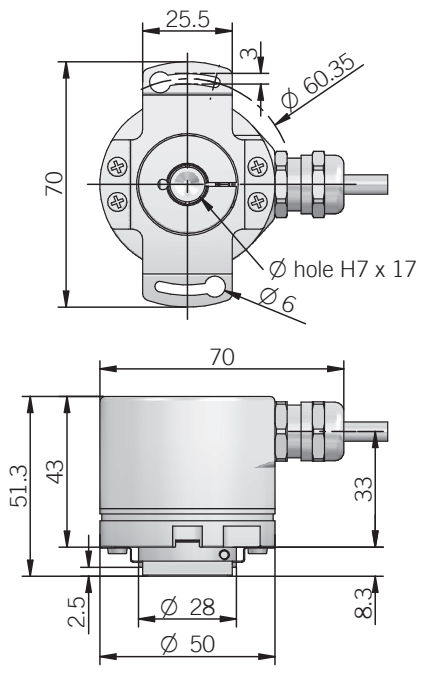
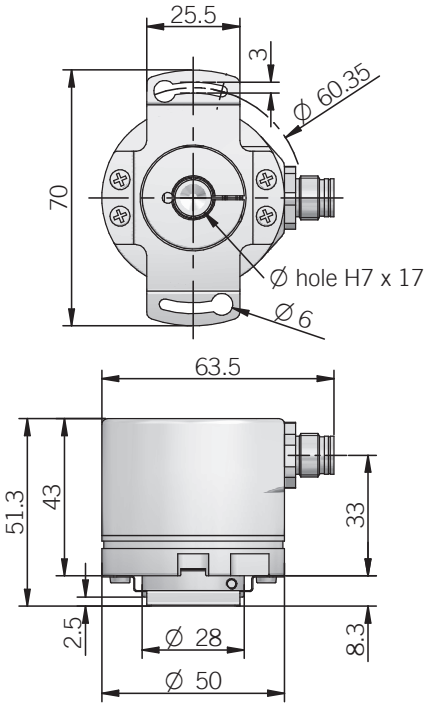
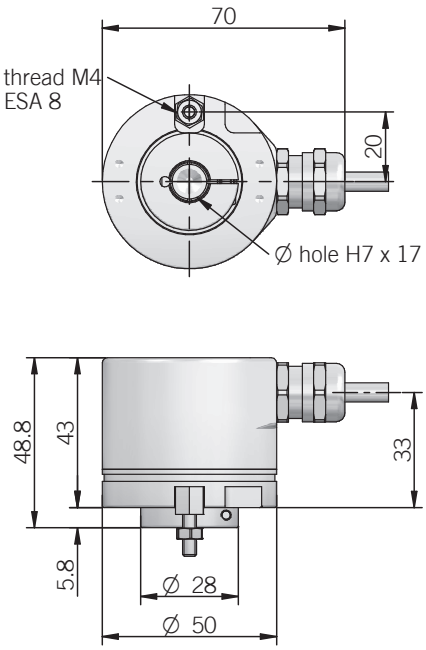
50 F
radial cable output



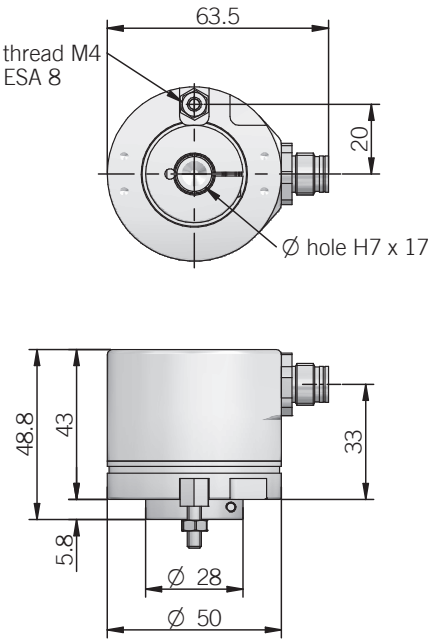
50 F
radial M12 output



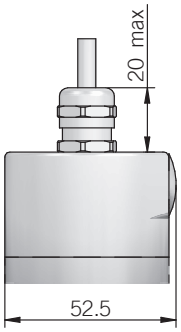
50 G
radial cable output



50 G
radial M12 output



Axial output



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

dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 2 to 4096 ppr (N / C / P / R / U interface) from 2 to 8192 ppr (S interface)
Power supply	5 = 4,5 ... 5,5 V DC 8/30 = 7,6 ... 31,5 V DC
Current consumption without load	< 100 mA
Max load current	20 mA / channel (push pull) 40 mA / channel (NPN / PNP)
Output type*	NPN / NPN open collector (ULN2003A) PNP / PNP open collector (TD62783) push pull (iC-DL) RS-422 (LTC1690 or equivalent)
Auxiliary inputs (U/D - Reset)	active high (+V DC) connect to 0 V if not used / Reset tmin 150 ms
Max frequency	output: 25 kHz LSB (Bit parallel) clock input: 100 kHz ... 1 MHz (SSI)
SSI monostable time (Tm)	20 µs
SSI pause time (Tp)	> 35 µs
Strobe time	20 µs
Accuracy	± 0,35° typical
SSI frame	(MSB ... LSB) 13 bit data length
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

BIT PARALLEL CONNECTIONS

Function	Gray / Binary	Cable
bit 1 (LSB)	G^0 / B^0	green
bit 2	G^1 / B^1	yellow
bit 3	G^2 / B^2	blue
bit 4	G^3 / B^3	brown
bit 5	G^4 / B^4	orange or pink
bit 6	G^5 / B^5	white
bit 7	G^6 / B^6	grey
bit 8	G^7 / B^7	violet
bit 9	G^8 / B^8	grey / pink
bit 10	G^9/ B^9	white / green
bit 11	G^{10}/ B^{10}	brown / green
bit 12	G^{11}/ B^{11}	white / yellow
0 V	/	black
+ V DC	/	red
U / D	/	red / blue
RESET	/	yellow / brown
STROBE	/	white / grey
⏚	/	shield

MECHANICAL SPECIFICATIONS

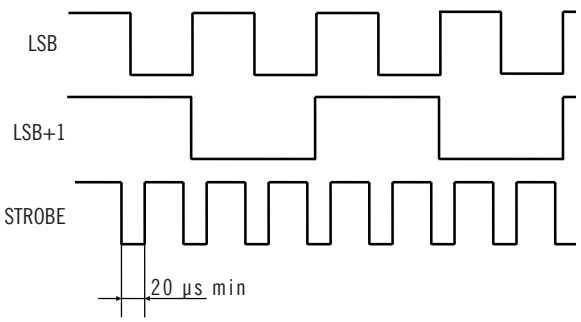
Bore diameter	ø 6* / 8* / 9,52* (3/8") / 10* / 12* / 14 / 15 mm * with supplied adapter shaft
Enclosure rating	X = IP 65 (IEC 60529) S = IP 67 (IEC 60529)
Max rotation speed	3000 rpm continuous
Max shaft load	30 N axial / 50 N radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 ... 2000 Hz (IEC 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)	< 0,03 Nm (4,25 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-25° ... +85°C (-13° ... +185°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Fixing torque for collar clamping	1,5 Nm (212 Ozin) recommended
Weight	200 g (7,05 oz)

SSI CONNECTIONS

Function	Cable	8 pin M12
+ V DC	red	8
0 V	black	5
data +	green	3
data -	brown	2
clock +	yellow	4
clock -	orange or pink	6
U / D	red / blue	7
RESET	white	1
⏚	shield	housing

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

STROBE TIMING



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EML 50 A / B / BY ANALOGUE

SOLID SHAFT MAGNETIC SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Singleturn absolute magnetic encoder size 50 mm with solid shaft

- Resolution 12 bit
- Power supply up to +28 V DC with analogue (voltage or current) as electrical interface
- Code reset for easy setup
- Cable or M12 output, other connector available on cable end
- Sturdy construction (separated chambers)
- Solid shaft diameter up to 10 mm
- IP 67 enclosure rating
- Mounting by syncronous flange

ORDERING CODE	EML	50A	360	X	12/28	V	05	X	6	X	3	P	R	.XXX

SERIES
analogue magnetic singleturn absolute encoder EML

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

ACTIVE ANGLE
degrees 360
degrees 270
degrees 180
degrees 90

OPTION
to be reported if not used X
reset ZE

POWER SUPPLY
12 ... 28 V DC 12/28

ELECTRICAL INTERFACE
voltage V
current I

OUTPUT RANGE
0 ... 5 V 05
0 ... 10 V 010
0 ... 20 mA 020
4 ... 20 mA 420

OPTIONS
to be reported with voltage output / 3 wires current output X
4 wires current output Q

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

ENCLOSURE RATING
IP 65 X
IP 67 S

MAX ROTATION SPEED
3000 rpm 3

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

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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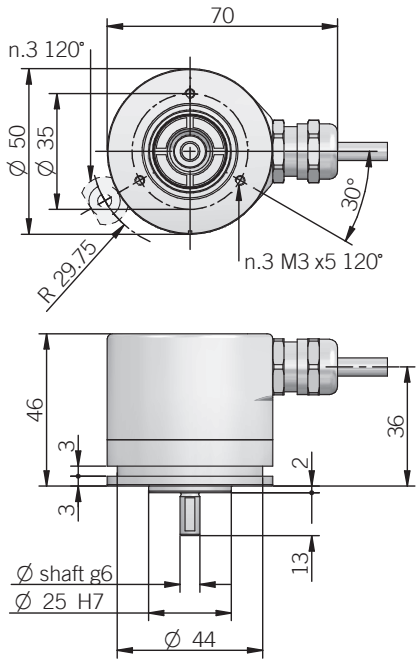
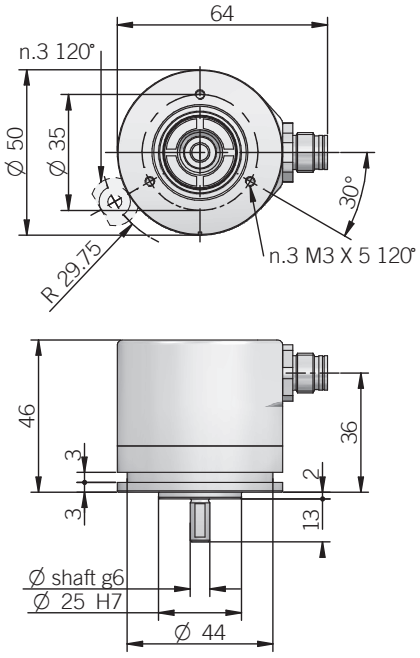
50 A
radial cable output



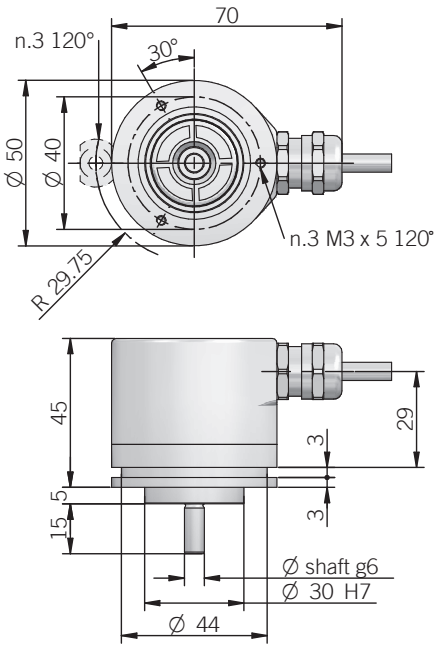
fixing clamps not included, please refer to Accessories section

50 A
radial M12 output



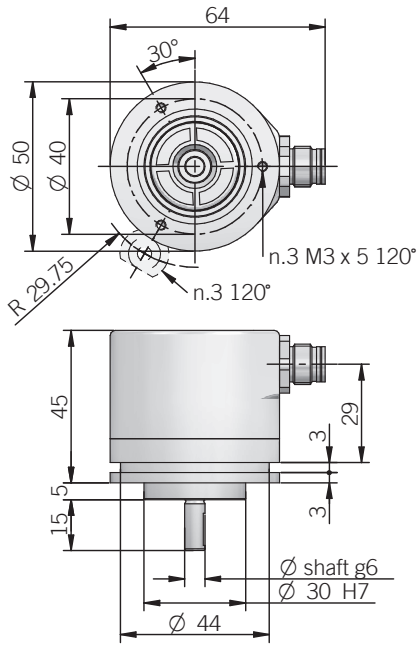
fixing clamps not included, please refer to Accessories section

50 B / BY
radial cable output



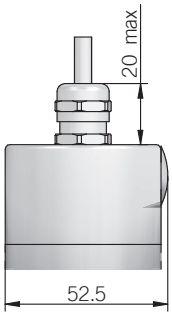
fixing clamps not included, please refer to Accessories section

50 B / BY
radial M12 output



fixing clamps not included, please refer to Accessories section

Axial output



dimensions in mm

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ELECTRICAL SPECIFICATIONS

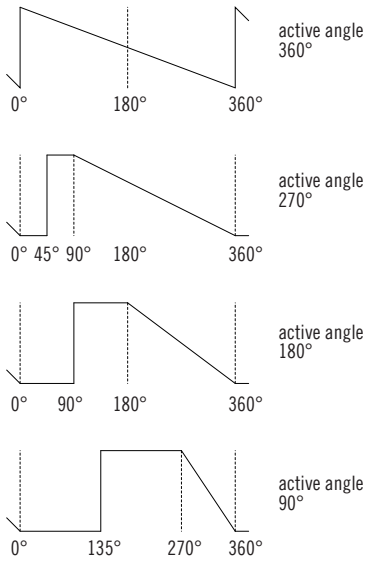
Resolution	12 bit per revolution
Output update frequency	100 kHz
Active angle	90 ... 360 mechanical degrees
Power supply	11,4 ... 29,4 V DC (reverse polarity protection)
Current consumption without load	40 mA max
Output type	voltage (0 ... 5 V / 0 ... 10 V) current (0 ... 20 mA / 4 ... 20 mA)
Auxiliary inputs (U/D - Reset)	active high (+V DC) connect to 0 V if not used / Reset tmin 150 ms
Load	R_{min}= 1 kΩ (voltage output) R_{max}= (V_{DC} - 2) / 0.02 (current output)
Linearity error	< 1 %
Signal pattern	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

