



Model Number

ASS58-H

Features

- Industrial standard housing Ø58 mm
- 16 Bit singleturn
- Hardware encoder
- Data transfer up to 2 MBaud
- Optically isolated RS 422 interface
- Recessed hollow shaft

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 ASS58-H is maximum 65536 steps per revolution. In contrast to the ASS58 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. It is possible to select the counting direction with the function input.

The absolute encoder is mounted directly onto the application shaft, without any coupling. Rotation of the absolute encoder is prevented by a torque rest.

The electrical connection is made by a 12-pin round plug connector. It is also possible to obtain a version with a 1 m cable connector.

Technical data

General specifications

Detection type photoelectric sampling

Functional safety related parameters

MTTF_d 170 a

Mission Time (T_M) 20 a

L_{10h} 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 4.5 ... 30 V DC

No-load supply current I₀ max. 180 mA

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 µs

Resolution

Single turn up to 16 Bit

Overall resolution up to 16 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

Connection

Connector type 9416, 12-pin, type 9416L, 12-pin

Cable Ø7 mm, 6 x 2 x 0.14 mm², 1 m

Standard conformity

Protection degree DIN EN 60529, IP65

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

Ambient conditions

Operating temperature -40 ... 85 °C (-40 ... 185 °F)

Storage temperature -40 ... 85 °C (-40 ... 185 °F)

Mechanical specifications

Material

Combination 1 housing: powder coated aluminium

flange: aluminium

shaft: stainless steel

Combination 2 (Inox) housing: stainless steel

flange: stainless steel

shaft: stainless steel

Mass approx. 460 g (combination 1)

approx. 800 g (combination 2)

Rotational speed max. 12000 min⁻¹

Moment of inertia 50 gcm²

Starting torque < 5 Ncm

Shaft load

Angle offset ± 0.9 °

Axial offset static: ± 0.3 mm, dynamic: ± 0.1 mm

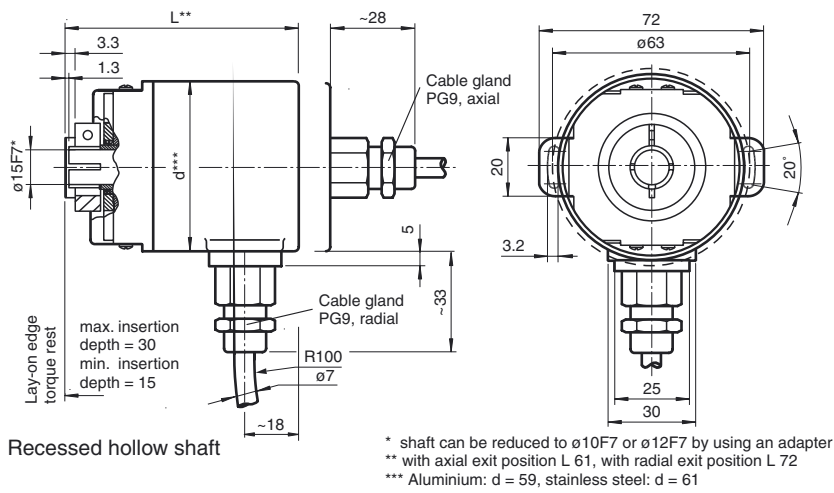
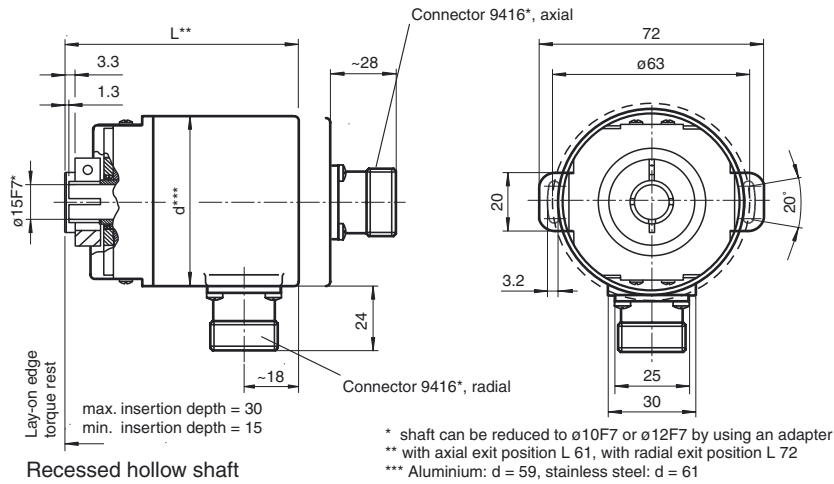
Radial offset static: ± 0.5 mm, dynamic: ± 0.2 mm

