

# Installation Instructions

## 842HR Sine Cosine/Serial Encoders

### Size 25, High Resolution Auxiliary Servo Feedback

**IMPORTANT: SAVE THESE INSTRUCTIONS FOR FUTURE USE.**

#### Description

Bulletin 842HR is a 15-bit serial/sine cosine encoder. Targeted for high performance digital servo drive systems that require absolute feedback for position control and high resolution incremental feedback for speed control.

Rockwell Automation's sine cosine high performance encoders provide commutation, speed regulation and position control all in one device. Absolute position values of up to 15 bit combined with incremental resolution up to 2 million counts per turn.

#### Features

- Absolute feedback for position control
- High resolution Incremental feedback for speed control
- Commutation
- Sine cosine differential interface
- Digital bi-directional RS-485 interface
- Compatible with Hiperface® interface
- Internal diagnostic functions

#### Benefits

- High performance motor or auxiliary feedback
- High accuracy and resolution
- Low bandwidth
- Maximum noise immunity
- One interface for all servo motor applications
- Standalone housing (suitable for mounting external to a servo motor)



**ATTENTION:** Rockwell Automation Bulletin 2090 feedback cables provide connections for both 5...12V and 7...12V encoder power supplies. Only one of these connections should be used. Simultaneous connection to different power supplies may result in damage to the servo drive and encoders.

#### Specifications

Certifications	CE Marked for all applicable directives
<b>Electrical</b>	
# of sine/cosine cycles per revolution	1,024
Code format for absolute position value	Binary
Code direction with clockwise rotation viewed from shaft end	Increasing
# of steps per revolution (Single 842HR-S)	32,768
# of revolutions (Multi 842HR-M)	4,096
Error limits for the digital absolute value via RS 485	± 90 angular seconds
Error limits in evaluating the 1,024 signals, integral non-linearity	± 45 angular seconds
Non-linearity within a sine/cosine period, differential non-linearity	± 7 angular seconds
Output frequency for sine/cosine signals	0...200 kHz
Operating voltage range	7...12V; 5...12V
Max. operating current, no load 5...12V Supply ❶ 7...12V Supply	180 mA 80 mA
Available memory on EEPROM ❷	128 bytes
Interface signals Process data channel = SIN, REFSIN, COS, REFCOS Parameter channel = RS 485	Analog, differential  Digital
<b>Mechanical</b>	
Max. angular acceleration	5 x 10 <sup>5</sup> rad/sec <sup>2</sup>
Max. operating speed	6,000 RPM
Operating torque, max.	3.5 oz-in
Starting torque, max.	5 oz-in
Shaft loading	Radial 35 lb; Axial 40 lb
Life of ball bearings	3.6 x 10 <sup>9</sup> rotations
<b>Environmental</b>	
Housing	Aluminum
Operating Temperature—C (F)	-20...+85° (-4...185°)
Storage Temperature—C (F)	-30...+90° (-22...194°)
Humidity ❸	90%
Shock ❹	30 g/11 ms
Vibration ❺	20 g/10...2 KHz
Protection ❻	IP66 (IEC 60529)
Approximate Weight	481 g (17 oz)
EMC	DIN EN 61000-6-2 DIN 6100-6-3

- ❶ Inrush current with 5...12 V supply can be as high as 1 Amp
- ❷ If applying the electronic type label, in connection with numeric controllers, attention should be paid to Patent EP 425 912 B 2; Application of the electronic type label in connection with speed regulation is exempt.
- ❸ Condensation not permissible
- ❹ To DIN EN 60068-2-27
- ❺ To DIN EN 60068-2-6
- ❻ With mating connector inserted

Hiperface is a registered trademark of SICK Stegmann GmbH

## Product Selection

842HR — **S** **J** **DZ** **1** **15FWY** **2**  
                   **a**   **b**   **c**                   **d**

### a

Number of Turns	
Code	Description
S	Single-turn (1 turn)
M	Multi-turn (4096 turns)

### b

Mounting Configuration (Note)	
Code	Description
DZ	Square Flange, 3/8 inch solid shaft
DN	Square Flange, 3/8 inch solid shaft with flat
A1	Hub Shaft, 15 mm blind hollow shaft
A2	Hub Shaft, 1/2 inch blind hollow shaft
A3	Hub Shaft, 12 mm blind hollow shaft
A4	Hub Shaft, 10 mm blind hollow shaft
A5	Hub Shaft, 3/8 inch blind hollow shaft
A6	Hub Shaft, 8 mm blind hollow shaft
A7	Hub Shaft, 1/4 inch blind hollow shaft
A8	Hub Shaft, 6 mm blind hollow shaft

