

# EtherNet/IP Absolute Encoders

Catalog Numbers 842E-SIPxBA, 842E-MIPxBA

**IMPORTANT** Save these instructions for future use.

## Introduction

The 842E is an ultra-high resolution encoder with an EtherNet/IP™ interface. These encoders provide 18-bit single-turn resolution and 30-bit multi-turn resolution. The EtherNet/IP encoder is targeted for high performance and reliability in harsh industrial environments. These encoders include an embedded EtherNet/IP switch to connect additional EtherNet/IP capable product in series and/or support a Device Level Ring (DLR) for Ethernet media redundancy.

## Features

- EtherNet/IP
- Embedded switch
- Hardware/software IP address setting
- Resolution up to 30 bits
- Protection class up to IP67
- Simple and fast install
- Device Level Ring (DLR)
- Revolution divisor
- Solid and blind hollow shaft options

## Configurable Parameters

- Count direction
- Counts per resolution
- Counts of revolution
- Preset value
- Velocity unit
- IP address

## Typical Applications

- Packing machines
- Robotics
- Printing machines
- Rotary table positioning

|            |  |
|------------|--|
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## Specifications

| Attribute  | Value  |
|--|--|
| Certifications                                   | CE Marked for all applicable directives  |
| <b>Electrical</b>                                |  |
| Bus connection                                   | EtherNet/IP IEC 61784-1  |
| Transmission rate                                | 10/100 Mbps  |
| Transmission medium                              | Cat-5e cable   |
| Code type  | Binary   |
| Operating voltage range                          | 10...30V   |
| Power consumption                                | 3.0 W  |
| Resolution                                       | 262,144 (18 bit)   |
| No. of revolutions, max                          | 4096 (12 bit)  |
| Error limits                                     | ±0.03°   |
| Repeatability                                    | ±0.002°  |
| Operating current, max, no load; 10...30V supply | ≤200 mA  |
| <b>Mechanical</b>                                |  |
| Moment of inertia                                | ≤6.2 gcm <sup>2</sup> (solid shaft) of the rotor<br>≤35 gcm <sup>2</sup> (blind hollow shaft) of the rotor   |
| Operating speed                                  | 9000 RPM (solid shaft), max<br>6000 RPM (blind hollow shaft), max  |
| Shaft loading                                    | Radial: 80 N max (solid shaft)<br>Axial: 40 N max (solid shaft)  |
| Permissible shaft movement                       | Radial (static/dynamic): ±0.3 / ±0.05 mm (0.002 in.) [of drive element (blind hollow shaft)]<br>Axial (static/dynamic): ±0.5 / ±0.1 mm (0.004 in.) [of drive element (blind hollow shaft)] |
| Bearing lifetime                                 | 3 x 10 <sup>9</sup> revolutions  |
| Angular acceleration                             | 5 x 10 <sup>5</sup> rad/s <sup>2</sup> , max   |
| Operating torque                                 | 0.3 Ncm (solid shaft) @ 20 °C (68 °F)<br>0.6 Ncm (blind hollow shaft) @ 20 °C (68 °F)  |
| Starting torque                                  | 0.5 Ncm (solid shaft) at 20 °C (68 °F)<br>0.8 Ncm (blind hollow shaft) at 20 °C (68 °F)  |
| <b>Environmental</b>                             |  |
| Housing material                                 | Aluminum   |
| Shaft material                                   | Stainless steel  |
| Operating temperature                            | -30...+85 °C (-22...+185 °F)   |
| Storage temperature <sup>1</sup>                 | -40...+100 °C (-40...+212 °F)  |
| Relative humidity <sup>2</sup>                   | 90%  |
| Shock <sup>3</sup>                               | 100 g/6 ms   |
| Vibration <sup>4</sup>                           | 20 g/10...2000 Hz  |
| Enclosure rating shaft                           | IP65   |
| Housing enclosure rating <sup>5</sup>            | IP67 (IEC 60529)   |
| Weight   | 0.2 kg (0.44 lb)   |
| Standards  | EN 61000-6-2 and EN 61000-6-3 EMC  |

<sup>1</sup> Without packaging.  
<sup>2</sup> To condensation not permitted.  
<sup>3</sup> To DIN EN 60068-2-27.  
<sup>4</sup> To DIN EN 60068-2-6.  
<sup>5</sup> With mating connector inserted.

## Summary of Changes

Added additional variants to the Product Selection table and Dimensional drawings.

