

ABSOLUTE ROTARY ENCODER

AWC58 CAN-BUS



CANopen

Main Features

- Compact and heavy-duty industrial model
- Interface: CAN according to CAL
- Housing: 58 mm Ø
- Shaft: 6 or 10 mm Ø
- Resolution: Max. 25 Bit = 33,554,432 steps over 4096 revolutions
- Code: Binary
- EMC: EN 50 081-2, EN 50 082-2, CE

Programmable Parameters

- Direction of rotation (complement)
- Resolution per revolution
- Total resolution
- Preset value
- Two limit switches
- Baud-rate and CAN-identifier
- Transmission mode:
Polled mode, cyclic mode, or sync mode

Mechanical Structure

- Flange and housing of Aluminum
- Shaft of stainless steel
- Precision ball bearings with sealing or cover rings
- Code disc made of unbreakable and durable plastic

Electrical Features

- Temperature insensitive
IR-opto-receiver-array
- Only one IR-transmitter-diode per opto-array
- Highly integrated circuit in SMD-technology
- Polarity inversion protection
- Over-voltage-peak protection

Standard Types

| Type | Steps per rev. | No. of rev. | Total resolution | Code |
|--------------------------|----------------|-------------|------------------|--------|
| 5812 - 1 - FBA1C203PG | 4096 | 1 | 4,096 | Binary |
| 5812 - 4096 - FBA1C203PG | 4096 | 4096 | 16,777,216 | Binary |

TECHNICAL DATA

AWC58 CAN-BUS

Electrical Data

| | |
|----------------------|--|
| Supply voltage | 10 - 30 V DC (absolute limits) |
| Power consumption | Max. 3.5 Watt |
| EMC | EN 50081-2, EN 50082-2 |
| Bus connection | CAN transceiver according to ISO/DIS 11898 Galvanically isolated by opto-couplers |
| Transmission rate | 20 kBaud ... 1 MBaud (programmable) |
| Accuracy of division | $\pm \frac{1}{2}$ LSB |
| Step frequency LSB | Max. 100 kHz (valid code) |
| Electrical lifetime | $> 10^5$ h |
| Node number | Programmable by 5 DIP-switches in connection cap |
| Identifier | Standard 11 bit identifier, passive to 29 bit identifier |

Mechanical data

| | | |
|-------------------------|---|-------------------------------|
| Housing | Aluminum | |
| Flange | Synchro (Y) | Clamp (F), Synchro (Z) |
| Shaft diameter | 6 mm | 10 mm |
| Shaft length | 10 mm | 20 mm |
| Shaft loading | Axial 10 N, radial 20 N | Axial 20 N, radial 110 N |
| Friction torque | ≤ 1 Ncm | ≤ 5 Ncm |
| Inertia of rotor | ≈ 20 gcm ² | ≈ 50 gcm ² |
| Lifetime | $> 10^5$ h at 1000 rpm | |
| RPM | Max. 6000 (continuously) | |
| Shock (IEC 68-2-27) | ≤ 200 m/s ² (12 ms) | |
| Vibration (IEC 68-2-26) | ≤ 100 m/s ² (10 Hz ... 1000 Hz) | |
| Weight, single-turn | ≈ 500 g | |
| Weight, multi-turn | ≈ 700 g | |

Environmental Conditions

| | | |
|-----------------------------|-----------------------------|------------------------|
| Operating temperature | 0 ... + 70 °C | |
| Storage temperature | - 40 ... + 85 °C | |
| Humidity | 98 % (without liquid state) | |
| Protection class (EN 60529) | Shaft $\varnothing 6$ | Shaft $\varnothing 10$ |
| Casing side | IP 65 | IP 65 |
| Shaft side | IP 54* | IP 65** |

* Optional with shaft sealing (IP 65)

