

# Installation Instructions

Original Instructions



**Allen-Bradley**

by ROCKWELL AUTOMATION

## Through-shaft Optical Incremental Encoders

Catalog Numbers 844DS-BMx, 844DS-BNx

### Specifications

Attribute	Value
<b>Electrical</b>	
Connection types	MS 10-pin, M23 12-pin, M12 8-pin, 1.5 m (4.92 ft) cable
Supply voltage	4.5...30V DC
Current [mA]	<ul style="list-style-type: none"> <li>Load: ≤ 40 (per channel)</li> <li>Operating: 50 (without load)</li> </ul>
Power consumption [W]	≤ 0.85
Reference signal, position	90°, electric, logically gated with A and B
Duty cycle	≤ 0.5 (±15%)
Measuring step	<ul style="list-style-type: none"> <li>90° electric/pulses per revolution</li> <li>Deviation: ±15° electrical</li> </ul>
Communication interface	<ul style="list-style-type: none"> <li>Incremental</li> <li>Detail: TTL/HTL</li> </ul>
Signal channels	6-channel
Initialization [ms]	< 50
Output frequency [kHz]	≤ 300
<b>Mechanical</b>	
Design	Through the hollow shaft
Diameter, shaft <sup>(1)</sup>	30 mm or 42 mm
Weight [kg (lb)]	0.65 (1.43)
Materials	<ul style="list-style-type: none"> <li>Shaft: Aluminum</li> <li>Flange: ZAMAC die cast</li> <li>Housing: ZAMAC die cast</li> <li>Shaft seal ring: FKM70</li> </ul>
Torque, 20 °C (68 °F) [N•m (lb•in)]	<ul style="list-style-type: none"> <li>Startup: 0.06 (0.53)</li> <li>Operating: 0.05 (0.44)</li> </ul>
Shaft load, permissible [N (lbf)]	100 (22.48)
Operating speed [min <sup>-1</sup> ]	≤ 3600
Moment of inertia [kg/cm <sup>2</sup> (lb/in <sup>2</sup> )]	Rotor: 0.408 (5.8)
Bearing lifetime	10 <sup>9</sup> revolutions
<b>Environmental</b>	
Radio frequency/EMC	EN 6100-6-2 and EN 6100-6-3
Enclosure rating	IP65 (IEC 60529)
Relative humidity	98% (no condensation)
Operating temperature [°C (°F)]	-25...+85 (-13...+185)
Storage temperature, without package [°C (°F)]	-25...+85 (-13...+185)
Shock and vibration	<ul style="list-style-type: none"> <li>EN 60068-2-27: 250 g, 6 ms</li> <li>EN 60068-2-6: 10 g, 5...2000 Hz</li> </ul>

(1) Collets (shaft reducer) accessories available to reduce shaft size < 30 mm (1.18 in.)/42 mm (1.65 in.).

### Product Selection

844DS - B  $\frac{M}{a}$  0  $\frac{C}{b}$   $\frac{T}{c}$   $\frac{CR}{d}$

a		b		c		d	
Bore Size [mm (in.)]		Connection		Output		Resolution	
Code	Description	Code	Description	Code	Description	Code	Description
M	30 (1.18)	1	1.5 m (4.92 ft) cable	H	HTL	DB	120
N	42 (1.65)	C	MS 10-pin	T	TTL	CK	360
		D	M12 8-pin			FW	1024
		J	M23 12-pin			CS	2048
						CR	2500
						DS	4096
						DR	5000
						FS	8192
						CV	10000
						LS	16384

### Accessories

Tether

844DS -  $\frac{TA}{a}$

a	
Tether Type	
Code	Description
TA	One-sided stator coupling, slot, 115 mm
TB	One-sided stator coupling, slot, 84 mm

Shaft Insert

844DS -  $\frac{M4}{a}$

a	
Shaft Insert <sup>(1)</sup>	
Code	Description
MA	16 mm
MB	18 mm
MC	24 mm
MD	24 mm
ME	25 mm
MF	28 mm
M4	1/2 in.
M5	5/8 in.
M6	3/4 in.
M7	7/8 in.
M8	1 in.
M9	1 1/8 in.
NG	30 mm
NH	32 mm
NI	35 mm
NJ	38 mm
NK	40 mm

(1) Mx are for bore size M units; Nx are for bore size N units.

