

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 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 16384 and revolution of 4096. The resolution and revolution can be programmed on requests. Its high speed communication and anti-interference performance ensure a steady operation.

Features

- Waterproof seal provides higher IP level
- Various types of stainless steel shaft diameter
- 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 Characteristics

Shaft diameter (mm)	Φ12H7/Φ15H7/Φ20H7//Φ24H7/Φ28H7/ Φ (5/8)"H7/Φ1"H7/Φ12g6X30
Protection acc. to EN 60529	IP 65
Speed (r/m)	Max. 6000 continuous Max. 3000
Max. load capacity of the shaft	
axial	40 N
radial	80 N
Shock resistance	2500 m/s ² 6ms
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°C...+80°C
Storage temperature	-25°C...+85°C
Weight	900g

Resolution

4096 (revolution) × 8192 (resolution)

4096 (revolution) × 4096 (resolution)

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

Electrical Characteristics

Supply voltage (+Ub)	10...30 V DC
Power consumption	Max. 0.29A
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.

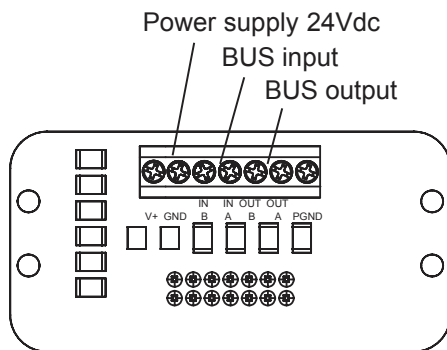
Programmable parameters:

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

Encoder with integrated coupler:

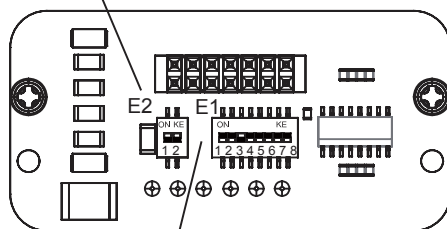
- Achieving current isolation through Fieldbus DC/DC converter
- Including RS485 driver, max baud rate 12MB
- Configure Fieldbus address through DIP switch
- LED Diagnostic Display
- Equipped with Class1 & Class 2 functions

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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

Connection

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

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 (16384 position per revolution, 16384 revolutions) and the features of a stand-alone 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:

- Display 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:

- Commissioning the slave onto the master (see corresponding chapter).
- Wiring the encoder into the Profibus network using the physical location of the device in the bus.
- Configuring slave's address (which must be unique in the network and the same as the device).
- Preparing applications from the master and setting up the Profibus network.

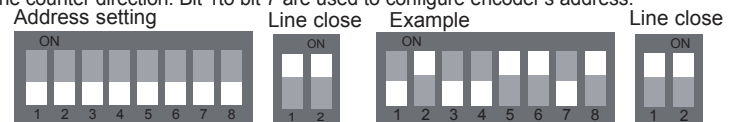
On the back cover of the encoder there are two LED indicators. The device's operating status can be observed by the two LED. The green LED shows the power status and must be on constantly. The red LED only switches off during the periodic data exchange between the Profibus master and the encoder.

Note: 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 as below:

In this example, device's address is set up as 1001101, 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 1 to bit 7 are used to configure encoder's address.



Network Characteristics

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...165 at 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	1200m	1200m	1200m	1000m	400m	200m	100m

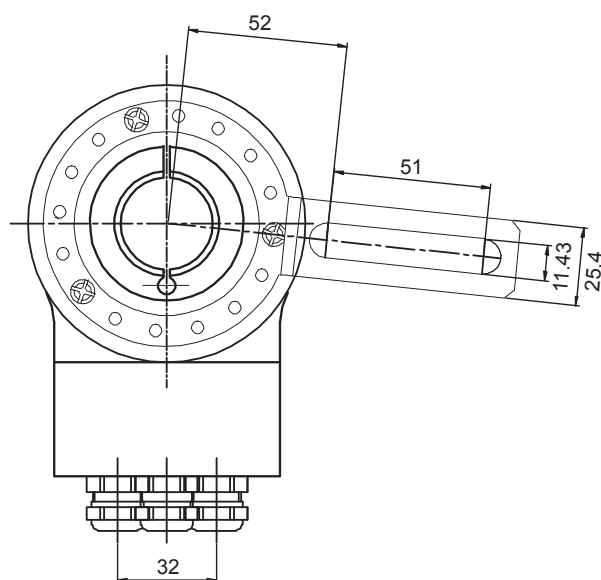
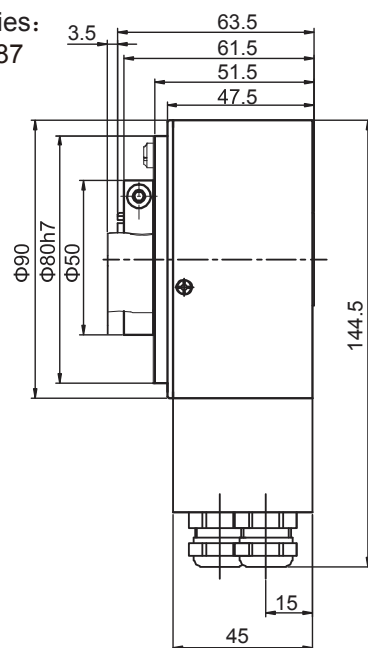
Finally, the physical characteristics of a Profibus network are now known.

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Dimension (mm)

EAM90L

Accessories:
E41350087



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Order Code

EAM	90	L	20	—	B	F6	X	X	R	—	4096/8192	DP
			Hollow shaft/ Shaft diameter							Resolution		
			12 = Φ 12 mm hollow shaft 15 = Φ 15 mm hollow shaft 16 = Φ 16 mm hollow shaft 20 = Φ 20 mm hollow shaft 24 = Φ 24 mm hollow shaft 25 = Φ 25 mm hollow shaft 28 = Φ 28 mm hollow shaft 15.9 = Φ 5/8" hollow shaft 1E = Φ 1" hollow shaft 1C = Φ 12 x 30 mm shaft							revolution/resolution 4096/16384 (max. 26bits) 4096/8192 (standard 25 bits)		
			Flange type							Outlet direction		
			L=long tether arm							R=radial		
										Types of connection		
										X= integrated coupler terminal box with 3 PG7 threaded connectors T= integrated coupler terminal box with 3 M12 plugs		
										Output logic		
										X=nonsense		
			Housing diameter							Output & Supply voltage		
			90mm=housing diameter							F6=Profibus-DP interface 10...30Vdc Profibus Class 2		
Series										Code type		
EAM= Profibus-DP interface absolute multiturn										B=Binary		

Accessories
Installation accessories
Various types of connection

Please see the enclosed CD for GSD documents and operation manual.