CONNECTIONS

Function	Cable (voltage)	Cable (current)	5 pin M12	8 pin M12*
+ V DC	red	red	2	8
0 V	black	black	4	5
V_{out}	green	/	3	/
I_{in}	/	yellow	3	3
I_{out}	/	green	/	2
U / D	blue	blue	5	7
RESET	white	white	1	1
⏚	shield	shield	housing	housing

* with Q current ouput

SIGNAL PATTERN (decreasing CW)



MECHANICAL SPECIFICATIONS

Shaft diameter	ø 6 / 8 / 9,52 (3/8") / 10 mm
Enclosure rating	X = IP 65 (IEC 60529) S = IP 67 (IEC 60529)
Max rotation speed	3000 rpm continuous / 5000 rpm peak
Max shaft load	30 N axial / 50 N radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 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)	< 0,03 Nm (4,25 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-25° ... +85°C (-13° ... +185°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Weight	200 g (7,05 oz)

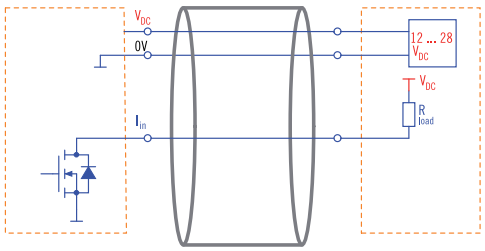
M12 connector (5 pin)
M12 A coded
solder side view FV

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

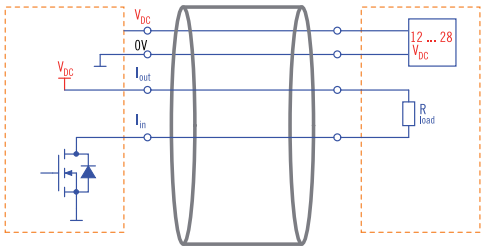
ELECTRICAL INTERFACE

Current output

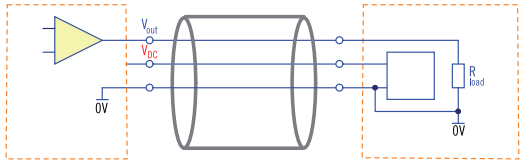
3 wire sink



4 wire sink



Voltage output



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EML 50 F / G
ANALOGUE

BLIND HOLLOW SHAFT MAGNETIC SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Singleturn absolute magnetic encoder size 50 mm with blind hollow shaft

- Resolution 12 bit
- Power supply up to +28 V DC with analogue (voltage or current) as electrical interface
- Code reset for easy setup
- Cable or M12 output, other connector available on cable end
- Sturdy construction (separated chambers)
- Blind hollow shaft diameter up to 15 mm
- IP 67 enclosure rating
- Mounting by stator coupling or torque pin

ORDERING CODE	EML	50F	360	X	12/28	V	05	X	6	X	3	P	R	. XXX

SERIES
analogue magnetic singleturn absolute encoder EML

MODEL
blind hollow shaft with stator coupling 50F
blind hollow shaft with torque pin 50G

ACTIVE ANGLE
degrees 360
degrees 270
degrees 180
degrees 90

OPTION
to be reported if not used X
reset ZE

POWER SUPPLY
12 ... 28 V DC 12/28

ELECTRICAL INTERFACE
voltage V
current I

OUTPUT RANGE
0 ... 5 V 05
0 ... 10 V 010
0 ... 20 mA 020
4 ... 20 mA 420

OPTIONS
to be reported with voltage output / 3 wires current output X
4 wires current output Q

BORE DIAMETER
mm 6
mm 8
(3/8") 9,52 mm 9
mm 10
mm 12
mm 14
mm 15

ENCLOSURE RATING
IP 65 X
IP 67 S

MAX ROTATION SPEED
3000 rpm 3

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

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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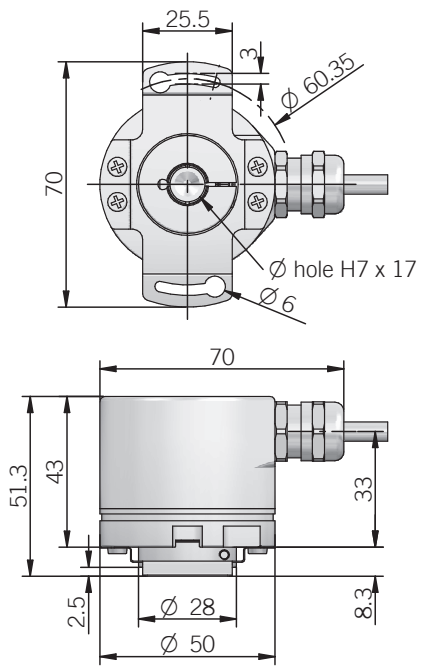
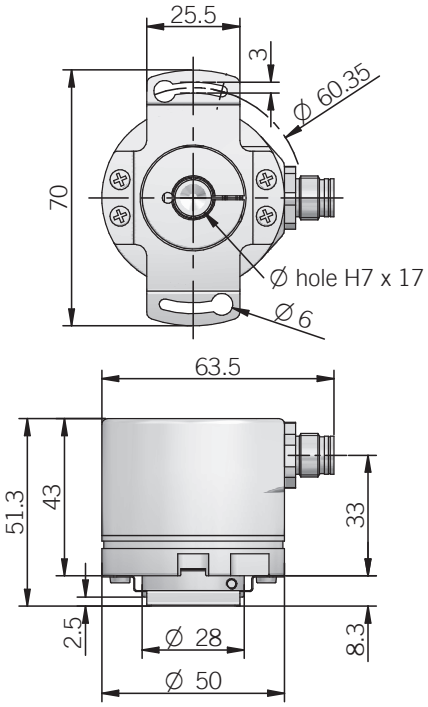
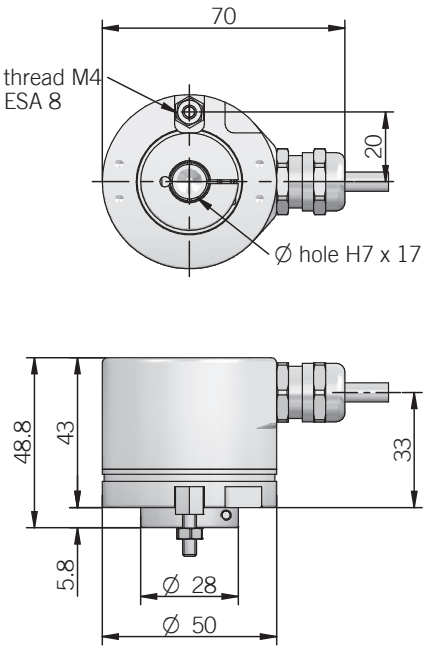
50 F
radial cable output



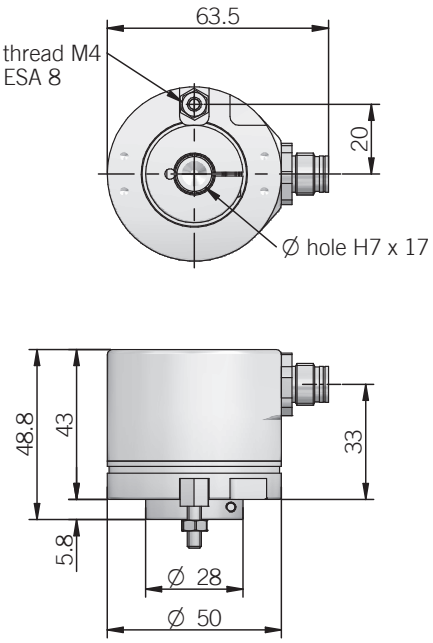
50 F
radial M12 output



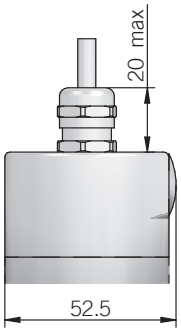
50 G
radial cable output



50 G
radial M12 output



Axial output



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

dimensions in mm

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ELECTRICAL SPECIFICATIONS

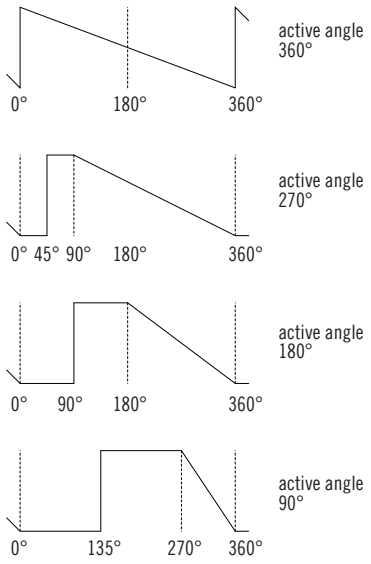
Resolution	12 bit per revolution
Output update frequency	100 kHz
Active angle	90 ... 360 mechanical degrees
Power supply	11,4 ... 29,4 V DC (reverse polarity protection)
Current consumption without load	40 mA max
Output type	voltage (0 ... 5 V / 0 ... 10 V) current (0 ... 20 mA / 4 ... 20 mA)
Auxiliary inputs (U/D - Reset)	active high (+V DC) connect to 0 V if not used / Reset tmin 150 ms
Load	R_{min}= 1 kΩ (voltage output) R_{max}= (V_{DC} - 2) / 0.02 (current output)
Linearity error	< 1 %
Signal pattern	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

CONNECTIONS

Function	Cable (voltage)	Cable (current)	5 pin M12	8 pin M12*
+ V DC	red	red	2	8
0 V	black	black	4	5
V_{out}	green	/	3	/
I_{in}	/	yellow	3	3
I_{out}	/	green	/	2
U / D	blue	blue	5	7
RESET	white	white	1	1
⏚	shield	shield	housing	housing

* with Q current ouput

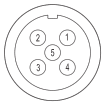
SIGNAL PATTERN (decreasing CW)



MECHANICAL SPECIFICATIONS

Bore diameter	ø 6* / 8* / 9,52* (3/8") / 10* / 12* / 14 / 15 mm * with supplied adapter shaft
Enclosure rating	X = IP 65 (IEC 60529) S = IP 67 (IEC 60529)
Max rotation speed	3000 rpm continuous
Max shaft load	30 N axial / 50 N radial
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)	< 0,03 Nm (4,25 Ozin)
Bearing stage material	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	EN-AW 2011 aluminum
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-25° ... +85°C (-13° ... +185°F)
Storage temperature	-25° ... +85°C (-13° ... +185°F)
Fixing torque for collar clamping	1,5 Nm (212 Ozin) recommended
Weight	200 g (7,05 oz)

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

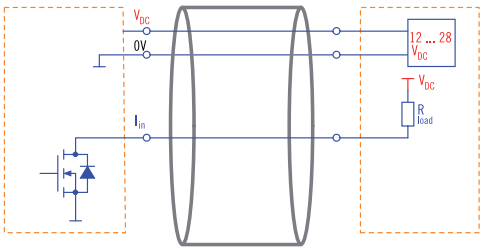


M12 connector (8 pin)
M12 A coded
solder side view FV

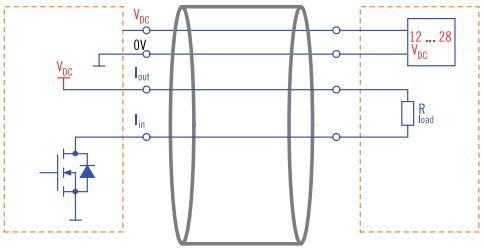
ELECTRICAL INTERFACE

Current output

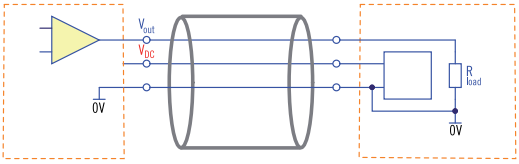
3 wire sink



4 wire sink



Voltage output



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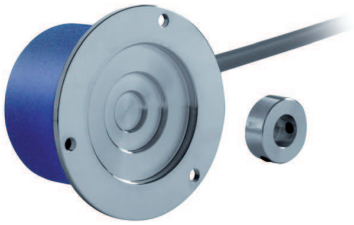
EMA 55 A / AY
SSI
MAGNETIC SINGLETURN ABSOLUTE KIT ENCODER

MAIN FEATURES

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

- Resolution up to 13 bit (8192 ppr) with SSI as electrical interface
- Cable or M12 output, other connector available on cable end
- No wear due to no contact magnetic technology
- Bore shaft diameter up to 10 mm
- Enclosure rating up to IP67
- Wide operating temperature -40° ... +100°C (-40° ... +212°F)



ORDERING CODE	EMA	55A	1024	B	5	S	P	X	6	X	10	P	R	. XXX

SERIES
magnetic singleturn absolute encoder EMA

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

RESOLUTION
ppr from 8 to 8192
see table for pulses availability

CODE TYPE
binary B
gray G

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

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
positive P

OPTIONS
to be reported X

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

ENCLOSURE RATING
IP 65 X
IP 67 S

MAX ROTATION SPEED
10000 rpm 10

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

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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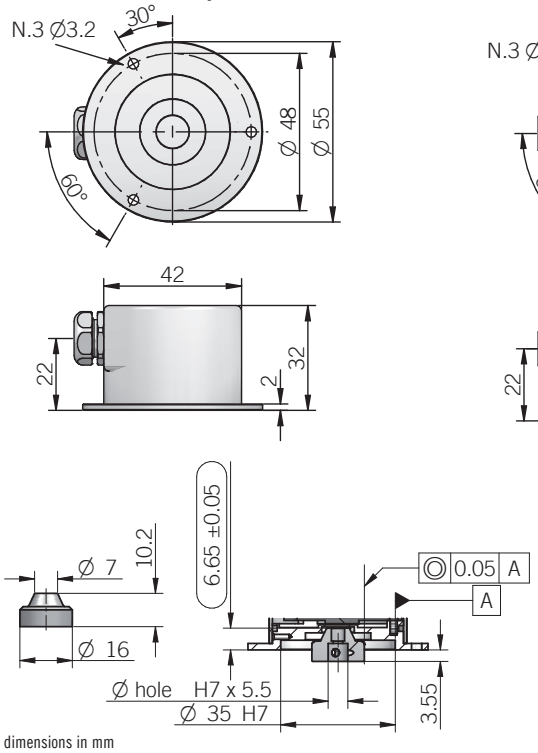
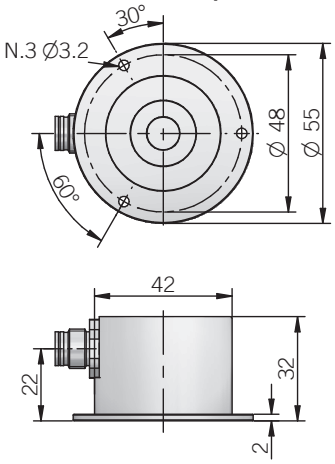
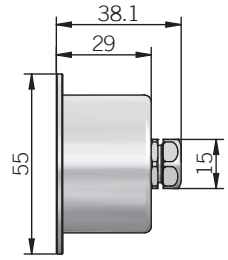
55 A radial cable output