## Product Selection

842E — S IP 10 B A  
a b c d

a  
Number of Turns

| Code | Description             |
|------|-------------------------|
| S    | Single-turn (one turn)  |
| M    | Multi-turn (4096 turns) |

b  
Mechanical Interface

| Code | Description                                       |
|------|---|
| 1    | Solid shaft 9.52 mm (3/8 in.)                     |
| 2    | Solid shaft 9.52 mm (3/8 in.) with flat           |
| 3    | Solid shaft 10 mm (0.39 in.)                      |
| 4    | Solid shaft 10 mm (0.39 in.) with flat            |
| 5    | Hollow shaft 6.35 mm (1/4 in.)                    |
| 6    | Hollow shaft 8 mm (0.31 in.)                      |
| 7    | Hollow shaft 9.52 mm (3/8 in.)                    |
| 8    | Hollow shaft 10 mm (0.39 in.)                     |
| 9    | Hollow shaft 12 mm (0.47 in.)                     |
| 10   | Hollow shaft 12.7 mm (1/2 in.)                    |
| 11   | Hollow shaft 14 mm (0.55 in.)                     |
| 12   | Hollow shaft 15 mm (0.59 in.)                     |
| 13   | Servo mount solid shaft 6 mm (0.24 in.) with flat |
| 14   | Solid shaft 10 mm (0.39 in.) with key             |

| c<br>Connector |               | d<br>Resolution |                                       |
|----------------|---------------|-----------------|---------------------------------------|
| Code           | Description   | Code            | Description                           |
| B              | M12 connector | A               | 262,144 (18 bit) steps per revolution |

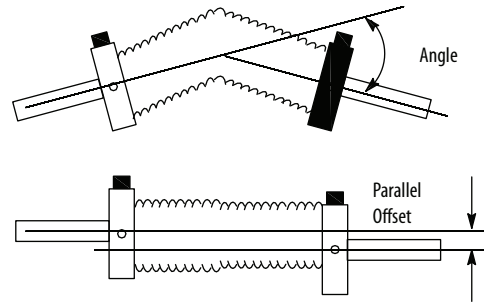
### Accessories

| Description             | Note  |
|-------------------------|---|
| Flexible couplings      | For information on these products, visit our website at <a href="http://www.rockwellautomation.com/">http://www.rockwellautomation.com/</a> |
| Mounting plates         |   |
| Ethernet media          |   |
| Cordsets and patchcords |   |

### Suggested Mating Cables

| Description                                     | Cat. No.       |
|---|----------------|
| 4-wire cable spool, robotic TPE, 100 m (328 ft) | 1585-C4TB-S100 |
| M12 D-code patchcord, male/male, 1 m (3.28 ft)  | 1585D-M4TBJM-2 |
| DC micro QD cordset, 4-pin, 2 m (6.56 ft)       | 889D-F4AC-2    |
| DC micro QD patchcord, 4-pin, 2 m (6.56 ft)     | 889D-F4ACDM-2  |

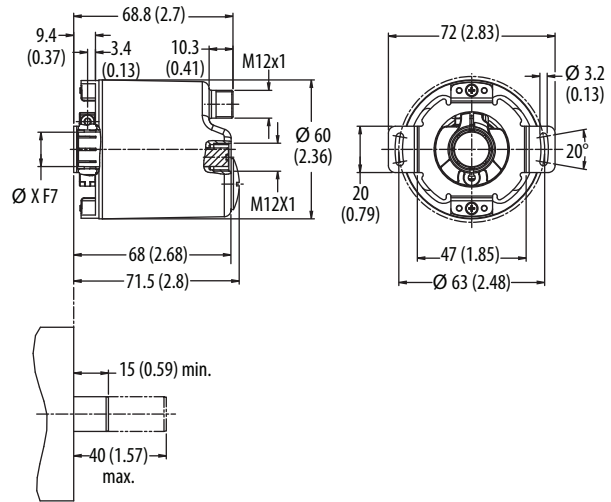
## Flexible Shaft Couplings



**ATTENTION:** Rigidly coupling the encoder shaft to the machine shaft causes a failure in either the bearings of the encoder or the bearings of the machine shaft.

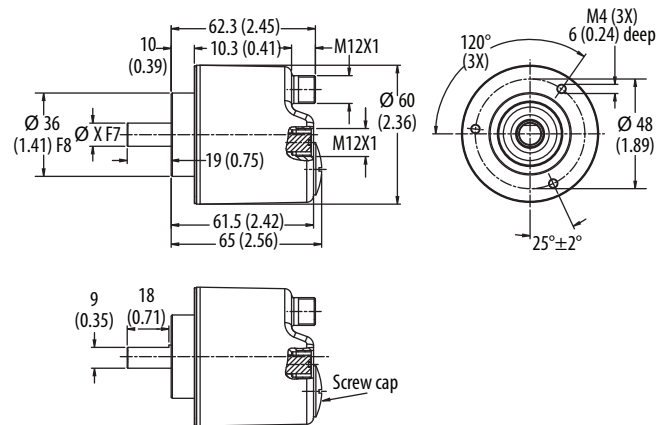
## Approximate Dimensions [mm (in.)]

### Blind Hollow Shaft



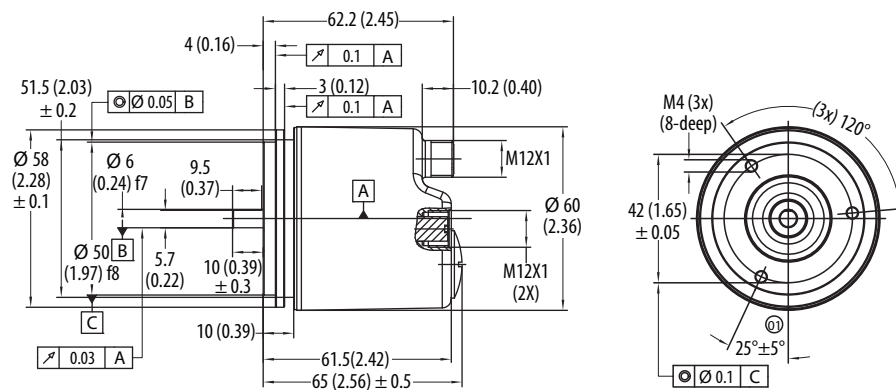
Tighten torque for screw cap is 0.8 N•m (7 in•lb).

