Large Hollow Shaft Profibus-DP Interface Absolute Multiturn Encoder EAM90L

Description

Profibus-DP interface absolute multiturn encoder EAM90L series delivers outstanding performance in withstanding mechanical damages and higher axial and radial loads. Through-hole installations and various types of shafts diameters could meet the different requirements of customers. It complies with Profibus protocol and has a maximum resolution of 8192 and revolution of 4096. The resolution and revolution can be programmed on request. Its high speed communication and anti-interference performance ensure a steady operation.

Features

- Waterproof seal provides greater IP level
- Various types of stainless steel shafts diameters
- Metal housing for better shock resistance
- Direct cable output, convenient for installation and maintenance
- Protection class IP65
- Conforming to the Profibus protocol
- Programmable revolution and resolution

Mechanical parameters

Shaft diameter	Φ12H7/Φ15H7/Φ20H7//Φ24H7/Φ28H7/ Φ(5/8)"H7/Φ1"H7/Φ12g6X30 mm
Protection class	IP65
Speed	Max.6000 r/m continuous Max.3000 r/m
Max load capacity of the shaft	
axial	40 N
radial	80 N
Shock resistance	2500 m/s^2 6 ms
Vibration resistance	100 m/s^2 10...2000 Hz
Bearing life	10^9 revolution
Moment of inertia	~72 x 10^{-6} kgm^2
Starting torque	hollow shaft < 0.2 Nm
	shaft < 0.05 Nm
Body material	AL-alloy
Housing material	AL-alloy
Operating temperature	-20...+80 ˚C
Storage temperature	-25...+85 ˚C
Relative humidity/condensation	90%, Condensation not permitted
Weight	~ 900 g

Resolution

4096（revolution）×8192（resolution）

4096（revolution）×4096（resolution）

Revolution and resolution are programmable in PLC (see operation manual for programming steps)

Electrical parameters

Supply voltage(+Ub)	10...30 VDC
Power consumption	Max.0.29 A
Linearity	± 1/2 LSB (± 1 LSB 13/14 bit)2
Interface	RS 485
Protocols	Profibus-DP, encoder profile class 2
Baud rate	Max. 12 Mbit/s
Address	programmable via DIP switches

Conforms to CE acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3
Conforms to EMC acc. to EN 61000-4, 5

Profibus Documentations for field bus Encoders:

Please refer to PROFIBUS-DP for detailed information, i.e. DIN 19245-3 and EN 50170, and OVERVIEW for other information.

Programmable parameters:

- Rotation Direction
- Proportional factor
  – Single turn resolution
  – Total resolution
- Preset position
- Diagnostic mode

Encoder with integrated coupler:

- Achieving current isolation through Fieldus DC/DC converter
- Including RS485 driver, max baud rate 12MB
- Configure Fieldbus address through DIP switch
- LED Diagnostic Display
- Equipped with Class1 & Class 2 functions

Power supply 24VDC
BUS input
BUS output
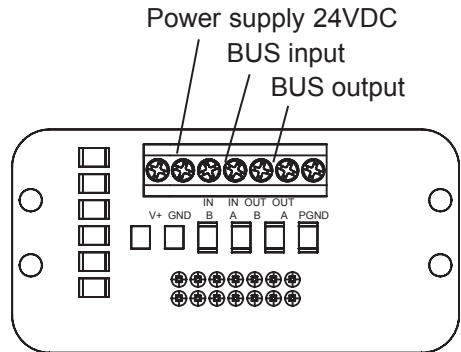
Terminal wiring block of an encoder

E2: Line close DIP switch —— Default OFF DIP1-DIP2, the BUS is closed when setting the two switches ON,120Ω.
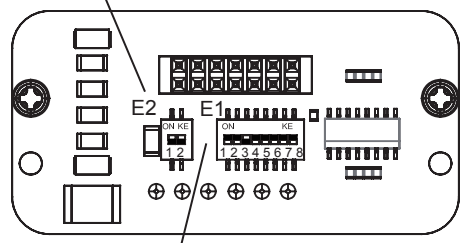
E1: Address DIP switch——DIP1- DIP7 address setting switch, binary operation, the default address is 4 as illustrated in the diagram, a maximum number of 126 addresses are acceptable in Profibus network. DIP8: CW/CCW

Introduction

Profibus-DP interface absolute multiturn encoder (Identification number 0x0CCA) complies with the Profibus-DP standards as described on the European Standard EN 50170 volume 2. The encoders also conform to "Profibus Profile for Encoders, Order No. 3062".

The Profibus-DP interface maintains the same maximum resolution (8192 position per revolution, 8192 revolutions) and the features of a stand-along unit with the bonus of the Profibus-DP network.

Through the Profibus-DP network it is able to:
- Obtain the angular position from the encoder during the periodic data exchange.
- Program the resolution and revolution (refer to corresponding chapters for parameter setup).
- Change the default incremental direction (convert between CW/CCW during parameter setup).
- Perform the Preset operation (program the encoder to read a specific position).
- Read the diagnostic status.
- Obtain info about the code came with the device.

With the device's class, it is able to:
- TDisplay the ON/OFF status.
- Display the BUS device activity on the bus.
- Reset function
- Configure the device address.
- If required, inserting the terminal resistor into the bus.
- Change the counting direction

Installation

Installing the Profibus-DP encoder in a network requires the execution of a typical procedure necessary for configuring any Profibus-DP slave. The procedure is as follows
1- Commissioning the slave onto the master (see corresponding chapter).
2- Wiring the encoder into the Profibus network using the physical location of the device in the bus.
3- Configuring slave's address (which must be unique in the network and the same as the device).
4- Preparing applications from the master and setting up the Profibus networr

On the back cover of the encoder there are two LED indicators. The device's operating status can be observed by the two LED. The green LED shows the power status and must be on constantly. The red LED only switches off during the periodic data exchange between the Profibus master and the encoder.

