



# Multiturn absolute rotary encoder EVM78E-E

- Up to 30 Bit multiturn
- ATEX approval
- IECEx approval
- Flameproof enclosure
- Removable connection cap



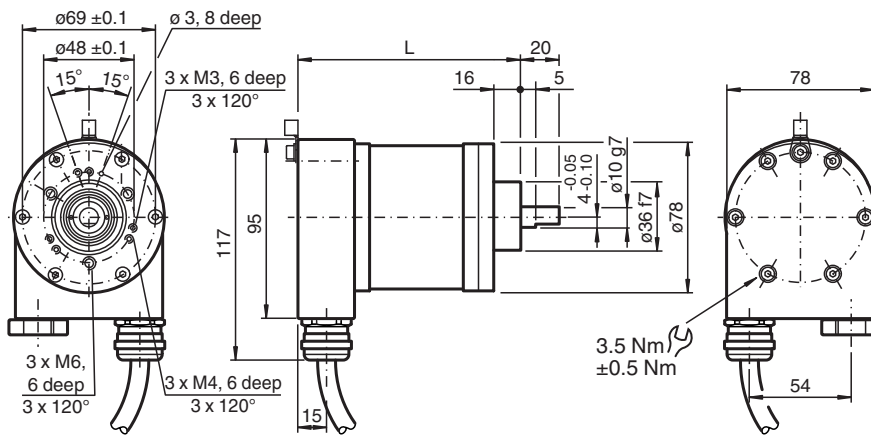
## Function

Absolute multiturn rotary encoders deliver an absolute step value for each angle setting. This device has a maximum basic resolution of 65536 steps per revolution (16 bits) and codes up to 16384 revolutions (14 bits). Thus the overall resolution amounts to 30 bits. On account of the high number of measuring steps resulting (more than 1 billion), this type of encoder can be used to divide very long linear distances into small measuring steps. The device is designed for shaft assembly and is available in servo flange or clamping flange design.

## Dimensions

### Encoder length L

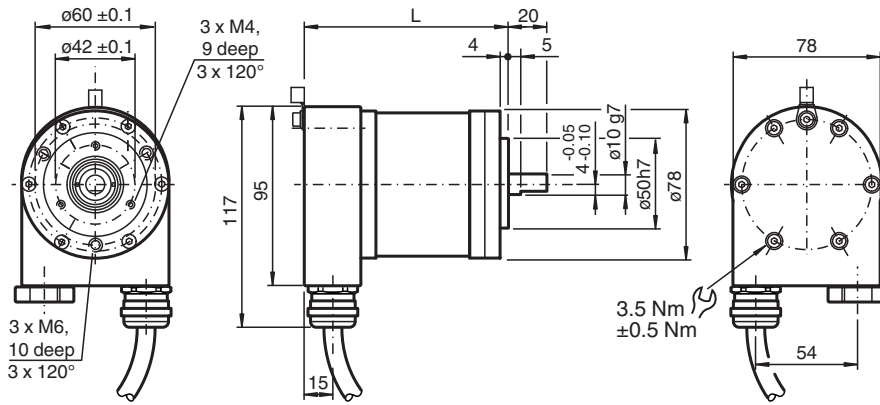
Version		Length L
Radial cable exit	Clamping flange	134 mm
	Servo flange	134 mm
Axial cable exit	Clamping flange	150 mm
	Servo flange	150 mm



