

# 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

Type	Steps per rev.	No. of rev.	Total resolution	Code
5812 - 1 - FB00C203PG	4096	1	4.096	Binary
5812 - 4096 - FB00C203PG	4096	4096	16.777.216	Binary

## 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	$\pm \frac{1}{2}$ LSB
Step frequency LSB	Max. 100kHz (valid code)
Electrical lifetime	> 10 <sup>5</sup> 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	$\leq 1$ Ncm	$\leq 5$ Ncm
Inertia of rotor	$\approx 20$ gcm <sup>2</sup>	$\approx 50$ gcm <sup>2</sup>
Lifetime	> 10 <sup>5</sup> h at 1000 min <sup>-1</sup>	
RPM	Max. 6000 min <sup>-1</sup> (continuously)	
Shock (IEC 68-2-27)	$\leq 200$ m/s <sup>2</sup> (12 ms)	
Vibration (IEC 68-2-26)	$\leq 100$ m/s <sup>2</sup> (10 Hz ... 1000 Hz)	
Weight, single-turn	$\approx 500$ g	
Weight, multi-turn	$\approx 700$ 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)

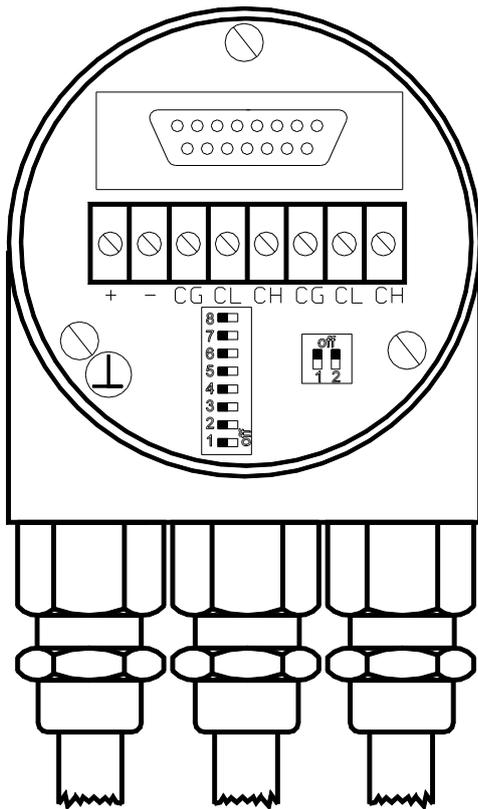
\*\* up to 0.5 bar

# 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):

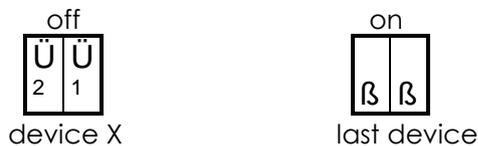


Clamp	Description
⊥	Ground
+	24 V Supply voltage
-	0 V Supply voltage
CG	CAN Ground
CL	CAN Low
CH	CAN High
CG	CAN Ground
CL	CAN Low
CH	CAN High

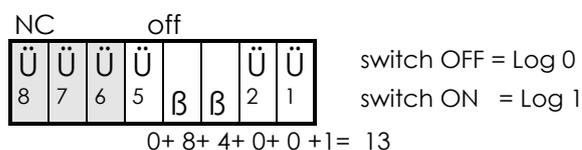
#### DIP-Switches:

- 1 - 5      Setting CAN-node number
- 6 - 8      Setting of the 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:



# 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 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 ( $2^x$  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.