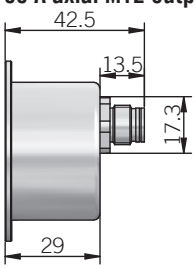
55 A radial M12 output



55 A axial cable output



55 A axial M12 output



dimensions in mm

ELECTRICAL SPECIFICATIONS

Resolution	from 8 to 8192 ppr
Power supply	5 = 4,75 ... 5,25 V DC 8/30 = 7,6 ... 31,5 V DC
Power draw without load	800 mW max
Output type	RS-422 (SN65LBC179Q or equivalent)
SSI output code	binary or gray
Clock frequency	100 kHz ... 1 MHz
SSI monostable time (Tm)	20 µs
SSI frame	(MSB ... LSB) 13 bit data length
Accuracy	± 0,35° typical / ± 0,50° max
Counting direction	decreasing clockwise (magnet actuator view)
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

MECHANICAL SPECIFICATIONS

Bore diameter (magnet actuator)	ø 6 / 8 / 9,52 (3/8") / 10 mm
Enclosure rating	X = IP 65 (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 aluminium
Magnet actuator material	EN-AW 2011 aluminum
Operating temperature	-40° ... +100 °C (-40° ... +212°F)
Storage temperature	-25° ... +85 °C (-13° ... +185°F)
Weight	150 g (5,29 oz)
Magnet actuator mounting tolerances (to get best electrical perfomances)	± 0,2 mm (axial) ± 0,1 mm (radial)

CONNECTIONS

Function	Cable	8 pin M12
+ V DC	red	8
0 V	black	5
data +	green	3
data -	brown	2
clock +	yellow	4
clock -	orange or pink	6
⏚	shield	housing

RESOLUTIONS

8 - 16 - 25 - 32 - 40 - 50 - 64 - 80 - 100 - 125 - 128 - 160 - 200 - 250 - 256 - 320 - 400 - 500 - 512 - 800 - 1000 - 1024 - 1600 - 2000 - 2048 - 4096 - 8192

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

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EAM 58 B / C - 63 A / D / E
BIT PARALLEL - SSI
SHAFT MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard multiturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC + gears)
- Resolution up to 27 bit (13 bit single turn (8192 ppr) + 14 bit multiturn (16384 turns))
- Power supply up to +28 V DC with Bit Parallel or SSI as electrical interface
- Cable or connector output
- Solid shaft diameter up to 10 mm
- Mounting by synchronous, clamping or centering 2,5" square flange

ORDERING CODE BIT PARALLEL

EAM	63A	R	512 / 512	G	8/28	P	P	X	10	X	6	PE	R	. XXX

SERIES
multiturn absolute encoder EAM

MODEL
synchronous flange ø 31.75 mm 63A
synchronous flange ø 50 mm 58B
clamping flange ø 36 mm 58C
centering square flange ø 31.75 mm 63D
centering square flange ø 50 mm 63E

rev. 2.0 R

MULTITURN RESOLUTION
(powers of 2) turns from 2 to 16384

SINGLETURN RESOLUTION
(powers of 2) ppr from 2 to 8192

CODE TYPE
binary B
gray G

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
push-pull P

LOGIC
negative N
positive P

OPTIONS
latch L
to be reported if not used X

SHAFT DIAMETER
(mod. 58 B) mm 6
(mod. 63 A / D) (3/8") 9,52 mm 9
(mod. 58 C - 63 A / D / E) 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
(up to 13 bit as total resolution) 16 cores cable (standard length 1,5 m) PD
(from 14 to 27 bit as total resolution or with latch option) 32 cores cable (standard length 1,5 m) PE
(up to 13 bit as total resolution) 19 pin MIL connector MA
(from 14 to 27 bit as total resolution) 32 pin MIL connector ME
female connector included, without female please add 162 as variant code

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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ORDERING CODE SSI	EAM	63A	R	4096 / 4096	G	8/28	S	X	X	10	X	3	MC	R	. XXX

SERIES
multiturn absolute encoder EAM

MODEL
synchronous flange ø 31.75 mm 63A
synchronous flange ø 50 mm 58B
clamping flange ø 36 mm 58C
centering square flange ø 31.75 mm 63D
centering square flange ø 50 mm 63E

rev. 2.0 R

MULTITURN RESOLUTION
(powers of 2) turns from 2 to 16384

SINGLETURN RESOLUTION
ppr 4096 / 8192

CODE TYPE
binary B
gray G

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
to be reported X

OPTIONS
to be reported X

SHAFT DIAMETER
(mod. 58 B) mm 6
(mod. 63 A / D) (3/8") 9,52 mm 9
(mod. 58 C - 63 A / D / E) mm 10

ENCLOSURE RATING
IP 54 X
IP 66 S

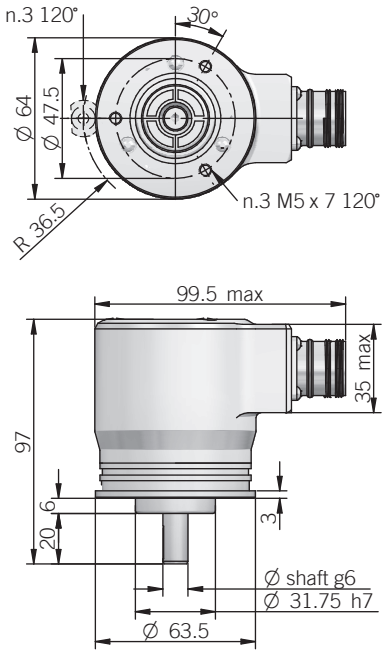
MAX ROTATION SPEED
(IP 66) 3000 rpm 3
(IP 54) 6000 rpm 6

OUTPUT TYPE
cable (standard length 1,5 m) PC
7 pin MIL connector MC
12 pin M23 connector HA
8 pin M12 connector M12
female connector included, without female please add 162 as variant code

DIRECTION TYPE
axial A
radial R

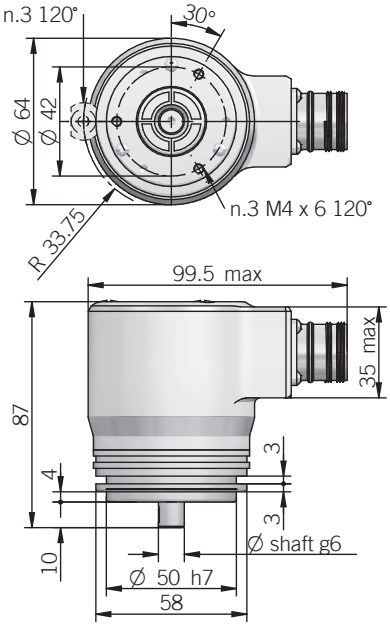
VARIANT
custom version XXX

63 A



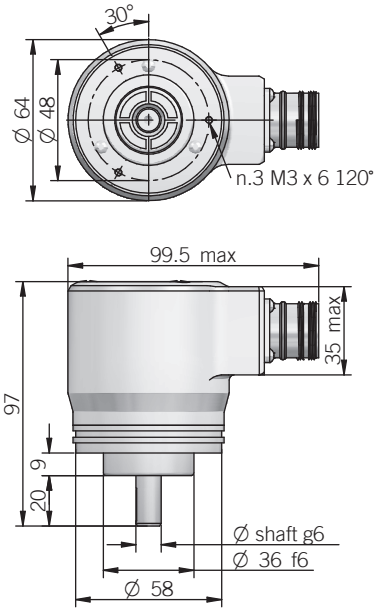
fixing clamps not included, please refer to Accessories section

58 B

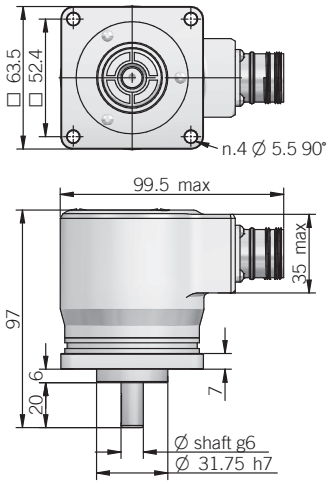


fixing clamps not included, please refer to Accessories section

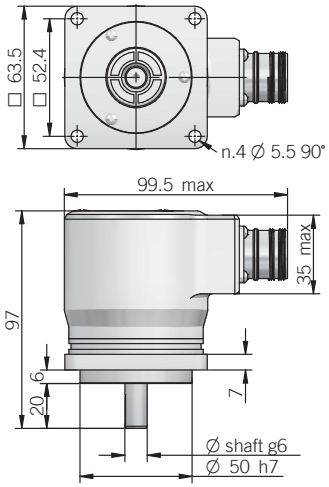
58 C



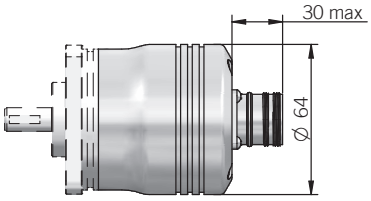
63 D



63 E



Dimensions with axial output



dimensions in mm

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ELECTRICAL SPECIFICATIONS

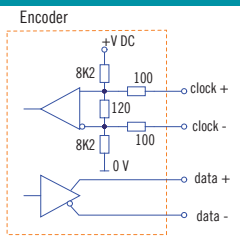
Multiturn resolution	from 2 to 16384 turns
Singleturn resolution	from 2 to 8192 ppr
Power supply	7,6 ... 29,4 V DC
Current consumption without load	100 mA
Max load current	20 mA / channel
Output type*	P = push-pull (iC-HD2) S = RS-422 (LTC1690 or equivalent)
Auxiliary inputs (U/D - Latch)	active high (+V DC) connect to 0 V if not used
Max frequency	output: 25 kHz LSB (Bit Parallel) clock input: 100 kHz ... 1 MHz (SSI)
SSI monostable time (Tm)	18 µs
SSI pause time (Tp)	> 35 µs
SSI frame	Tree format (MSB ... LSB) up to 12 bit multiturn = length 25 bit (12MT + 13ST) 13 to 14 bit multiturn = length 27 bit (14MT + 13ST)
Accuracy	± 1/2 LSB
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 6 / 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 - 3000 rpm
Max shaft load	10 N axial / 20 N radial with ø6 shaft 100 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	painted aluminium
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Weight	500 g (17,64 oz)

SSI SCHEMATICS



BIT PARALLEL CONNECTIONS

Function	Binary / Gray	Cable PD	Cable PE	19 pin MA	32 pin ME
bit 1 (LSB)	B^0 / G^0	green	green	A	A
bit 2	B^1 / G^1	yellow	yellow	B	B
bit 3	B^2 / G^2	blue	blue	C	C
bit 4	B^3 / G^3	brown	brown	D	D
bit 5	B^4 / G^4	orange or pink	orange or pink	E	E
bit 6	B^5 / G^5	white	white	F	F
bit 7	B^6 / G^6	grey	grey	G	G
bit 8	B^7 / G^7	purple	purple	H	H
bit 9	B^8 / G^8	grey / pink	grey / pink	J	J
bit 10	B^9 / G^9	white / green	white / green	K	K
bit 11	B^{10} / G^{10}	brown / green	brown / green	L	L
bit 12	B^{11} / G^{11}	white / yellow	white / yellow	M	M
bit 13	B^{12} / G^{12}	yellow / brown	yellow / brown	N	N
bit 14	B^{13} / G^{13}	/	white / grey	/	P
bit 15	B^{14} / G^{14}	/	grey / brown	/	R
bit 16	B^{15} / G^{15}	/	white / pink	/	S
bit 17	B^{16} / G^{16}	/	pink / brown	/	T
bit 18	B^{17} / G^{17}	/	white / blue	/	U
bit 19	B^{18} / G^{18}	/	brown / blue	/	V
bit 20	B^{19} / G^{19}	/	white / red	/	W
bit 21	B^{20} / G^{20}	/	brown / red	/	X
bit 22	B^{21} / G^{21}	/	white / black	/	Y
bit 23	B^{22} / G^{22}	/	brown / black	/	Z
bit 24	B^{23} / G^{23}	/	grey / green	/	a
bit 25	B^{24} / G^{24}	/	yellow / pink	/	b
bit 26	B^{25} / G^{25}	/	yellow / blue	/	c
bit 27	B^{26} / G^{26}	/	green / blue	/	d
LATCH	/	/	yellow / grey	R	e
0 V	/	black	black	T	j
U / D	/	red / blue	red / blue	U	g
+ V DC	/	red	red	V	h
⏚	/	shield	shield	S	housing

BIT PARALLEL CONNECTOR OR CABLE CHOICE

According to the resolution and the chosen number of turns is possible to calculate the connections required by the connector or the cable. From the below table is possible to know the connection number.

EXAMPLE 1:
256 PPR = 8 connections
N° turns 32 = 5 connections
Total connections 13.

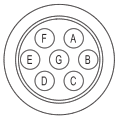
EXAMPLE 2:
4096 PPR = 12 connections
N° turns 4096 = 12 connections
Total connections 24.

From 1 to 13 connections a 16 cores cable (PD) or a 19 cores connector (MA) have to be considered.
From 14 to 27 connections a 32 cores cable (PE) or a 32 cores connector (ME) have to be considered.
If LATCH is used a cable or a 32 poles connector is required.

