Allen-Bradley 845H-SJDZ24FWY2C

ENGINEERING GUIDE / field replacement and commissioning

Allen-Bradley 845H-SJDZ24FWY2C is a size 25 optical incremental encoder with a square-flange mount, 3/8 in. shaft, 1024 pulses per revolution, 8–24 V DC supply and 5 V RS-422 differential line-driver outputs.

01 Job scope and safe-work boundary

Offer the 845H-SJDZ24FWY2C encoder with its selected mating-connector option; coupling, counter and application cable must be verified separately.

Power-output distinction	Check 8–24 V encoder supply and 5 V RS-422 receiver compatibility as separate requirements.
Connector identity	Verify the radial 10-pin interface and supplied mating connector against the installed cable.
Shaft coupling	Avoid rigid shaft coupling; inspect offset, axial load and flange alignment.
Pulse scaling	Set 1024 PPR and the actual x1/x2/x4 counter mode before validating displayed speed.
Shield routing	Keep paired signal conductors and the approved shield bond away from high-noise power wiring.
Acceptance test	Rotate in a controlled direction and prove A/B order, zero index and speed at the controller.

Before work starts

Record the complete marking, installed host configuration, connected interfaces and the as-found operating result. Follow the approved site isolation and maintenance procedure before changing the unit.

Environmental and configuration limits

Zero-index pulse	Half cycle gated to channel B, family data
Maximum data response	210 kHz, family data
Maximum index response	125 kHz, family data
Mechanical speed ceiling	6000 rpm, family data
Enclosure protection	NEMA Type 4 and 13; IP66, family data
Operating temperature	0 to +60 °C, family data

02 Readiness and fit

Encoder family	Bulletin 845H, size 25 high performance
Code format	Incremental A/B quadrature plus zero index
Mounting option D	Square flange
Shaft option Z	Smooth 3/8 in. diameter
Supply option 2	8–24 V DC, unregulated
Output option 4	5 V DC differential line driver, RS-422
Resolution option FW	1024 pulses per revolution

Connection option Y2	Radial side connector
Connection suffix C	Mating connector included
Encoder connector	10-pin for differential line-driver output
A/B phase relation	90° ±22° electrical; A leads B counterclockwise, family data

Why these checks matter

Supply versus output
Code 2 accepts 8–24 V DC supply; code 4 drives a separate 5 V differential RS-422 receiver.

Counts per revolution
FW denotes 1024 PPR; x1/x2/x4 counter decoding produces 1024/2048/4096 counted edges per turn.

Direction convention
The family reference defines A leading B for counterclockwise shaft rotation; verify the installed controller convention.

Index qualification
The Z pulse is gated to channel B; establish the machine home reference with the installed counter logic.

Speed boundary
At 6000 rpm and 1024 PPR the A-channel pulse frequency is 102.4 kHz, below the family 210 kHz data-response limit.

Connector scope
Y2 is the radial side connection; C identifies a mating connector option, not a supplied application cable.

Cable pair discipline
Carry each complementary A, B and Z signal as a pair and follow the specified ground and shield arrangement.

Mechanical fit
Confirm square flange, smooth 3/8 in. shaft, coupling geometry and permitted shaft loading at the machine.

Acceptance evidence
Record the complete marking, known-turn count, direction, index capture and operating speed.

03 Replacement sequence

01	**Record the baseline**	Save the installed marking, host/project configuration and current operating result.
02	**Verify the offered identity**	Compare the offered assembly and its supplied components with the installed unit.
03	**Prepare the interface**	Inspect connectors, routes, mounting and the documented host allocation.
04	**Fit and reconnect**	Use the approved site procedure and restore each documented connection in order.
05	**Restore configuration**	Load or retain the approved project and node assignments as applicable.
06	**Prove operation**	Test the used functions, status and diagnostics under an approved machine state.
07	**Keep the as-left record**	Record the new identity, changes, test results and remaining exceptions.

Installed-system relationship

The complete 845H-SJDZ24FWY2C order code selects a square-flange size 25 encoder with a smooth 3/8 in. shaft and 1024 pulses per revolution. The FW code describes the incremental code disk; the A/B channel

interpretation depends on the counter decoding mode, so pulses per revolution must not be confused with counted edges.

The encoder is supplied from 8–24 V DC but its selected output option is a 5 V differential RS-422 line driver. The 10-pin radial connector carries A/$\overline{A}$, B/$\overline{B}$ and zero-index Z/$\overline{Z}$ paths along with supply, return and case grounding. The C suffix identifies the mating connector option; inspect the offered connector and cable before replacing the installed unit.

