Installation Instructions

Original Instructions

Allen-Bradley

Blind and Through-shaft Optical Incremental Encoders

Catalog Numbers 844D-A*x*, 844D-R*x*

Summary of Changes

This publication contains new and updated information as indicated in the following table.

Topic	Page
Deleted "200 kHz Push-Pull (120-8192 PPR)" from Output Frequency from the Specifications table	1
Deleted "Push-Pull Single Ended Driver = ±70 mA" from Specifications table	1
Deleted "Code 5" in Power Supply and Output from Selection tables	1
Deleted "Push-pull single end driver output" graphic	2

Specifications

Attribute	844D-A*x*, 844D-R*x*
Electrical	
Code Format	2 channels with zero index
Power Requirements	120 mA (no load)
Output Frequency	300 kHz all drivers (120…8192 PPR) 600 kHz (above 8192 PPR)
Resolution	Up to 16,384 pulses per revolution
Output Driver Capability	3487 Line driver = ±40 mA 4469 Line driver = ±200 mA 7272 Line driver = ±40 mA
Mechanical	
Angular Acceleration	100,000 radians/sec^2
Starting Torque @ 25 °C (77 °F)	9.3 Ncm (13 in•oz)
Running Torque @ 25 °C (77 °F)	5 Ncm (7 in•oz)
Moment of Inertia	490 gcm^2 (6.9 x x 10^{-3}oz-in-sec^2)
Slew Speed	3000 rpm maximum
Shaft Loading (120…2500 PPR)	Axial 67 N (15 lbs) Radial 133 N (30 lbs)
Shaft Loading (4096…16,384 PPR)	Axial 44 N (10 lbs) Radial 67 N (15 lbs)
Permissible Shaft Radial Movement	Static ±0.5 mm (0.02 in.) Dynamic ±0.1 mm (0.004 in.)
Permissible Shaft Axial Movement	Static ±0.5 mm (0.02 in.) Dynamic ±0.5 mm (0.02 in.)
Bore Size	Supports 1/2…1-1/8 in. and 30 mm shafts
Environmental	
Protection	NEMA Type 4, 13, IP66 (IEC 529) except terminal block connection type rated IP40 (IEC 529) only
Housing material	Aluminum
Temperature	Operating: -20…+85 °C (-4…+185 °F) Storage: -30…+85 °C (-22…+185 °F)
Humidity	90% noncondensing
Shock	50 g (1.76 oz) for 11 ms
Vibration	20 g (0.70 oz) from 5…2000 Hz
Approximate weight	0.91 kg (2 lbs)

Selection

844D —	A	5	A	C	1	CR
	a	b	c	d	e	f

a

Shaft Design	
Code	**Description**
A	Blind-shaft
B	Through-shaft

b

Shaft Size[1]	
Code	**Description**
4	12.7 mm (1/2 in.)
5	15.87 mm (5/8 in.)
6	19.05 mm (3/4 in.)
7	22.22 mm (7/8 in.)
8	25.4 mm (1.0 in.)
9	28.57 mm (1 1/8 in.)
M	30 mm (1.18 in.)

c

Mounting Configuration	
Code	**Description**
A	Tether, 12.7 mm (0.50 in.) bolt on a 184.15 mm (7.25 in.) dia. B.C. (to fit 215.9 mm (8.5 in.) NEMA C face)
B	Tether, 9.525 mm (0.375 in.) bolt on a 149.35 mm (5.88 in.) dia. B.C. (to fit 114.3 mm (4.5 in.) NEMA C face)
C	Tether, 9.525 mm (0.375 in.) bolt on a 63.5…101.6 mm (2.5…4.0 in.) dia. radius
D	Anti-rotation pin

d

Connection Type	
Code	**Description**
C	10-pin connector
T	Terminal block[2]
1	1 m (3.28 ft) cable

e

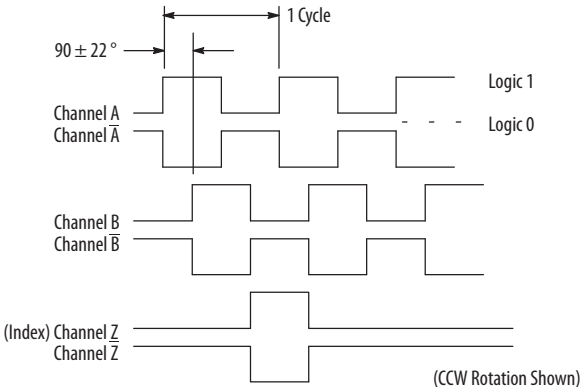
Power Supply and Output[3]	
Code	**Description**
1	5V DC in, 5V DC DLD out (3487)
2	5…26V DC in, 5…26V DC DLD out (7272)[4]
3	5…15V DC in, 5…15V DC DLD out (4469)
4	8…26 DC in, 5V DC DLD out (3487)

