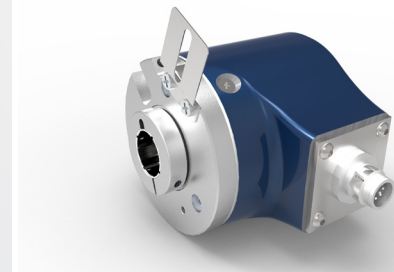


### MAIN FEATURES

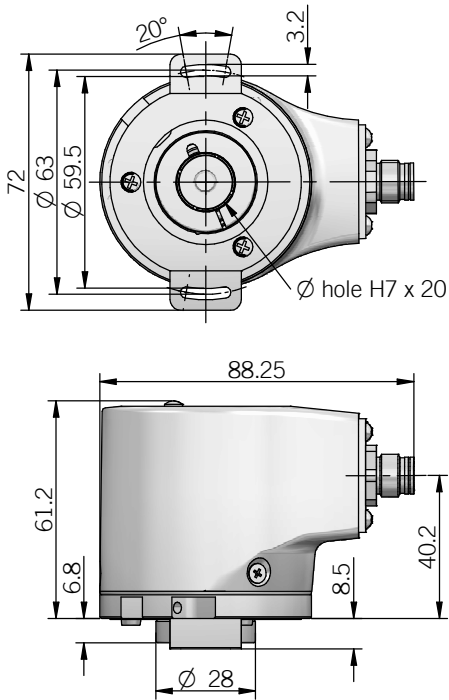
Industry standard multiturn absolute encoder for factory automation applications.

- Optical sensor technology (OptoASIC + Energy Harvesting)
- Programmable measuring range via teach-in function (inputs or cover button)
- Power supply up to +30 VDC with analogue (voltage or current) as electronic interface
- Cable or M12 connector output
- Blind hollow shaft up to 15 mm
- Mounting by stator coupling, bracket or torque pin

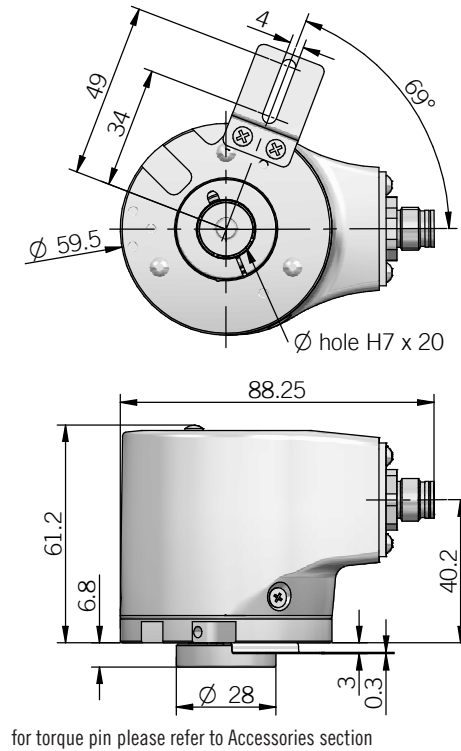


ORDERING CODE	EAML	58F	16B	12/30	V	05	X	15	X	P	R	.XXX
<b>SERIES</b> analogue multiturn absolute encoder <b>EAML</b>												
<b>MODEL</b> blind hollow shaft with stator coupling <b>58F</b> blind hollow shaft with bracket <b>63F</b> blind hollow shaft with torque pin <b>63G</b>												
<b>OUTPUT DAC RESOLUTION</b> 16 bit <b>16B</b>												
<b>POWER SUPPLY</b> 12 ... 30 V DC <b>12/30</b>												
<b>ELECTRONIC INTERFACE</b> voltage <b>V</b> current <b>I</b>												
<b>OUTPUT RANGE</b> 0 ... 5 V <b>05</b> 0 ... 10 V <b>010</b> 0 ... 20 mA <b>020</b> 4 ... 20 mA <b>420</b>												
<b>OPTIONS</b> to be reported with voltage output / 3 wires current output <b>X</b> 4 wires current output <b>Q</b>												
<b>BORE DIAMETER</b> mm <b>14</b> mm <b>15</b> other diameters with optional shaft adapter												
<b>ENCLOSURE RATING</b> IP 65 shaft side / IP67 cover side <b>X</b> IP 67 <b>S</b>												
<b>OUTPUT TYPE</b> cable (standard length 1,5 m) <b>P</b> M12 connector <b>M12</b> female connector included, without female please add 162 as variant code												
<b>DIRECTION TYPE</b> radial <b>R</b>												
<b>VARIANT</b> custom version <b>XXX</b>												

