

Absolute encoders – multiturn

Standard electronic multiturn, magnetic	ESAV58 (shaft)	Analog
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The ESAV58 with Energy Harvesting Technology is an electronic multiturn encoder without gear and without battery – in the standard format with 58 mm flange.

High robustness and high resolution make this encoder the ideal device for use in demanding applications.



Safety-Lockplus™	High rotational speed	Temperature range	High protection level	High shaft load capacity	Shock / vibration resistant	Reverse polarity protection	Energy Harvesting

Highest robustness

- Sturdy bearing construction in Safety-Lockplus™ design for particularly high resistance.
- Extra large bearings.
- Mechanically protected shaft seal.
- Wide temperature range -40 °C ... +85 °C.
- Without gear and without battery, thanks to the Energy Harvesting technology.

Application oriented

- Current output 4 ... 20 mA.
- Voltage output 0 ... 10 V or 0 ... 5 V.
- Measuring range scalable.
- Limit switch function.

Order code	ESAV58	XXXX	.XX	1	2		
Shaft version	Type	a	b	c	d	e	f
a Version		3 = clamping flange, IP65, ø 58 mm [2.28"]					
		4 = synchro flange, IP65, ø 58 mm [2.28"]					
b Shaft (ø x L), with flat			1 = ø 6 x 12.5 mm [0.24 x 0.49"]				
			5 = ø 10 x 20 mm [0.39 x 0.79"]				
c Output circuit ¹⁾				3 = current output			
				4 = voltage output			
					d Type of connection		
					2 = radial cable, 1 m [3.28'] PVC		
					B = radial cable, special length PVC *)		
					4 = radial M12 connector, 5-pin		
					*) Available special lengths (connection types B):		
					2, 3, 5, 8, 10, 15 m [5.56, 9.84, 16.40, 26.25, 32.80, 49.21']		
					order code expansion .XXXX = length in dm		
					ex.: 8.M5861.3132.3112.0030 (for cable length 3 m)		
					e Interface / resolution / supply voltage		
					3 = 4 ... 20 mA / 12 bit / 10 ... 30 V DC		
					4 = 0 ... 10 V / 12 bit / 15 ... 30 V DC		
					5 = 0 ... 5 V / 11 bit / 10 ... 30 V DC		
					f Measuring range		
					1 = 16 revolutions / cw		
					2 = 16 revolutions / ccw		
					3 = scalable up to 65,536 revolutions, with limit switch function / cw		
					4 = scalable up to 65,536 revolutions, without limit switch function / cw		
					5 = scalable up to 65,536 revolutions, with limit switch function / ccw		
					6 = scalable up to 65,536 revolutions, without limit switch function / ccw		
					<i>Optional on request</i>		
					- Ex 2/22 (only for connection type 4)		

Specifications subject to change without notice, 98-0ENC-01-A, released 11/27/2023

1) Output circuit "3" only in conjunction with interface "3",
output circuit "4" only in conjunction with interface "4" or "5".

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Technical data

Electrical characteristics current interface 4 ... 20 mA

Supply voltage	10 ... 30 V DC
Current consumption (no load)	max. 30 mA
Reverse polarity protection of the supply voltage	yes
Short-circuit proof outputs	yes ¹⁾
Measuring range	factory setting 2 ⁴ revolutions optionally scalable up to 2 ¹⁶ revolutions
DA converter resolution	12 bit
Angular measurement deviation ²⁾	±0,5°
Temperature coefficient	< 100 ppm/K
Repeat accuracy, at 25 °C [77 °F]	±0,2°
Output load	at 10 V DC max. 200 Ohm at 24 V DC max. 900 Ohm at 30 V DC max. 1200 Ohm
Setting time	< 1 ms, R _{Burden} = 900 Ohm, 25°C [77°F]
LEDs (green/red)	<ul style="list-style-type: none"> - system status - current loop interruption – input load too high - reference point display (only with factory settings) at cw: betw. 0° and 1° at ccw: betw. 0° and -1° - status in teach mode
Options	<ul style="list-style-type: none"> - output signal scalable via the teach inputs - output signal scalable via the teach inputs + limit switch function
Teach inputs	level = +V for 1 s minimum
PowerON Time	< 1 s
Update rate	1 ms