### Solid Shaft

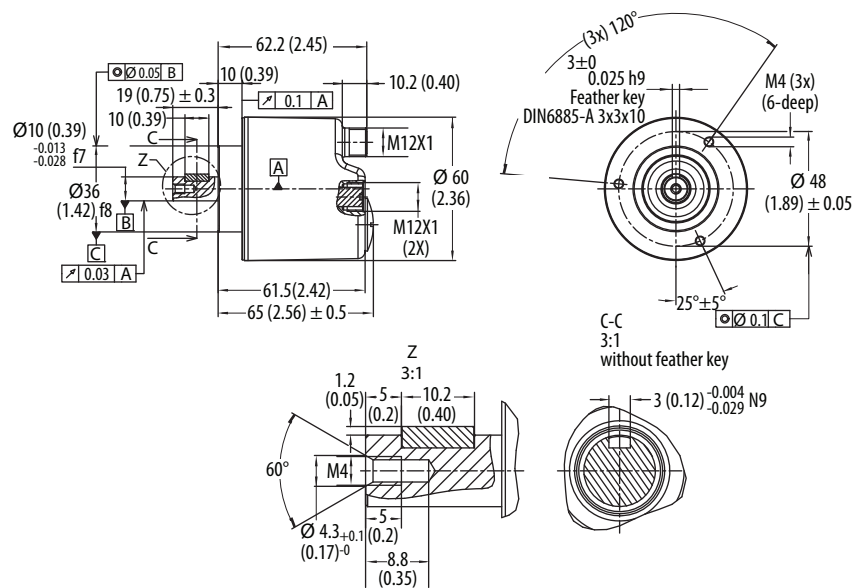


## Approximate Dimensions (Continued) [mm (in.)]

### 6 mm Servo Mount Solid Shaft with Flat



### 10 mm Solid Shaft with Key



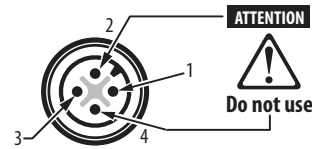
# Pinout and Color Code

## EtherNet/IP Pinout



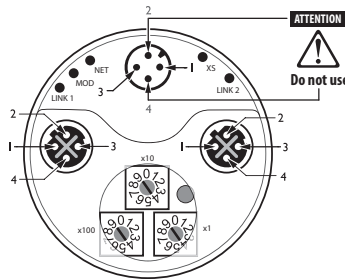
| Pin | Signal Name | Color Code   | Pair Assignment |
|-----|-------------|--------------|-----------------|
| 1   | TXD+        | White Orange | Pair 1          |
| 3   | TXD-        | Orange       |                 |
| 2   | RXD+        | White Green  | Pair 2          |
| 4   | RXD-        | Green        |                 |

## Power Supply Pinout



| Pin | Signal Name | Color Code | Pair Assignment               |
|-----|-------------|------------|-------------------------------|
| 1   | Versus      | Brown      | Supply voltage<br>10...32V DC |
| 2   | —           | White      | Do not use                    |
| 3   | GND         | Blue       | 0V DC (ground)                |
| 4   | —           | Black      | Do not use                    |

## LED Status



| Module Status LED  | Short Description  |
|--------------------|--------------------|
| OFF                | No power           |
| Green              | Device operational |
| Green flashing     | Standby            |
| Red flashing       | Minor fault        |
| Red                | Major fault        |
| Green/red flashing | Self-test          |

| Network Status LED | Short Description   |
|--------------------|---------------------|
| OFF                | No power/IP address |
| Green flashing     | No connected        |
| Green              | Connected           |
| Red flashing       | Minor fault         |
| Red                | Major fault         |
| Green/red flashing | Self-test           |

| Encoder Status LED | Short Description  |
|--------------------|--------------------|
| OFF                | No power           |
| Green flashing     | Wrong parameter    |
| Green              | Device operational |
| Red flashing       | Minor fault        |
| Red                | Major fault        |
| Green/red flashing | Self-test          |

| Link 1 Status LED | Short Description |
|-------------------|-------------------|
| OFF               | No link/power off |
| Green solid       | LINK              |
| Amber solid       | Port disabled     |
| Green flashing    | Port activity     |
| Amber flashing    | Collision         |

| Link 2 Status LED | Short Description |
|-------------------|-------------------|
| OFF               | No link/power off |
| Green solid       | LINK              |
| Amber solid       | Port disabled     |
| Green flashing    | Port activity     |
| Amber flashing    | Collision         |

1 Applying power to pins 2 and 4 will damage the encoder.

## Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment can be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

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