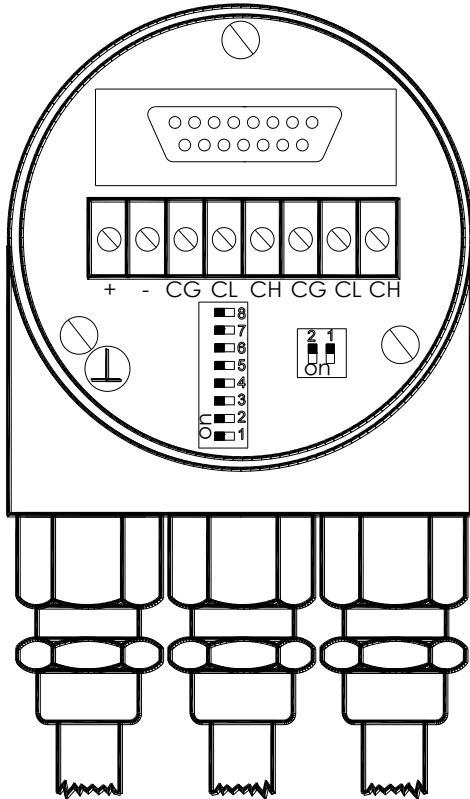
** up to 0.5 bar

INTERFACE

AWC58 CAN-BUS

Installation

The rotary encoder is connected by three cables. The power supply is achieved with a two-wire connection cable through one PG 9. Each one of the twisted-pair and shielded bus lines are guided in and out through two PG 9 on the right side (as seen on clamps):



| Clamp | Description |
|-------|---------------------|
| ⊥ | Ground |
| + | 24 V Supply voltage |
| - | 0 V Supply voltage |
| CG | CAN Ground |
| CL | CAN Low |
| CH | CAN High |
| CG | CAN Ground |
| CL | CAN Low |
| CH | CAN High |

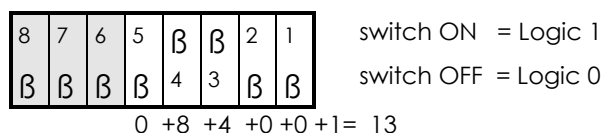
DIP-Switches:

- 1 - 5 Setting CAN-node number
- 6 - 8 Setting of the baud-rate
- 1 + 2 Termination resistor for the last CAN-bus node (120 Ω - resistor)

There is a resistor provided in the connection cap, which must be used as a line termination on the last device:



The setting of the node number is achieved by 5 DIP-switches in the connection cap. The connection cap can easily be opened for installation by removing the two cap screws. The following example shows how the device address 13 (decimal) is set :



INTERFACE

AWC58 CAN-BUS

Programmable Encoder - Parameters

– **Operating Parameters:**

As operating parameters the code sequence (complement) can be programmed. This parameter determines the counting direction, in which the output code increases or decreases.

– **Resolution per Revolution:**

The parameter resolution per revolution is used to program the desired number of steps per revolution. Each value between 1 and 4096 can be programmed.

– **Total Resolution:**

This parameter is used to program the desired number of measuring units over the total measuring range. This value may not exceed the total resolution of the absolute rotary encoder. If the encoder is used in a continuous measuring application, certain rules for the setting of this parameter must be followed. These rules are outlined in the manual.

– **Preset Value:**

The preset value is the desired position value, which should be reached at a certain physical position of the axis. The position value is set to the desired process value by the parameter preset.

– **Limit Switch, Min. and Max.:**

Two position values can be programmed as limit switches. By reaching these values one bit of the 32 bit process value is set to high.

– **Cam:**

One free programmable cam can be set in the total measuring range. The same functionality is realised like a mechanical cam unit.

Programmable CAN Transmission Modes

– **Polled Mode:**

By a remote-transmission-request telegram the connected host calls for the current process value. The absolute rotary encoder reads the current position value, calculates eventually set-parameters and sends back the obtained process value by the same identifier.

– **Cyclic Mode:**

The absolute rotary encoder transmits cyclically - without being called by the host - the current process value. The cycle time can be programmed in milliseconds for values between 1 ms and 65536 ms.