Electrical characteristics voltage interface 0 ... 10 V / 0 ... 5 V

Supply voltage	output 0 ... 5 V 10 ... 30 V DC output 0 ... 10 V 15 ... 30 V DC
Current consumption (no load)	max. 30 mA
Reverse polarity protection of the supply voltage	yes
Short-circuit proof outputs	yes ¹⁾
Measuring range	factory setting 2 ⁴ revolutions optionally scalable up to 2 ¹⁶ revolutions
DA converter resolution	0 ... 10 V 12 bit 0 ... 5 V 11 bit
Angular measurement deviation ²⁾	±0,5°
Temperature coefficient	< 100 ppm/K
Repeat accuracy, at 25°C [77°F]	±0,2°
Current output	max. 10 mA
Setting time	< 1 ms, R _{Load} = 1000 Ohm, 25°C [77°F]
LEDs (green/red)	<ul style="list-style-type: none"> - system status - reference point display (only with factory settings) at cw: betw. 0° and 1° at ccw: betw. 0° and -1° - status in teach mode
Options	<ul style="list-style-type: none"> - output signal scalable via the teach inputs - output signal scalable via the teach inputs + limit switch function
Teach inputs	level = +V for 1 s minimum
PowerON Time	< 1 s
Update rate	1 ms

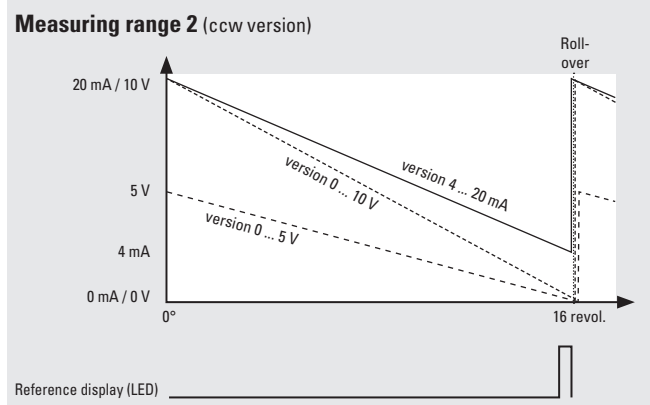
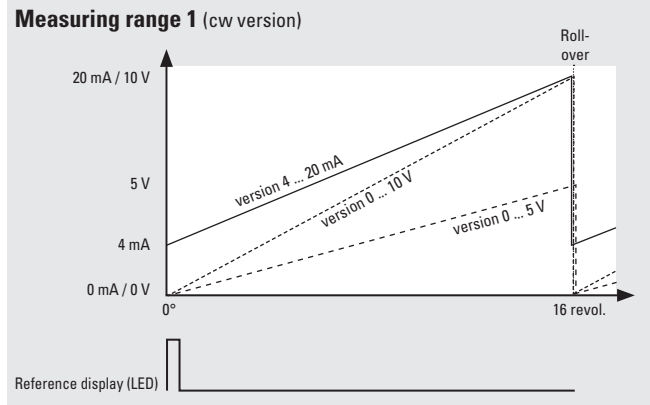
1) When the supply voltage is correctly applied.
But not output to +V. Supply voltage and sensor output signal are not galvanically isolated.
2) Over the whole temperature range.

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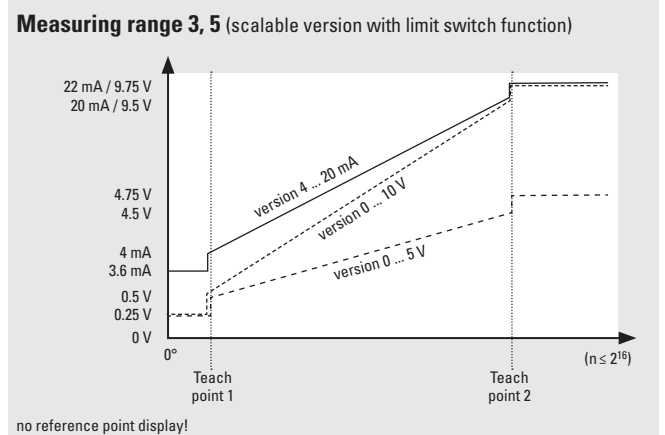
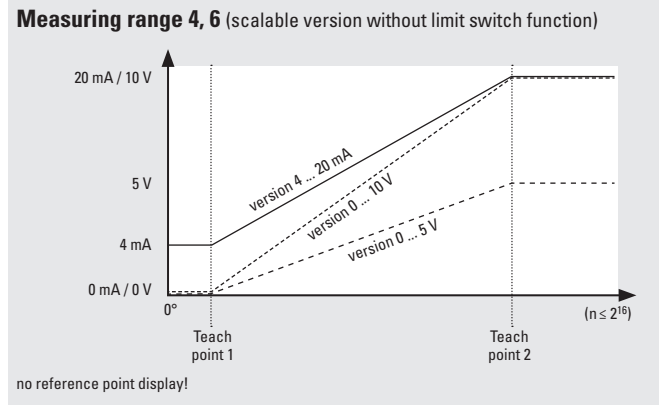
Mechanical characteristics	
Maximum speed	4000 min ⁻¹ 2000 min ⁻¹ (continuous)
Starting torque at 20 °C [68 °F]	< 0.01 Nm
Shaft load capacity	radial 80 N axial 40 N
Weight	approx. 280 g [9.88 oz]
Protection acc. to EN 60529/DIN 40050-9	IP65
Working temperature range	-40 °C ... +85 °C [-40 °F ... +185 °F]
Materials	shaft V2A flange aluminum housing zinc die-cast cable PVC
Shock resistance acc. to EN 60068-2-27	5000 m/s ² , 4 ms
Vibration resistance acc. to EN 60068-2-6	300 m/s ² , 10 ... 2000 Hz

