

# Installation Instructions

## 847H-F 2.5-inch Diameter Solid Shaft Incremental Encoders with Bell Housing and Coupler

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

### Selection Guide

**847**  $\frac{H}{a}$  -  $\frac{F}{b}$   $\frac{B}{c}$   $\frac{2}{d}$   $\frac{4}{e}$  -  $\frac{A}{f}$   $\frac{B}{g}$   $\frac{01204}{h}$

#### a

Code	Encoder Diameter/Type
H	2.5 in. diameter solid shaft

#### b

Code	Mounting Configuration
F	Bell housing and coupler

#### c

Code	Shaft Size
B	1/4 in. diameter bore helical coupler (standard)
E	3/8 in. diameter bore helical coupler (standard)
F	1/4 in. diameter bore bellows coupler (high performance)
G	3/8 in. diameter bore bellows coupler (high performance)

#### d

Code	Power Supply
1	4.5...5.5V DC
2	8...30V DC

#### e

Code	Output Configuration
<b>Signal Phasing A-leads-B</b> clockwise rotation viewed from shaft end, Z gated A	
4	4.5...5.5V line driver outputs (TTL)
5	4.5...5.5V open collector outputs ❶
6	8...30V line driver outputs (HTL) ❷
7	8...30V open collector outputs ❷
<b>Signal Phasing B-leads-A</b> clockwise rotation viewed from shaft end, Z gated BN	
A	4.5...5.5V line driver outputs (TTL)
B	4.5...5.5V open collector outputs ❶
C	8...30V line driver outputs (HTL) ❷
D	8...30V open collector outputs ❷

- ❶ Options 5 and B cannot be ordered with option 2 from table d.
- ❷ Options 6, 7, C, and D cannot be ordered with option 1 from table d.

#### f

Code	Connector/Cable Exit
A	Axial exit
R	Radial exit

#### g

Code	Connector/Cable Type
A	M12 connector, 8-pin with mating connector
B	M12 connector, 8-pin
C	MS connector, 6-pin with mating connector
D	MS connector, 6-pin
E	MS connector, 7-pin with mating connector
F	MS connector, 7-pin
G	MS connector, 10-pin with mating connector
H	MS connector, 10-pin
P	1.5 m (4.9 ft) cable
Q	5 m (16.4 ft) cable
R	10 m (32.8 ft) cable

#### h

Code	Resolution
1...65536	00001...65536 pulses/revolution

### Accessories

Description	Part Number
Pre-wired cables	845-CA-*. *
Mating connectors	845-6P 845-7P 845-7P-RT 845-10P 845-10P-RT
Differential encoder buffer board	845-BB*
M12 cable	889D-F8FB-*

\* See Sensor Catalog for selection

## Specifications

Electrical	
Code format	Incremental, 2 channels with zero index
Signal options, clockwise rotation viewed from shaft end	A-leads-B, 180° marker gated with A or B-leads-A, 180° marker gated with BN
Signal phase relation	90° ± 22°, channels
Symmetry	50% ± 10%
Zero index channel	Gated 1/2 cycle
Supply current	50 mA
Frequency response	4.5...5.5V line driver output: 820 kHz 8...30V line driver output: 820 kHz Open collector: 150 kHz
Resolution	1...65536 pulses/revolution
Load current	30 mA for all output types
Output drivers	4.5...5.5V line driver - IC HD2 8...30V line driver - IC HD2 Open collector - 7406
Electrical protection	Reverse polarity and short circuit for all output types
Cable outer diameter	0.25 in (6.2 mm)
Cable type	300V, 105° C, 26 AWG, 9-conductor with overall braided shield, UL AWM type 20327 for use in fixed (non-flexing) installations; RoHS compliant
Cable bend radius	Minimum 5x outer diameter

### Mechanical [mm (in.)]

Maximum operating speed	9,000 RPM
Angular acceleration	500,000 radians/s <sup>2</sup>
Moment of inertia	41 g·cm <sup>2</sup>
Startup torque at 20° C (68° F)	0.8 N·cm
Operating torque at 20° C (68° F)	0.6 N·cm
Approximate weight [kg (lb)]	0.40 (0.86 lb) with M12 connector
MTTFd (EN ISO 13849-1)	330 years
Angular shaft misalignment [mm (in.)]	5° standard coupler, 10° high performance coupler
Parallel shaft misalignment [mm (in.)]	0.25 (0.010) standard coupler, 0.51 (0.020) high performance coupler
Coupling axial compliance [mm (in.)]	± 0.76 (0.030) standard coupler, ± 1.52 (0.060) high performance coupler
Coupler bore size	9.52 (3/8) or 6.4 (1/4) diameter

