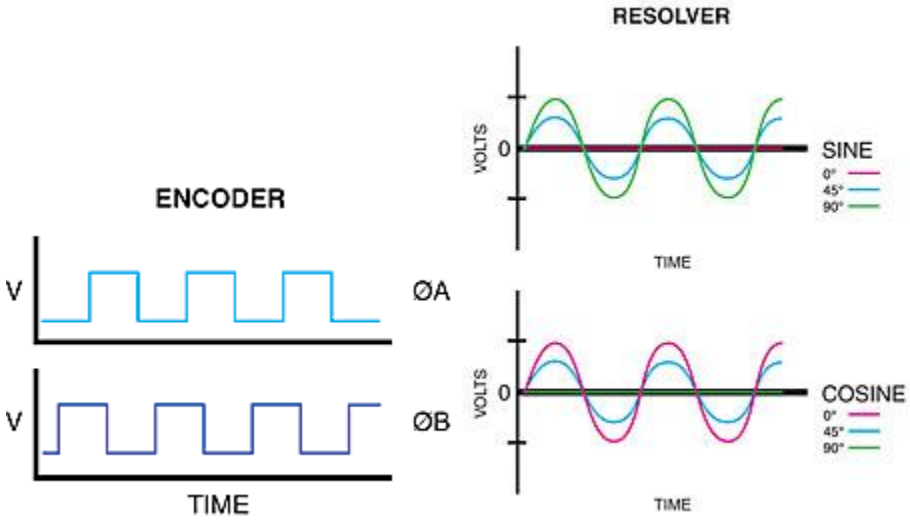
Encoders vs. Resolvers

How are incremental encoders different than resolvers?

Output Signal

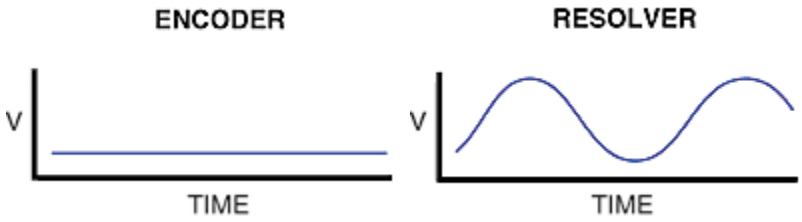


Encoders produce pulses indicating movement over a short distance; counting these pulses indicates distance (and speed over time) and checking the order of pulses in channel A vs. channel B indicates direction (quadrature).

Resolvers produce a set of sine/cosine waves (analog voltage) indicating absolute position within a single revolution; these signals are typically converted with a resolver interface board to a digital signal.

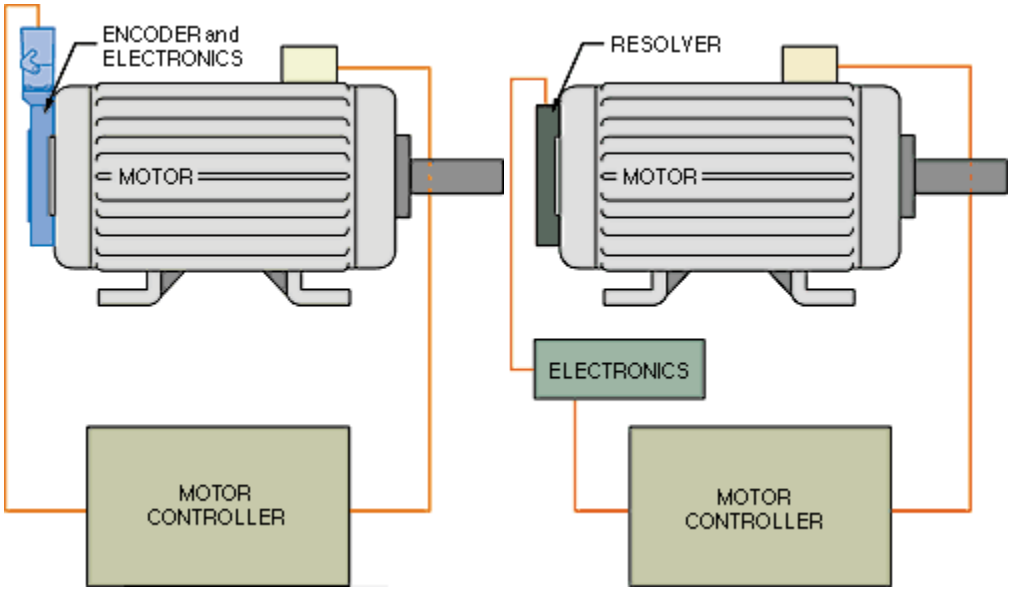
Input Signal

Encoders are typically powered with simple DC voltage.



Resolvers are "excited" by an AC reference sine wave, typically created with a dedicated resolver power supply; this power supply is typically powered with simple DC voltage.

Location of Electronics



Encoders typically have all their electronics onboard, minimizing interconnections, but limiting operating temperatures.

Resolver systems typically mount the resolver power supply and resolver interface board near the input device, requiring substantial inter-device wiring, but allowing the resolver to withstand higher temperature environments.

Typical Applications

Encoder Applications:

- AC Induction Motor Speed and Position Control
- DC Motor Speed and Position Control
- AC & DC Servo Motors (with commutation tracks added)

Resolver Applications

- Permanent Magnet (PM) Motor Commutation and Speed Control
- AC & DC Servo Motor Commutation and Speed Control