Approvals	
E1 compliant in accordance with	ECE guideline
UL compliant in accordance with	File no. E224618
CE compliant in accordance with	
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU
ATEX Directive	2014/34/EU (for Ex 2/22 variants)
UKCA compliant in accordance with	
EMC Regulations	S.I. 2016/1091
RoHS Regulations	S.I. 2012/3032
UKEX Regulations	S.I. 2016/1107 (for Ex 2/22 variants)

Example (output signal evolution) – factory setting



Example (output signal evolution) – option: scalable



Factory-set measuring range	2 ⁴ revolutions with roll-over			
Limit switch function	version	0 ... 10 V	0 ... 5 V	4 ... 20 mA
	limit switch low	0.25 V	0.25 V	3.6 mA
	limit switch high	9.75 V	4.75 V	22.0 mA

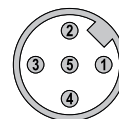
1) For scalable version.

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Terminal assignment

Interface	Type of connection	Cable (isolate unused cores individually before initial start-up)					
3 (current)	2, B	Signal:	0 V	+V	+I	SET 1 ¹⁾	SET 2 ¹⁾
		Core color:	WH	BN	GN	GY	PK
Interface	Type of connection	M12 connector, 5 pin					
3 (current)	4	Signal:	0 V	+V	+I	SET 1 ¹⁾	SET 2 ¹⁾
		Pin:	3	2	1	5	4
Interface	Type of connection	Cable (isolate unused cores individually before initial start-up)					
4, 5 (voltage)	2, B	Signal:	0 V	+V	+U	SET 1 ¹⁾	SET 2 ¹⁾
		Core color:	WH	BN	GN	GY	PK
Interface	Type of connection	M12 connector, 5 pin					
4, 5 (voltage)	4	Signal:	0 V	+V	+U	SET 1 ¹⁾	SET 2 ¹⁾
		Pin:	3	2	1	5	4

Top view of mating side, male contact base



M12 connector, 5-pin

- +V : Supply voltage encoder +V DC
 - 0 V : Supply voltage encoder ground GND (0 V)
 - +U : Voltage
 - +I : Current
- SET 1 : Set input for teachpoint 1
 - SET 2 : Set input for teachpoint 2

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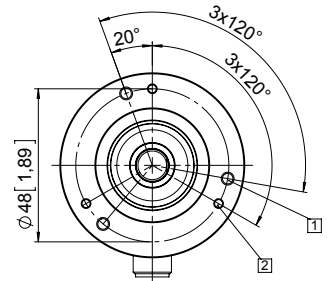
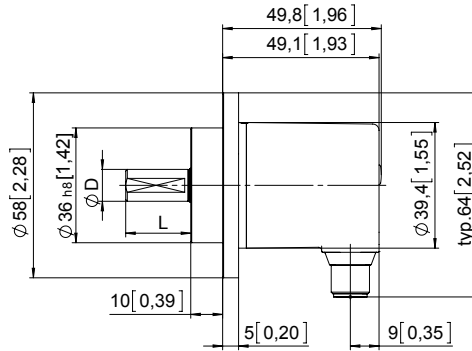
Dimensions

Dimensions in mm [inch]

Clamping flange, ø 58 [2.28] Flange type 3

- 1 3 x M4
- 2 3 x M3

D	Fit	L
6 [0.24]	h7	12.5 [0.49]
10 [0.39]	h7	20 [0.79]



Synchro flange, ø 58 [2.28] Flange type 4

- 1 3 x M4, 10 [0.39] deep

D	Fit	L
6 [0.24]	h7	12.5 [0.49]
10 [0.39]	h7	20 [0.79]