SSI CONNECTIONS

Function	Cable PC	7 pin MC	12 pin HA	8 pin M12
+ V DC	red	G	8	8
0 V	black	F	1	5
data +	green	C	2	3
data -	brown	D	10	2
clock +	yellow	A	3	4
clock -	orange or pink	B	11	6
U / D	red / blue	E	5	7
⏚	shield	housing	9	housing

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



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

MA connector (19 pin)
Amphenol 62IN 12E 14-19 P
solder side view FV

ME connector (32 pin)
Glenair IPT 02 A 18-32 P F6
solder side view FV

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

EAM 58 F - 63 F / G
BIT PARALLEL - SSI
BLIND HOLLOW SHAFT MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard multiturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC + gears)
- Resolution up to 27 bit (13 bit single turn (8192 ppr) + 14 bit multiturn (16384 turns))
- Power supply up to +28 V DC with Bit Parallel or SSI as electrical interface
- Cable or connector output
- Blind hollow shaft diameter up to 15 mm
- Mounting by stator coupling, spring or torque pin

ORDERING CODE BIT PARALLEL

EAM	63G	R	4096 / 4096	G	8/28	P	P	X	8	X	3	PD	R	. XXX

SERIES
multiturn absolute encoder EAM

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

rev. 2.0 R

MULTITURN RESOLUTION
(powers of 2) from 2 to 16384 turns

SINGLETURN RESOLUTION
(powers of 2) ppr from 2 to 8192

CODE TYPE
binary B
gray G

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
push-pull P

LOGIC
negative N
positive P

OPTIONS
latch L
to be reported if not used X

BORE DIAMETER
mm 8
(3/8") 9,52 mm 9
mm 10
mm 12
mm 14
mm 15

ENCLOSURE RATING
IP 54 X

MAX ROTATION SPEED
3000 rpm 3

OUTPUT TYPE
(up to 13 bit as total resolution) 16 cores cable (standard length 1,5 m) PD
(from 14 to 27 bit as total resolution or with latch option) 32 cores cable (standard length 1,5 m) PE
(up to 13 bit as total resolution) 19 pin MIL connector MA
(from 14 to 27 bit as total resolution) 32 pin MIL connector ME
female connector included, without female please add 162 as variant code

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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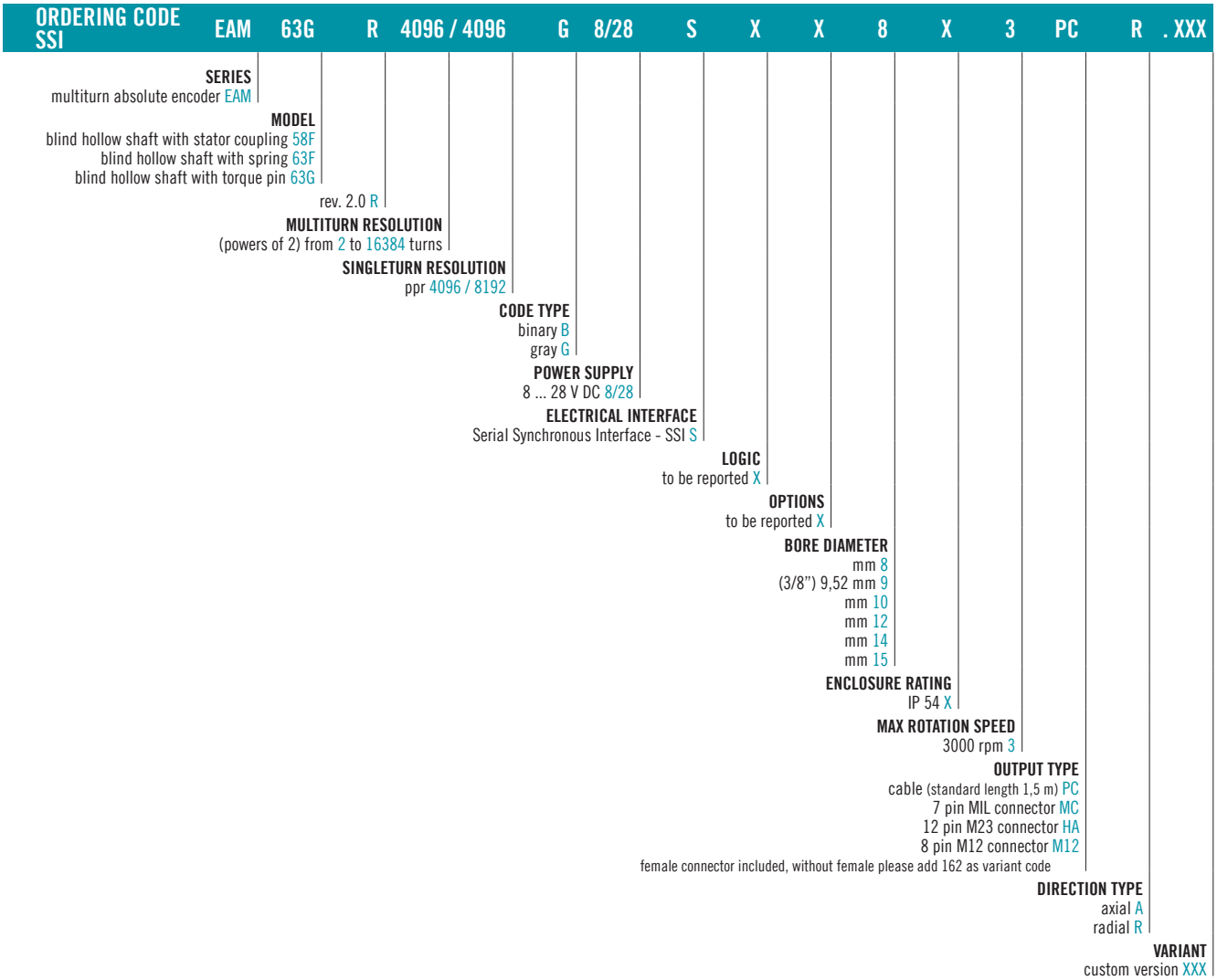

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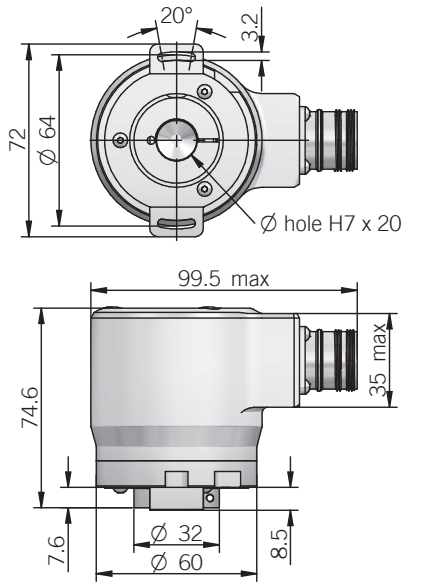
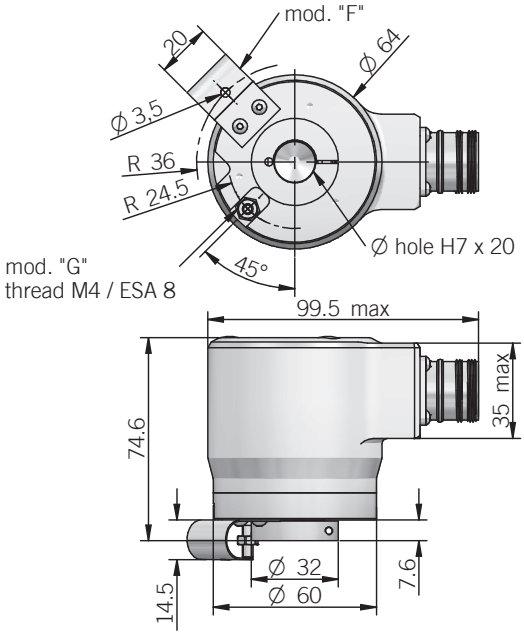
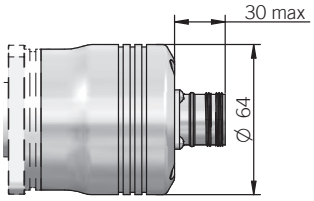
58 F



63 F - G



Dimensions with axial output



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

dimensions in mm

ELECTRICAL SPECIFICATIONS

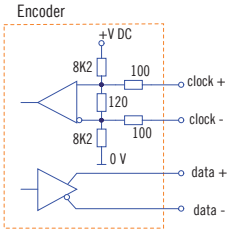
Multiturn resolution	from 2 to 16384 turns
Singleturn resolution	from 2 to 8192 ppr
Power supply	7,6 ... 29,4 V DC
Current consumption without load	100 mA
Max load current	20 mA / channel
Output type*	P = push-pull (iC-HD2) S = RS-422 (LTC1690 or equivalent)
Auxiliary inputs (U/D - Latch)	active high (+V DC) connect to 0 V if not used
Max frequency	output: 25 kHz LSB (Bit Parallel) clock input: 100 kHz ... 1 MHz (SSI)
SSI monostable time (Tm)	18 µs
SSI pause time (Tp)	> 35 µs
SSI frame	Tree format (MSB ... LSB) up to 12 bit multiturn = length 25 bit (12MT + 13ST) 13 to 14 bit multiturn = length 27 bit (14MT + 13ST)
Accuracy	± 1/2 LSB
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 8* / 9* / 10* / 12* / 14 / 15 mm * with supplied adapter shaft
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	5 x 10^{-6} kgm^2 (119 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
Housing material	painted aluminum
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Fixing torque for collar clamping	1,5 Nm (212 Ozin) recommended
Weight	450 g (15,87 oz)

SSI SCHEMATICS



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BIT PARALLEL CONNECTIONS

Function	Binary / Gray	Cable PD	Cable PE	19 pin MA	32 pin ME
bit 1 (LSB)	B^0 / G^0	green	green	A	A
bit 2	B^1 / G^1	yellow	yellow	B	B
bit 3	B^2 / G^2	blue	blue	C	C
bit 4	B^3 / G^3	brown	brown	D	D
bit 5	B^4 / G^4	orange or pink	orange or pink	E	E
bit 6	B^5 / G^5	white	white	F	F
bit 7	B^6 / G^6	grey	grey	G	G
bit 8	B^7 / G^7	purple	purple	H	H
bit 9	B^8 / G^8	grey / pink	grey / pink	J	J
bit 10	B^9 / G^9	white / green	white / green	K	K
bit 11	B^{10} / G^{10}	brown / green	brown / green	L	L
bit 12	B^{11} / G^{11}	white / yellow	white / yellow	M	M
bit 13	B^{12} / G^{12}	yellow / brown	yellow / brown	N	N
bit 14	B^{13} / G^{13}	/	white / grey	/	P
bit 15	B^{14} / G^{14}	/	grey / brown	/	R
bit 16	B^{15} / G^{15}	/	white / pink	/	S
bit 17	B^{16} / G^{16}	/	pink / brown	/	T
bit 18	B^{17} / G^{17}	/	white / blue	/	U
bit 19	B^{18} / G^{18}	/	brown / blue	/	V
bit 20	B^{19} / G^{19}	/	white / red	/	W
bit 21	B^{20} / G^{20}	/	brown / red	/	X
bit 22	B^{21} / G^{21}	/	white / black	/	Y
bit 23	B^{22} / G^{22}	/	brown / black	/	Z
bit 24	B^{23} / G^{23}	/	grey / green	/	a
bit 25	B^{24} / G^{24}	/	yellow / pink	/	b
bit 26	B^{25} / G^{25}	/	yellow / blue	/	c
bit 27	B^{26} / G^{26}	/	green / blue	/	d
LATCH	/	/	yellow / grey	R	e
0 V	/	black	black	T	j
U / D	/	red / blue	red / blue	U	g
+ V DC	/	red	red	V	h
⏚	/	shield	shield	S	housing

BIT PARALLEL CONNECTOR OR CABLE CHOICE

According to the resolution and the chosen number of turns is possible to calculate the connections required by the connector or the cable. From the below table is possible to know the connection number.

EXAMPLE 1:
256 PPR = 8 connections
N° turns 32 = 5 connections
Total connections 13.

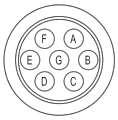
EXAMPLE 2:
4096 PPR = 12 connections
N° turns 4096 = 12 connections
Total connections 24.

From 1 to 13 connections a 16 cores cable (PD) or a 19 cores connector (MA) have to be considered.
From 14 to 27 connections a 32 cores cable (PE) or a 32 cores connector (ME) have to be considered.
If LATCH is used a cable or a 32 poles connector is required.

SSI CONNECTIONS

Function	Cable PC	7 pin MC	12 pin HA	8 pin M12
+ V DC	red	G	8	8
0 V	black	F	1	5
data +	green	C	2	3
data -	brown	D	10	2
clock +	yellow	A	3	4
clock -	orange or pink	B	11	6
U / D	red / blue	E	5	7
⏚	shield	housing	9	housing

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



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

MA connector (19 pin)
Amphenol 62IN 12E 14-19 P
solder side view FV

ME connector (32 pin)
Glenair IPT 02 A 18-32 P F6
solder side view FV

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

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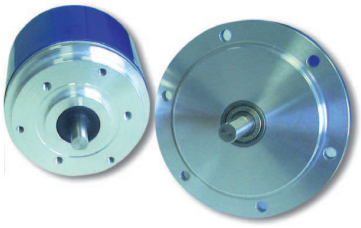
EAM 90 A - 115 A
BIT PARALLEL - SSI
SOLID SHAFT MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Optical absolute multiturn encoder for general factory automation.