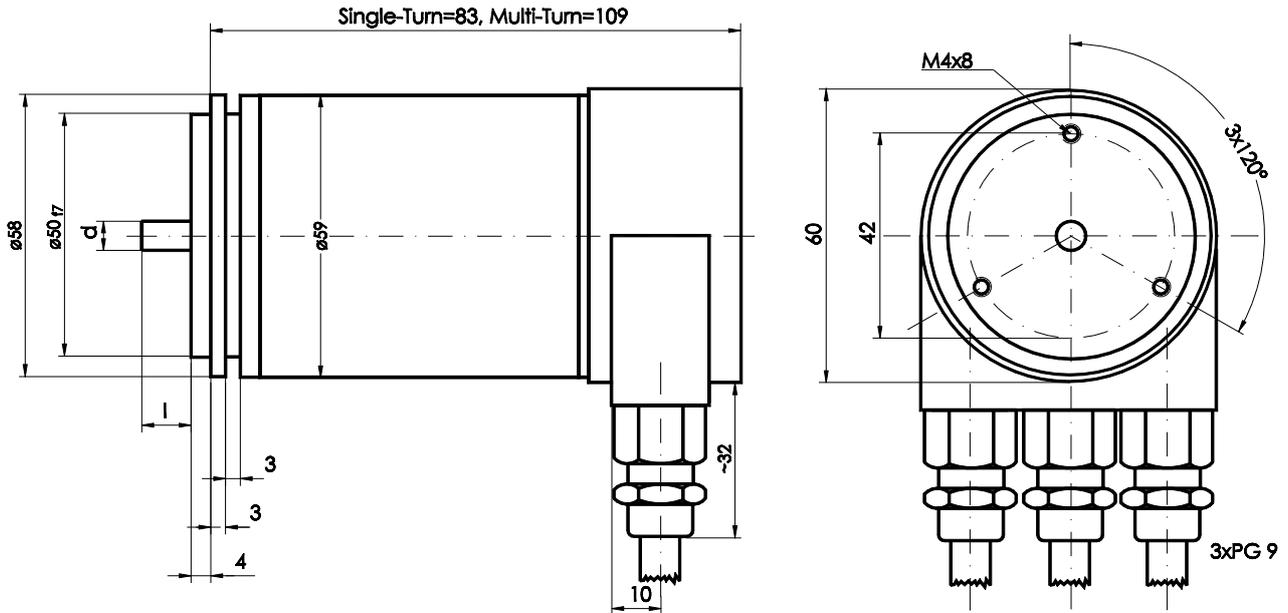
– **Sync Mode:**

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.

MECHANICAL DRAWINGS  
AWC58 CAN-BUS

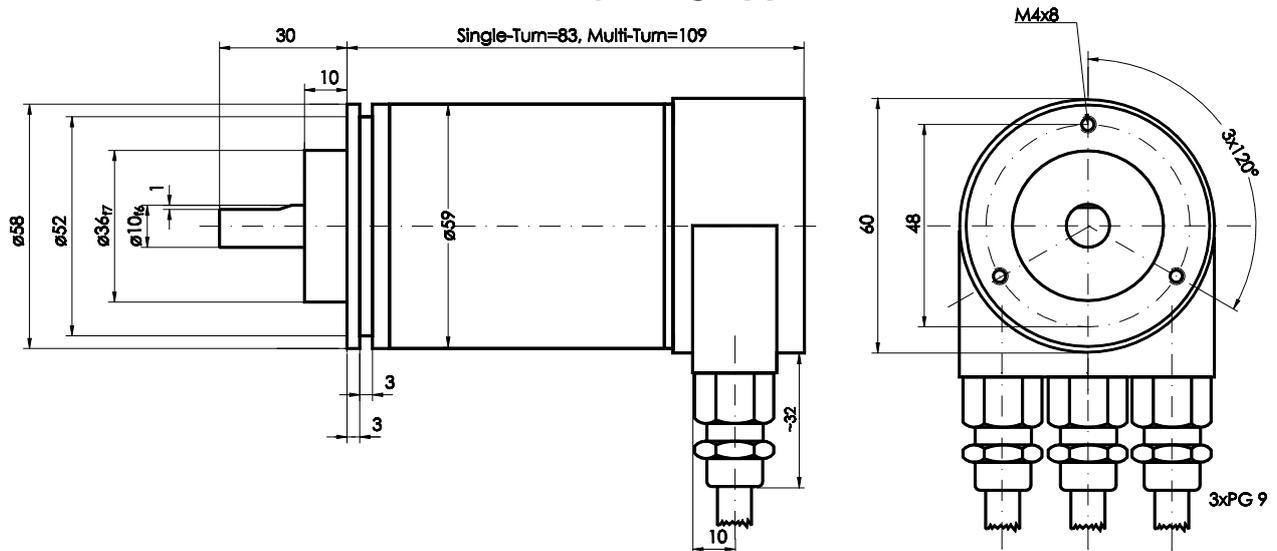
**Synchro-Flange (Y,Z)**

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 <sub>f6</sub>	10
Z-Flange	10 <sub>f6</sub>	20

**Clamp Flange (F)**



MODELS / ORDERING DESCRIPTION  
AWC58 CAN-BUS

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

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
<b>Connection cap*</b> T-coupling-functionality with integrated address setting	<b>AH-CA-3PG</b>
Shaft coupling	Drilling: 10 mm
	Drilling: 6 mm
Clamp disc	3 pcs. / AWC

(\* ) The connection cap must be ordered separately !

### Documentation

Description	Type
User's manual	Installation- and configuration manual, German
User's manual	Installation- and configuration manual, English

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