58 F

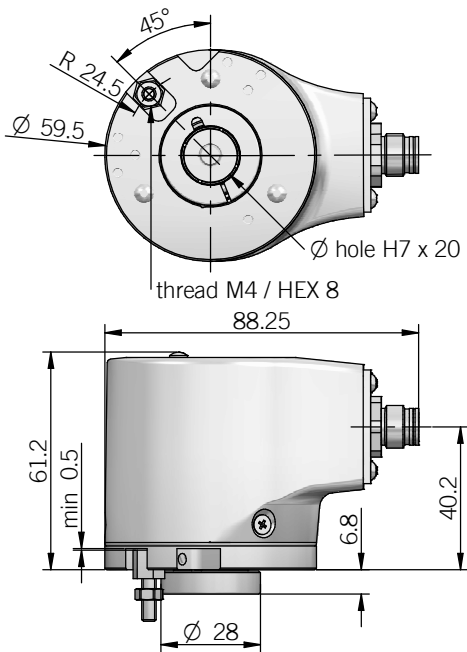


63 F



for torque pin please refer to Accessories section

63 G



torque pin is included

dimensions in mm

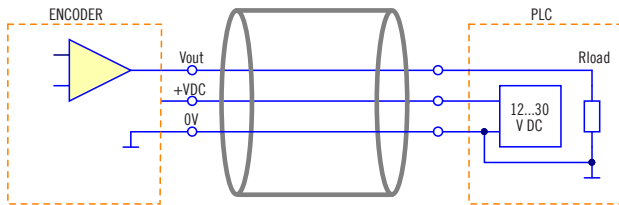
ELECTRICAL SPECIFICATIONS	
Multiturn resolution	16 bit max
Singleturn resolution	16 bit max
Output DAC resolution	16 bit
Minimum angle	22,5°
Linearity error	± 250 arc-sec
Power supply	+11,4 ... +30 V DC (reverse polarity protection)
Power draw without load	< 1 W
Output type	voltage (0 ... 5 V / 0 ... 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	$R_{min} = 1 \text{ k}\Omega$ (voltage output) $R_{max} = (V \text{ DC} - 2) / 0,02$ (current output)
Output update frequency	16 kHz
Signal pattern	auto teaching according to commissioning
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

MECHANICAL SPECIFICATIONS	
Bore diameter	$\varnothing 8^* / 9,52 (3/8)^* / 10^* / 12^* / 14 / 15 \text{ mm}$
Enclosure rating IEC 60529	X = IP 65 shaft side / IP67 cover side S = IP 67
Max rotation speed	see 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	$5 \times 10^{-6} \text{ kgm}^2 (119 \times 10^{-6} \text{ lbft}^2)$
Starting torque (at +20°C / +68°F)	< 0,03 Nm (4,25 Ozin)
Body 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)

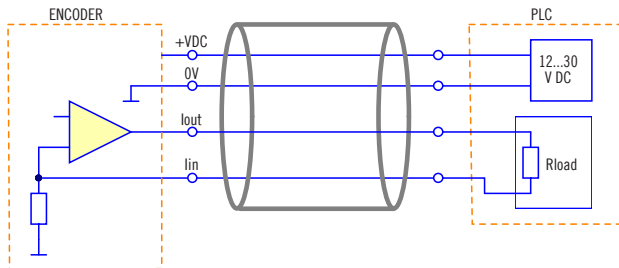
\* with optional shaft adapter, please refer to Accessories section

### ELECTRICAL INTERFACE

Voltage output



Current output



3 / 4 wire source with 3 wires interface I<sub>in</sub> is internally connected to 0V

### ROTATION SPEED / TEMPERATURE TABLE

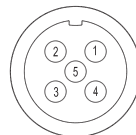
	Temperature °C (°F)	Max speed (rpm)	Max continuous speed (rpm)
IP65	up to +70 (+158)	9000	6000
	+70 ... +85 (+158 ... +185)	6000	3000
IP67	up to +70 (+158)	8000	4000
	+70 ... +85 (+158 ... +185)	4000	2000

### CONNECTIONS

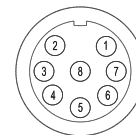
Function	Cable	5 pin M12	8 pin M12*
+ V DC	red	2	2
0 V	black	3	3
V <sub>out</sub> / I <sub>out</sub>	green	1	1
I <sub>in</sub>	yellow	/	6
U/D	blue	/	7
BEGIN	white	4	4
END	brown	5	5
⊥	shield	housing	housing

\* with Q current output

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



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



**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

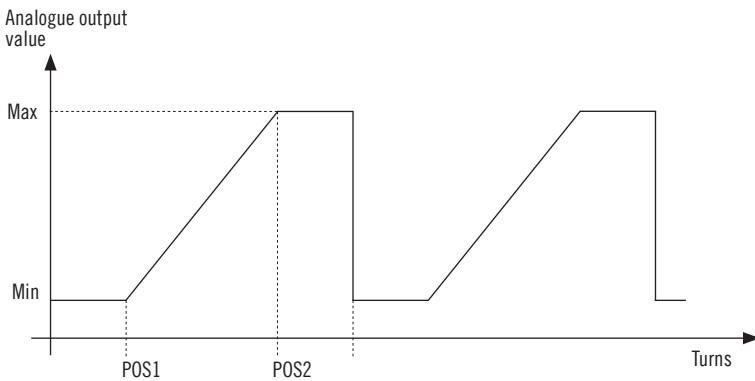
Teach-in procedure with BEGIN/END inputs

- 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