

Model Number

AVM42H-0

Heavy-duty encoder

Features

- **Sturdy construction**
- **Highly shock / vibration and soiling resistant**
- **Increased shaft load capacity**
- **SSI interface**
- **Stainless steel housing**
- **IP69K**
- **Very small housing**

Description

This absolute rotary encoder with magnetic sampling provides a position value corresponding to the shaft position on its integrated SSI interface (Synchronous Serial Interface).

The very sturdy design of this encoder has been dimensioned for use in harsh environmental conditions and high mechanical stress.

The control module sends a start sequence 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.

Technical data

General specifications

Detection type magnetic sampling

Nominal ratings

Linearity error $\pm 0.36^\circ$

Electrical specifications

Operating voltage U_B 4.5 ... 30 V DC

Power consumption P_0 ≤ 1.5 W

Linearity ± 2 LSB at 16 Bit, ± 1 LSB at 13 Bit, ± 0.5 LSB at 12 Bit

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 μ s

Resolution

Single turn up to 13 Bit

Multiturn 12 Bit

Overall resolution up to 25 Bit

Transfer rate 0.1 ... 2 MBit/s

Voltage drop $U_B - 2.5$ V

Standard conformity RS 422

Input 1

Input type Selection of counting direction (cw/ccw)

Signal voltage

High 4.5 V ... U_B (cw descending)

Low 0 ... 2 V or unconnected (cw ascending)

Input current < 6 mA

Switch-on delay < 1.1 s

Input 2

Input type zero-set (PRESET 1) with falling edge

Signal voltage

High 4.5 V ... U_B

Low 0 ... 2 V

Input current < 6 mA

Signal duration ≥ 1.1 s

Connection

Connector M12 connector, 8-pin

Standard conformity

Degree of protection acc. DIN EN 60529

Climatic testing DIN EN 60068-2-3, 95 %, no moisture condensation

Emitted interference EN 61000-6-4:2007

Noise immunity EN 61000-6-2:2005

Shock resistance DIN EN 60068-2-27, 300 g, 6 ms

Vibration resistance DIN EN 60068-2-6, 30 g, 55 ... 2000 Hz

Ambient conditions

Operating temperature $-40 \dots 85^\circ\text{C}$ ($-40 \dots 185^\circ\text{F}$)

Storage temperature $-40 \dots 85^\circ\text{C}$ ($-40 \dots 185^\circ\text{F}$)

