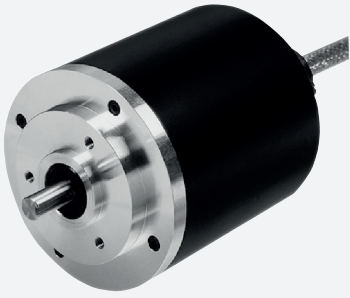


# Multiturn absolute encoder

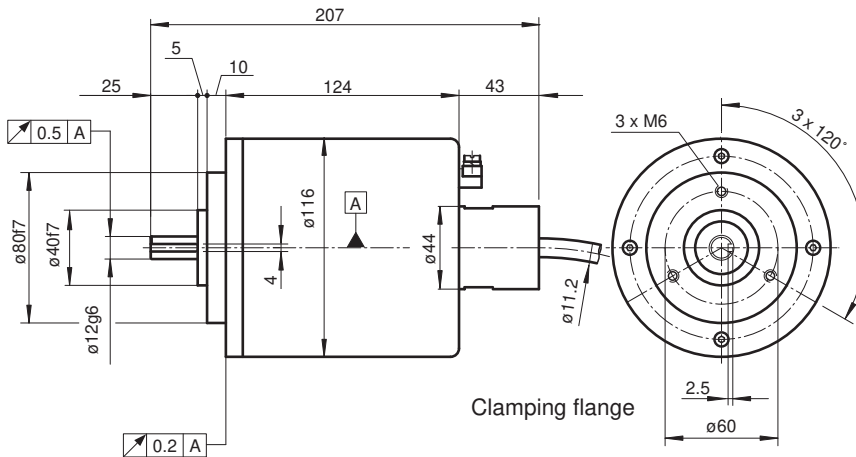
## AVM14



- 24 bit multiturn
- ATEX approval
- Flameproof enclosure
- Galvanically isolated RS 422 interface



### Dimensions



### Technical Data

General specifications	
Detection type	photoelectric sampling
Device type	Multiturn absolute encoder
Functional safety related parameters	
MTTF <sub>d</sub>	30 a
Mission Time (T <sub>M</sub> )	20 a
L <sub>10</sub>	6.8 E+9 at 6000 rpm
Diagnostic Coverage (DC)	0 %
Electrical specifications	
Operating voltage	U <sub>B</sub> 10 ... 30 V DC
No-load supply current	I <sub>0</sub> max. 90 mA
Linearity	± 0.5 LSB
Output code	Gray code, binary code
Code course (counting direction)	cw descending (clockwise rotation, code course descending)
Interface	
Interface type	SSI
Monoflop time	20 ± 10 μs

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Pepperl+Fuchs Group  
www.pepperl-fuchs.com

USA: +1 330 486 0001  
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 1111  
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091  
fa-info@sg.pepperl-fuchs.com

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## Technical Data

<b>Resolution</b>		
Single turn		12 Bit
Multiturn		12 Bit
Overall resolution		24 Bit
Transfer rate		0.05 ... 1.5 MBit/s
Standard conformity		RS 422
<b>Input 1</b>		
Input type		Selection of counting direction (cw/ccw)
Signal voltage		
High		10 ... 30 V
Low		0 ... 2 V
Input current		< 6 mA
Switch-on delay		< 10 ms
Switch-off delay		< 0.1 ms
<b>Input 2</b>		
Input type		zero-set (PRESET 1)
Signal voltage		
High		10 ... 30 V
Low		0 ... 2 V
Signal duration		min. 100 ms
Switch-on delay		< 10 ms
<b>Connection</b>		
Cable		Ø11.2 mm, 9-core, 2 m
<b>Standard conformity</b>		
Degree of protection		DIN EN 60529, IP66
Climatic testing		DIN EN 60068-2-3, 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>Ambient conditions</b>		
Operating temperature		
Gas Ex-area		-40 ... 55 °C (-40 ... 131 °F)
Dust Ex-area		-30 ... 55 °C (-22 ... 131 °F)
Storage temperature		
Gas Ex-area		-40 ... 70 °C (-40 ... 158 °F)
Dust Ex-area		-30 ... 70 °C (-22 ... 158 °F)
<b>Mechanical specifications</b>		
Material		
Housing		Aluminum
Flange		Aluminum
Shaft		Stainless steel
Mass		approx. 3400 g
Rotational speed		max. 6000 min <sup>-1</sup>
Moment of inertia		400 gcm <sup>2</sup>
Starting torque		≤ 5 Ncm
Shaft load		
Axial		60 N
Radial		80 N
<b>Data for application in connection with hazardous areas</b>		
EU-Type Examination Certificate		ZELM 02 ATEX 0078 X
Marking		Ⓜ II 2G Ex db IIC T6 Gb Ⓜ II 2D Ex tb IIIC T80°C Db

