

# Installation Instructions

## 847T 2 in. Diameter Solid Shaft Incremental Encoders

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

### Selection Guide

847  $\frac{T}{a}$  -  $\frac{P}{b}$   $\frac{Y}{c}$   $\frac{1}{d}$   $\frac{4}{e}$  -  $\frac{R}{f}$   $\frac{C}{g}$   $\frac{01204}{h}$

**a**

Code	Encoder Diameter/Type
T	2 in. diameter, solid shaft

**b**

Code	Mounting Configuration
D	Standard square flange
H	Standard servo mount
P	5 PY mounting*

\*P can be ordered only with option Y from table c

**c**

Code	Shaft Size
K	6 mm diameter shaft with flat
L	10 mm diameter shaft with flat
M	1/4 in. diameter shaft with flat
N	3/8 in. diameter shaft with flat
Y	5/8 in. diameter extended shaft with flat**

\*\*Y can be ordered only with option P from table b

**d**

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

**e**

Code	Output Configuration
<b>Signal Phasing A-leads-B, Z gated A</b>	
4	4.5...5.5V line driver outputs
5	4.5...5.5V open collector outputs ❶
6	8...30V line driver outputs ❷
7	8...30V open collector outputs ❷
<b>Signal Phasing B-leads-A, Z gated BN</b>	
A	4.5...5.5V line driver outputs
B	4.5...5.5V open collector outputs ❶
C	8...30V line driver outputs 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
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	Cable with 1.5 m (4.92 ft) length
Q	Cable with 5 m (16.4 ft) length
R	Cable with 10 m (32.8 ft) length

**h**

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

### Accessories

Description	Part Number
High performance flexible coupling ❶	845-FC-*.*
Measuring wheels ❶	845-MW-A-*
Mounting plates ❶	845-MB-*
Servo clamps ❶	845-SC
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-*

- ❶ Not available for PY mounting
- \* 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

**Electrical** (continued)

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**

Maximum operating speed	9,000 RPM
Angular acceleration	500,000 radians/s <sup>2</sup>
Moment of inertia	15 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)]	0.22 (0.50) square flange mounting with M12 connector 0.34 (0.75) PY mounting with M12 connector

**Mechanical** (continued)

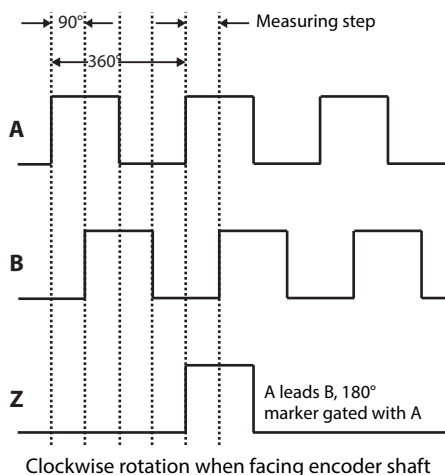
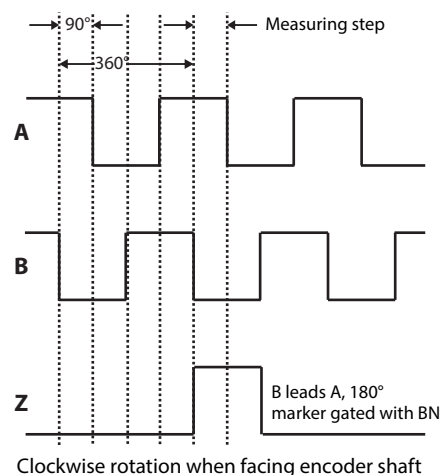
MTTFd (EN ISO 13849-1)	330 years
Shaft loading	80 N radial, 20 mm (0.79 in.) from front bearing and 40 N axial provide L10 life of 3.6 x 10 <sup>9</sup> revolutions at 9,000 RPM and 80 °C ambient temperature
Shaft diameter [mm (in.)]	6 (0.24), 10 (0.39), 6.4 (0.25), and 9.2 (0.38) diameter for solid shaft encoders 7.94 (0.313) for encoder with PY mounting

**Environmental**

Enclosure type rating	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 (-4...212 °F) storage
Relative humidity	90% non-condensing
Shock	100G/11 ms duration
Vibration	30G/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 listed only with cable or 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)**

