Model Number

AVS58N-011YYRYGN-0014

Features

- **YY: Connector 9416L with special assignment**
- **Y: Power supply 5 V DC**
- **14 Bit singleturn**
- **Hardware encoder**
- **Data transfer up to 2 MBaud**
- **Optically isolated RS 422 interface**
- **Clamping flange**

Description

This singleturn absolute encoder with modern fast technology transmits a position value corresponding to the shaft setting via the SSI interface (Synchronous Serial Interface). The resolution of the AVS58 is maximum 16384 steps per revolution.

In contrast to the AVS58 series the encoder does not have a microcontroller. Thus, it is a pure hardware encoder.

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.

This singleturn absolute encoder is available in clamp flange design with a shaft diameter of 10 mm x 20 mm. The electrical connection is made by a 12-pin round plug connector.

Technical Data

Functional safety related parameters	
$MTTF_d$	170 a
Mission Time (T_M)	20 a
L_{10}	1.9 E+11 at 6000 rpm and 20/40 N axial/radial shaft load
Diagnostic Coverage (DC)	0 %
Electrical specifications	
Operating voltage U_B	5 V DC
No-load supply current I_0	max. 120 mA
Linearity	± 2 LSB at 14 Bit, ± 1 LSB at 13 Bit, ± 0,5 LSB at 12 Bit
Output code	Gray code
Code course (counting direction)	cw descending (clockwise rotation, code course descending)
Interface	
Interface type	SSI
Monoflop time	20 ± 10 µs
Resolution	
Single turn	14 Bit
Overall resolution	14 Bit
Transfer rate	0.1 ... 2 MBit/s
Standard conformity	RS 422
Connection	
Connector	type 9416L (M23), 12-pin
Standard conformity	
Degree of protection	DIN EN 60529, IP65
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	-40 ... 85 °C (-40 ... 185 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Mechanical specifications	
Material	housing: powder coated aluminum flange: aluminum shaft: stainless steel
Mass	approx. 460 g
Rotational speed	max. 12000 min^{-1}
Moment of inertia	50 gcm^2
Starting torque	< 5 Ncm
Shaft load	
Axial	40 N
Radial	110 N

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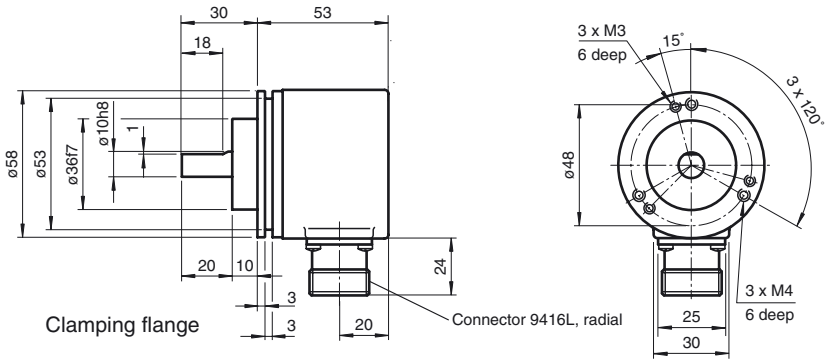
Dimensions



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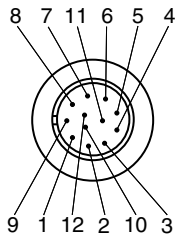
Electrical connection

Signal	Connector 9416L, 12-pin	Explanation	Pinout
GND (encoder)	12	Power supply	
U_b (encoder)	10	Power supply	
Clock (+)	2	Positive cycle line	
Clock (-)	1	Negative cycle line	
Data (+)	3	Positive transmission data	
Data (-)	4	Negative transmission data	
Reserved	11	Not wired, reserved	
Reserved	5	Not wired, reserved	
Reserved	9	Not wired, reserved	
Reserved	8	Not wired, reserved	
Reserved	6	Not wired, reserved	
Reserved	7	Not wired, reserved	

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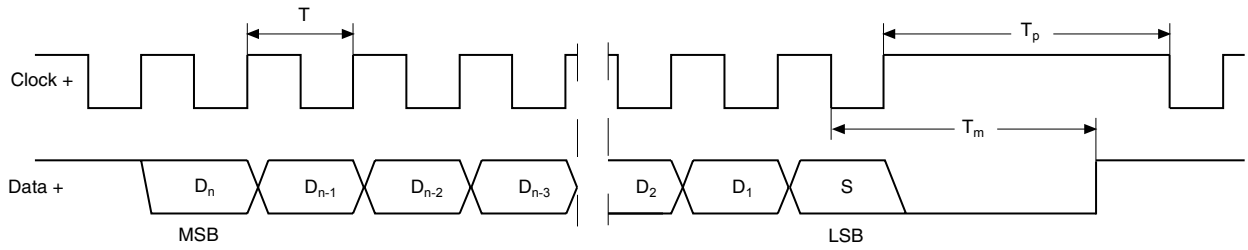
Description

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



$D_1, ..., D_n$:	Position data	T = 1/f:	Duration of period of clock signal ≤ 1 MHz
S:	Special bit	T_m:	Monoflop time 10 µs ... 30 µs
MSB:	Most significant bit	T_p:	Clock pause ≥ monoflop time ($T_p \geq T_m$)
LSB:	Least significant bit		

SSI output format Standard

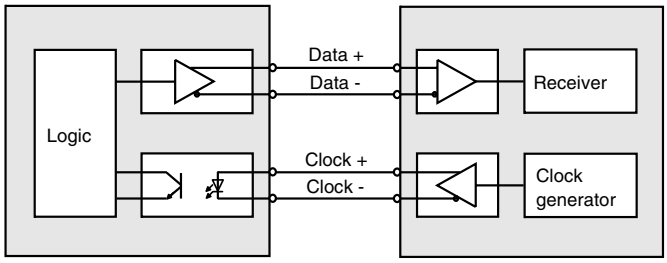
- At idle status signal lines "Data +" and "Clock +" are at high level (5 V).
- The first time the clock signal switches from high to low, the data transfer in which the current information (position data (D_n) and special bit (S)) is stored in the encoder is introduced.
- The highest order bit (MSB) 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

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