Relative humidity 95 %, no moisture condensation

Mechanical specifications

Flange servo flange 42 mm with 4 x Threading M4

Shaft dimensions $\varnothing \times l$ 10 mm x 21 mm

Degree of protection IP66 / IP68 / IP69K

Material

Housing Stainless steel 1.4305 / AISI 303

Flange Stainless steel 1.4305 / AISI 303

Shaft stainless steel 1.4104 / AISI 430F

Mass approx. 350 g

Rotational speed max. 6000 min^{-1}

Moment of inertia 30 gcm^2

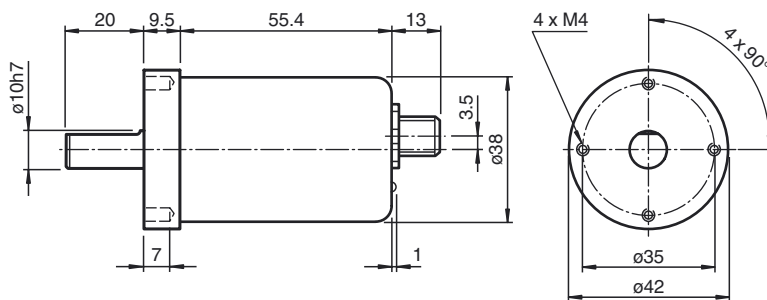
Starting torque < 5 Ncm

Shaft load

Axial 270 N

Radial 270 N

Dimensions



Electrical connection

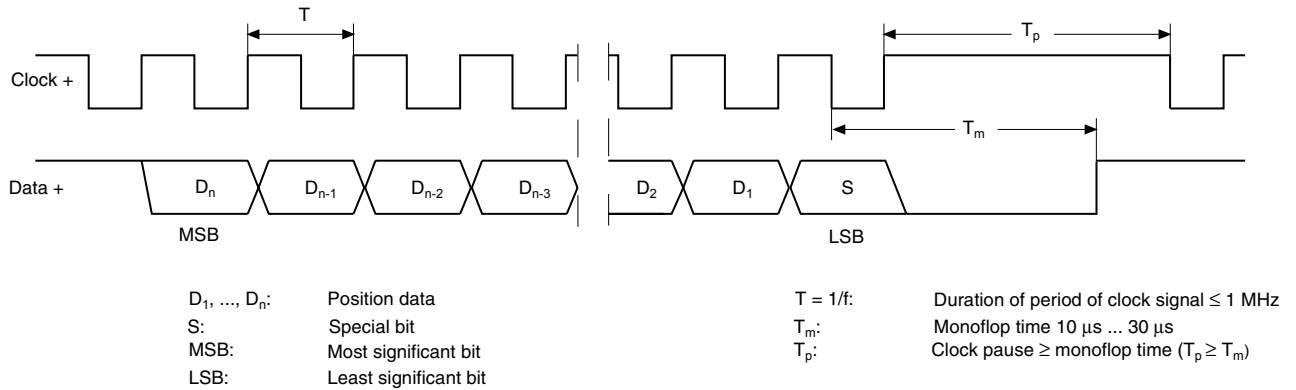
Signal	Connector
GND (encoder)	1
U_b (encoder)	2
Clock (+)	3
Clock (-)	4
Data (+)	5
Data (-)	6
Preset	7
Counting direction	8
Shielding	Housing
Pinout	

Release date: 2015-03-05 16:35 Date of issue: 2015-03-05 t154926_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 optically isolated from the power supply.

SSI signal course Standard



SSI output format Standard

- At idle status signal lines "Data +" and "Clock +" are at high level (5 V).
- The first time the clock signal switches from high to low, the data transfer in which the current information (position data (D_n) and special bit (S)) is stored in the encoder is introduced.
- The highest order bit (MSB) is applied to the serial data output of the encoder with the first rising pulse edge.
- The next successive lower order bit is transferred with each following rising pulse edge.
- After the lowest order bit (LSB) has been transferred the data line switches to low until the monoflop time T_m has expired.
- No subsequent data transfer can be started until the data line switches to high again or the time for the clock pause T_p has expired.
- After the clock sequence is complete, the monoflop time T_m is triggered with the last falling pulse edge.
- The monoflop time T_m determines the lowest transmission frequency.

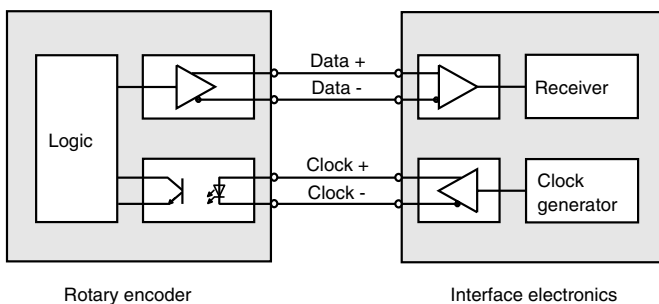
SSI output format ring slide operation (multiple transmission)

- In ring slide operation, multiple transmission of the same data word over the SSI interface makes it possible to offer the possibility of detecting transmission errors.
- In multiple transmission, 25 bits are transferred per data word in standard format.
- If the clock change is not interrupted after the last falling pulse edge, ring slide operation automatically becomes active. This means that the information that was stored at the time of the first clock change is generated again.
- After the first transmission, the 26th pulse controls data repetition. If the 26th pulse follows after an amount of time greater than the monoflop time T_m, a new current data word will be transmitted with the following pulses.



If the pulse line is exchanged, the data word is generated offset. Ring slide operation is possible up to max. 13 bits.

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.

Release date: 2015-03-05 16:35 Date of issue: 2015-03-05 t154926_eng.xml

