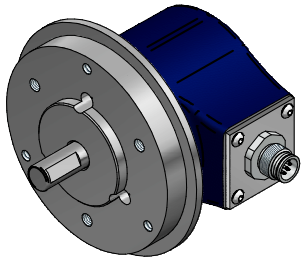
EAL 90 - 115 A
ANALOGUE
SOLID SHAFT SINGLETURN ABSOLUTE ENCODER

MAIN FEATURES

Industry standard singleturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC)
- Programmable measuring range via teach-in function (inputs or cover button)
- Power supply up to +30 VDC with analogue (voltage or current) as electrical interface
- Cable or M12 connector output
- Solid shaft diameter up to 11 mm
- Mounting by synchronous or RE0-444 flange



ORDERING CODE

EAL	90A	16B	12/30	V	05	X	10	X	P	R	.XXX

SERIES
analogue singleturn absolute encoder EAL

MODEL
synchronous flange ø 40 mm 90A
RE0-444 flange 115A

OUTPUT DAC RESOLUTION
16 bit 16B

POWER SUPPLY
12 ... 30 V DC 12/30

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

ENCLOSURE RATING
IP 65 shaft side / IP67 cover side X
IP 67 S

OUTPUT TYPE
cable (standard length 1,5 m) P
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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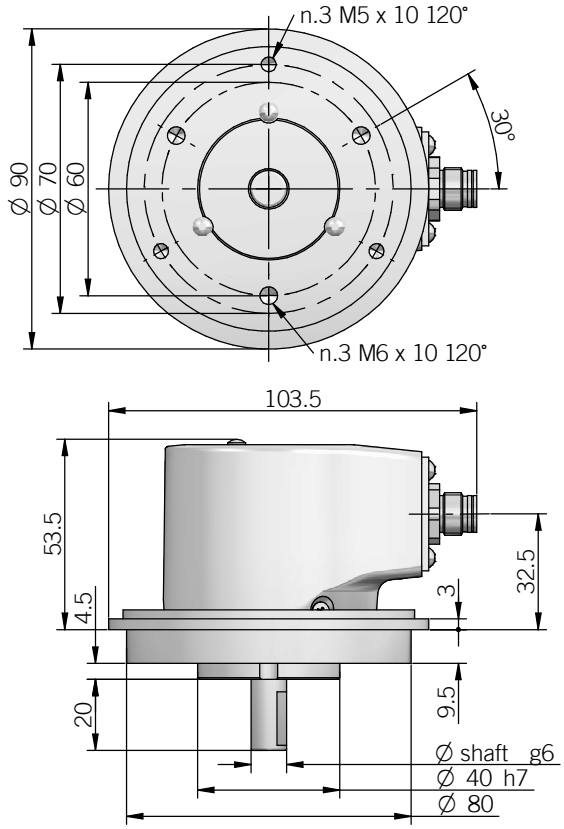
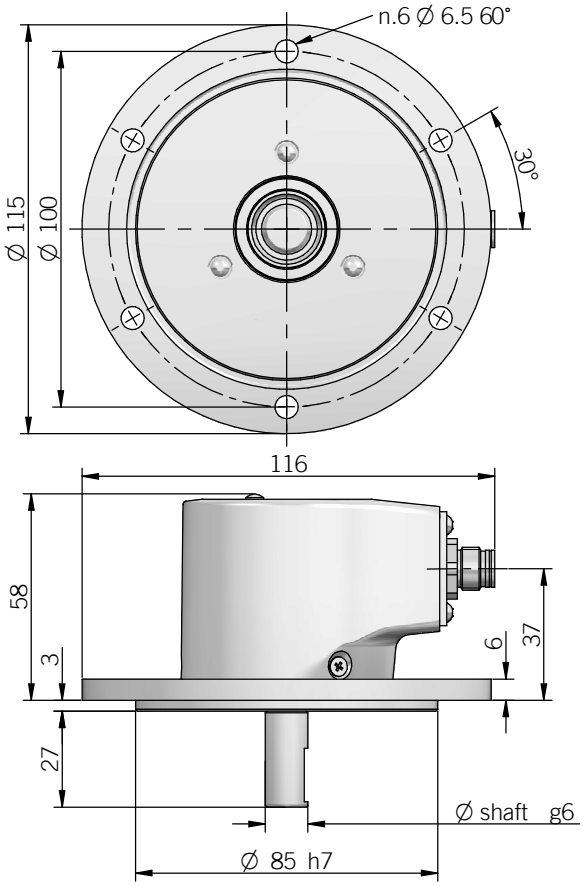
90 A



115 A



fixing clamps not included, please refer to Accessories section

dimensions in mm

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ELECTRICAL SPECIFICATIONS

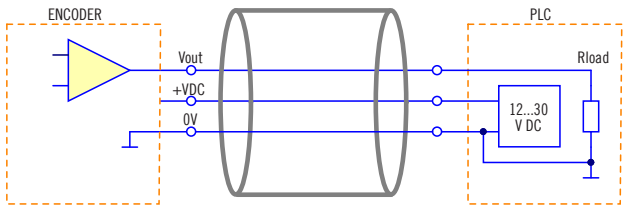
Resolution	16 bit max
Output DAC resolution	16 bit
Minimum angle	22,5°
Linearity error	± 250 arc-sec
Power supply	+11,4 ... +30 V DC (reverse polarity protection)
Power draw without load	< 1 W
Output type	voltage (0 ... 5 V / 0 ... 10 V) current (0 ... 20 mA / 4 ... 20 mA)
Auxiliary inputs (BEGIN - END - U/D)	active high (+V DC) connect to 0 V if not used / t_{min} 150 ms
Load	R_{min}= 1 kΩ (voltage output) R_{max}= (V DC - 2) / 0,02 (current output)
Output update frequency	16 kHz
Signal pattern	auto teaching according to commissioning
Start-up time	700 ms
Electromagnetic compatibility	according to 2014/30/EU directive
RoHS	according to 2011/65/EU directive
UL / CSA	certificate n. E212495

