ABSOLUTE ROTARY ENCODERS

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 at 4096 revolutions
- Code: Binary
- EMC: EN 50 081-2, EN 50 082-2, CE

Programmable Parameters

- Code Sequence
- Resolution per revolution
- Total resolution
- Pre-set value
- Two limit switches
- Baud-rate and CAN-Identifier
- Transmission mode: Polled mode, cyclic mode and sync mode

Mechanical Structure

- Flange and housing of light metal
- 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

<table>
<thead>
<tr>
<th>Type</th>
<th>Steps per rev.</th>
<th>No. of rev.</th>
<th>Total resolution</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>5812 - 1 - FB00C203PG</td>
<td>4096</td>
<td>1</td>
<td>4,096</td>
<td>Binary</td>
</tr>
<tr>
<td>5812 - 4096 - FB00C203PG</td>
<td>4096</td>
<td>4096</td>
<td>16,777,216</td>
<td>Binary</td>
</tr>
</tbody>
</table>
TECHNICAL DATA
AWC58 CAN-BUS

Electrical Data

Supply voltage
10 - 30 V DC (absolute limits)
Galvanically separated by DC/DC-transformer

Power consumption
Max. 3.5 Watt

EMC
EN 50081-2, EN 50082-2

Bus connection
CAN transceiver according to ISO/DIS 11898
Galvanically separated by opto-couplers

Clock frequency
20 kBaud ... 1 MBaud (programmable)

Accuracy of division
± ½ LSB

Step frequency LSB
Max. 100 kHz (valid code)

Electrical lifetime
> 10^5 h

Node number
Programmable by 5 DIP-switches in connection cap

Mechanical data

Housing
Aluminum

Flange
Synchro (Y)
Clamp (F), synchro (Z)

Shaft diameter
6 mm, 10 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 min^-1

RPM
Max. 6000 min^-1 (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 Ø6
Shaft Ø10

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):

<table>
<thead>
<tr>
<th>Clamp</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Ground</td>
</tr>
<tr>
<td>+</td>
<td>24 V Supply voltage</td>
</tr>
<tr>
<td>-</td>
<td>0 V Supply voltage</td>
</tr>
<tr>
<td>CG</td>
<td>CAN Ground</td>
</tr>
<tr>
<td>CL</td>
<td>CAN Low</td>
</tr>
<tr>
<td>CH</td>
<td>CAN High</td>
</tr>
<tr>
<td>CG</td>
<td>CAN Ground</td>
</tr>
<tr>
<td>CL</td>
<td>CAN Low</td>
</tr>
<tr>
<td>CH</td>
<td>CAN High</td>
</tr>
</tbody>
</table>

DIP-Switches:
1 - 5 Setting CAN-node number
6 - 8 Setting of the bits-per-Second
1+2 Terminating resistor for last CAN-bus node (120 Ω - resistor)

There are three resistors 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:

```
NC off
8 7 6 5 B B 2 1
0+ 8+ 4+ 0+ 0 +1= 13
```

switch OFF = Log 0
switch ON = Log 1
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 realized.

- **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, the parameter must be programmed in values with powers of 2 \(2^x \text{ with } x<12\).

- **Pre-set Value:**
  The pre-set 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 pre-set.

- **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.

Programmable CAN Transmission Modes

- **Polled Mode:**
  By a remote-transmission-request telegram the connected host calls off 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.
Synchro-Flange (Y,Z)

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

<table>
<thead>
<tr>
<th></th>
<th>d [mm]</th>
<th>l [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y-Flange</td>
<td>6 ( f_6 )</td>
<td>10</td>
</tr>
<tr>
<td>Z-Flange</td>
<td>10 ( f_6 )</td>
<td>20</td>
</tr>
</tbody>
</table>

Clamp Flange (F)
### MODELS / ORDERING DESCRIPTION

**AWC58 CAN-BUS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Type Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute rotary encoder</td>
<td>AWC</td>
</tr>
<tr>
<td>Diameter in mm</td>
<td>58</td>
</tr>
<tr>
<td>Steps per revolution</td>
<td>4096</td>
</tr>
<tr>
<td></td>
<td>8192</td>
</tr>
<tr>
<td>No. of revolutions</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4096</td>
</tr>
<tr>
<td>Flange</td>
<td>F</td>
</tr>
<tr>
<td>Synchro flange (shaft = 10 mm)</td>
<td>Y</td>
</tr>
<tr>
<td>Synchro flange (shaft = 6 mm)</td>
<td>Z</td>
</tr>
<tr>
<td>Code</td>
<td>B</td>
</tr>
<tr>
<td>Latch-function</td>
<td>Without</td>
</tr>
<tr>
<td>Strobe-function</td>
<td>Without</td>
</tr>
<tr>
<td>Interface</td>
<td>CAN</td>
</tr>
<tr>
<td></td>
<td>C1</td>
</tr>
<tr>
<td></td>
<td>C2</td>
</tr>
<tr>
<td>Options</td>
<td>Without</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>W</td>
</tr>
<tr>
<td></td>
<td>Q</td>
</tr>
<tr>
<td>Connector-/cable-exit</td>
<td>3PG exits, radial at connection cap</td>
</tr>
</tbody>
</table>

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

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### Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection cap*</td>
<td>T-coupling-functionality with integrated address setting</td>
</tr>
<tr>
<td>Shaft coupling</td>
<td>Drilling: 10 mm</td>
</tr>
<tr>
<td></td>
<td>Drilling: 6 mm</td>
</tr>
<tr>
<td>Clamp disc</td>
<td>3 pcs. / AWC</td>
</tr>
</tbody>
</table>

(*) The connection cap must be ordered separately!

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### Documentation

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>User’s manual</td>
<td>Installation- and configuration manual, German</td>
</tr>
<tr>
<td>User’s manual</td>
<td>Installation- and configuration manual, English</td>
</tr>
</tbody>
</table>