## Installation



**ATTENTION:**

- Observe the relevant national work safety regulations as specified by trade associations.
- During mounting, disconnect all applicable devices, machinery, and systems from the supply voltage.
- Never modify electrical connections while the optical encoder has power. This action can damage the equipment.
- To prevent ball bearing damage, avoid shocks or impacts to the optical encoder shaft.
- Provide cables with strain relief, otherwise the optical encoder and cables can become damaged.
- Keep the area around the optical encoder clear to avoid collisions with objects, which can damage the optical encoder.
- Connect the optical encoders to an EMC screen (fitted on both sides) to confirm the optical encoders function properly.
- The device is intended to be powered by an industrial SELV or PELV power supply.
- The sensors are qualified up to a maximum cable length of 30 m (98.42 ft), according to standard EN 62000-6-2. Larger cable lengths are possible, but not assessed under the EMC aspects.

1. To prevent rotation, lock the drive shaft on which you mount the optical encoder.
2. Loosen the M4 x 16 UNI5931 screw on the clamp ring.
3. If necessary, insert the collet into the optical encoder shaft, check the diameter of the drive shaft.
4. Check the shaft length on which you mount the optical encoder.
5. Slide the optical encoder onto the drive shaft.
6. Confirm that the optical encoder shaft or the collet does not touch the customer application.
7. If necessary, use the M3 x 5 DIN7500 screws to mount stator coupling accessories (see [Figure 1](#)..[Figure 2](#)) to the optical encoder housing. Torque to 1.1 N•m (9.74 lb•in)
8. Confirm that the stator coupling attaches to the application so the optical encoder cannot rotate, and that the stator coupling is not pre-stressed.
9. Partially torque the M4 screws to 0.2 N•m (1.77 lb•in) on the clamp ring. Then, torque the screws fully to 2.5 N•m (22.13 lb•in).
10. With power disconnected, connect the optical encoder signals to the application.
11. Reconnect the power on and check the optical encoder functionality.

Figure 1 - Optical Encoder Installation

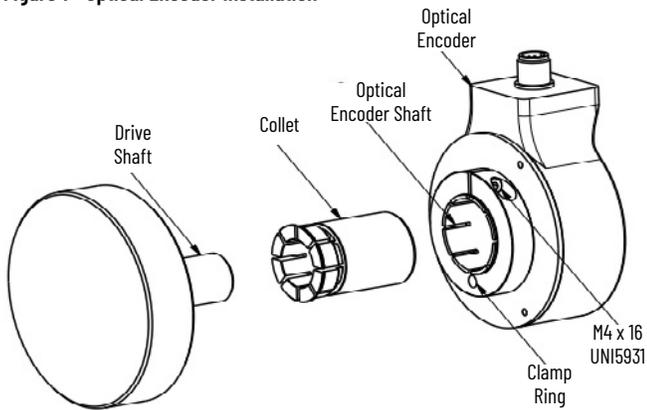
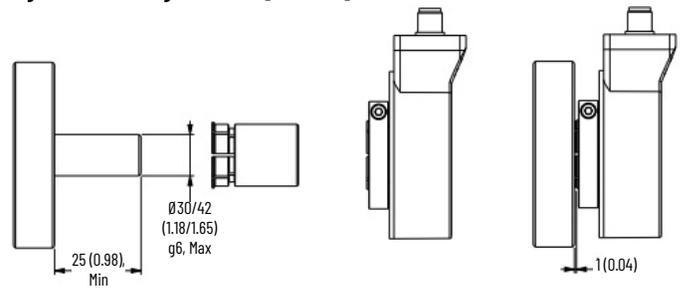


Figure 2 - Mounting Distances [mm (in.)]



## Approximate Dimensions

Figure 3 - 844DS with MS 10 Plug Connector (30 mm Bore) [mm (in.)]