- Optical sensor technology (OptoASIC + gears)
- Resolution up to 27 bit (13 bit single turn (8192 ppr) + 14 bit multiturn (16384 turns))
- Power supply up to +28 V DC with Bit Parallel or SSI as electrical interface
- Cable or connector output
- Solid shaft up to 11 mm diameter
- Mounting by synchronous or REO-444 flange



ORDERING CODE BIT PARALLEL	EAM	90A	R	512 / 512	G	8/28	P	P	X	10	X	6	PD	R	. XXX

SERIES
multiturn absolute encoder EAM

MODEL
synchronous flange ø 40 mm 90A
REO444 flange 115A

rev. 2.0 R

MULTITURN RESOLUTION
(powers of 2) turns from 2 to 16384

SINGLETURN RESOLUTION
(powers of 2) ppr from 2 to 8192

CODE TYPE
binary B
gray G

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
push-pull P

LOGIC
negative N
positive P

OPTIONS
latch L
to be reported if not used X

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

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

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

OUTPUT TYPE
(up to 13 bit as total resolution) 16 cores cable (standard length 1,5 m) PD
(from 14 to 27 bit as total resolution or with latch option) 32 cores cable (standard length 1,5 m) PE
(up to 13 bit as total resolution) 19 pin MIL connector MA
(from 14 to 27 bit as total resolution) 32 pin MIL connector ME
female connector included, without female please add 162 as variant code

DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

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ORDERING CODE SSI	EAM	90A	R	4096 / 4096	G	8/28	S	X	X	10	X	6	MC	R	. XXX

SERIES
multiturn absolute encoder EAM

MODEL
synchronous flange ø 40 mm 90A
RE0444 flange 115A

rev. 2.0 R

MULTITURN RESOLUTION
(powers of 2) turns from 2 to 16384

SINGLETURN RESOLUTION
ppr 4096 / 8192

CODE TYPE
binary B
gray G

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
to be reported X

OPTIONS
to be reported X

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

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

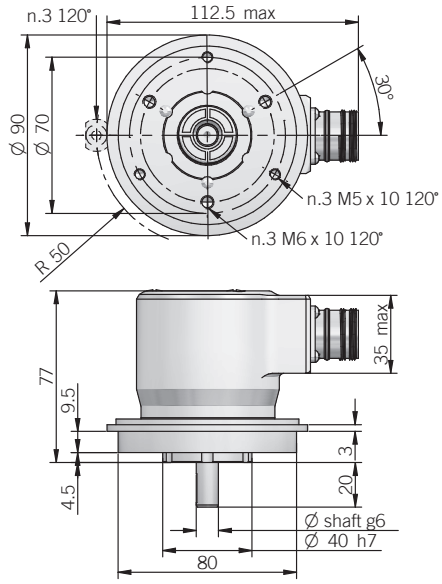
MAX ROTATION SPEED
(IP 66) 3000 rpm 3
(IP 54) 6000 rpm 6

OUTPUT TYPE
cable (standard length 1,5 m) PC
7 pin MIL connector MC
12 pin M23 connector HA
8 pin M12 connector M12
female connector included, without female please add 162 as variant code

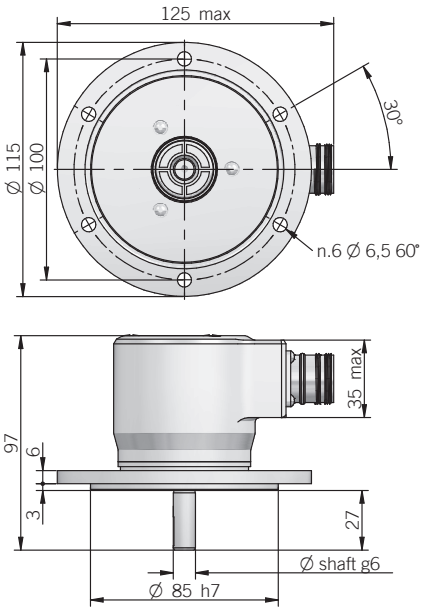
DIRECTION TYPE
axial A
radial R

VARIANT
custom version XXX

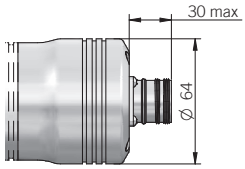
90 A



115 A



Dimensions with axial output



fixing clamps not included, please refer to Accessories section

dimensions in mm

ELECTRICAL SPECIFICATIONS

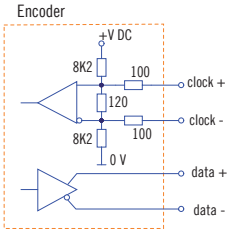
Multiturn resolution	from 2 to 16384 turns
Singleturn resolution	from 2 to 8192 ppr
Power supply	7,6 ... 29,4 V DC
Current consumption without load	100 mA
Max load current	20 mA / channel
Output type*	P = push-pull (iC-HD2) S = RS-422 (LTC1690 or equivalent)
Auxiliary inputs (U/D - Latch)	active high (+V DC) connect to 0 V if not used
Max frequency	output: 25 kHz LSB (Bit Parallel) clock input: 100 kHz ... 1 MHz (SSI)
SSI monostable time (Tm)	18 µs
SSI pause time (Tp)	> 35 µs
SSI frame	Tree format (MSB ... LSB) up to 12 bit multiturn = length 25 bit (12MT + 13ST) 13 to 14 bit multiturn = length 27 bit (14MT + 13ST)
Accuracy	± 1/2 LSB
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 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	100 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	painted aluminium
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Weight	650 g (22,93 oz)

SSI SCHEMATICS



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BIT PARALLEL CONNECTIONS

Function	Binary / Gray	Cable PD	Cable PE	19 pin MA	32 pin ME
bit 1 (LSB)	B^0 / G^0	green	green	A	A
bit 2	B^1 / G^1	yellow	yellow	B	B
bit 3	B^2 / G^2	blue	blue	C	C
bit 4	B^3 / G^3	brown	brown	D	D
bit 5	B^4 / G^4	orange or pink	orange or pink	E	E
bit 6	B^5 / G^5	white	white	F	F
bit 7	B^6 / G^6	grey	grey	G	G
bit 8	B^7 / G^7	purple	purple	H	H
bit 9	B^8 / G^8	grey / pink	grey / pink	J	J
bit 10	B^9 / G^9	white / green	white / green	K	K
bit 11	B^{10} / G^{10}	brown / green	brown / green	L	L
bit 12	B^{11} / G^{11}	white / yellow	white / yellow	M	M
bit 13	B^{12} / G^{12}	yellow / brown	yellow / brown	N	N
bit 14	B^{13} / G^{13}	/	white / grey	/	P
bit 15	B^{14} / G^{14}	/	grey / brown	/	R
bit 16	B^{15} / G^{15}	/	white / pink	/	S
bit 17	B^{16} / G^{16}	/	pink / brown	/	T
bit 18	B^{17} / G^{17}	/	white / blue	/	U
bit 19	B^{18} / G^{18}	/	brown / blue	/	V
bit 20	B^{19} / G^{19}	/	white / red	/	W
bit 21	B^{20} / G^{20}	/	brown / red	/	X
bit 22	B^{21} / G^{21}	/	white / black	/	Y
bit 23	B^{22} / G^{22}	/	brown / black	/	Z
bit 24	B^{23} / G^{23}	/	grey / green	/	a
bit 25	B^{24} / G^{24}	/	yellow / pink	/	b
bit 26	B^{25} / G^{25}	/	yellow / blue	/	c
bit 27	B^{26} / G^{26}	/	green / blue	/	d
LATCH	/	/	yellow / grey	R	e
0 V	/	black	black	T	j
U / D	/	red / blue	red / blue	U	g
+ V DC	/	red	red	V	h
⏚	/	shield	shield	S	housing

BIT PARALLEL CONNECTOR OR CABLE CHOICE

According to the resolution and the chosen number of turns is possible to calculate the connections required by the connector or the cable. From the below table is possible to know the connection number.

EXAMPLE 1:
256 PPR = 8 connections
N° turns 32 = 5 connections
Total connections 13.

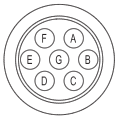
EXAMPLE 2:
4096 PPR = 12 connections
N° turns 4096 = 12 connections
Total connections 24.

From 1 to 13 connections a 16 cores cable (PD) or a 19 cores connector (MA) have to be considered.
From 14 to 27 connections a 32 cores cable (PE) or a 32 cores connector (ME) have to be considered.
If LATCH is used a cable or a 32 poles connector is required.

SSI CONNECTIONS

Function	Cable PC	7 pin MC	12 pin HA	8 pin M12
+ V DC	red	G	8	8
0 V	black	F	1	5
data +	green	C	2	3
data -	brown	D	10	2
clock +	yellow	A	3	4
clock -	orange or pink	B	11	6
U / D	red / blue	E	5	7
⏚	shield	housing	9	housing

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



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

MA connector (19 pin)
Amphenol 62IN 12E 14-19 P
solder side view FV

ME connector (32 pin)
Glenair IPT 02 A 18-32 P F6
solder side view FV

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

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EAM 58 B / C - 63 A / D / E PROFIBUS

SOLID SHAFT MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard multiturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC + gears)
- 25 bit total resolution (13 bit single turn (8192 ppr) + 12 bit multiturn (4096 turns))
- Power supply up to +28 V DC with Profibus DP as electrical interface
- Intelligent status leds
- Terminal box or M12 connector for fast setup
- Solid shaft diameter up to 10 mm
- Mounting by synchronous, clamping or centering 2,5" square flange

EAM	63A	R	4096 / 4096	B	12/28	FXX	10	X	6	P3R	. XXX

SERIES
multiturn absolute encoder EAM

MODEL
synchronous flange ø 31.75 mm 63A
synchronous flange ø 50 mm 58B
clamping flange ø 36 mm 58C
centering square flange ø 31.75 mm 63D
centering square flange ø 50 mm 63E

rev. 2.0 R

MULTITURN RESOLUTION
turns 4096

SINGLETURN RESOLUTION
ppr 4096 / 8192

CODE TYPE
binary B

POWER SUPPLY
12 ... 28 V DC 12/28

ELECTRICAL INTERFACE
PROFIBUS DP V0 CLASS 2 FXX

SHAFT DIAMETER
(mod. 58 B) mm 6
(mod. 63 A / D) (3/8") 9,52 mm 9
(mod. 58 C - 63 A / D / E) 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
terminal box - radial cable glands P3R
radial M12 connector M12R
female connector included, without female please add 162 as variant code

VARIANT
custom version XXX

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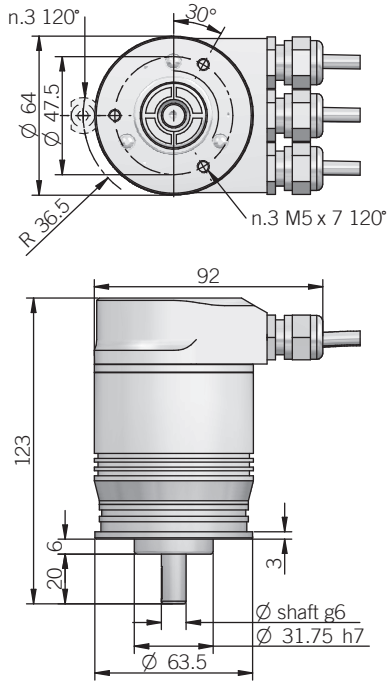
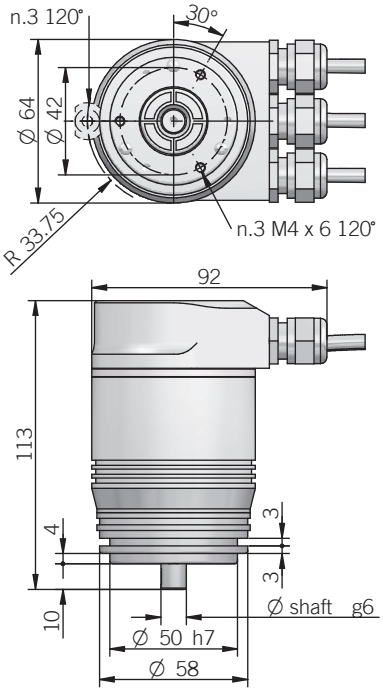
63 A



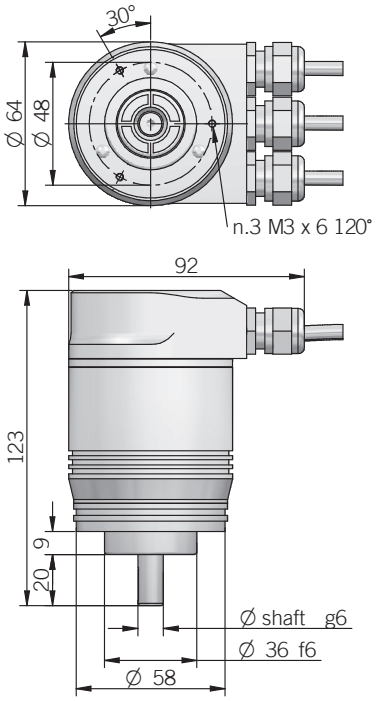
fixing clamps not included, please refer to Accessories section

58 B

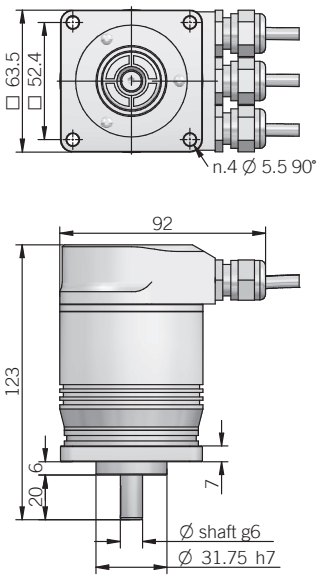


fixing clamps not included, please refer to Accessories section

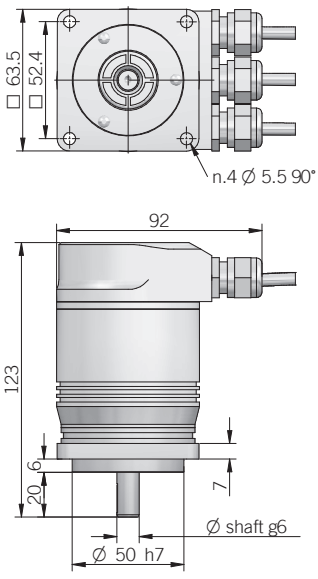
58 C



63 D



63 E



dimensions in mm

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ELECTRICAL SPECIFICATIONS

Multiturn resolution	1 ... 4096 turns programmable during commissioning
Singleturn resolution	2 ... 4096 / 2 ... 8192 ppr programmable during commissioning
Power supply	11,4 ... 29,4 V DC
Current consumption without load	300 mA
Output type	RS 485 galvanically isolated
Max bus frequency	12 Mbaud
Diagnostic features	frequency warning position warning / alarm please refer to installation manual for more informations
Max frequency	max 25 kHz LSB
Accuracy	± 1/2 LSB
Counting direction	programmable during commissioning
Start-up time	500 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 6 / 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 - 3000 rpm
Max shaft load	10 N axial / 20 N radial with ø6 shaft 100 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	painted aluminium
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Weight	650 g (22,93 oz)

CONNECTIONS

Function	Pin M12A male	Pin M12B female	Pin M12B male
+ V DC	2		
0 V	4		
signal A (out)		2	
signal B (out)		4	
signal A (in)			2
signal B (in)			4

S3 connector
(M12 5 pins A coded)
power supply
view solder side FV

S3 connector
(M12 5 pins B coded)
line out - female
view solder side FV

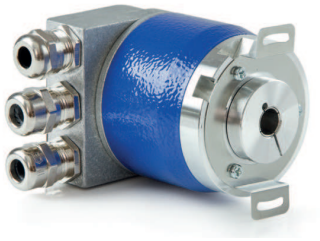
S3 connector
(M12 5 pins B coded)
line in - male
view solder side MV