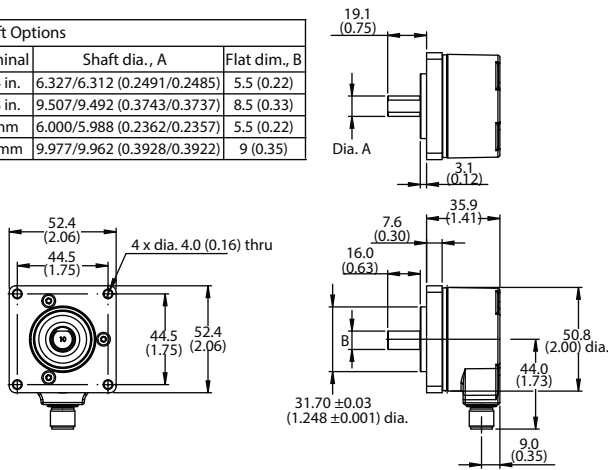
# Connector Pins and Signal Availability

Signal Name	MS 6-pin	MS 7-pin	MS 10-pin	M12 8-pin	Cable wire colors
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 Cat. No.	845-CA-A*	845-CA-B*	845-CA-C*	889D-F8FB*	(Attached to encoder)

## Dimensions [mm (in.)]

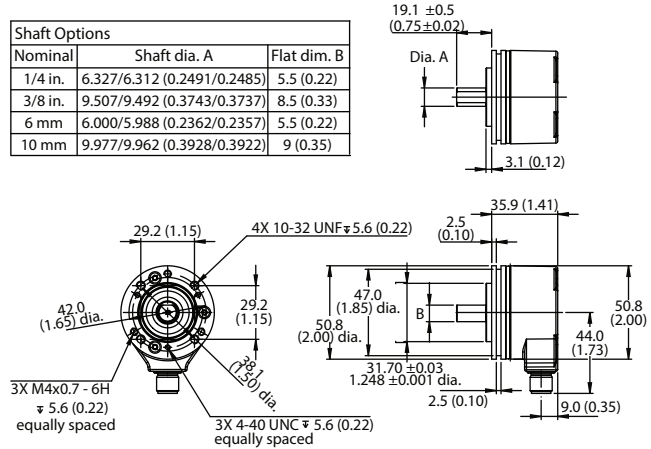
Square Flange Mounting with Radial M12 Connector

Shaft Options		
Nominal	Shaft dia., A	Flat dim., B
1/4 in.	6.327/6.312 (0.2491/0.2485)	5.5 (0.22)
3/8 in.	9.507/9.492 (0.3743/0.3737)	8.5 (0.33)
6 mm	6.000/5.988 (0.2362/0.2357)	5.5 (0.22)
10 mm	9.977/9.962 (0.3928/0.3922)	9 (0.35)

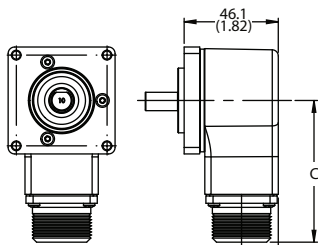


Servo Flange Mounting with Radial M12 Connector

Shaft Options		
Nominal	Shaft dia. A	Flat dim. B
1/4 in.	6.327/6.312 (0.2491/0.2485)	5.5 (0.22)
3/8 in.	9.507/9.492 (0.3743/0.3737)	8.5 (0.33)
6 mm	6.000/5.988 (0.2362/0.2357)	5.5 (0.22)
10 mm	9.977/9.962 (0.3928/0.3922)	9 (0.35)

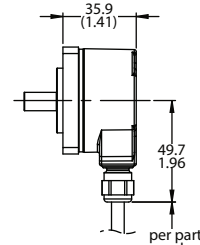


Square Flange Mounting with Radial M12 Connector



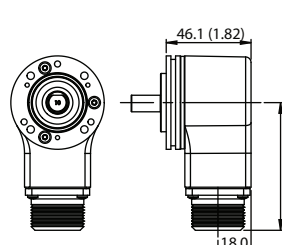
MS Connector Options	
Type	C
6 pin	63.9 (2.52)
7 pin	63.9 (2.52)
10 pin	69.4 (2.73)

Square Flange Mounting with Radial Cable



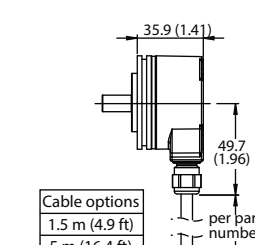
Cable options	
1.5 m (4.9 ft)	
5 m (16.4 ft)	
10 m (32.8 ft)	

Servo Flange Mounting with Radial MS Connector



MS Connector Options	
Type	C
6 pin	63.9 (2.52)
7 pin	63.9 (2.52)
10 pin	69.4 (2.73)