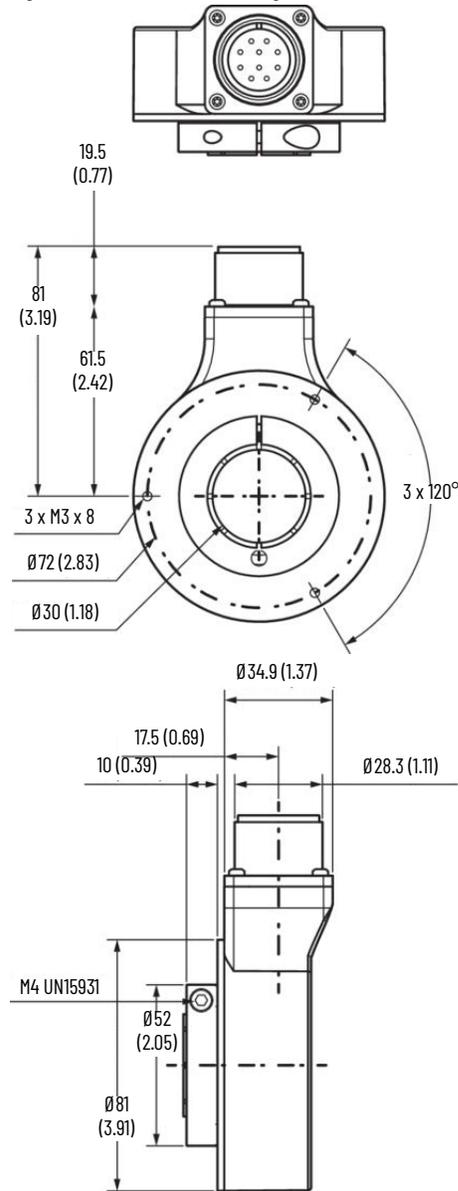


Figure 4 - 844DS with M23 Plug Connector (42 mm Bore) [mm (in.)]

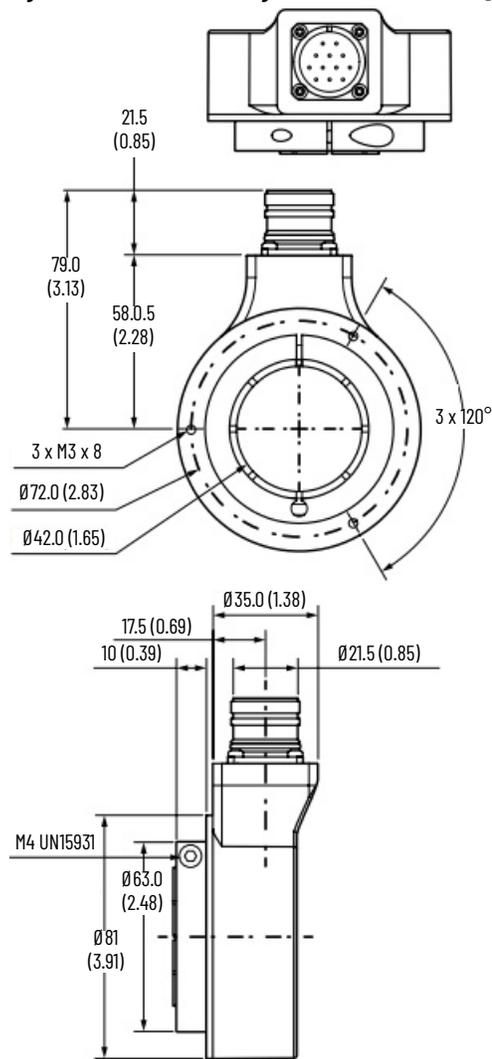


Figure 6 - 844DS-TBx One-sided Stator Coupling (Slot, 84 mm) [mm (in.)]