Rockwell specifies a maximum 210 kHz data response and 6000 rpm mechanical ceiling for this family. At 1024 PPR, the mechanical ceiling is the binding speed limit under the stated response values. Fit a suitable flexible coupling, preserve shield and grounding arrangements and prove direction, index and counted speed against a known reference during commissioning.

04 Commissioning and acceptance

Identity and fit	Confirm exact order code, supplied scope and host position against the approved record.
Power and protection	Verify operating supply, enclosure, grounding and environmental boundary.
Connection continuity	Trace every used connector, cable or optical/network path end to end.
Configuration restore	Restore the documented project, controller setup and node mapping.
Dynamic proof	Test the used functions and diagnostics with the machine in an approved test state.
Handover	Retain marked-up drawings and as-left test evidence with maintenance records.

Acceptance by application

Rotary speed feedback
Convert shaft rotation into A/B pulse trains for the installed drive or counter input.

Position accumulation
Use counter edges and the configured decoding factor to track relative angular travel.

Direction determination
Compare the A/B phase relationship against the configured machine convention.

Reference indexing
Use the gated Z pulse for a once-per-revolution reference where the machine sequence requires it.

Engineering questions

What limits the usable shaft speed of 845H-SJDZ24FWY2C?	For this 1024-PPR selection, compare the family 210 kHz data response with the 6000 rpm mechanical ceiling. The 1024-PPR pulse frequency at 6000 rpm is 102.4 kHz, so the mechanical limit is lower under these stated conditions; also respect the coupling and shaft-load limits.
What connector inspection matters before replacing 845H-SJDZ24FWY2C?	Confirm the radial 10-pin differential connector, the C-suffix mating connector and the pin assignments in the applicable Rockwell drawing. Compare shell, keying, cable exit and strain relief with the installed harness before energizing.
What can cause intermittent pulses from 845H-SJDZ24FWY2C during vibration?	Inspect the flexible coupling, shaft runout, connector retention, shield bond and A/B pair continuity while observing the counter diagnostics. Correlate dropouts with speed and machine vibration before assigning the fault to the encoder.

05 Fault isolation and handover

No pulses at counter	Check DC supply at encoder, differential receiver type, connector seating and A/A-bar continuity.
Half or double count	Compare x1/x2/x4 decoding with the installed program and 1024-PPR order code.
Direction reversed	Observe A/B phase order at a known rotation direction; inspect pair polarity and software convention.
Index missing	Observe Z/Z-bar through a slow revolution and inspect index capture and connector paths.
Intermittent speed	Correlate counter dropout with shaft speed, coupling motion, shield bond and cable strain.
Noise-induced counts	Inspect complementary-pair routing, termination and separation from drive power cables.
Mechanical distress	Inspect flange alignment, coupling flexibility and shaft loads before replacement.

Additional engineer questions

How should 845H-SJDZ24FWY2C counts per revolution be configured in a quadrature counter?	Start with 1024 pulses per revolution from the FW order code. A counter using x1, x2 or x4 decoding may accumulate 1024, 2048 or 4096 edges per shaft turn; select the mode used by the installed control program and prove it with one known revolution.
Why can 845H-SJDZ24FWY2C be powered correctly yet produce unusable counter signals?	The encoder supply is 8–24 V DC while code 4 delivers 5 V RS-422 differential outputs. Verify the receiver input type, A/$\overline{A}$ and B/$\overline{B}$ polarity, cable continuity and ground reference rather than assuming supply and signal voltage are identical.
How is direction reversal diagnosed on 845H-SJDZ24FWY2C?	Check the A/B phase order against a known shaft direction; the family reference states that A leads B for counterclockwise rotation. Compare wiring polarity and the controller direction convention before changing software scaling.
How should the index signal of 845H-SJDZ24FWY2C be proved?	Observe the differential Z/$\overline{Z}$ pair during a slow controlled turn and confirm one valid gated reference event per revolution. Compare the controller capture point with the machine home sequence and check the index receiver wiring.

Evidence and applicability

Rockwell Automation C116 Sensor Catalog, Bulletin 845H selection guide and specifications. Order-code values come from the Bulletin 845H selection guide; frequency, environmental and mechanical limits are 845H family specifications.

Additional installation context: Rockwell Automation High-Speed Counter Module Installation Instructions, publication 1746-IN011C-EN-P.

Related model boundary

Other Bulletin 845H order codes may change the shaft, flange, supply, output, resolution or connector. Compare the full installed marking and manufacturer selection guide before considering a different encoder.

Discuss the complete marking with Apter Power.
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