EAM 58 F - 63 F / G
PROFIBUS
BLIND HOLLOW SHAFT MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard multiturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC + gears)
- 25 bit total resolution (13 bit single turn (8192 ppr) + 12 bit multiturn (4096 turns))
- Power supply up to +28 V DC with Profibus DP as electrical interface
- Intelligent status leds
- Terminal box or M12 connector for fast setup
- Blind hollow shaft up to 15 mm diameter
- Mounting by stator coupling, spring or torque pin



ORDERING CODE	EAM	63F	R	4096 / 4096	B	12/28	FXX	8	X	3	P3R	. XXX

SERIES
multiturn absolute encoder EAM

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

rev. 2.0 R

MULTITURN RESOLUTION
turns 4096

SINGLETURN RESOLUTION
ppr 4096 / 8192

CODE TYPE
binary B

POWER SUPPLY
12 ... 28 V DC 12/28

ELECTRICAL INTERFACE
PROFIBUS DP V0 CLASS 2 FXX

BORE DIAMETER
mm 8
(3/8") 9,52 mm 9
mm 10
mm 12
mm 14
mm 15

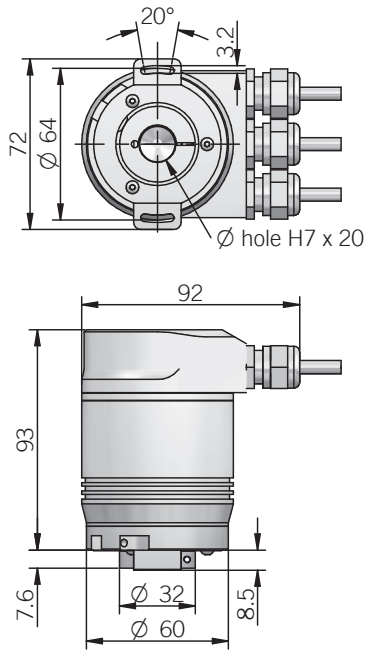
ENCLOSURE RATING
IP 54 X

MAX ROTATION SPEED
3000 rpm 3

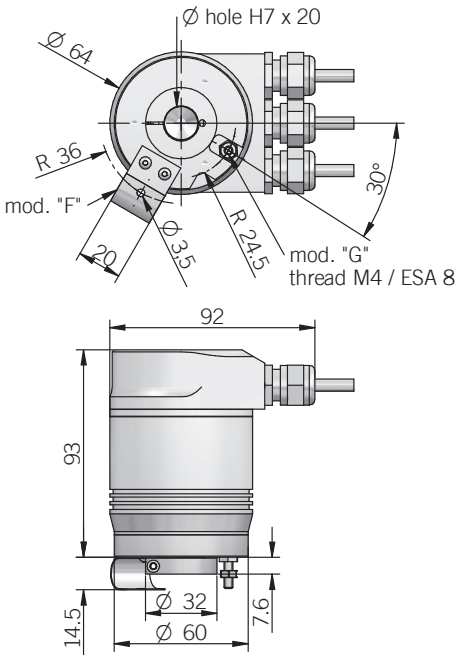
OUTPUT TYPE
terminal box - radial cable glands P3R
radial M12 connector M12R
female connector included, without female please add 162 as variant code

VARIANT
custom version XXX

58 F



63 F - G



dimensions in mm

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

ELECTRICAL SPECIFICATIONS

Multiturn resolution	1 ... 4096 turns programmable during commissioning
Singleturn resolution	2 ... 4096 / 2 ... 8192 ppr programmable during commissioning
Power supply	11,4 ... 29,4 V DC
Current consumption without load	300 mA
Output type	RS 485 galvanically isolated
Max bus frequency	12 Mbaud
Diagnostic features	frequency warning position warning / alarm please refer to installation manual for more informations
Max frequency	max 25 kHz LSB
Accuracy	± 1/2 LSB
Counting direction	programmable during commissioning
Start-up time	500 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICATIONS

Bore diameter	ø 8* / 9* / 10* / 12* / 14 / 15 mm * with supplied adapter shaft
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	5 x 10^{-6} kgm^2 (119 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
Housing material	painted aluminium
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Fixing torque for collar clamping	1,5 Nm (212 Ozin) recommended
Weight	650 g (22,93 oz)

CONNECTIONS

Function	Pin M12A male	Pin M12B female	Pin M12B male
+ V DC	2		
0 V	4		
signal A (out)		2	
signal B (out)		4	
signal A (in)			2
signal B (in)			4

S3 connector
(M12 5 pins A coded)
power supply
view solder side FV

S3 connector
(M12 5 pins B coded)
line out - female
view solder side FV

S3 connector
(M12 5 pins B coded)
line in - male
view solder side MV

EAM 90 A -115 A PROFIBUS

SOLID SHAFT MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard multiturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC + gears)
- 25 bit total resolution (13 bit single turn (8192 ppr) + 12 bit multiturn (4096 turns))
- Power supply up to +28 V DC with Profibus DP as electrical interface
- Intelligent status leds
- Terminal box or M12 connector for fast setup
- Solid shaft diameter up to 11 mm
- Mounting by synchronous or REO-444 flange

ORDERING CODE	EAM	90A	R	4096 / 4096	B	12/28	FXX	8	X	6	P3R	.XXX

SERIES
multiturn absolute encoder EAM

MODEL
synchronous flange ø 40 mm 90A
REO444 flange 115A

rev. 2.0 R

MULTITURN RESOLUTION
turns 4096

SINGLETURN RESOLUTION
ppr 4096 / 8192

CODE TYPE
binary B

POWER SUPPLY
12 ... 28 V DC 12/28

ELECTRICAL INTERFACE
PROFIBUS DP V0 CLASS 2 FXX

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

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

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

OUTPUT TYPE
terminal box - radial cable glands P3R
radial M12 connector M12R
female connector included, without female please add 162 as variant code

VARIANT
custom version XXX

1985 - 2015
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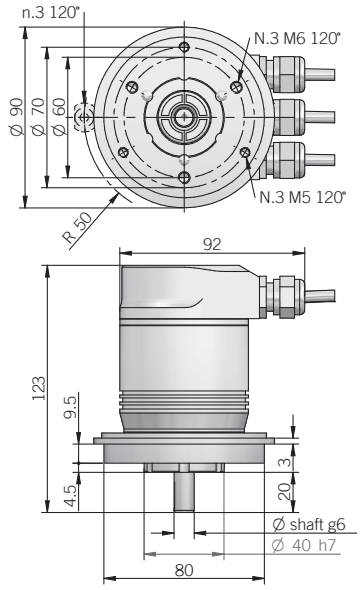
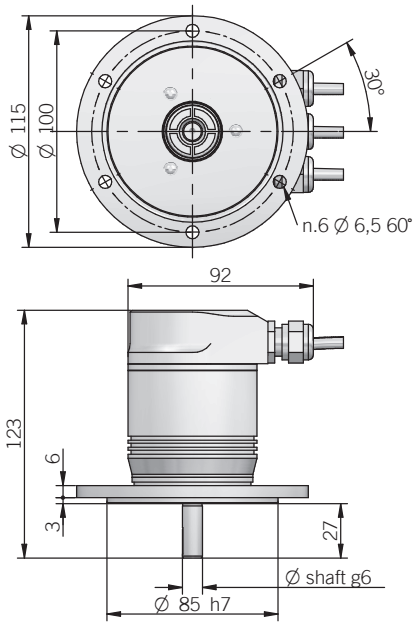
90 A



fixing clamps not included, please refer to Accessories section

dimensions in mm

115 A



ELECTRICAL SPECIFICATIONS

Multiturn resolution	1 ... 4096 turns programmable during commissioning
Singleturn resolution	2 ... 4096 / 2 ... 8192 ppr programmable during commissioning
Power supply	11,4 ... 29,4 V DC
Current consumption without load	300 mA
Output type	RS 485 galvanically isolated
Max bus frequency	12 Mbaud
Diagnostic features	frequency warning position warning / alarm please refer to installation manual for more informations
Max frequency	max 25 kHz LSB
Accuracy	± 1/2 LSB
Counting direction	programmable during commissioning
Start-up time	500 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 9,52 / 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	100 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	painted aluminium
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +60°C (+32° ... +140°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Weight	750 g (26,46 oz)

CONNECTIONS

Function	Pin M12A male	Pin M12B female	Pin M12B male
+ V DC	2		
0 V	4		
signal A (out)		2	
signal B (out)		4	
signal A (in)			2
signal B (in)			4

S3 connector
(M12 5 pins A coded)
power supply
view solder side FV

S3 connector
(M12 5 pins B coded)
line out - female
view solder side FV

S3 connector
(M12 5 pins B coded)
line in - male
view solder side MV

AAM 58 B / C PROFINET

SOLID SHAFT MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard multiturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC + gears)
- 25 bit total resolution (13 bit single turn + 12 bit multiturn)
- Power supply up to +30 V DC with Profinet IO as electrical interface
- Intelligent status leds
- M12 connector for fast setup
- Solid shaft diameter up to 10 mm
- Mounting by synchronous or clamping flange
- Operating temperature -40° ... +80°C (-40° ... +176°F)

ORDERING CODE	AAM	58B	12	/	13	B	10/30	PFN	6	X	X	M12R	.162

SERIES
absolute multiturn encoder AAM

MODEL
synchronous flange ø 50 mm 58B
clamping flange ø 36 mm 58C

MULTITURN RESOLUTION
bit 12

SINGLETURN RESOLUTION
bit 13

CODE TYPE
binary B

POWER SUPPLY
10 ... 30 V DC 10/30

ELECTRICAL INTERFACE
PROFINET IO PFN

SHAFT DIAMETER
(mod. 58B) mm 6
(mod. 58C) mm 10

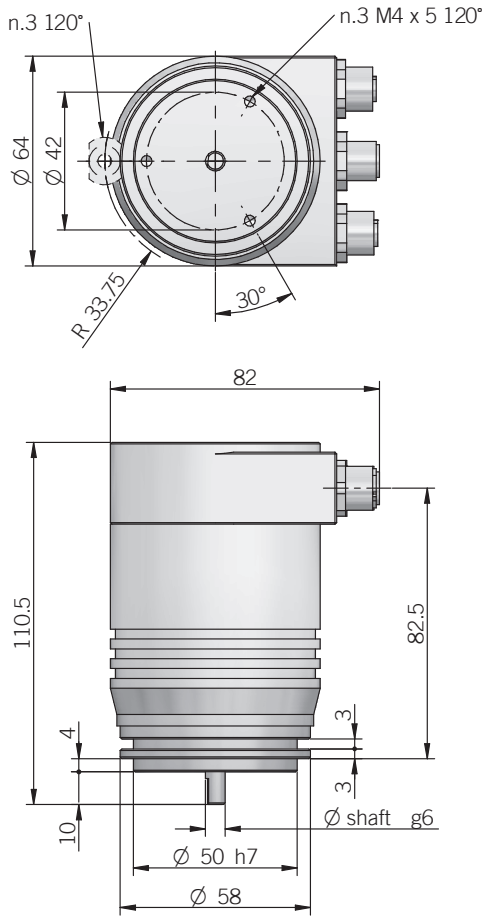
ENCLOSURE RATING
IP 65 X

OPTIONS
to be reported X

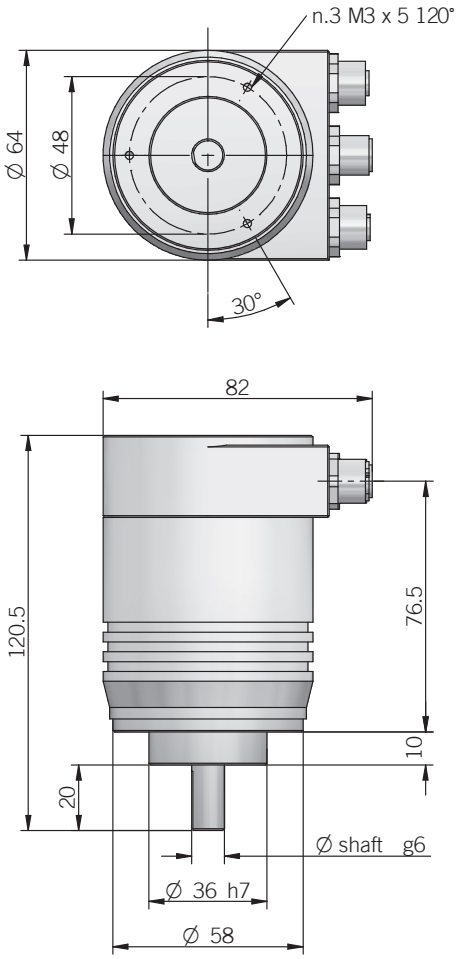
OUTPUT TYPE
radial M12 connector M12R

VARIANT
without mating connector 162

58 B



58 C



fixing clamps not included, please refer to Accessories

dimensions in mm

ELECTRICAL SPECIFICATIONS

Multiturn resolution	1 ... 12 bit programmabile during commissioning
Singleturn resolution	1 ... 13 bit programmabile during commissioning
Power supply	10 ... 30 V DC (with reverse polarity protection)
Current consumption without load	< 200 mA
Electrical interface	PROFINET IO RT Class 1 / Conformance Class B
Encoder profile	V 4.1 - Application Class 3
Hardware features	Ertec 200 auto-negotiation auto-polarity auto-crossover diagnostic LEDs
Code type	binary
Max bus frequency	100 Mbit/s
Cycle time	≤ 1 ms
Accuracy	± 0,04°
Start-up time	500 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHs	according to 2011/65/EU directive

MECHANICAL SPECIFICATIONS

Solid shaft diameter	ø 6 mm (mod. 58B) ø 10 mm (mod. 58C)
Enclousure rating	IP 65 (IEC 60529)
Max rotation speed	6000 rpm
Max shaft load	80 N radial / 40 N axial
Starting torque (at +20°C / 68°F)	< 0,05 Nm
Moment of inertia	approx 1,8 x 10^{-6} kgm^2
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibrations	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Bearings life	10^9 revolutions
Bearings	n° 2 ball bearings
Shaft material	1.4305 / AISI 303 stainless steel
Body / cover material	EN-AW 2011 aluminium
Housing material	painted aluminium
Operating temperature	-40° ... +80°C (-40° ... +176°F)
Storage temperature	-40° ... +85°C (-40° ... +185°F)
Weight	600 g (21 oz)