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## Technical Data

### Directive conformity

Directive 94/9/EC

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

## Accessories

	<b>9101, 12</b>	Measuring wheel for shaft diameter 12 mm
	<b>9102, 12</b>	Measuring wheel for shaft diameter 12 mm
	<b>9103, 12</b>	Measuring wheel for shaft diameter 12 mm
	<b>9112, 12</b>	Measuring wheel

## Function

The AVM14 multiturn absolute encoder transmits a position value corresponding to the shaft setting via the SSI interface (Synchronous Serial Interface). The maximum resolution of the AVM14 is 4096 steps per revolution at 4096 revolutions.

The control module sends a clock bundle to the absolute encoder to obtain the position data. The rotary encoder then sends the position data synchronous to the cycles of the control module.

It is possible to select the direction of counting and to set the zero position by using the function inputs.

The shaft is specially equipped with a feather key groove for receiving a belt pulley or similar device. The permissible radial force is 80 N, while the permissible axial force is 60 N.

One special feature is the mechanical versatility of the flange. The absolute encoder has one centering shoulder with a diameter of 40 mm and one with a diameter of 80 mm. Three M6 holes are available for fastening.

## Connection

### Electrical connection

Signal	Cable Ø11.2 mm, 9-core
Protective conductor	Green/Yellow
GND (rotary encoder)	1
+U <sub>b</sub> (rotary encoder)	2
Clock (+)	3
Clock (-)	4
Data (+)	5
Data (-)	6
Preset	7
Counting direction	8

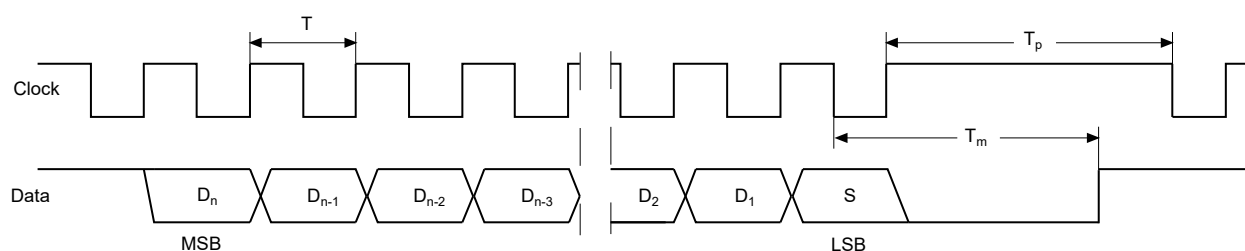
## Interface

### Description

The Synchronous Serial Interface was specially developed for transferring the output data of an absolute encoder to a control device. The control module sends a clock bundle and the absolute encoder responds with the position value.

Thus only 4 lines are required for the clock and data, no matter what the resolution of the rotary encoder is. The RS 422 interface is galvanically isolated from the power supply.

### SSI data transfer

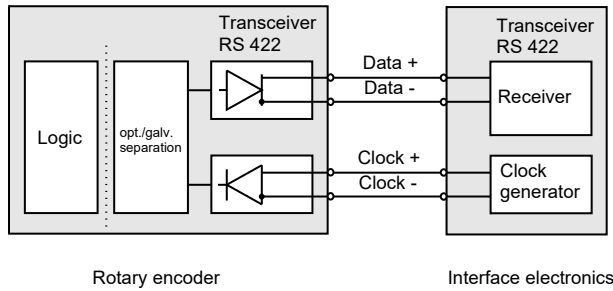


$D_1, \dots, D_n$ : Position data  
 S: Special bit  
 MSB: Most significant bit  
 LSB: Least significant bit

$T = 1/f$ : Duration of period,  $f < 1.5$  MHz  
 $T_m$ : Monoflop time 20  $\mu$ s  
 $T_p$ : Clock pause > 25  $\mu$ s

### Block diagram

### Line length

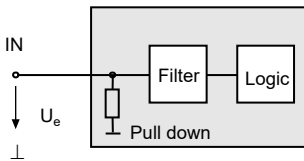


Line length in m	Baudrate in kHz
< 50	< 400
< 100	< 300
< 200	< 200
< 400	< 100

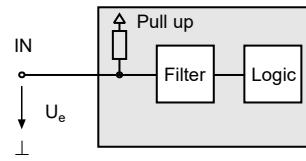
**Inputs**

The selection of the counting direction input (cw/ccw) is activated with 0-level. The zero-set input (PRESET 1) is activated with 1-level.