Approvals and certificates

UL approval

cULus Listed, General Purpose, Class 2 Power Source

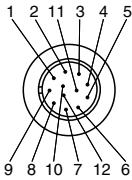
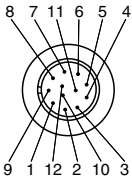
Dimensions



Accessories

9416
Cable connector

Electrical connection

Signal	Cable Ø7 mm, 12-core	Connector 9416, 12-pin	Connector 9416L, 12-pin	Explanation
GND (encoder)	White	1	1	Power supply
U _b (encoder)	Brown	2	8	Power supply
Clock (+)	Green	3	3	Positive cycle line
Clock (-)	Yellow	4	11	Negative cycle line
Data (+)	Grey	5	2	Positive transmission data
Data (-)	Pink	6	10	Negative transmission data
Reserved	Blue	7	12	Not wired, reserved
V/R	Red	8	5	Input for selection of counting direction
Reserved	Black	9	9	Not wired, reserved
Reserved	Violet	10	4	Not wired, reserved
Reserved	Grey/Pink	11	6	Not wired, reserved
Reserved	Red/Blue	12	7	Not wired, reserved
				

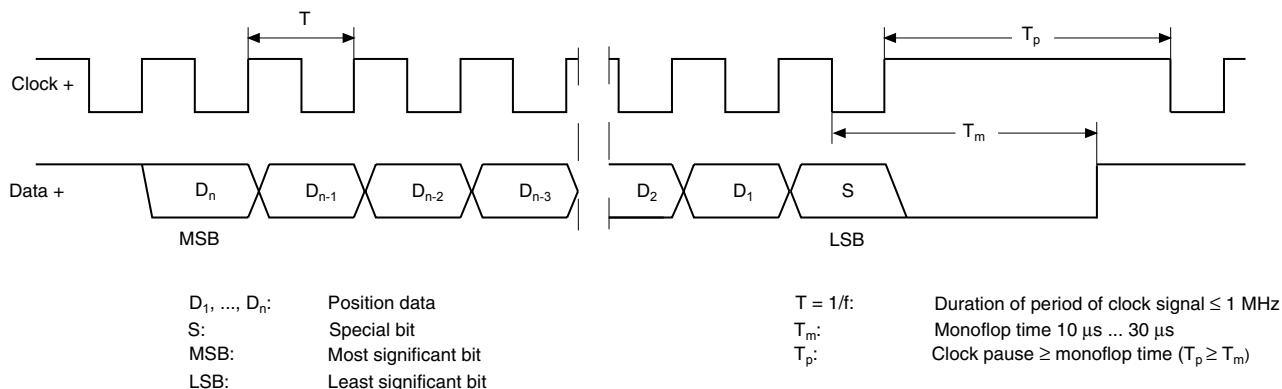
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Description

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



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.

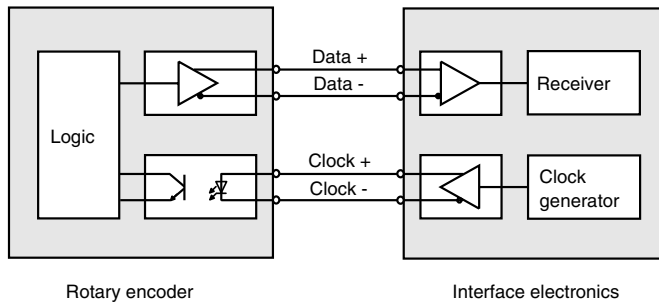
SSI output format ring slide operation (multiple transmission)

- 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

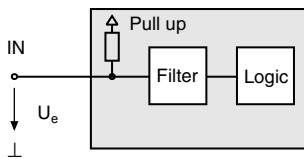


Line length

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

Input

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



Accessories

Accessories	Name/defining feature	Order code
Connectors	Cable socket	9416
	Cable socket	9416L

For additional information on the accessories, please see the "Accessories" section.

Order code



- Number of bits singleturn**
 - 12 4096 (standard)
 - 13 8192
 - 16 65536
- Output code**
 - B Binary
 - G Gray
- Exit position**
 - A Axial
 - R Radial
- Connection type**
 - K1 Cable Ø7 mm, 6 x 2 x 0.14 mm², 1 m
 - AA Plug connector type 9416, 12-pin
 - AB Plug connector type 9416L, 12-pin
- Shaft dimension/flange version**
 - F1A Recessed hollow shaft Ø10 mm x 30 mm
 - F2A Recessed hollow shaft Ø12 mm x 30 mm
 - F3A Recessed hollow shaft Ø15 mm x 30 mm
- Housing material**
 - N Aluminium, powder coated
 - I Inox*
 - W Aluminium, powder coated with shaft seal
- Principle of operation**
 - S Singleturn
- Shaft version**
 - S Recessed hollow shaft
- Data format**
 - A SSI (Synchronous Serial Interface)

*Housing material I only available with axial exit position.

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