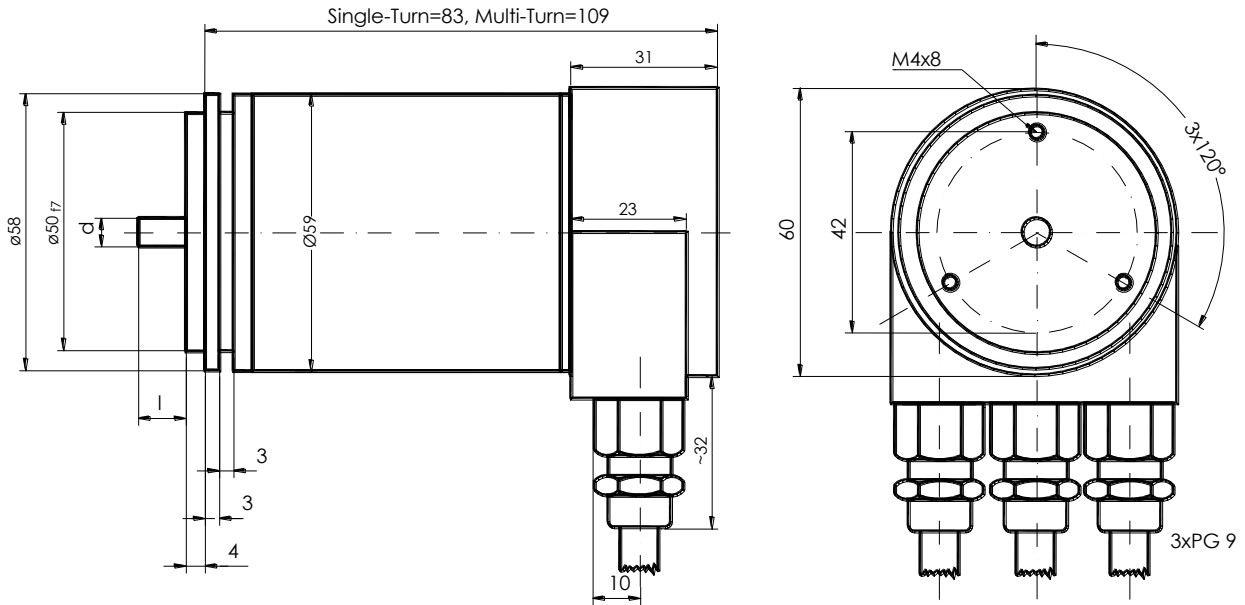
– **Sync Mode:**

After receiving a sync telegram by the host, the absolute rotary encoder answers with the current process value. If more than one node number (encoder) shall answer after receiving a sync telegram, the answer telegrams of the nodes will be received by the host in order of their node numbers. The programming of an offset-time is not necessary. If a node should not answer after each sync telegram on the CAN network, the parameter sync counter can be programmed to skip a certain number of sync telegrams before answering again.