### c

Power Supply	
Code	Description
1	5...12V DC
2	7...12V DC

### d

Connector Options	
Code	Description
2	MS 10-Pin
D	M23 17-Pin

## Output Terminations: M23 17-Pin

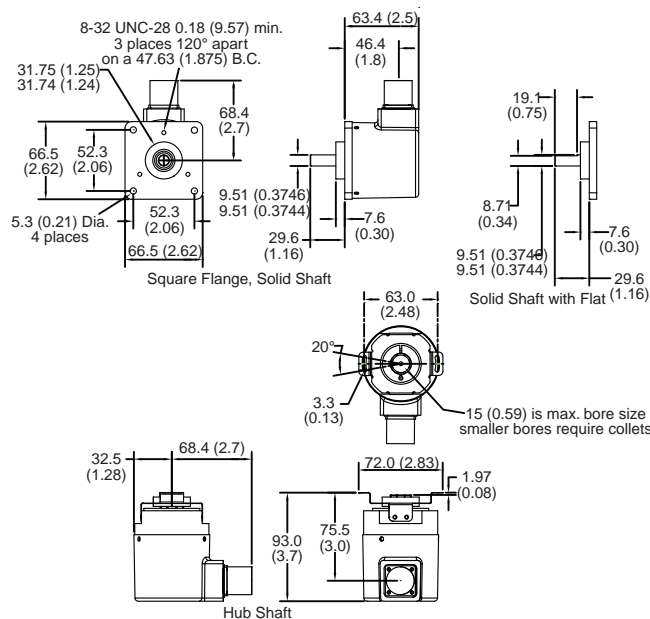
Pin No.	Function	Explanation	Wire Color
1	SINE	Process Data Channel	Black
2	REFSINE	Process Data Channel	White/Black
3	COSINE	Process Data Channel	Red
4	REFCOSINE	Process Data Channel	White/Red
5	Data +	RS-485 parameter channel	Green
6	Data -	RS-485 parameter channel	White/Green
9	DC + Input	5V Supply Voltage	Gray
10	DC Return	Ground Connection	White/Gray ①
11	DC + Input	9V Supply Voltage	Orange
13	N.C.		
14	N.C.		
15	N.C.		
16	N.C.		
17	N.C.		
7	CASE	Case Ground	Brown
8	N.C.		
12	DC Return	Ground Connection	

① Pin 12 internally tied to Pin 10.

## Output Termination: MS 10-Pin

Pin No.	Function	Wire Color
A	+VS	Red
B	Common	Blue
C	Ref SIN	Brown
D	Ref COS	Black
E	Data +	Grey
F	Data -	Green
G	SIN	White
H	COS	Pink
I	Not used	
J	Case	Case

## Approximate Dimensions [mm (in.)]



## Accessories

Description	Cat. No.
M23 17-pin Cables	2090-XXNFMF-Sxx
MS 10-pin Cables	842HR-CA-2-yy
Flexible Coupling	845-FC-x-x

### 2090-XXNFMF-Sxx

Pre-wired cable to an M23 DIN 17-pin connector for the encoder. The other end of the cable is flying leads.

xx = Cable Length

01	1 m
02	2 m
03	3 m
04	4 m
05	5 m
07	7 m
09	9 m
12	12 m
15	15 m
20	20 m
25	25 m
30	30 m

**Note:** Consult manufacturer's drive manual for maximum recommended cable length.

### 842HR-CA-2-yy

Pre-wired cable to an MS 10-pin connector for the encoder. The other end of the cable is flying leads.

yy = Cable Length

01	1 m
03	3 m
05	5 m
10	10 m
20	20 m
30	30 m

## Flexible Couplings



High Performance Flexible Coupling  
845-FC-B-B

### Description

High performance flexible couplings are used to connect two shafts, and help to reduce the effects of misalignment between the shafts. Flexible couplings are offered in the high performance version, with nonconductive inserts. They are of the flexible curved beam helical type with clamping screw at both ends.

### Specifications

Parallel Offset	0.51 mm (0.02 in) max.
Angular Offset	10° max.
Axial Compliance	1.58 mm (0.06 in) max.
Construction	Aluminum with a fiberglass insert

Available catalog numbers for this encoder:

845-FC-B-B  
845-FC-B-C  
845-FC-B-R  
845-FC-B-T  
845-FC-A-B  
845-FC-R-B

### Product Selection

845 — FC —  $\frac{B}{a}$  —  $\frac{B}{b}$

a

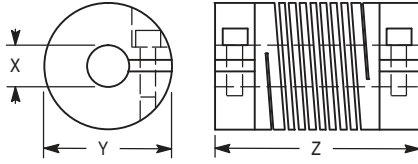
Smallest Bore Diameter	
Code	Description
A	1/4 inch
B	3/8 inch
R	6 mm
T	10 mm

b

Largest Bore Diameter	
Code	Description
A	1/4 inch
B	3/8 inch
C	1/2 inch
R	6 mm
T	10 mm

## Approximate Dimensions [mm (in.)]

### High Performance Flexible Coupling

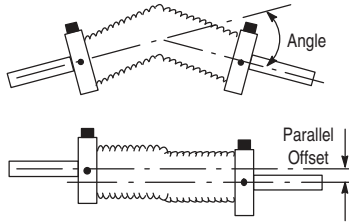


Dimension Code	Bore Size Code Letter				
	A	B	C	R	T
X	6.4 (0.25)	9.5 (0.375)	12.7 (0.50)	6	10
Y	30.56 (1.20) Dia.				
Z	32 (1.25) Long				



**ATTENTION:** The shielded cables, output devices, and power supplies must be properly grounded. All National Electric Code and applicable local codes and ordinances must be observed when wiring the system.

### Flexible Shaft Couplings



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

[www.rockwellautomation.com](http://www.rockwellautomation.com)

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