Attention: To set and configure the slave into the Profibus-DP master it is necessary to use the "gsd" file delivered with the encoder. The file can be found on the CD.

DIP-switches setup (configuring slave address)

Besides the address and the standard position of a terminal DIP switch, a configuration example of Profibus and the devices is illustrated below:
In this example, device's address is set up as 1011001, with the corresponding decimal address as 77. Bit 7 is the top digit, and bit 1 is the lowest digit Bit 8 is used for changing the counter direction. Bit 1to bit 7 are used to configure encoder's address

Address setting   Line close   Example• •   Line close
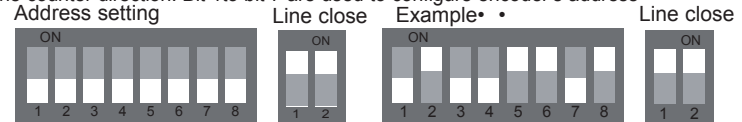
Network parameters

Usually, an A type cable is used to wire a DP/FMS network. This cable has to have the following characteristics.

Parameter	A type cable
Characteristic resistance（Ω）	135…165at a certain frequency（3…20Mhz）
Rated capacity（PF/m）	<30
Loop resistance（Ω/Km）	<=110
Core diameter（mm）	>0.64*)
Core cross-section（mm²）	>0.34*)

This cable allows the optimal network utilization. In fact, it is possible to reach the maximum communication speed allowed (12Mbaud). However, there are some limitations due to the maximum physical dimensions of a bus segment as follows

kbaud	9.6	19.2	93.75	187.5	500	1500	12000
Range/Segment	1200 m	1200 m	1200 m	1000 m	400 m	200 m	100 m

Finally, the physical characteristics of a Profibus network are now known.

Connection

V+	Supply voltage
GND	Ground
B	Profibus-DPline input (RD)
A	Profibus-DPline input (GN)
B	Profibus-DPline output (RD)
A	Profibus-DPline output (GN)

Dimensions (mm)

EAM90L
Accessories：
E41350087
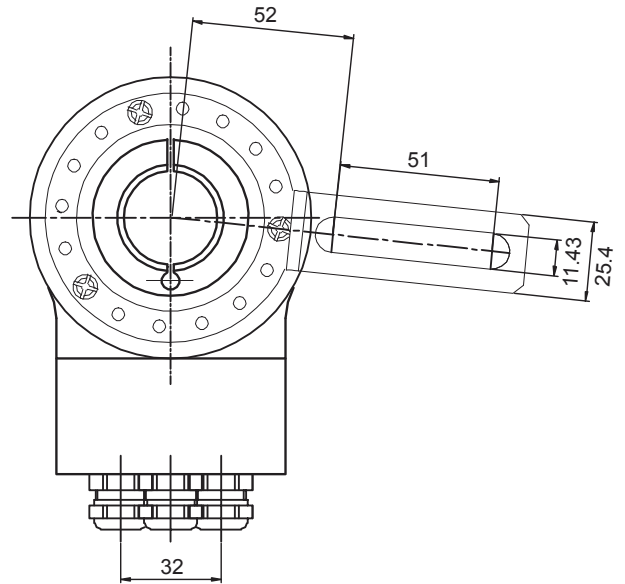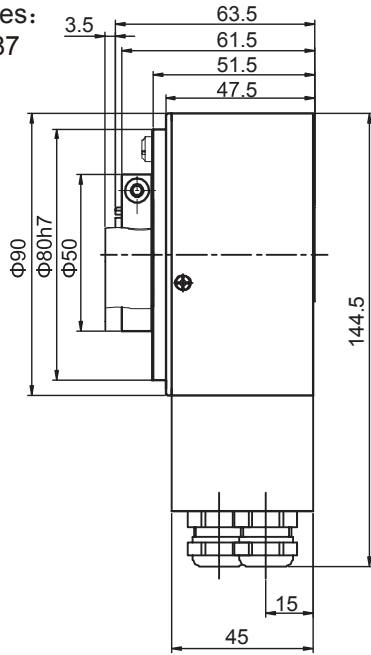
3.5
63.5
61.5
51.5
47.5

Φ90
Φ80h7
Φ50

144.5

15
45

52

51

11.43
25.4

32

Order Code

EAM 90 L 20 – B F6 X X R – 4096 /8192 DP

Profibus-DP Interface Encoder

Hollow shaft/ Shaft diameter

12 = Φ12 mm hollow shaft
15 = Φ15 mm hollow shaft
16 = Φ16 mm hollow shaft
20 = Φ20 mm hollow shaft
24 = Φ24 mm hollow shaft
25 = Φ25 mm hollow shaft
28 = Φ28 mm hollow shaft
15.9 = Φ5/8" hollow shaft
1E = Φ1"hollow shaft
1C = Φ12 x 30 mm shaft

Resolution

revolution/resolution
Standard 4096/8192 (25 bits)

Flange types

L=long tether arm

Outlets direction

R=radial

Types of connection

X= integrated coupler terminal box with 3 PG7 threaded connectors
T= integrated coupler terminal box with 3 M12 plugs

Housing diameter

90=housing diameter

Output logic

X= No definition

Output & Supply voltage

F6=Profibus-DP interface 10...30 VDC
Profibus Class 2

Series

EAM= Profibus-DP interface absolute multiturn

Code type

B=Binary

Accessories
Installation accessories
Various types of connection
Please see the enclosed CD for GSD documents and operation manual.