CONNECTIONS

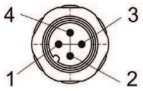
	Pin	Function
PORT 1 Connector	1	Tx D+
	2	Rx D+
	3	Tx D-
	4	Rx D-
POWER connector	1	+V DC
	2	/
	3	0 V
	4	/
PORT 2 Connector	1	Tx D+
	2	Rx D+
	3	Tx D-
	4	Rx D-

female connectors not included, please refer to Accessories section

PORT 1 POWER PORT 2

PORT 1 / 2 connector
M12 D-coded (4-pin)
(front view)

POWER connector
M12 A-coded
(front view)



AAM 58 F
PROFINET
BLIND HOLLOW SHAFT MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard multiturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC + gears)
- 25 bit total resolution (13 bit single turn + 12 bit multiturn)
- Power supply up to +30 V DC with Profinet IO as electrical interface
- Intelligent status leds
- M12 connector for fast setup
- Blind hollow shaft diameter up to 15 mm
- Mounting by stator coupling
- Operating temperature -40° ... +80°C (-40° ... +176°F)

ORDERING CODE	AAM	58F	12	/	13	B	10/30	PFN	15	X	X	M12R	.162

SERIES
absolute multiturn encoder AAM

MODEL
blind hollow shaft with stator coupling 58F

MULTITURN RESOLUTION
bit 12

SINGLETURN RESOLUTION
bit 13

CODE TYPE
binary B

POWER SUPPLY
10 ... 30 V DC 10/30

ELECTRICAL INTERFACE
PROFINET IO PFN

BORE DIAMETER
mm 15

ENCLOSURE RATING
IP 65 X

OPTIONS
to be reported X

OUTPUT TYPE
radial M12 connector M12R

VARIANT
without mating connector 162

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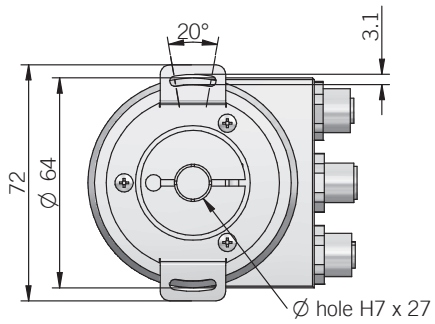
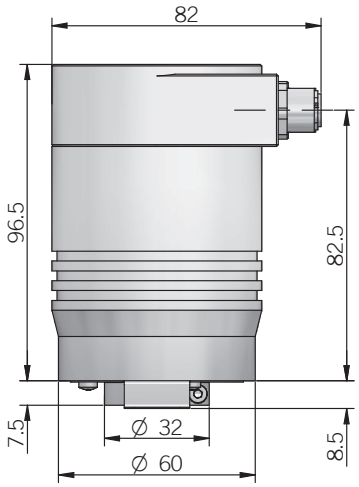
58 F





dimensions in mm

MECHANICAL SPECIFICATIONS

Bore diameter	ø 15 / 12* / 10* mm * with optional adapter shaft, please refer to Accessories section
Enclousure rating	IP 65 (IEC 60529)
Max rotation speed	6000 rpm
Max shaft load	80 N radial / 40 N axial
Starting torque (at +20°C / 68°F)	< 0,05 Nm
Moment of inertia	approx 1,8 x 10^{-6} kgm^2
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibrations	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Bearings life	10^9 revolutions
Bearings	n° 2 ball bearings
Shaft material	1.4305 / AISI 303 stainless steel
Body / cover material	EN-AW 2011 aluminium
Housing material	painted aluminium
Flange material	EN-AW 2011 aluminium
Operating temperature	-40° ... +80°C (-40° ... +176°F)
Storage temperature	-40° ... +85°C (-40° ... +185°F)
Fixing torque for collar clamping	1,5 Nm (212 Ozin) recommended
Weight	600 g (21 oz)

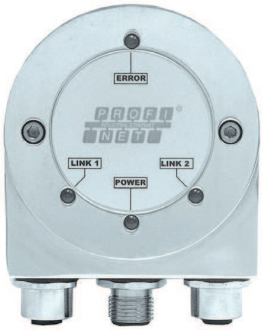
ELECTRICAL SPECIFICATIONS

Multiturn resolution	1 ... 12 bit programmabile during commissioning
Singleturn resolution	1 ... 13 bit programmabile during commissioning
Power supply	10 ... 30 V DC (with reverse polarity protection)
Current consumption without load	< 200 mA
Electrical interface	PROFINET IO RT Class 1 / Conformance Class B
Encoder profile	V 4.1 - Application Class 3
Hardware features	Ertec 200 auto-negotiation auto-polarity auto-crossover diagnostic LEDs
Code type	binary
Max bus frequency	100 Mbit/s
Cycle time	≤ 1 ms
Start-up time	500 ms
Accuracy	± 0,04°
Electromagnetic compatibility	according to 2014/30/EU directive
RoHs	according to 2011/65/EU directive

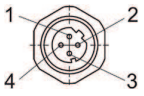
CONNECTIONS

	Pin	Function
PORT 1 Connector	1	Tx D+
	2	Rx D+
	3	Tx D-
	4	Rx D-
POWER connector	1	+V DC
	2	/
	3	0 V
	4	/
PORT 2 Connector	1	Tx D+
	2	Rx D+
	3	Tx D-
	4	Rx D-

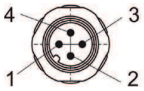
female connectors not included, please refer to Accessories section



PORT 1 / 2 connector
M12 D-coded (4-pin)
(front view)



POWER connector
M12 A-coded
(front view)



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EAMX 80 A / D
SSI
EXPLOSION PROOF ATEX MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Explosion proof encoder for applications within explosive and hazardous areas.

- Optical sensor technology (OptoASIC + gears)
- Resolution up to 27 bit (13 bit single turn (8192 ppr) + 14 bit multiturn (16384 turns))
- Power supply up to +28 V DC with SSI as electrical interface
- Cable output
- Solid shaft diameter up to 10 mm
- Mounting with syncronous or centering square flange

EX CLASSIFICATION

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

- EN 60079-0:2012+A11:2013
- EN 60079-1:2007
- EN 60079-31:2014

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

ORDERING CODE	EAMX	80A	4096 / 4096	G	8/28	S	X	X	10	X	3	PR	. XXX

SERIES
multiturn absolute explosion proof encoder EAMX

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

MULTITURN RESOLUTION
(powers of 2) turns from 2 to 16384

SINGLETURN RESOLUTION
ppr 4096 / 8192

CODE TYPE
binary B
gray G

POWER SUPPLY
8 ... 28 V DC 8/28

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
to be reported X

OPTION
to be reported X

SHAFT DIAMETER
mm 10

ENCLOSURE RATING
IP 65 X

MAX ROTATION SPEED
3000 rpm 3

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

VARIANT
custom version XXX

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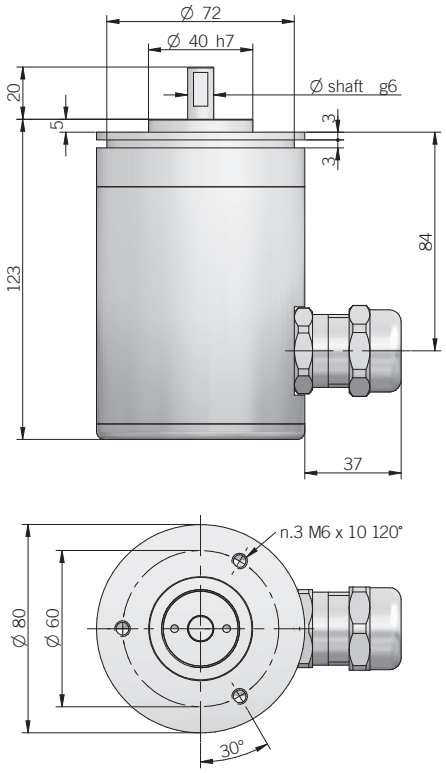
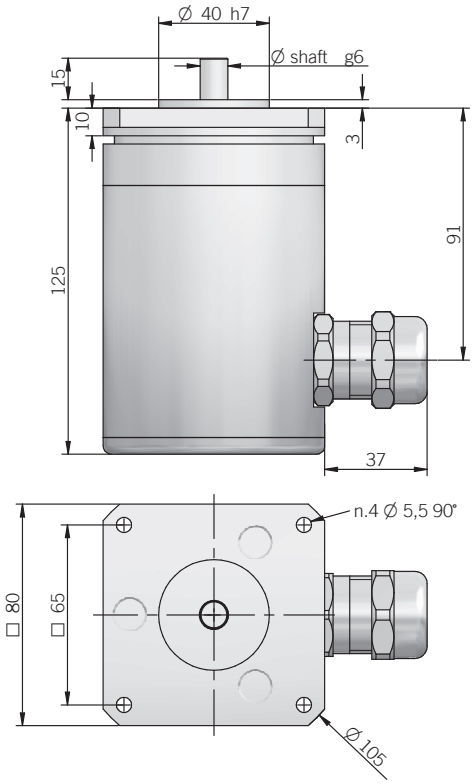
80 A



80 D



fixing clamps not included, please refer to Accessories section

dimensions in mm

ELECTRICAL SPECIFICATIONS

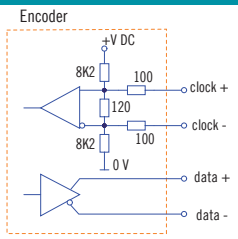
Multiturn resolution	from 2 to 16384 turns
Singleturn resolution	4096 / 8192 ppr
Power supply	7,6 ... 29,4 V DC
Current consumption without load	100 mA
Max load current	20 mA / channel
Output type*	RS-422 (LTC1690 or equivalent)
Auxiliary input (U/D)	active high (+V DC) connect to 0 V if not used
Clock frequency	100 kHz ... 1 MHz
SSI monostable time (Tm)	18 µs
SSI pause time (Tp)	> 35 µs
SSI frame	Tree format (MSB ... LSB) up to 12 bit multiturn = length 25 bit (12MT + 13ST) 13 to 14 bit multiturn = length 27 bit (14MT + 13ST)
Accuracy	± 1/2 LSB
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

MECHANICAL SPECIFICATIONS

Shaft diameter	ø 10 mm
Enclosure rating	IP 65 (IEC 60529)
Max rotation speed	3000 rpm
Max shaft load	200 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	1,5 x 10^{-6} kgm^2 (36 x 10^{-6} lbft^2)
Starting torque (at 20°C / +68°F)	< 0,03 Nm (4,25 Ozin)
Bearing stage material	anodized aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	anodized aluminum
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	0° ... +50°C (+32° ... +122°F)
Storage temperature	-15° ... +70°C (+5° ... +158°F)
Weight	1200 g (42,33 oz)

SSI SCHEMATICS



CONNECTIONS

Function	Cable
+ V DC	red
0 V	grey
data +	green
data -	brown
clock +	yellow
clock -	pink
U / D	blue
⏚	shield

ATEX MARKING

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

II 2GD

II: group II: different than mines
2: category 2: high level of protection
GD: areas containing gas (G) and dust (D)

Ex d IIC T6 Gb

Ex d: flameproof enclosure for explosive atmospheres with gases, vapours and mists
IIC: group of gas IIC
T6: max surface temperature +85°C of the device for atmospheres with gas
Gb: product with a high level of protection

Ex tb IIIC T85°C Db

Ex tb: flameproof enclosure safety type
IIIC: group of dust combustibles IIIC
T85°C: max surface temperature +85°C of the device in the presence of dust
Db: product with a high level of protection

EAM 36 A SSI

SOLID SHAFT MAGNETIC MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Miniaturized multiturn absolute encoder for limited size applications.

- Magnetic sensor technology without contact (Magnetic ASIC + Energy Harvesting)
- Sturdy construction thanks to separated chambers
- Up to 51 bit as total resolution (12 bit single turn + 39 bit multiturn)
- Power supply up to +30 V DC with SSI as electrical interface
- Code reset for easy setup
- Cable output, connector available on cable end
- 6 mm diameter solid shaft
- Mounting by fixing flange

ORDERING CODE	EAM	36A	13	/	12	B	5	S	P	X	6	X	8	PR	. XXX

SERIES
magnetic multiturn absolute encoder series EAM

MODEL
fixing flange ø 28 mm 36A

MULTITURN RESOLUTION
turns from 1 to 39 bit

SINGLETURN RESOLUTION
from 1 to 12 bit

CODE TYPE
binary B
gray G

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

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
positive P

OPTIONS
to be reported if not used X
reset ZE

SHAFT DIAMETER
mm 6

ENCLOSURE RATING
IP 67 cover side / IP 65 shaft side X

MAX ROTATION SPEED
8000 rpm 8

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

VARIANT
custom version XXX

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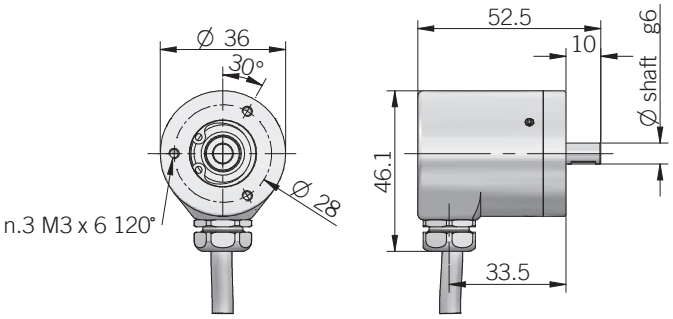
36 A



dimensions in mm

ELECTRICAL SPECIFICATIONS

Multiturn resolution	turns from 1 to 39 bit
Singleturn resolution	ppr from 1 to 12 bit
Power supply	5 = 4,75 ... 5,25 V DC 8/30 = 7,6 ... 30 V DC (reverse polarity protection)
Power draw without load	< 400 mW
Output type*	RS-422 (SN65LBC179Q or equivalent)
Code type	binary or gray
Auxiliary inputs (U/D - Reset)	active high (+V DC) connect to 0 V if not used / Reset t_{min} 150 ms
Clock frequency	100 kHz ... 1 MHz
SSI monostable time (Tm)	20 µs
SSI pause time (Tp)	> 35 µs
SSI frame	Tree format (MSB ... LSB) up to 12 bit multiturn = length 25 bit (12MT + 12ST+'0') 13 to 14 bit multiturn = length 27 bit (14MT + 12ST + '0') 15 to 19 bit multiturn = length 32 bit (19MT + 12ST + '0')
Accuracy	± 0,35° typical
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

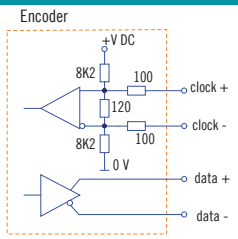
MECHANICAL SPECIFICATIONS

Shaft diameter	ø 6 mm
Enclosure rating	IP 67 cover side / IP 65 shaft side (IEC 60529)
Rotation speed	8000 rpm continuous / 10000 rpm max
Max shaft load	20 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,001 x 10^{-6} kgm^2 (0,02 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin)
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	AISI 420 stainless steel
Bearing stage material	EN-AW 2011 aluminium
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-20° ... +85°C (-4° ... +185°F)
Storage temperature	-20° ... +85°C (-4° ... +185°F)
Weight	150 g (5,29 oz)

CONNECTIONS

Function	Cable
+ V DC	red
0 V	black
data +	green
data -	brown
clock +	yellow
clock -	orange
U / D	red / blue
RESET	white
⏚	shield

SSI SCHEMATICS



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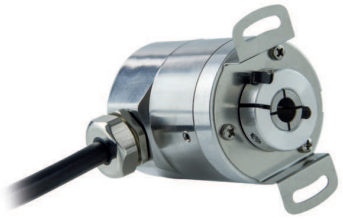
EAM 36 F / G
SSI
BLIND HOLLOW SHAFT MAGNETIC MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Miniaturized multiturn absolute encoder for limited size applications.