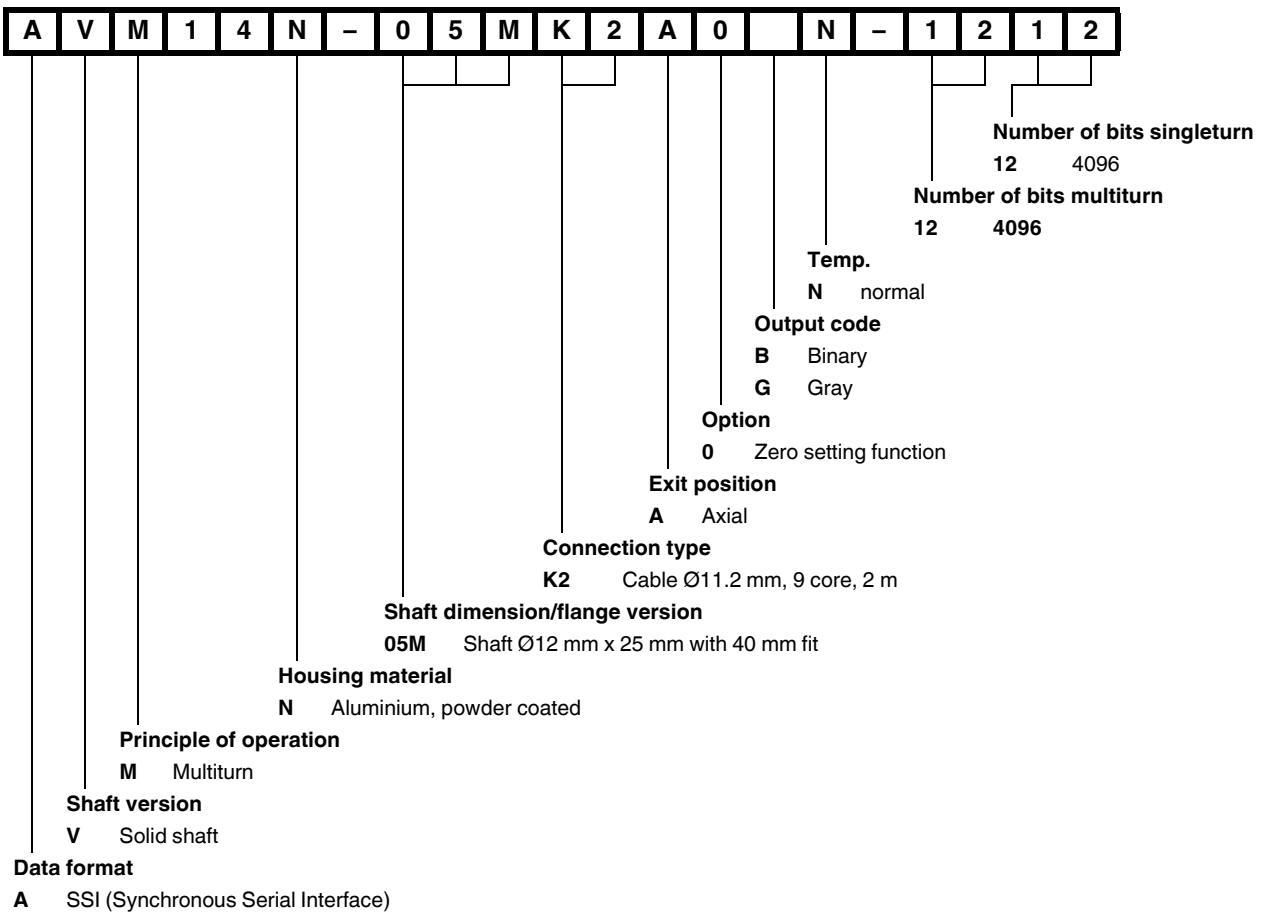
zero-set input (PRESET 1)



Input for selection of counting direction (cw/ccw)



**Order code**



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