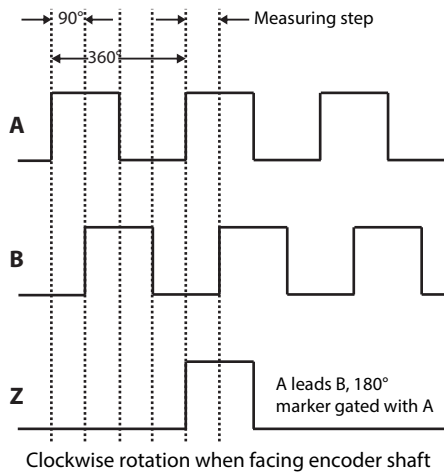
### Environmental

Enclosure rating per IEC 60529	Shaft: IP 65 Housing, connector version with mating connector installed: IP67 Housing, cable version: IP67
Temperature	-30...80° C (-22...176° F) operating -40...100° C (-40...212° F) storage
Relative humidity	90% non-condensing
Shock	100 G/11 ms duration
Vibration	30 G/10...2,000 Hz
EMC	EN 61000-6-2 and EN 61000-6-3 (M12 connector)
Housing material	EN AC-47100 die-cast aluminium
Housing finish	Powder coat paint, color RAL 9005, Pantone black C (jet black)
Flange material	6061-T6 aluminium
Shaft material	SAE 303 stainless steel
Certifications	RoHS compliant CE marked for all applicable directives UL listing valid only for encoders with cable and M12 connections.

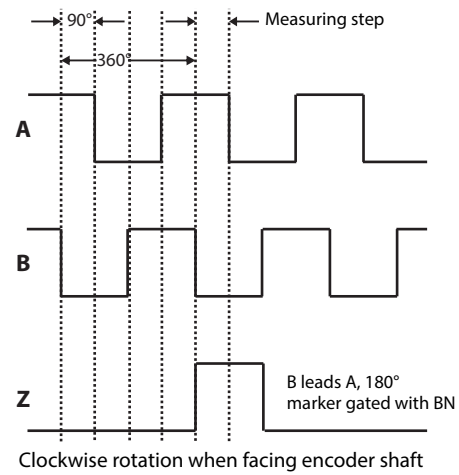
## Output Waveforms

Complementary signals AN, BN, and ZN are supplied only on units with line driver outputs.

Signals and marker option - A leads B (CW rotation)



Signals and marker option - B leads A (CW rotation)



## Connector Pins and Signal Availability

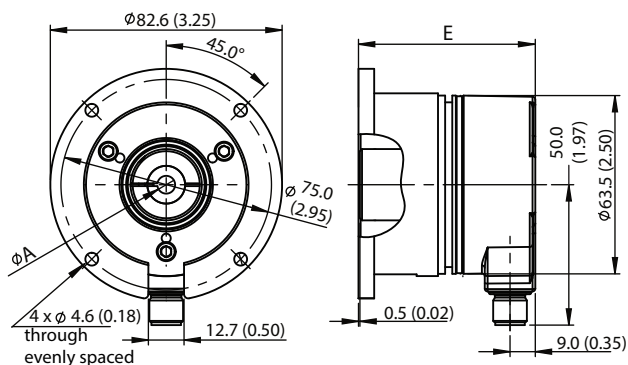
Signal Name	MS 6-pin	MS 7-pin	MS 10-pin	M12 8-pin	Wire colors, attached cable
V DC	B	D	D	8	Red
Common	A	F	F	7	Black with red band
A output	E	A	A	2	White
AN output	-	-	H	1	Black with white band
B output	D	B	B	4	Blue
BN output	-	-	I	3	Black with blue band
Z output	C	C	C	6	Green
ZN output	-	-	J	5	Black with green band
Zero set input	-	E	E	-	Yellow
Case	F	G	G	-	Black
Encoder connectors					-
Recommended mating cable	845-CA-A-*	845-CA-B-*	845-CA-C-*	889D-F8FB-*	(Attached to encoder)

