

Model Number

AVM14

Features

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

Description

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.

Technical data

General specifications

| | |
|----------------|----------------------------|
| Detection type | photoelectric sampling |
| Device type | Multiturn absolute encoder |

Functional safety related parameters

| | |
|--------------------------------|---------------------|
| MTTF _d | 30 a |
| Mission Time (T _M) | 20 a |
| L _{10h} | 6.8 E+9 at 6000 rpm |
| Diagnostic Coverage (DC) | 0 % |

Electrical specifications

| | |
|---------------------------------------|--|
| Operating voltage U _B | 10 ... 30 V DC |
| No-load supply current I ₀ | 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 |
| Resolution | |
| Single turn | 12 Bit |
| Multiturn | 12 Bit |
| Overall resolution | 24 Bit |
| Transfer rate | 0.05 ... 1.5 MBit/s |
| Standard conformity | RS 422 |

Input 1

| | |
|------------------|--|
| 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 |

Input 2

| | |
|-----------------|---------------------|
| Input type | zero-set (PRESET 1) |
| Signal voltage | |
| High | 10 ... 30 V |
| Low | 0 ... 2 V |
| Signal duration | ≥ 100 ms |
| Switch-on delay | < 10 ms |

Connection

| | |
|-------|-----------------------|
| Cable | Ø11.2 mm, 9-core, 2 m |
|-------|-----------------------|

Standard conformity

| | |
|----------------------|--|
| Degree of protection | DIN EN 60529, IP66 |
| Climatic testing | DIN EN 60068-2-3, no moisture condensation |
| Emitted interference | EN 61000-6-4:2007 |
| 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 |

Ambient conditions

| | |
|-----------------------|--------------------------------|
| 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) |

Mechanical specifications

| | |
|-------------------|-----------------------------|
| Material | |
| Housing | aluminum |
| Flange | aluminum |
| Shaft | Stainless steel |
| Mass | approx. 3400 g |
| Rotational speed | max. 6000 min ⁻¹ |
| Moment of inertia | 400 gcm ² |
| Starting torque | ≤ 5 Ncm |
| Shaft load | |
| Axial | 60 N |
| Radial | 80 N |

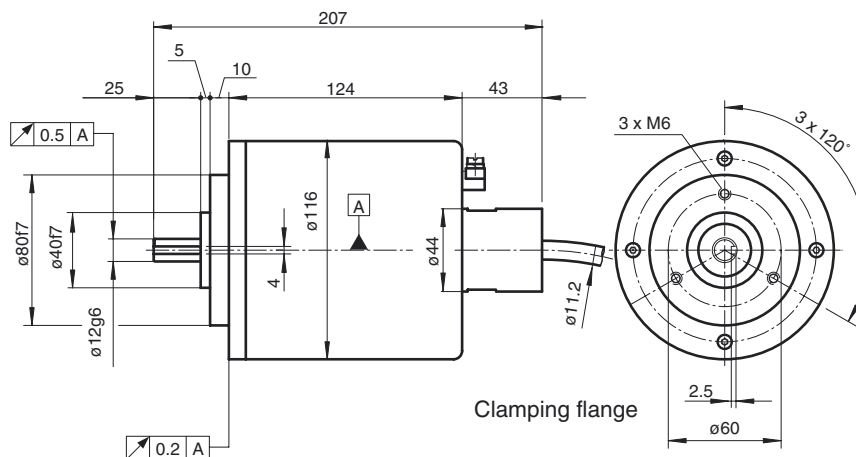
Data for application in connection with Ex-areas

| | |
|-------------------------------------|---|
| EC-Type Examination Certificate | ZELM 02 ATEX 0078 X |
| Group, category, type of protection | ⊕ II 2G Ex db IIC T6 Gb ⊕ II 2D Ex tb IIIC T80°C Db IP66 |

Directive conformity

| | |
|-------------------|--|
| Directive 94/9/EC | EN 60079-0:2012 EN 60079-1:2007 EN 60079-31:2009 |
|-------------------|--|

Dimensions



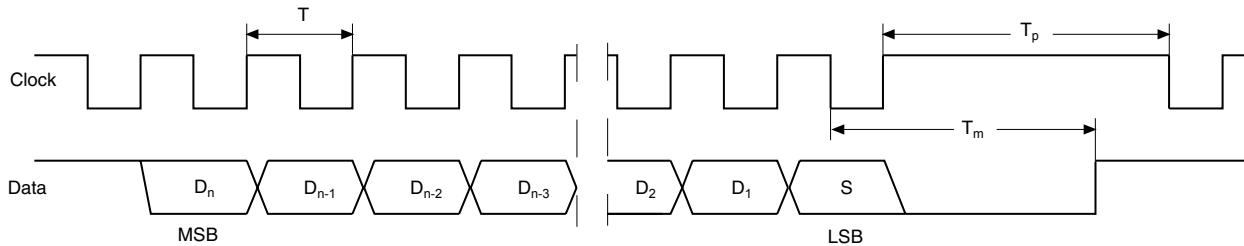
Electrical connection

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

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.

