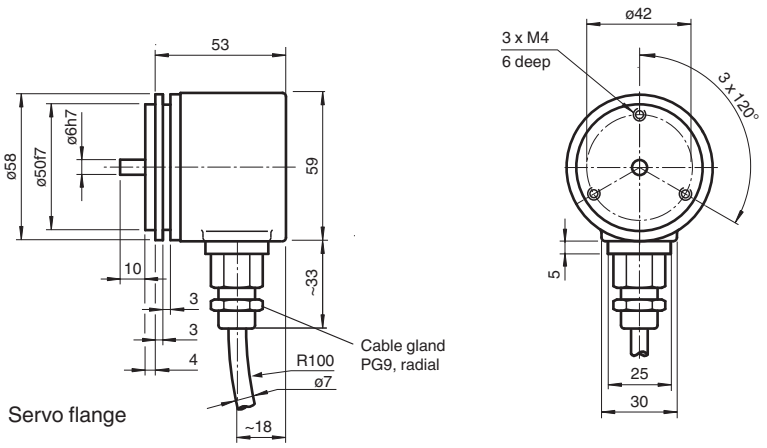
Multiturn absolute rotary encoder
AVM58W-032K1R0G5-1212

- Industrial standard housing Ø58 mm
- 24 bit multiturn
- Data transfer up to 2 MBaud
- Optically isolated RS 422 interface
- Servo or clamping flange
- Zero-set function
- 2048 pulses

Dimensions



Technical Data

General specifications		
Detection type		photoelectric sampling
Device type		Multiturn absolute rotary encoder
UL File Number		E223176 "For use in NFPA 79 Applications only" , if UL marking is marked on the product.
Functional safety related parameters		
MTBF		8.1 a (Operation at +40 °C)
Electrical specifications		
Operating voltage	U_B	4.5 ... 30 V DC
No-load supply current	I_0	max. 180 mA
Time delay before availability	t_v	< 250 ms
Linearity		± 2 LSB at 16 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 ; SSI + incremental track
Monoflop time		20 ± 10 µs
Resolution		
Single turn		up to 12 Bit
Multiturn		12 Bit

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Technical Data

Overall resolution		up to 24 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 ... 30 V
Low		0 ... 2 V
Input current		< 6 mA
Switch-on delay		< 10 ms
Input 2		
Input type		zero-set (PRESET 1)
Signal voltage		
High		4.5 ... 30 V
Low		0 ... 2 V
Input current		< 6 mA
Signal duration		min. 100 ms
Switch-on delay		< 10 ms
Output		
Output type		RS422
Signal output		A+B+/A+/B
Pulses		2048
Connection		
Cable		Ø7 mm, 6 x 2 x 0.14 mm², 1 m
Standard conformity		
Degree of protection		DIN EN 60529, IP66/IP67 (with shaft seal)
Climatic testing		DIN EN 60068-2-3, no moisture condensation
Emitted interference		DIN EN 61000-6-4
Noise immunity		DIN EN 61000-6-2
Shock resistance		DIN EN 60068-2-27, 100 *g*, 6 ms
Vibration resistance		DIN EN 60068-2-6, 20 *g*, 10 ... 2000 Hz
Approvals and certificates		
UL approval		cULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.
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		aluminium, salt water resitant
Shaft		Stainless steel
Mass		approx. 460 g
Rotational speed		max. 12000 min $^{-1}$
Moment of inertia		50 gcm²
Starting torque		< 5 Ncm
Shaft load		
Axial		40 N
Radial		110 N

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Connection Assignment

Signal	Cable, 12-core
GND (Encoder)	White
$+U_B$ (Encoder)	Brown
Clock (+)	Green
Clock (-)	Yellow
Data (+)	Grey
Data (-)	Pink
A	Blue
V/R	Red
Preset 1	Black
B	Grey Pink
/A	Violett
/B	Red blue

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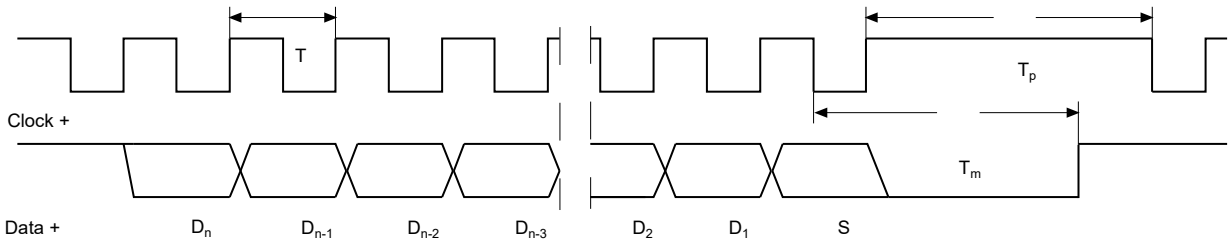
Interface

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 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

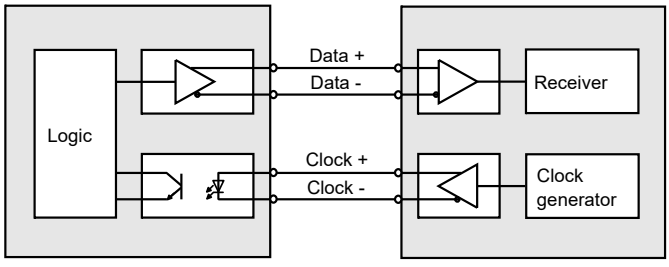
- At idle status signal lines "Data +" and "Clock +" are at high level (5 V).
- The first time the clock signal switches from high to low, the data transfer in which the current information (position data (D_n) and special bit (S)) is stored in the encoder is introduced.
- The highest order bit (MSB)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

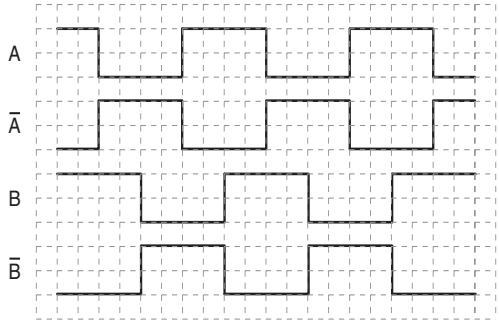


Line length

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

Operation

Signal output

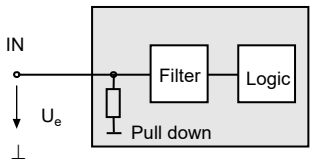


↻ cw - with view onto the shaft

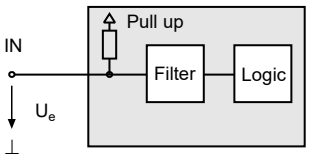
Inputs

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)



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