0102

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.

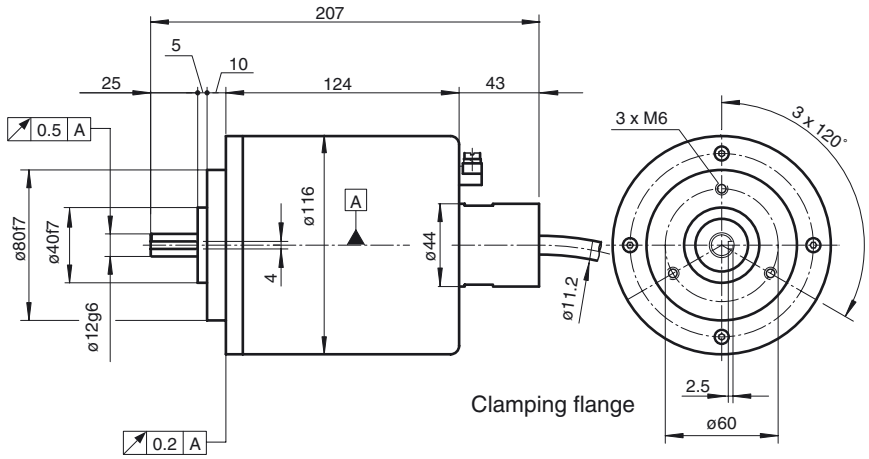
One special feature is the mechanical versatility of the flange. The absolute encoder has one centering shoulder with a diameter of 40 mm and one with a diameter of 80 mm. Three M6 holes are available for fastening.

Technical data

General specifications	
Detection type	photoelectric sampling
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 (V/R)
Signal voltage	
High	10 ... 30 V
Low	0 ... 2 V
Input current	< 6 mA
Signal duration	≥ 10 ms
Switch-on delay	< 0.1 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	≥ 10 ms
Switch-on delay	< 100 ms
Connection	
Cable	Ø11.2 mm, 9-core, 2 m
Standard conformity	
Protection degree	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	Ex II 2G Ex d IIC T6 Ex II 2D Ex tD A21 IP66 T80°C
Directive conformity	
Directive 94/9/EC	EN 60079-0 EN 60079-1 EN 61241-0 EN 61241-1

Release date: 2012-01-30 15:54 Date of issue: 2012-01-30 t30847_eng.xml

Dimensions



Accessories

9401 12*12
Spring steel coupling

9404 12*12
Spring disk coupling

9409 12*12
Bellows coupling

9410 12*12
Precision coupling

9460 12*12
Stainless steel bellows coupling

9101, 12
Measurement wheel

9102, 12
Measurement wheel

9103, 12
Measurement wheel

9104, 12

9112, 12
Measurement wheel

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

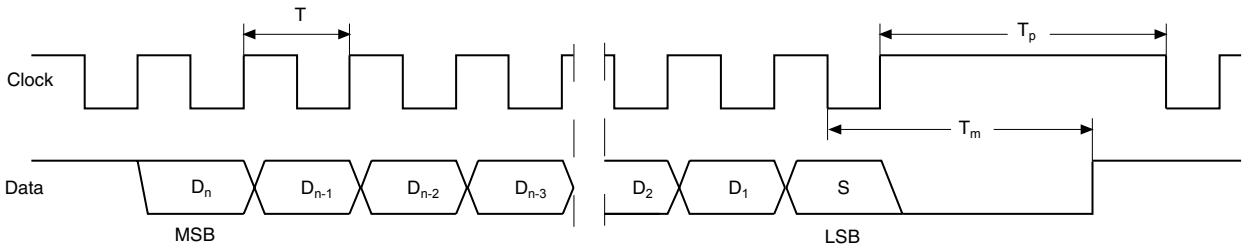
Release date: 2012-01-30 15:54 Date of issue: 2012-01-30 t30847_eng.xml

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.

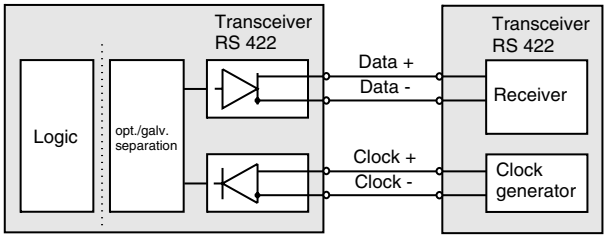
Thus only 4 lines are required for the clock and data, no matter what the resolution of the rotary encoder is. The RS 422 interface is galvanically isolated from the power supply.

SSI data transfer



D_1, ..., D_n:	Position data	T = 1/f:	Duration of period, f < 1.5 MHz
S:	Special bit	T_m:	Monoflop time 20 µs
MSB:	Most significant bit	T_p:	Clock pause > 25 µs
LSB:	Least significant bit		

Block diagram



Rotary encoder Interface electronics

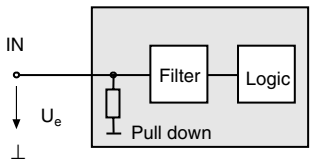
Line length

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

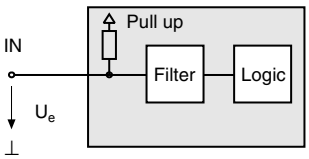
Inputs

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)



Release date: 2012-01-30 15:54 Date of issue: 2012-01-30 t30847_eng.xml

Order code

A	V	M	1	4	N	–	0	5	M	K	2	A	0		N	–	1	2	1	2

Data format
A SSI (Synchronous Serial Interface)

Shaft version
V Solid shaft

Principle of operation
M Multiturn

Housing material
N Aluminium, powder coated

Shaft dimension/flange version
05M Shaft Ø12 mm x 25 mm with 40 mm fit

Connection type
K2 Cable Ø11.2 mm, 9 core, 2 m

Exit position
A Axial

Option
0 Zero setting function

Output code
B Binary
G Gray

Temp.
N normal

Number of bits multiturn
12 **4096**

Number of bits singleturn
12 4096

Release date: 2012-01-30 15:54 Date of issue: 2012-01-30 t30847_eng.xml