f

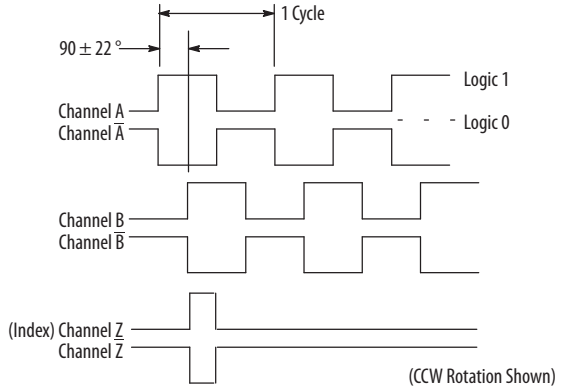
Resolution	
Code	**Description**
DB	120
CK	360
FW	1024
CS	2048
CR	2500
DS	4096
DR	5000
FS	8192
CV	10000[5]
LS	16384[5]

1 Shaft sizes below 25.4 mm (1.0 in.) include an insulating insert.
2 Terminal block unit is not rated for fluid ingress protection (IP40 (IEC 529) only.
3 DLD = Differential Line Driver.
4 7272 line driver has a voltage drop of 1.9V.
5 Available with power supply and output options 1, 2, 3, and 4.

Differential Line Driver Output (for resolution ≤ 8192 PPR)



Differential Line Driver Output (for resolution > 8192 PPR)



Electrical Connections

Table 1 - Differential Line Driver Outputs

Function	10-pin Connector	Shielded Cable	Terminal
Channel A Output	A	White	1
Channel B Output	B	Pink	2
Channel Z Output	C	Violet	7
DC+ Input	D	Red	3
DC Return	F	Blue	4
Case Ground	G	Green	—
Channel A Output	H	Brown	5
Channel B Output	I	Black	6
Channel Z Output	J	Yellow	8

IMPORTANT The 10-pin connector type MS3102R18-1P

Table 2 - Blind-shaft Tolerance [mm (in.)]

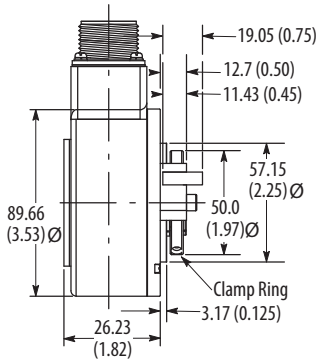
Size	Bore	Mating Shaft	Length
12.7 (0.5)	12.7/12.72 (0.500/0.501)	12.7/12.67 (0.500/0.499)	17.78/50.8 (0.70/2.00)
15.87 (0.625)	15.87/15.9 (0.625/0.626)	15.87/15.85 (0.625/0.624)	17.78/50.8 (0.70/2.00)
19.05 (0.75)	19.05/19.07 (0.750/0.751)	19.05/19.02 (0.750/0.749)	17.78/50.8 (0.70/2.00)
22.22 (0.875)	22.22/22.25 (0.875/0.876)	22.22/22.20 (0.875/0.874)	17.78/50.8 (0.70/2.00)
25.4 (1.0)	25.4/25.42 (1.000/1.001)	25.4/25.39 (1.000/0.999)	17.78/50.8 (0.70/2.00)
28.57 (1.125)	28.57/28.60 (1.125/1.126)	28.57/28.55 (1.125/1.124)	17.78/50.8 (0.70/2.00)
30 (1.181)	30.000/30.025 (1.181/1.182)	30.000/29.975 (1.181/1.180)	18/50 (0.71/1.97)

Table 3 - Through-shaft Tolerance [mm (in.)]

