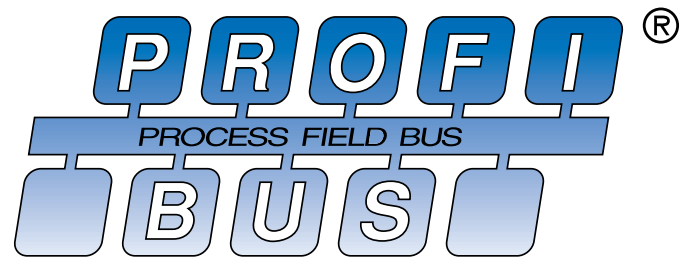


AHG 926 DP

Absolute Hollow-Shaft Angle Encoder with Profibus DP



Features

Rugged magnetic technology

24-bit multi-turn (4096 steps per revolution x 4096 revolutions or 8192 x 2048 or 2048 x 8192)

Transmission rate up to 12 Mbaud

Automatic baud-rate detection

Numerous programmable functions including resolution, presets and offsets

Visible status information via two LEDs

Electrical interface in accordance with Profibus DP (DIN 19245 Part 1/3)

Bus termination resistors can be set in the bus connector or may be connected externally



General Data

AHG 926 DP is a 24 bit multiturn absolute angle encoder. The resolution produced is 4096 steps/revolution x 4096 revolutions or 8192 x 2048 (always 24 bit total). The multiturn information is produced by use of a gearing mechanism and additional encoding stages. The Profibus DP interface is an integral part of the encoder and is configured as a Profibus DP slave in accordance with DIN E 19245 part 3. The AHG 926 DP encoder has the identification number 00FE.

- Profibus class 2 conformity tested by the PROFIBUS Interface Centre in Fürth.
- Conformity with Profile for Encoders, tested and certified by the PNO (PROFIBUS user organization).
- Provides additional feature of RPM with time stamp. This is configurable within the configuration byte.

Features

By comparison with conventional technology, field-bus systems offer advantages in terms of cost savings in cabling, commissioning and maintenance. Profibus DP is designed to meet the requirements for the rapid and efficient exchange of data with peripheral devices.

The AHG 926 DP is equipped with a Profibus DP interface (DIN 19245 Part 3), in order that these advantages can be used in the widest possible range of automation applications.

In the case of the AHG 926 DP, it is not only the position value that is transmitted via the bus but also diagnostic and configuration data. This simplifies commissioning and maintenance, since various functions of the AHG 926 DP can be configured during operation, and the status (diagnostic data) can be read by the Master at any time. The device-specific features of the AHG 926 DP needed for automatic commissioning are stored in the GSD file (Device master data). This enables the data to be read easily in using a project engineering tool and taken into account automatically during the configuration of the bus system.

The Profibus DP connection is carried out via the SPC 3, a Profibus ASIC from Siemens.

The testing of the AHG 926 DP for Profibus operability and Profibus functionality was carried out in the PNO testing laboratory of the Siemens Interface Centre in Fürth.

The AHG 926 DP supports the Profibus profile for encoders drawn up by a working group of the PNO for the purpose of standardizing communications. This profile defines the most important basic functions (Class 1) and an expanded scope of functions (Class 2).

The features of the AHG 926 DP in summary:

- 24-bit multiturn (4096 steps per revolution x 4096 revolutions maximum)
- Transmission rate up to 12 Mbaud
- Automatic baud-rate detection
- Programmable functions include:
 - Electronic adjustment (PRESET or number-SET)
 - RPM with time stamp, configurable within the configuration byte.
 - The electronic adjustment may be carried out via the Profibus DP (Set_Outputs message) or via a push-button in the housing of the AHG 926 DP.
 - Counting direction configurable. The counting direction can be set with a configuration message via the Profibus DP or via a DIP switch.
- Diagnostics according Class 2. The encoder transmits up to 63 bytes of diagnostic data.
- Scaling function. Programming the number of measurement steps per revolution and the number of revolutions. (Measurement steps per revolution freely programmable times 2^n revolutions, where n: 0 ... max.13)
- Station address of the AHG 926 DP. The setting of the station address can be carried out via a DIP switch behind PG (gland plug) on the rear side of the encoder.
- Visible status information via two LEDs: green LED for operating voltage indication, red LED for the indication of the bus activity.
- Electrical interface in accordance with Profibus DP (DIN 19245 Part 1/3).
- Two switches for bus termination are located behind the PG (gland plug).

