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

<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 - FB00DP03PG</td>
<td>4096</td>
<td>1</td>
<td>4.096</td>
<td>Binary</td>
</tr>
<tr>
<td>5812 - 4096 - FB00DP03PG</td>
<td>4096</td>
<td>4096</td>
<td>16,777,216</td>
<td>Binary</td>
</tr>
</tbody>
</table>
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
Galvanically insulated by opto-couplers
Transmission rate Max. 12 MBaud
Accuracy of division ± ½ 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 ≤ 1 Ncm ≤ 5 Ncm
Inertia of rotor ≈ 20 gcm² ≈ 50 gcm²
Lifetime > 10^5 h at 1000 min⁻¹
RPM Max. 6000 min⁻¹ (continuously)
Shock (IEC 68-2-27) ≤ 200 m/s² (12 ms)
Vibration (IEC 68-2-26) ≤ 100 m/s² (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 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:

```
device X
0 0
2 1
ON

last device
8 8
ON
```

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:

```
NC off
8 7 6 5 4 3 2 1

switch OFF = Log 1
switch ON = Log 0

64+32+16+8+0+2+1 = 123
```
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.
MECHANICAL DRAWINGS
AWC58 PROFIBUS-DP

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>6.16</td>
<td>10</td>
</tr>
<tr>
<td>Z-Flange</td>
<td>10.16</td>
<td>20</td>
</tr>
</tbody>
</table>

Clamp Flange (F)
## MODELS / ORDERING DESCRIPTION

### AWC58 PROFIBUS-DP

<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></td>
</tr>
<tr>
<td></td>
<td>4096</td>
</tr>
<tr>
<td></td>
<td>8192</td>
</tr>
<tr>
<td>No. of revolutions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4096</td>
</tr>
<tr>
<td>Flange</td>
<td></td>
</tr>
<tr>
<td>Clamp flange (shaft = 10 mm ø)</td>
<td>F</td>
</tr>
<tr>
<td>Synchro flange (shaft = 6 mm ø)</td>
<td>Y</td>
</tr>
<tr>
<td>Synchro flange (shaft = 10 mm ø)</td>
<td>Z</td>
</tr>
<tr>
<td>Code</td>
<td>Binary</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>Profibus-DP</td>
</tr>
<tr>
<td></td>
<td>Non programmable</td>
</tr>
<tr>
<td></td>
<td>Pre-set value programmable</td>
</tr>
<tr>
<td></td>
<td>Programmable acc. CLASS 2</td>
</tr>
<tr>
<td>Options</td>
<td>Without</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Connector-/cable-exit</td>
<td>3 PG-exits, radial at connection cap</td>
</tr>
</tbody>
</table>

Further models on request
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### Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>Connection cap*</td>
<td>AH 58-DP-3PG</td>
</tr>
<tr>
<td>Shaft coupling Drilling: 10 mm</td>
<td>GS 10</td>
</tr>
<tr>
<td></td>
<td>GS 06</td>
</tr>
<tr>
<td>Clamp disc 3 pcs. / AWC</td>
<td>SP 15</td>
</tr>
</tbody>
</table>

(*) The connection cap must be ordered separately!

### Documentation

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>User’s manual</td>
<td>UME-DP</td>
</tr>
<tr>
<td>Type File DM,DC</td>
<td>DK-DM</td>
</tr>
<tr>
<td>Type File DP</td>
<td>DK-DP</td>
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</tbody>
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