

Choosing Feedback for a New Servo or BLDC Motor

A worksheet for motor manufacturers and machine builders. Choose the drive first, then the feedback the drive can read, then the simplest device that meets speed, accuracy and environment needs.

Feedback	Resolution	Strengths	Watch out for	Good fit
Hall sensors	6 states / electrical cycle	Cheap, simple	Low-speed ripple; board alignment	Fans, pumps, EV hub motors
Incremental ABZ+UVW	1,000-10,000 lines	Widely supported	Homing; noise; UVW alignment	General servo axes
Sin/cos 1 Vpp	High (interpolated)	Smooth low speed	Noise, cable quality	Precision axes
Serial absolute	17-26 bit / turn	No homing; data in memory	Drive compatibility; programming	Modern servo motors
Resolver	Moderate	Heat, shock, coolant	R/D converter; accuracy	Heavy duty, hot

Answer these first

Question	Your answer
Drives that must run the motor, and their accepted protocols	
Speed range and allowed speed ripple	
Absolute position needed at power-up? Multi-turn?	
Multi-turn method: battery, geared, battery-free	
Temperature, vibration, coolant, IP rating	
Cable length and wires available	
Shaft: tapered, hollow, coupling; service removal	
Functional safety requirement	

Plan production and service

- Decide how the offset is set: mechanically or written to encoder memory.
- End-of-line test: insulation, winding balance, back-EMF, counts, offset at every pole pair, run test.
- Keep records per serial number.
- Use testable connectors and publish the commutation reference for repairers.

Need it tested, aligned or repaired? Send a photo of the motor nameplate and the encoder label on WhatsApp +91 97866 22233. Emergency same day where the fault and parts allow; urgent 3 working days; standard 7 working days. Printed test report with every motor.