Technical Data/Features

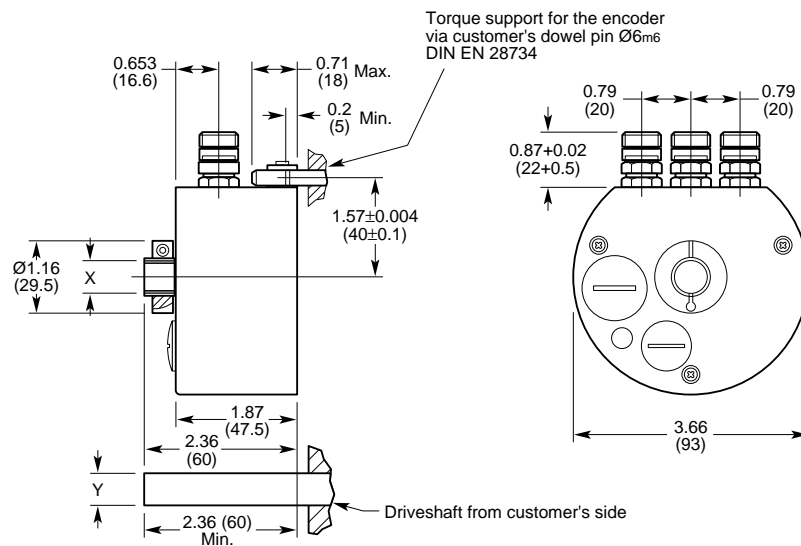
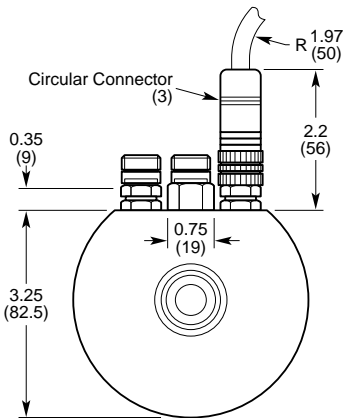
Dimensions	see drawing (mm)
Mass	about 0.8 kg
Moment of inertia of the rotor	152.77 gcm ²
Code direction (configurable)	cw/ccw
Measuring step	2.6 or 5.2 or 10.4 min of arc*
Max. number of steps per revolution	8192*
Max. number of revolutions	8192*
Error limits	40 mins of arc
Repeatability	6 mins of arc
Max. operating speed	3000 rpm
Position formation time — with scaling, less than...	1.0 ms
Position formation time — without scaling, less than...	0.4 ms
Max. angular acceleration	0.6 x 10 ⁵ rad/s ²
Operating torque	0.4 Ncm
Starting torque	0.5 Ncm
Bearing lifetime	1 x 10 ⁹ revolutions
Design performance temperature range	-20 to +70 °C
Operating temperature range	-40 to +85 °C
Storage temperature range	-40 to +100 °C
Permissible relative humidity, Condensation permissible (on request)	98%
EMC according to EN 50082-2 and EN 50081-2	
Resistance to shocks in the mounted state according to DIN IEC 68 Part 2-27	100/6 g/ms
Resistance to vibrations in the mounted state according to DIN IEC 68 Part 2-6	20/10 to 2000 g/Hz
Degree of protection according to DIN VDE 0470 Part 1	IP65
Operating voltage range	10 to 32 V
Recommended supply voltage	24 V
Max. power demand	3 W
Electrical interface	Profibus DP/RS485, DIN 19245 Part 1/3
Data transmission rate	9.5 kBd up to 12 MBd
Electrical connection	3 radial connectors
Bus termination resistors	via DIP switch or Profibus
Address setting	via DIP switch or Profibus
Electronic adjustment (number SET)	via PRESET push button or Profibus DP
Setting the counting direction	via DIP switch or Profibus DP

*The total range (steps per revolution times number of revolutions) is always limited to 24 bit.