- Magnetic sensor technology without contact (Magnetic ASIC + Energy Harvesting)
- Sturdy construction thanks to separated chambers
- Up to 51 bit as total resolution (12 bit single turn + 39 bit multiturn)
- Power supply up to +30 V DC with SSI as electrical interface
- Code reset for easy setup
- Cable output, connector available on cable end
- 6 mm diameter blind hollow shaft
- Mounting by stator coupling or torque pin



ORDERING CODE	EAM	36F	13	/	12	G	8/30	S	P	X	6	X	8	P	.XXX

SERIES
magnetic multiturn absolute encoder series EAM

MODEL
blind hollow shaft with stator coupling 36F
blind hollow shaft with torque pin 36G

MULTITURN RESOLUTION
turns from 1 to 39 bit

SINGLETURN RESOLUTION
from 1 to 12 bit

CODE TYPE
binary B
gray G

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

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
positive P

OPTIONS
to be reported if not used X
reset ZE

BORE DIAMETER
mm 6

ENCLOSURE RATING
IP 67 cover side / IP 65 shaft side X

MAX ROTATION SPEED
8000 rpm 8

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

VARIANT
custom version XXX

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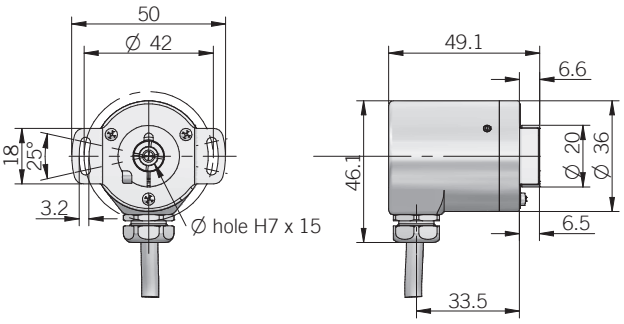
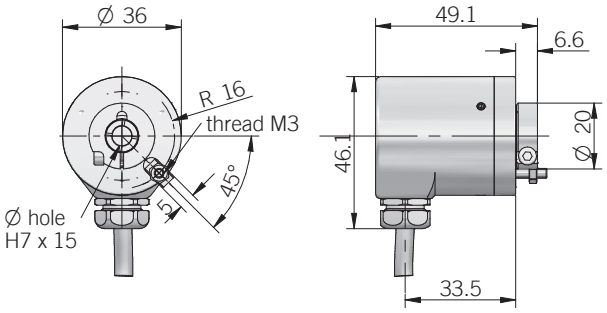
36 F



dimensions in mm

36 G



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

ELECTRICAL SPECIFICATIONS

Multiturn resolution	turns from 1 to 39 bit
Singleturn resolution	ppr from 1 to 12 bit
Power supply	5 = 4,75 ... 5,25 V DC 8/30 = 7,6 ... 30 V DC (reverse polarity protection)
Power draw without load	< 400 mW
Output type*	RS-422 (SN65LBC179Q or equivalent)
Code type	binary or gray
Auxiliary inputs (U/D - Reset)	active high (+V DC) connect to 0 V if not used / Reset t_{min} 150 ms
Clock frequency	100 kHz ... 1 MHz
SSI monostable time (Tm)	20 µs
SSI pause time (Tp)	> 35 µs
SSI frame	Tree format (MSB ... LSB) up to 12 bit multiturn = length 25 bit (12MT + 12ST+'0') 13 to 14 bit multiturn = length 27 bit (14MT + 12ST + '0') 15 to 19 bit multiturn = length 32 bit (19MT + 12ST + '0')
Accuracy	± 0,35° typical
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

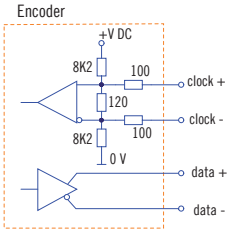
MECHANICAL SPECIFICATIONS

Bore diameter	ø 6 mm
Enclosure rating	IP 67 cover side / IP 65 shaft side (IEC 60529)
Rotation speed	8000 rpm continuous / 10000 rpm max
Max shaft load	20 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,001 x 10^{-6} kgm^2 (0,02 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,01 Nm (1,42 Ozin)
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	AISI 420 stainless steel
Bearing stage material	EN-AW 2011 aluminium
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-20° ... +85°C (-4° ... +185°F)
Storage temperature	-20° ... +85°C (-4° ... +185°F)
Fixing torque for collar clamping	0,6 Nm (85 Ozin) recommended
Weight	150 g (5,29 oz)

CONNECTIONS

Function	Cable
+ V DC	red
0 V	black
data +	green
data -	brown
clock +	yellow
clock -	orange
U / D	red / blue
RESET	white
⏚	shield

SSI SCHEMATICS



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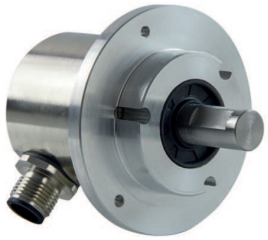
EAMW 58 B / C - 63 A / D SSI

SOLID SHAFT MAGNETIC MULTITURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard multiturn absolute encoder for factory automation applications.

- Magnetic sensor technology without contact (Magnetic ASIC + Energy Harvesting)
- Up to 24 bit as total resolution (12 bit single turn + 12 bit multiturn)
- Power supply up to +30 V DC with SSI as electrical interface
- Code reset for easy setup
- Cable or connector output
- Solid shaft diameter up to 10 mm
- Mounting by synchronous, clamping or centering 2,5" square flange



ORDERING CODE	EAMW	58B	12	/	12	G	8/30	S	P	ZE	6	X	X	P	R	. XXX

SERIES
magnetic multiturn absolute encoder series EAMW

MODEL
synchronous flange ø 31.75 mm 63A
synchronous flange ø 50 mm 58B
clamping flange ø 36 mm 58C
centering square flange ø 31.75 mm 63D

MULTITURN RESOLUTION
12 bit

SINGLETURN RESOLUTION
8 / 10 / 12 bit

CODE TYPE
binary B
gray G

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

ELECTRICAL INTERFACE
Serial Synchronous Interface - SSI S

LOGIC
positive P

OPTIONS
reset ZE

SHAFT DIAMETER
(mod. 58 B) mm 6
(mod. 63 A / D) (3/8") 9,52 mm 9
(mod. 58 C - 63 A / D) mm 10

ENCLOSURE RATING
IP 67 cover side / IP 65 shaft side X

OPTIONS
to be reported X

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

DIRECTION TYPE
radial R

VARIANT
custom version XXX

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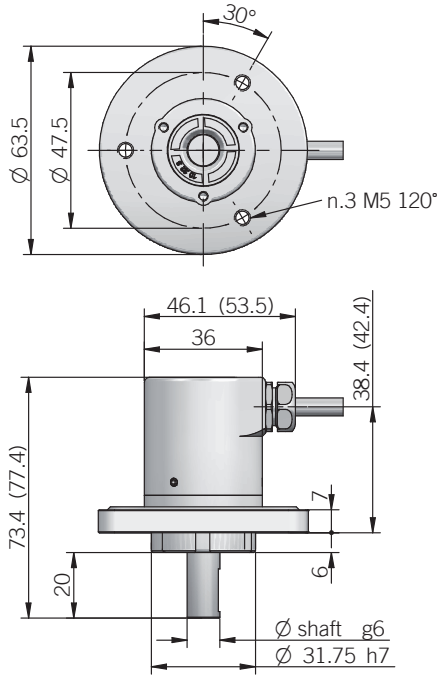
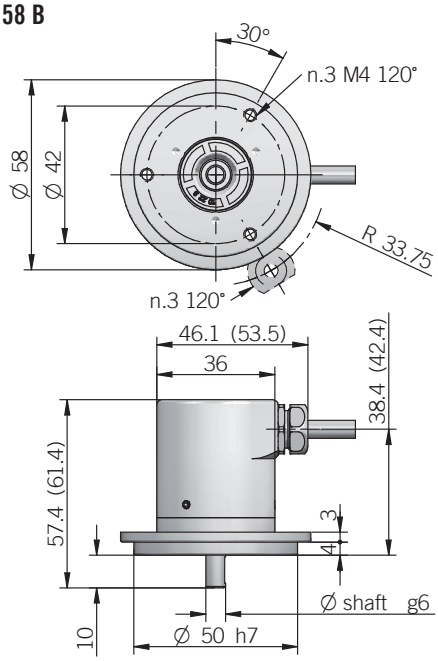
63 A

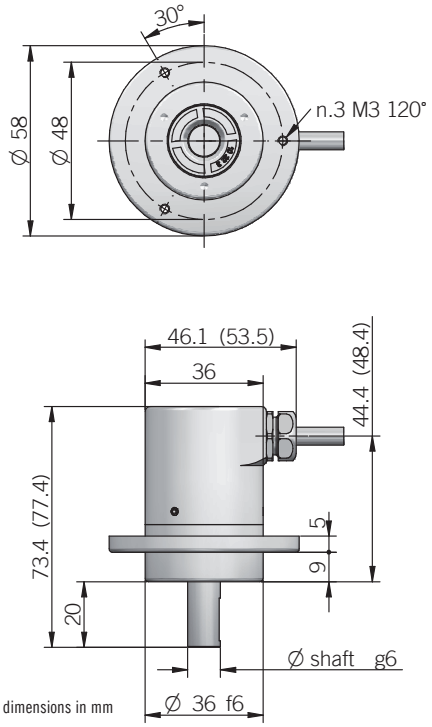


58 B



fixing clamps not included, please refer to Accessories section

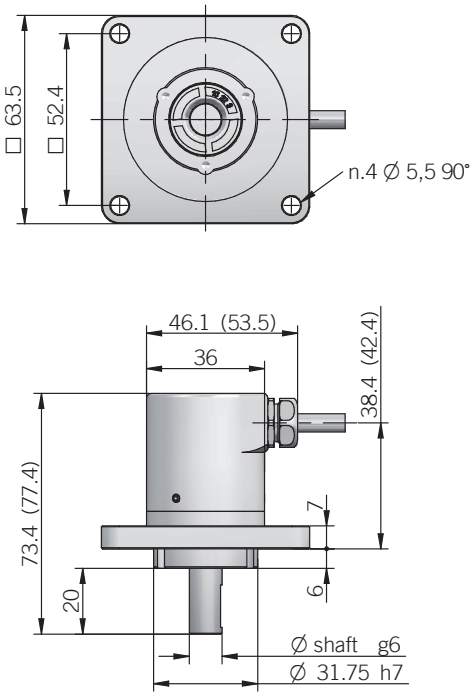
58 C



dimensions in mm

( ) with M12 connector

63 D



ELECTRICAL SPECIFICATIONS

Multiturn resolution	12 bit
Singleturn resolution	8 / 10 / 12 bit
Power supply	7,6 ... 30 V DC
Power draw without load	< 400 mW
Output type*	RS-422 (SN65LBC179Q or equivalent)
Code type	binary or gray
Auxiliary inputs (U/D - Reset)	active high (+V DC) connect to 0 V if not used / Reset t_{min} 150 ms
Clock frequency	100 kHz ... 1 MHz
SSI monostable time (Tm)	20 µs
SSI pause time (Tp)	> 35 µs
SSI frame	tree format (MSB ... LSB) 25 bit length (12MT + 12ST + '0')
Accuracy	± 0,35° typical
Counting direction	decreasing clockwise (shaft view)
Start-up time	150 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

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

MECHANICAL SPECIFICATIONS

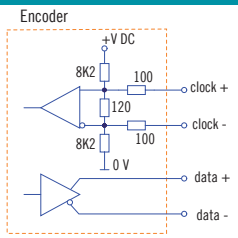
Shaft diameter	ø 6 mm / 9,52 mm (3/8") / 10 mm
Enclosure rating	IP 67 cover side / IP 65 shaft side (IEC 60529)
Max rotation speed	6000 rpm continuous
Max shaft load	10 N axial / 20 N radial with ø 6 shaft 100 N axial / radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	20 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	0,5 x 10^{-6} kgm^2 (12 x 10^{-6} lbft^2)
Starting torque (at +20°C / +68°F)	< 0,03 Nm (4,25 Ozin)
Shaft material	AISI 303 stainless steel
Housing material	AISI 420 stainless steel
Bearing stage material	EN-AW 2011 aluminium
Bearings	2 ball bearings
Bearings life	10^9 revolutions
Operating temperature	-20° ... +85°C (-4° ... +185°F)
Storage temperature	-20° ... +85°C (-4° ... +185°F)
Weight	350 g (12,35 oz)

CONNECTIONS

Function	Cable	8 pin M12
+ V DC	red	8
0 V	black	5
data +	green	3
data -	brown	2
clock +	yellow	4
clock -	orange or pink	6
U / D	red / blue	7
RESET	white	1
⏚	shield	housing

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

SSI SCHEMATICS



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