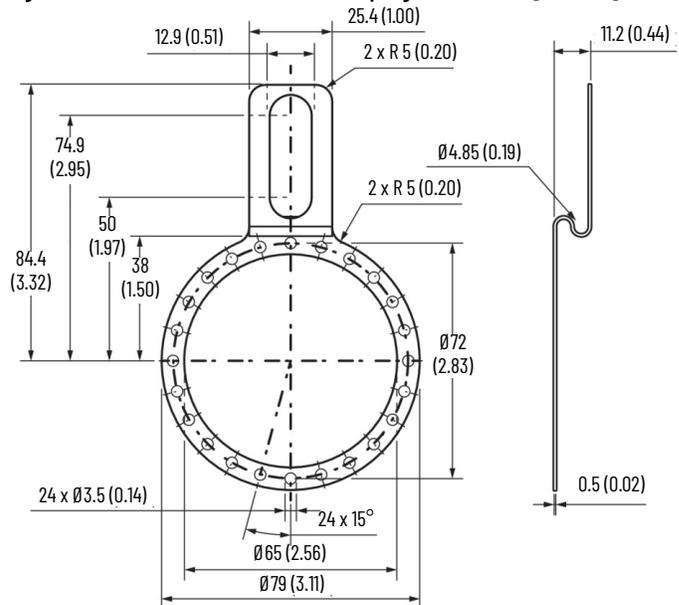
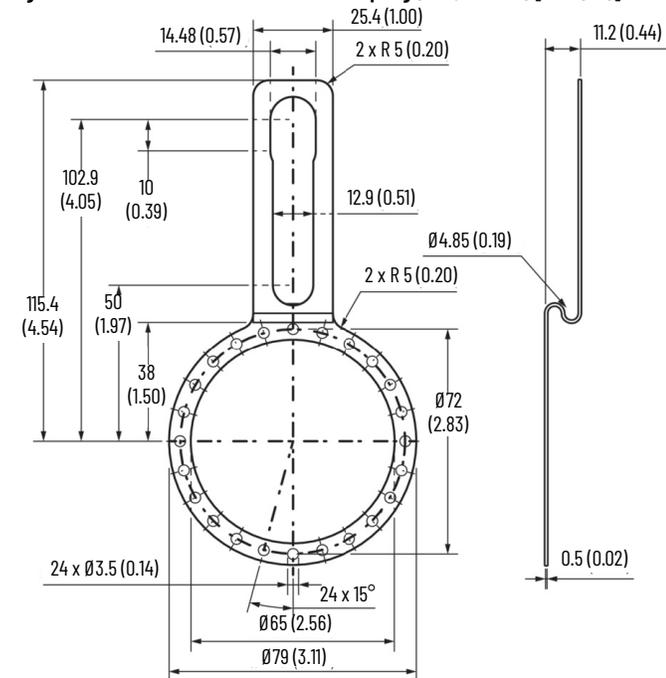
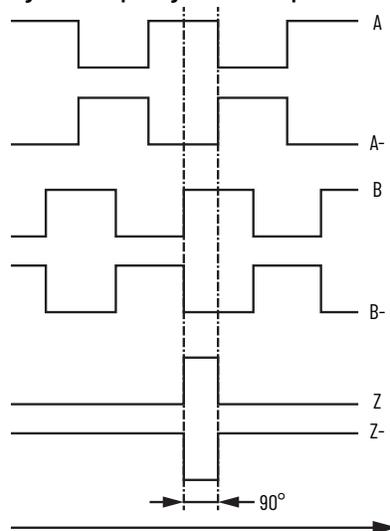


Figure 5 - 844DS-TAx One-sided Stator Coupling (Slot, 115 mm) [mm (in.)]



### Electrical Connections

Figure 7 - Output Signal Phase Sequence



Clockwise rotation, which is seen from the flange side.

**Table 1 - Differential Line Driver Outputs**

Cable Wire Color	M12 8-pin Socket	M23 12-pin Socket	MS 10-pin Socket	Signal	Explanation
Brown	1	6	H	A-	Signal cable
White	2	5	A	A	Signal cable
Black	3	1	I	B-	Signal cable
Pink	4	8	B	B	Signal cable
Yellow	5	4	J	Z-	Signal cable
Purple	6	3	C	Z	Signal cable
Blue	7	10	F	GND	Ground connection
Red	8	12	D	+U <sub>S</sub>	Supply voltage
-	-	2	E	N.C.	Not connected
-	-	7	-	N.C.	Not connected
-	-	-	G	Housing	Housing
-	-	9	-	N.C.	Not connected
-	-	11	-	N.C.	Not connected
Screen	-	-	-	Screen	Connects to the housing on the optical encoder side

## Additional Resources

To download publications, visit [rok.auto/literature](http://rok.auto/literature) and search for the following publication numbers.

Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a>	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, <a href="http://rok.auto/certifications">rok.auto/certifications</a>	Provides declarations of conformity, certificates, and other certification details.

## Waste Electrical and Electronic Equipment (WEEE)



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

Rockwell Automation maintains current product environmental compliance information on its website at [rok.auto/pec](http://rok.auto/pec).

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