# Physical Dimensions [mm (in.)]

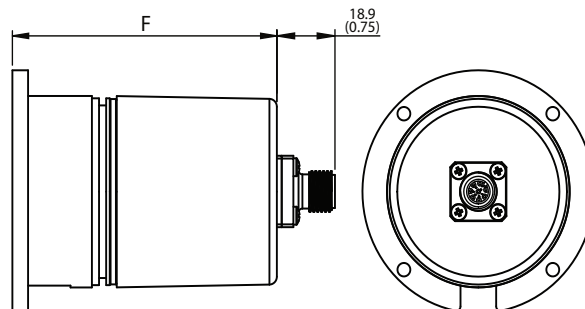
Shaft dimensions		
Nominal, in.	Shaft $\phi$ A	Bore depth
1/4	6.35/6.43(0.250/0.253)	12.7 (0.50)
3/8	9.53/9.61 (0.375/0.378)	12.7 (0.50)

Part no.	E	F	G
847H-FB**_*****	63.0 (2.48)	94.2 (3.71)	73.2 (2.88)
847H-FE**_*****	63.0 (2.48)	94.2 (3.71)	73.2(2.88)
847H-FF**_*****	74.8 (2.94)	106.0 (4.17)	85.0 (3.35)
847H-FG**_*****	74.8 (2.94)	106.0 (4.17)	85.0 (3.35)

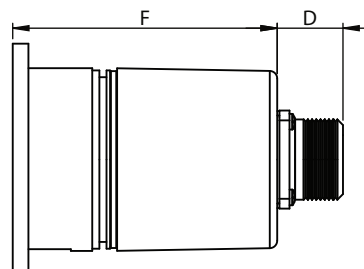
**Standard/high performance with radial M12 connector**



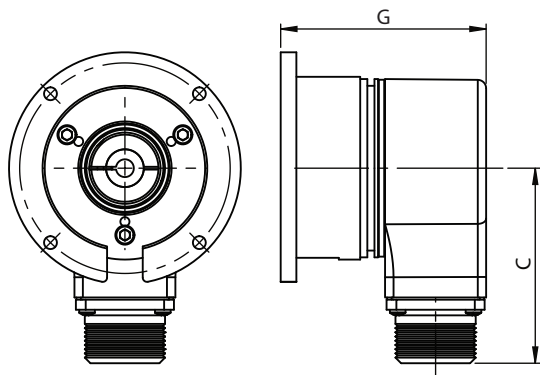
**Standard/high performance with axial M12 connector**



**Standard/high performance with axial MS connector**



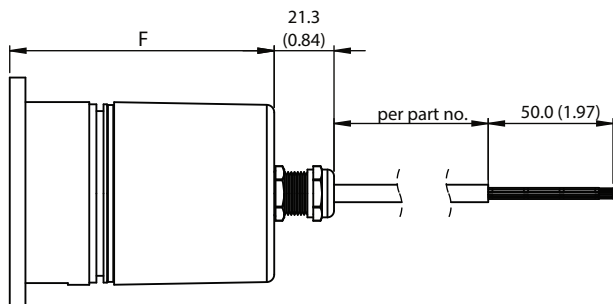
**Standard/high performance with radial MS connector**



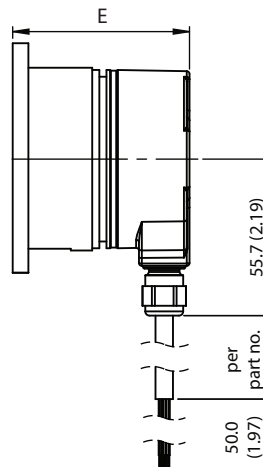
MS connector dimensions		
Type	C	D
6-pin	63.9 [2.5 2]	17.8 [0.70]
7-pin	63.9 [2.5 2]	17.8 [0.70]
10-pin	69.4 [2.7 3]	23.4 [0.92]

**Standard/high performance with radial cable**

**Standard/high performance with axial cable**



Cable options
1.5 m (4.9 ft)
5 m (16.4 ft)
10 m (32.8 ft)



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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