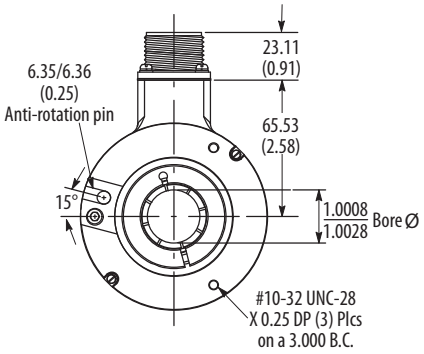
Size	Bore	Mating Shaft	Length (min.)
12.7 (0.5)	12.7/12.72 (0.500/0.501)	12.7/12.67 (0.500/0.499)	17.78 (0.70)
15.87 (0.625)	15.87/15.9 (0.625/0.626)	15.87/15.85 (0.625/0.624)	17.78 (0.70)
19.05 (0.75)	19.05/19.07 (0.750/0.751)	19.05/19.02 (0.750/0.749)	17.78 (0.70)
22.22 (0.875)	22.22/22.25 (0.875/0.876)	22.22/22.20 (0.875/0.874)	17.78 (0.70)
25.4 (1.0)	25.4/25.42 (1.000/1.001)	25.4/25.39 (1.000/0.999)	17.78 (0.70)
28.57 (1.125)	28.57/28.60 (1.125/1.126)	28.57/28.55 (1.125/1.124)	17.78 (0.70)
30 (1.181)	29.980/29.959 (1.18/1.179)	30.000/29.975 (1.181/1.180)	18 (0.71)

Dimensions [mm (in.)]

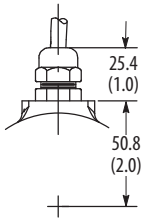
Blind-Shaft ❶



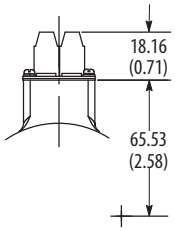
Connector Option



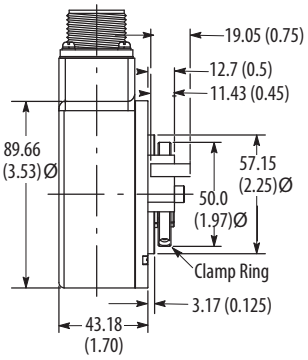
Cable Option



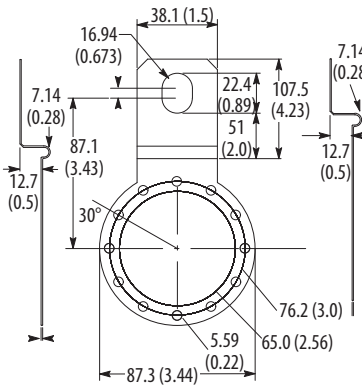
Terminal Option



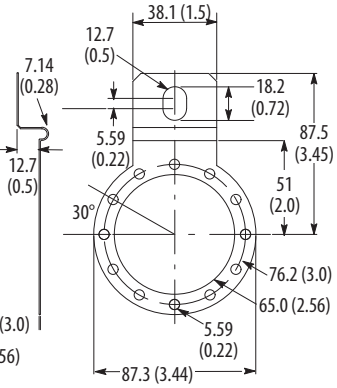
Through-Shaft ❶



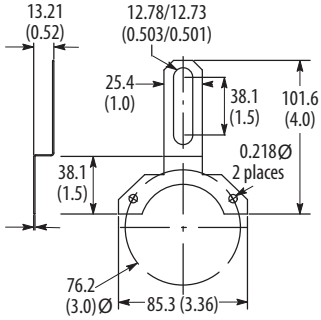
Tether Option "A"



Tether Option "B"



Tether Option "C"



Mounting Instructions

IMPORTANT Be sure mating shaft is chamfered and grease-free.

1. Loosen the screw on the clamping ring with a 3/32 in. hexagon socket wrench.
2. Slide the encoder onto the mating shaft until the tether mount or anti-rotation pin rests on the machine surface.

   The encoder should slide freely on the shaft; if not, do not force. Check the shaft for interferences such as gouges, burrs, rust or size.

   If a mounting hole or anti-rotation pin stop already exists, proceed to Step 6.
3. Mark the mounting hole and/or anti-rotation pin stop location.
4. Slide the encoder off. Drill and tap the marked hole to accept the 0.375 in. x 16 (tether option B or C) or 0.5 in. x 13 (tether option A) bolt.
5. Slide the encoder back in the shaft until the tether mount or anti-rotation pin rests on the machine surface.
6. Attach the encoder with either the 0.375 in. or 0.5 in. bolt.

IMPORTANT Do not stress the tether mount while tightening the bolt.

7. Tighten the clamping ring to 8 inch-lbs.
8. Make the electrical connections according to the table under "Electrical Connections."

IMPORTANT Wiring must be in accordance with the National Electric Code and applicable local codes and ordinances.

9. Apply the specified voltage (see Table "e" under "Selection" on page 1 of this publication).

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	http://www.rockwellautomation.com/global/support/direct-dial.page
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