MECHANICAL SPECIFICATIONS

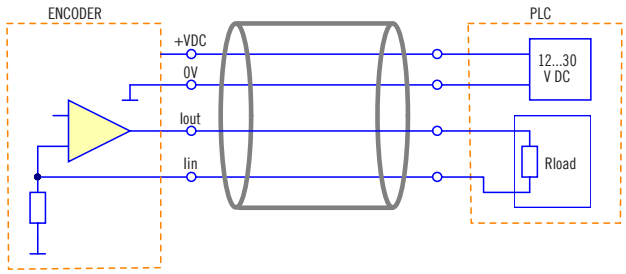
Shaft diameter	ø 9,52 (3/8") / 10 / 11 mm
Enclosure rating IEC 60529	X = IP 65 shaft side / IP67 cover side S = IP 67
Max rotation speed	see below table
Max shaft load	80 N radial / 40 N axial (TBD)
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibration	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
Moment of inertia	1,5 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	EN-AW 2011 aluminum
Shaft material	1.4305 / AISI 303 stainless steel
Housing material	painted aluminium / mild 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	approx 350 g (12,35 oz)

ELECTRICAL INTERFACE

Voltage output



Current output



3 / 4 wire source
with 3 wires interface I_{in} is internally connected to 0V

ROTATION SPEED / TEMPERATURE TABLE

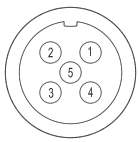
Temperature °C (°F)	Max speed (rpm)	Max continuous speed (rpm)
up to +70 (+158)	10000	8000
+70 ... +85 (+158 ... +185)	8000	5000

CONNECTIONS

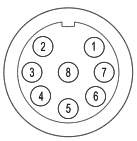
Function	Cable	5 pin M12	8 pin M12*
+ V DC	red	2	2
0 V	black	3	3
V_{out} / I_{out}	green	1	1
I_{in}	yellow	/	6
U/D	blue	/	7
BEGIN	white	4	4
END	brown	5	5
⏚	shield	housing	housing

* with Q current ouput

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



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



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TEACH IN PROCEDURE

Teach-in procedure with SET button

- press SET button (at least 3 sec) -> the encoder enters into teach in procedure (led B (GREEN) / led A (RED) on)
- keep pressed SET button (at least 3 more sec, 6 sec total) -> teach in procedure confirmed (led B (GREEN) / led A (RED) flashing 2 Hz frequency), 1 min timeout
- rotate the encoder shaft to initial position
- press SET button -> initial position set (led B (GREEN) on / led A (RED) flashing), 10 min timeout
- rotate the encoder shaft to end position
- press SET button -> end position set (led B (GREEN) / led A (RED) flashing 4 times (1,5 Hz frequency))
- led B (GREEN) on -> user parameters set

To reset to factory default (15 turns) press SET button at least 10 seconds (led B (GREEN) / led A (RED) alternate flashing) -> led A (RED) on

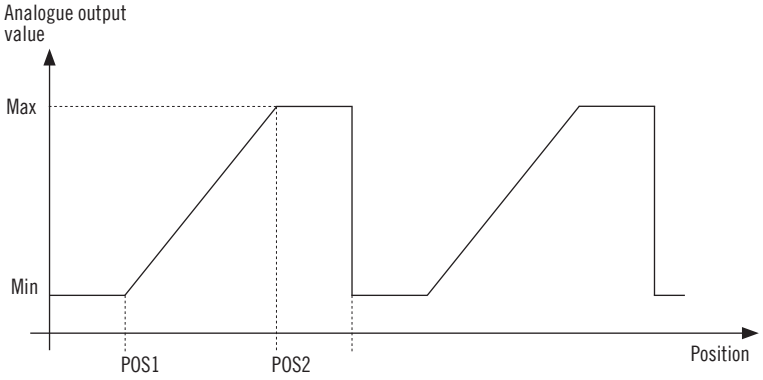
Teach-in procedure with BEGIN/END inputs

- rotate the encoder shaft to start position
- set BEGIN input on high level (pulse) -> led B (GREEN) on / led A (RED) flashing (10 min timeout)
- rotate the encoder shaft to end position
- set END input on high level (pulse) -> end position set (led B (GREEN) and led A (RED) flashing 4 times (frequency 1,5 Hz))
- led B (GREEN) on -> user parameter set

To reset to factory default (15 turns) set BEGIN / END inputs on high level simultaneously (led B (GREEN) / led A (RED) alternate flashing) -> led A (RED) on

OVERRUN

Overrun values outside programmed travel POS1 and POS2 are equally splitted respect minimum and maximum output value with approximation to the next integer.



LED INDICATION

The leds on the encoder cover are useful to understand operating status of the product as show on below table:

Led A (RED)	Led B (GREEN)	Meaning
on	off	normale operation default parameters
off	on	normal operation user parameters
on	on	entering teach-in
flashing	flashing	teach-in confirmed frequency 2 Hz
flashing	on	encoder start position set, wait for end position
flashing	flashing	SET button pressed for at least 10 sec, reset to factory default alternate flashing