

# ABSOLUTE ROTARY ENCODERS

## AWC58 PROFIBUS-DP



### Main Features

- Compact and heavy-duty industrial model
- Certified: By Profibus Trade Org., CE
- Interface: Profibus-DP
- Housing: 58 mm Ø
- Shaft: 6 or 10 mm Ø
- Resolution: Max. 25 Bit = 33.554.432 steps at 4096 revolutions
- Code: Binary

### Programmable Parameters

- Code sequence (complement)
- Resolution per revolution
- Total resolution
- Pre-set value
- Output of velocity
- Timebase for velocity
- Device addressing

### 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 - FB00DP03PG    | 4096           | 1           | 4.096            | Binary |
| 5812 - 4096 - FB00DP03PG | 4096           | 4096        | 16.777.216       | Binary |

## TECHNICAL DATA

### AWC58 PROFIBUS-DP

#### 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       | Line-driver according to RS 485<br>Galvanically insulated by opto-couplers |
| Transmission rate    | Max. 12 Mbaud  |
| Accuracy of division | $\pm \frac{1}{2}$ LSB  |
| Step frequency LSB   | Max. 100kHz (valid code)   |
| Electrical lifetime  | $> 10^5$ h   |
| Device addressing    | Programmable by 8 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                | $> 10^5$ 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 Ø6                    | Shaft Ø10 |
| Casing side                 | IP 65                       | IP 65     |
| Shaft side                  | IP 54*                      | IP 65**   |

\* Optional with shaft sealing (IP 65)

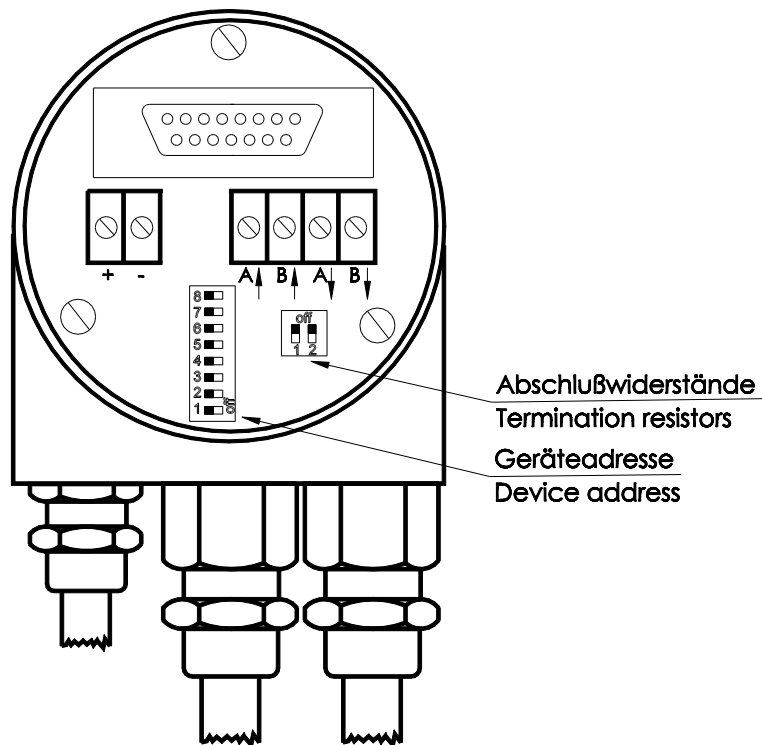
\*\* up to 0.5 bar

# INTERFACE

## AWC58 PROFIBUS-DP

### Installation

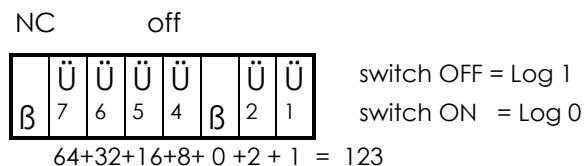
The rotary encoder is connected by three cables. The power supply is achieved with a two-wire connection cable through the single PG 7. Each one of the twisted-pair and shielded bus lines are guided in and out through the two PG 9 on the right side (as seen on clamps):



There are three resistors provided in the connection cap, which must be used as a line termination on the last device:



The settings of the Profibus-DP device address is achieved by 8 DIP-switches in the connection cap. Possible (allowed) addresses are between 3 and 124 (decimal) and each can only be used once. The connection cap can easily be opened for installation by removing the two cap screws. The following example shows how the device address 123 (decimal) is set:



## INTERFACE AWC58 PROFIBUS-DP

### Programmable Encoder - Parameters

The Profibus-DP interface supports the encoder profile\* according to CLASS 1 and CLASS 2 of Profibus-DP. Following encoder parameters can be programmed directly via the Profibus-DP network without any extra device:

- **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, certain rules for the setting of this parameter must be followed. These rules are outlined in the manual.

- **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.

- **Velocity:**

The implemented software can additionally deliver the current velocity by setting the according configuration bit. This value is given in binary code, 32 Bit, after the process value.

(\*) The Profibus-DP profile for encoder can be ordered by the Profibus Nutzerorganisation e.V.,  
Haid und Neu-Str. 7, D-76131 Karlsruhe, Germany with Order-No. 3.062.



## MODELS / ORDERING DESCRIPTION

### AWC58 PROFIBUS-DP

| 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)<br>Synchro flange (shaft = 6 mm Ø)<br>Synchro flange (shaft = 10 mm Ø) |  |   |   |      |   | F<br>Y<br>Z |   |   |   |                |             |     |  |
| Code                    | Binary  |  |   |   |      |   |             | B |   |   |                |             |     |  |
| Latch-function          | Without   |  |   |   |      |   |             |   | 0 |   |                |             |     |  |
| Strobe-function         | Without   |  |   |   |      |   |             |   |   | 0 |                |             |     |  |
| Interface               | Profibus-DP   |  | Non programmable<br>Pre-set value programmable<br>Programmable acc. CLASS 2 |   |      |   |             |   |   |   | DM<br>DC<br>DP |             |     |  |
| Options                 | Without<br>Shaft sealing ( not for Z-flange)<br>Stainless-steel configuration (flange, housing, cap)  |  |   |   |      |   |             |   |   |   |                | 0<br>W<br>Q |     |  |
| Connector-/cable-exit   | 3 PG-exits, radial at connection cap  |  |   |   |      |   |             |   |   |   |                |             | 3PG |  |

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 58-DP-3PG</b> |
| Shaft coupling Drilling: 10 mm  | GS 10               |
| Drilling: 6 mm  | GS 06               |
| Clamp disc 3 pcs. / AWC   | SP 15               |

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

### Documentation

| Description  | Type         |
|--|--------------|
| User's manual Installations- and configuration manual for DP-encoder | UME-DP       |
| Type File DM,DC Floppy disk with type file for DM-, DC-encoder       | DK-DM        |
| Type File DP Floppy disk with type file for DP-encoder               | <b>DK-DP</b> |