AHG 926 DP



Dimensions (mm)



Hollow and Mating Shaft Tolerances	
Bore (X)	Diameter (Y)
12 ^{F7}	12 ^{h7}
1/2" (12.7) ^{F7}	12.7 ^{h7}
16mm ^{F7}	16 ^{h7}

Pin Allocation

In order to connect the bus lines and the power supply, see the following pinout diagrams for the Interconntec connectors which are IP-67 rated.

The connections for the Profibus are flush sockets with sockets, those for the supply voltage have pins.

Connector pin allocation for Profibus DP:

Flush socket with sockets 7-pole., MINITEC

	Signal	Explanation
1	RTS	Control signal for a repeater
2	A	Profibus DP A line
3	N/C	No connection
4	B	Profibus DP B line
5	2M	Ground for +5V
6	2P5	+5V with max. 200mA**
7	N/C	

**With this for example you can supply the transceivers inside the plugs of an optical fiber cable.
Note: Either connector can be used as bus in or bus out.

Connector pin allocation for the supply voltage:

Flush socket with pins 7-pole., MINITEC

	Signal	Explanation
1	US (+V _S)	+24 V, Supply voltage to the encoder
2	N/C	No connection
3	GND	Ground connection of the encoder
4	N/C	
5	RTS	Control signal for a repeater
6	N/C	
7	N/C	



Pinout of the flush sockets with sockets or pins. View is of the receptical connector on the encoder.

Configuration

Specific features of the AHG 926 DP may be configured manually using DIP switches. These are:

- the PROFIBUS address
- the counting direction
- the PROFIBUS bus termination

In addition, by actuating a push-button, the encoder can be set to a fixed value (PRESET function). In order to carry out this measure, the bigger PG (gland plug) on the rear side of the encoder should be removed. Under this, two DIP switches and a micro push-button become visible.

Changing the address

The station address can be set in two different ways:

- using the Set_Slave_Address message via the bus (software address change) or
- via the DIP switch (hardware address change)

The default factory setting of the AHG 926 DP ex works is as follows:

- The station address is read from the DIP switch and is set to 01.
- The changing of the station address via the bus is prevented (*RealNoAddChange = 0xFF*)
- The address 01 is stored in the EEPROM

Setting the counting direction

As standard, this input is connected internally to low potential (OFF), that is to say the counting direction increases when the shaft is rotated in the clockwise direction when viewed from the shaft end.

Switch 8: Bit 0 = 0:

The encoder count increases, when the encoder shaft rotates in the clockwise direction, viewed from the shaft end.

Switch 8: Bit 0 = 1:

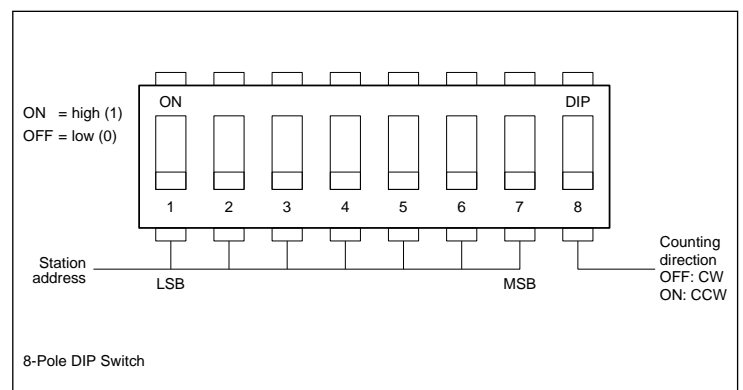
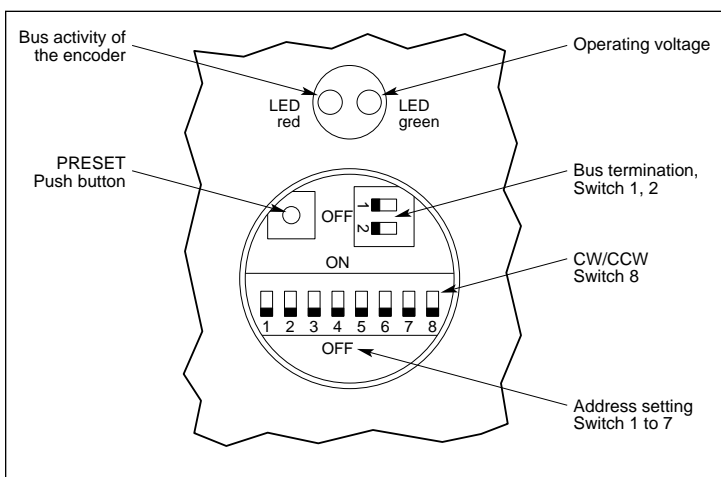
Encoder count decreases.