MECHANICAL DRAWINGS
AWC58 CAN-BUS

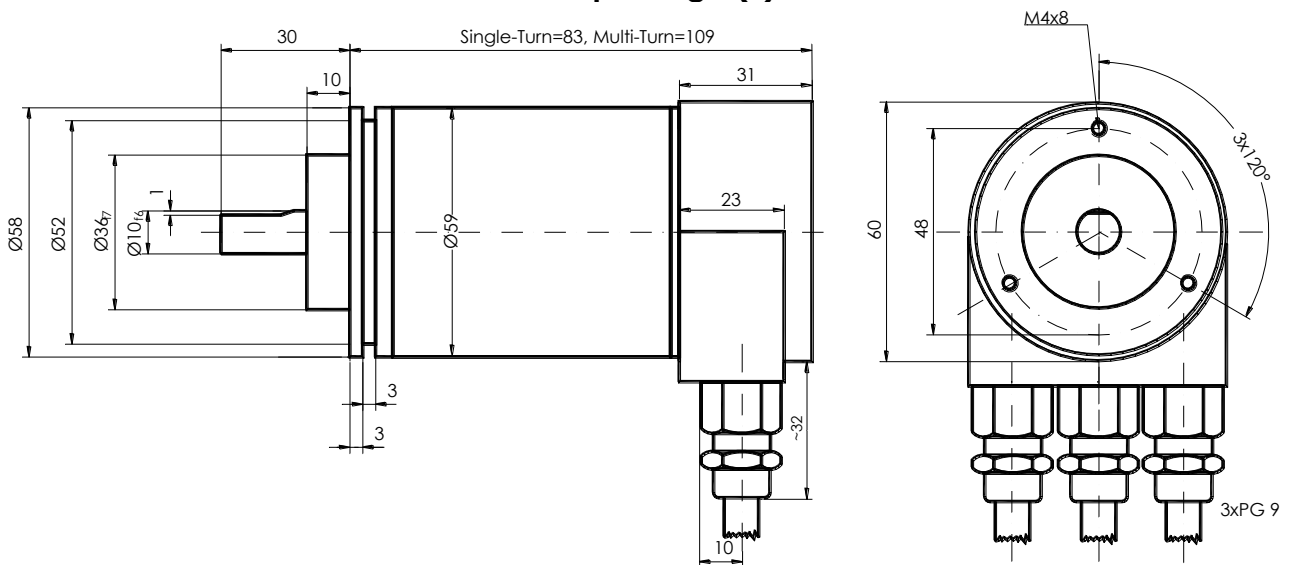
Synchro Flange (Y,Z)

The only difference between the Y- and Z-flange is the shaft size (refer to the table below).



| | d [mm] | l [mm] |
|----------|-------------------|--------|
| Y-Flange | 6 f ₆ | 10 |
| Z-Flange | 10 f ₆ | 20 |

Clamp Flange (F)



MODELS / ORDERING DESCRIPTION
AWC58 CAN-BUS

| Description | Type Key | | | | | | | | | | |
|-------------------------|--|-----------|--------------------------|---|--|---|----------|----------|-----------|--|-------------------|
| Absolute rotary encoder | AWC | | | - | | - | | | | | |
| Diameter in mm | 58 | | | | | | | | | | |
| Steps per revolution | 4096 | 12 | | | | | | | | | |
| | 8192 | 13 | | | | | | | | | |
| No. of revolutions | 1 | | 1 | | | | | | | | |
| | 4096 | | 4096 | | | | | | | | |
| Flange | Clamp flange (shaft = 10 mm Ø) | | | | | | F | | | | |
| | Synchro flange (shaft = 6 mm Ø) | | | | | | Y | | | | |
| | Synchro flange (shaft = 10 mm Ø) | | | | | | Z | | | | |
| Code | Binary | | | | | | B | | | | |
| Version | for internal use only | | | | | | A | 1 | | | |
| Interface | CAN | | Non programmable | | | | | | C1 | | |
| | | | Programmable | | | | | | C2 | | |
| | | | without connection cap * | | | | | | C5 | | |
| Options | Without | | | | | | | | 0 | | |
| | Shaft sealing (not for Z-flange) | | | | | | | | W | | |
| | Stainless steel configuration (flange, housing, cap) | | | | | | | | Q | | |
| Connector-/cable-exit | 3 PG-exits, radial at connection cap cable-exit (only for interface C5) * | | | | | | | | | | 3PG 00R |

* Configuration of baudrate and node number via SDO-objects is only available with cable-exit.

Further models on request

FRABA GmbH does not resume responsibility for technical inaccuracies or omissions. Specifications are subject to change without notice.

Accessories

| Description | Type |
|---|--|
| Connection cap* T-coupling-functionality with integrated address setting is necessary to use the encoder | AH 58-CA-3PG |
| Shaft coupling | Drilling: 10 mm |
| | Drilling: 6 mm |
| EDS-file** | Disc containing EDS-file for configuration, is only necessary if FRABA rotary encoder is used for the first time |
| Clamp disc | 3 pcs. / AWC |

* The connection cap must be ordered separately !

Documentation

| Description | Type |
|-----------------|--|
| User's manual** | Installation and configuration manual for CAN-Bus, English |
| User's manual** | Installation and configuration manual for CAN-Bus, German |

** These can be downloaded free of charge at www.fraba.com under Sensor - Download