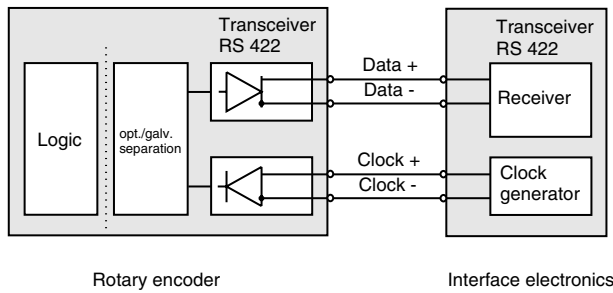
SSI data transfer



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

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

Block diagram



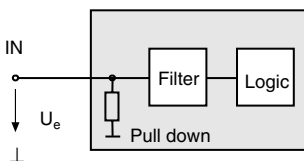
Line length

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

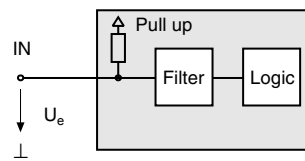
Inputs

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

zero-set input (PRESET 1)

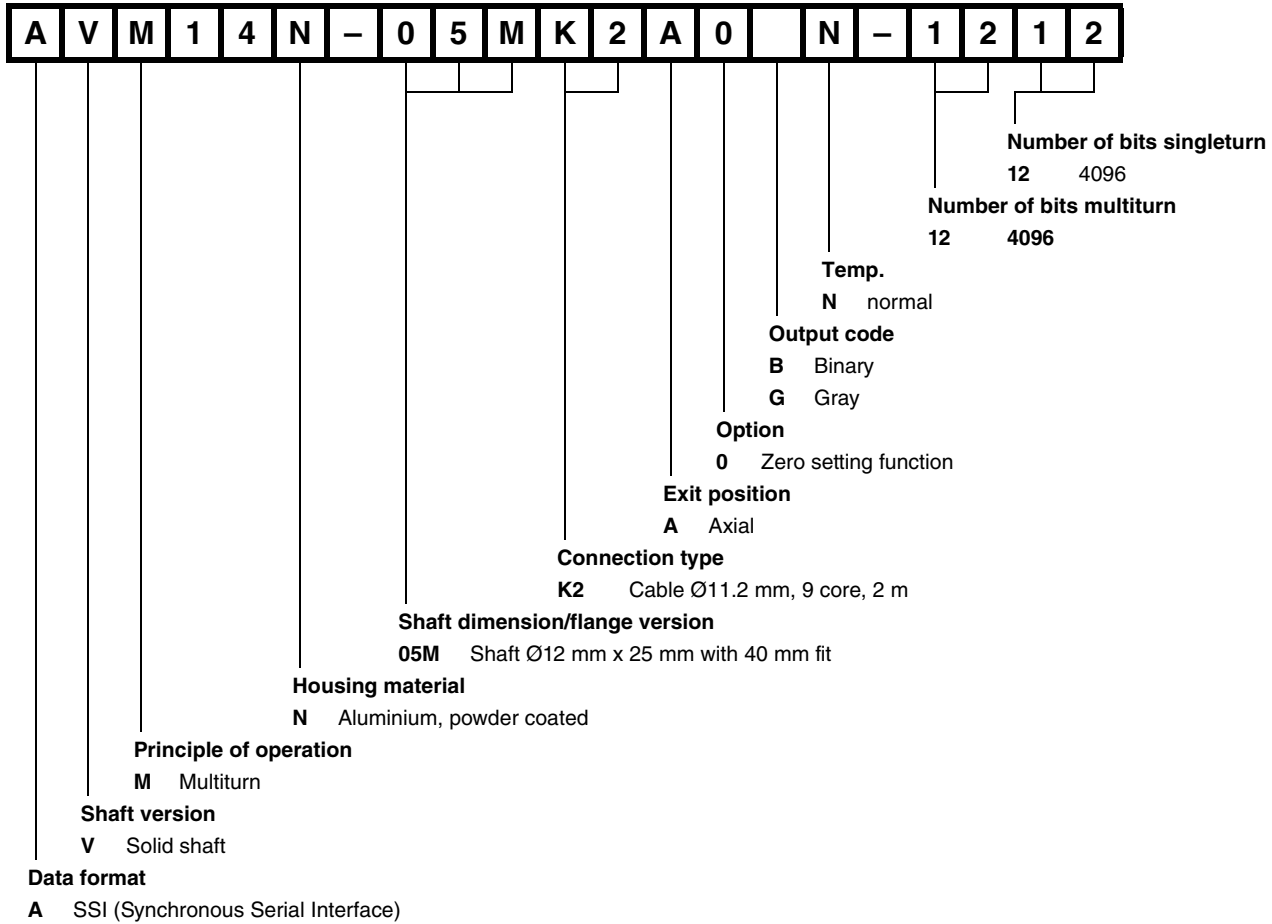


Input for selection of counting direction (V/R)



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Order code



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