The counting direction of the AHG 926 DP can also be defined via the parameter message.

The setting of the counting direction is

stored in the EEPROM, so that it is maintained when the supply voltage is switched off and on again.

The counting direction is evaluated when each configuration message is sent, and is stored in the EEPROM.



Configuration (cont.)

Activation of the bus termination resistors

Bus termination can be connected in using the 2-pole DIP switch. For this, both sliding switches should be switched to the "ON" position. The standard factory setting is "OFF".

PRESET function

The AHG 926 DP is set to a specific, predefined value, which over writes the current shaft position, when the PRESET function is executed (by a push-button or Set_Outputs message). This value is stored in the EEPROM and can be changed by the output message. The factory PRESET value is 0.

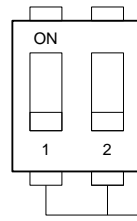
The PRESET function is not intended for dynamic configuration operations (during movement), but as an electronic

adjustment function for commissioning. By actuating the push-button for a period of approximately 0.5s, the encoder value is set. The PRESET value must lie within the currently configured resolution (steps per revolution x number of revolutions).

Scope of Supply

- AHG 926 DP without cable and mating connectors
Mating connectors (one set = three pieces) and cables have to be ordered separately.
- Floppy disk with GSD files.
- A set of mating connectors, 3 each (ordered separately)

The scope of supply of the AHG 926 DP includes a floppy disk on which



Switch for bus termination resistors
1 and 2 OFF: not active
1 and 2 ON: internal resistors are active

2-Pole DIP Switch for Bus Termination Resistors

the GSD files (master data of the device) will be found under the name STEG00FE.GSE. The device-specific features of the AHG 926 DP are stored in this file.

This data, required for automatic commissioning, can be easily read using a project engineering tool and taken into account automatically when configuring the bus system.

Notes

For Parameter setting, configuration, and the data exchange the "Profile for Encoders, Version 1.1, order number 3.062" is the authoritative profibus specification. You can order the profile at:

Profibus Trade Organization USA
Mr. Michael Bryant
5010 East Shea Blvd., Suite C226
Scottsdale, AZ 85254-4683 USA
Phone: 1-602-483-2456
Fax: 1-602-483-7202

Additional information about AHG 926 DP can be found in our Commissioning Instructions available on our website.

Cable and connector assemblies and other accessories are also available upon request.

How To Order

Type

AHG 926 DP with 1/2" hollow shaft

AHG 926 DP with 16mm hollow shaft

AHG 926 DP with 12mm hollow shaft

One set of mating connectors (3 each)

Order Number

AHG 926 0.5" 1SRDP

AHG 926 16 1SRDP

AHG 926 12 1SRDP

PS0 000 000 710

With your order, please supply us with the desired configuration regarding the basic steps per revolution and number of revolutions.

Steps per revolution	Number of revolutions
8192	2048
4096	4096
2048	8192



Example for ordering

AHG 926 DP with 1/2" hollow shaft =
AHG 926 0.5" 1SRDP