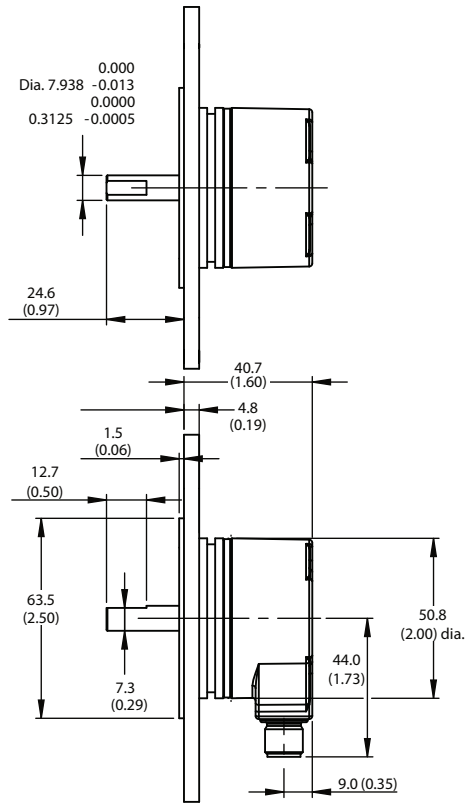
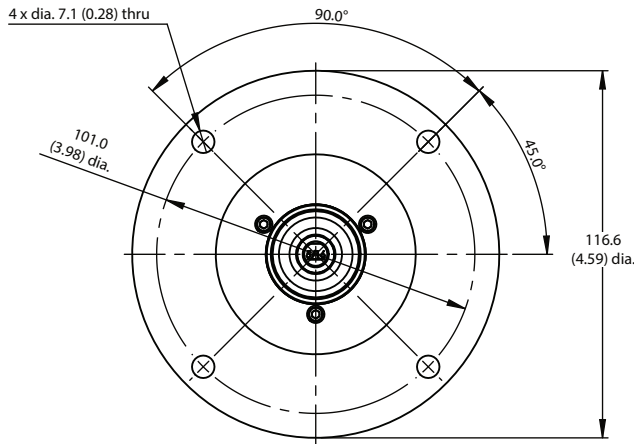
Servo Flange Mounting with Radial Cable



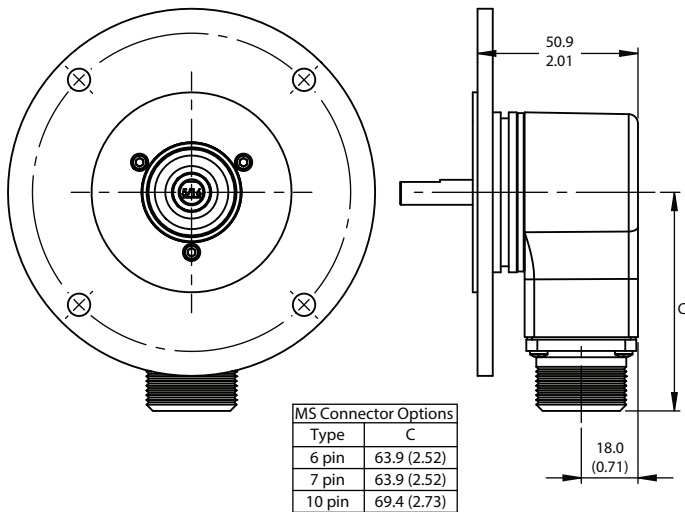
Cable options	
1.5 m (4.9 ft)	
5 m (16.4 ft)	
10 m (32.8 ft)	

# Dimensions [mm (in.)] (continued)

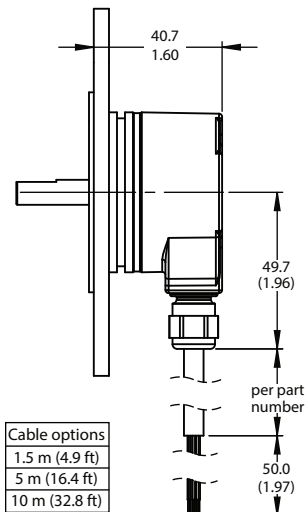
**PY Flange Mounting with Radial M12 Connector**



**PY Flange Mounting with Radial MS Connector**



**PY Flange Mounting with Radial Cable**



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10001065811 Ver 00 Jul7 2014  
 847T-IN001A-EN-P  
 Printed in USA