KOLLMORGEN

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Application of BDS4 or BDS5 to Other Manufacturer's Brushless Permanent Magnetic Motors

When applying Danaher Motion's BDS-type amplifiers to other manufacturers' motors, the first requirement is that the motor be fitted with a resolver electrically equivalent to that used in a standard Kollmorgen **GOLD**LINE® Series motor. Drawing B-40059 details this information. Secondly, the combination of resolver and mounting inaccuracies should generally not exceed ± 10.0 arc minutes for maximum motor performance.

The following additional information is required regarding specific motor parameters and load data. This information is needed to determine drive sizing, microprocessor programming, velocity and current loop compensation, and system configuration.

1. Motor pole count

Motor pole count stipulates resolver pole count and limits maximum motor speeds based on the maximum tracking rate of the R-to-D converter (12-bit).

2. Maximum motor speed
3. Desired operating voltage [specify DC bus or motor voltage (L-L]

DC Bus voltage equals motor volts (L-L) $\sqrt{2}$. Standard preferred system voltages are 230 volts (L-L) or 115 volts (L-L).

4. Motor continuous and intermittent current ratings ($A/\varnothing_{RMS}$)
5. Maximum on time at intermittent current rating and maximum duty cycle
6. Velocity or current mode operation with input scaling requirement of command volts versus speed or current
7. Determination of torque angle control configuration (fixed or dynamic)

Torque angle control is valuable in optimizing motor performance for both torque and speed. Torque is benefited by counteracting the affects of armature reaction that result in KT roll-off. In addition, operation above base speed is possible by effectively lowering KB. Torque angle control is particularly beneficial for motor designs having soft iron poles such as found in buried magnet designs.

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8. Load and motor inertia

The sum of load and motor inertia needs to be known for compensation and shunt regeneration sizing.

9. Axis configuration for determination of power supply bus requirements
10. Motor torsional resonance frequency (TRF) should be high in order not to limit system bandwidth compatibility; a TRF or 800 Hz or greater is recommended
11. Motor direct axis inductance is needed for current loop compensation calculations

MOTOR POLES	RESOLVER POLES	MAXIMUM SPEED
4	2	7,500
6	2	7,500
8	2	5,000
12	2	3,500
18	6	2,500
28	4	1,500
48	8	1,000

When using other than two-pole resolvers, the marker pulse form the encoder option card will be generated multiple times per mechanical revolution.

When a motor is supplied to Danaher Motion for BDS compensation, it is the customer's responsibility to deliver it in a testable configuration. In addition to having the correct resolver, this requires that the motor has a suitable mounting surface and shaft extension for attaching an appropriate inertia wheel. In some cases, based on the required inertia and motor shaft size, the customer will need to supply the necessary hardware.