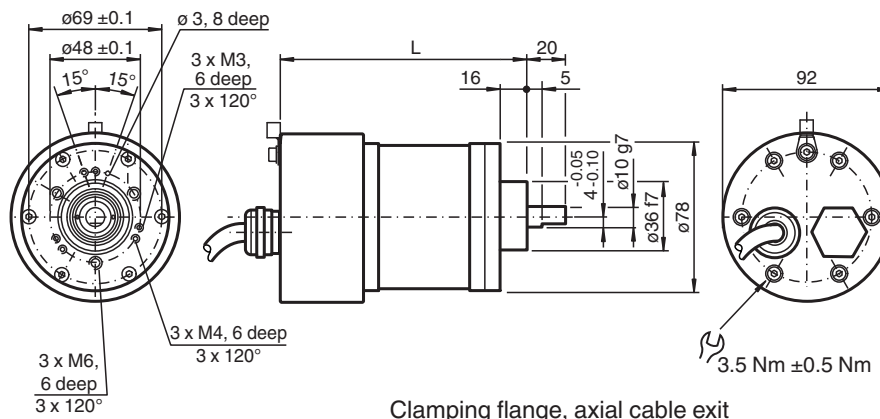
Clamping flange, cable exit radial

Release date: 2024-08-09 Date of issue: 2024-08-09 Filename: t193496\_eng.pdf

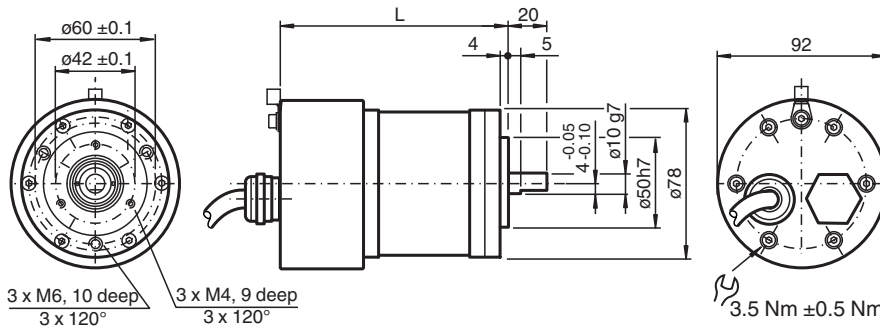
Dimensions



Servo flange, radial cable exit

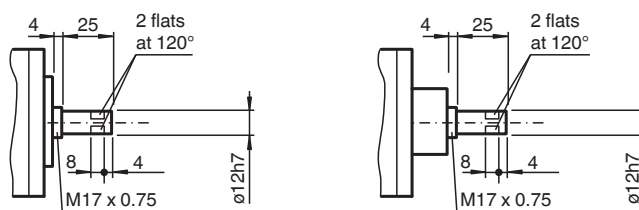


Clamping flange, axial cable exit



Servo flange, axial cable exit

Shaft 12 mm



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Technical Data

General specifications

## Technical Data

Detection type	photoelectric sampling	
Device type	Multiturn absolute rotary encoder	
<b>Functional safety related parameters</b>		
MTTF <sub>d</sub>	25 a	
L <sub>10</sub>	7.7 E+9 at 3000 rpm	
<b>Electrical specifications</b>		
Operating voltage	U <sub>B</sub>	10 ... 30 V DC
No-load supply current	I <sub>0</sub>	max. 270 mA at 10 V DC max. 115 mA at 24 V DC
Time delay before availability	t <sub>v</sub>	< 250 ms
Linearity	± 2 LSB at 16 Bit, ± 1 LSB at 13 Bit	
Output code	binary code	
Code course (counting direction)	programmable, cw ascending (clockwise rotation, code course ascending) cw descending (clockwise rotation, code course descending)	
<b>Interface</b>		
Interface type	EtherCAT® CoE (CANopen over EtherCAT, according to CiA DS-301 and DS-406 device profile CiA)	
<b>Resolution</b>		
Single turn	up to 16 Bit	
Multiturn	up to 14 Bit	
Overall resolution	up to 30 Bit	
Transfer rate	100 MBit/s	
Cycle time	≤ 1 ms (IRT) , ≤ 10 ms (RT)	
<b>Connection</b>		
Terminal compartment	see ordering information	
<b>Standard conformity</b>		
Degree of protection	DIN EN 60529, IP66	
Climatic testing	DIN EN 60068-2-78 , no moisture condensation	
Emitted interference	EN 61000-6-4:2007/A1:2011	
Noise immunity	EN 61000-6-2:2005	
Shock resistance	DIN EN 60068-2-27, 100 g, 3 ms	
Vibration resistance	DIN EN 60068-2-6, 10 g, 10 ... 2000 Hz	
<b>Approvals and certificates</b>		
IECEX approval		
Equipment protection level Gb	IECEX ITS 15.0061X	
ATEX approval		
Equipment protection level Gb	ITS 15 ATEX 18372X	
<b>Ambient conditions</b>		
Operating temperature	-40 ... 70 °C (-40 ... 158 °F)	
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)	
<b>Mechanical specifications</b>		
<b>Material</b>		
Combination 1	housing: anodized aluminum flange: anodized aluminum shaft: Stainless steel 1.4404 / AISI 316L	
Combination 2 (Inox)	housing: Stainless steel 1.4404 / AISI 316L flange: Stainless steel 1.4404 / AISI 316L shaft: Stainless steel 1.4404 / AISI 316L	
Mass	approx. 2600 g (combination 1) approx. 3900 g (combination 2)	
Rotational speed	max. 3000 min <sup>-1</sup>	
Moment of inertia	180 gcm <sup>2</sup>	
Starting torque	≤ 4 Ncm	
Shaft load		
Axial	60 N	

## Technical Data

Radial	80 N
<b>General information</b>	
Use in the hazardous area	see instruction manuals

## Type Code

### Structure of the type code

E	V	M	7	8	E	-	(1)	(1)	(2)	(3)	(3)	(4)	E	B	(5)	-	(6)	(6)	(7)	(7)
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<b>E</b>	<b>Data format</b>
E	Ethernet

<b>V</b>	<b>Shaft version</b>
V	Solid shaft

<b>M</b>	<b>Funktional principle</b>
M	Multiturn

<b>78</b>	<b>Size</b>
78	Housing diameter 78 mm

<b>E</b>	<b>Option 1</b>
E	Explosion Proof, Standard IP66

<b>(1) (1)</b>	<b>Shaft diameter</b>
01	Shaft Ø 10 mm x 20 mm
02	Shaft Ø 12 mm x 25 mm

<b>(2)</b>	<b>Flange</b>
1	Clamping flange
2	Servo flange

<b>(3) (3)</b>	<b>Connection type</b>
00	Terminal compartment with two M20 x 1.5 6H threads each, 17 mm thread depth, for cable glands
DR	Terminal compartment, 2 cable glands
KR	Terminal compartment, 1 cable gland, 1 stopping plug

<b>(4)</b>	<b>Exit position</b>
A	Axial
R	Radial

<b>E</b>	<b>Option</b>
E	EtherCat

<b>B</b>	<b>Output Code</b>
B	Binary

<b>(5)</b>	<b>Housing material</b>
N	Aluminum
I	INOX 1.4404 (AISI 316L)

<b>(6) (6)</b>	<b>Multiturn: Number of bits and puls count</b>
12	12 Bits, 4096 pulses
14	14 Bits, 16384 pulses

<b>(7) (7)</b>	<b>Singleturn: Number of bits and puls count</b>
13	13 Bits, 8192 Impulse
16	16 Bits, 65536 Impulse

## Connection

Signal	Terminal compartment
Ground wire	Grounding terminal
GND (rotary encoder)	1
+U <sub>b</sub> (rotary encoder)	2
Not connected	3
Not connected	4
Rx-	5
Tx-	6
Rx+	7
Tx+	8

