

# GEARMOTOR FAQs

TECH TIPS FROM BODINE ELECTRIC COMPANY

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COMPANY

## 1. Can a 60 Hz AC Gearmotor Operate off 50 Hz?

**A:** A motor designed for 60 Hz operation will run at 5/6 rated speed on 50 Hz. For example, a motor rated 1700 RPM on 60 Hz will run at 1400 RPM on 50 Hz. Bodine 60 Hz type CI (PSC) motors will run hotter on 50 Hz. The motor temperature should be monitored during testing to make sure it is not overheating (a different run capacitor might be required). 60 Hz versions of Bodine type SI (split-phase) gearmotors and motors should never be operated on 50 Hz. Custom winding options are available for OEM applications.



## 2. What Is Meant By The Term Self-Locking?

**A:** Self-locking refers to the tendency of some gearing to resist movement when the gearmotor is at rest and the load is attempting to move. An example is a load on a conveyor belt trying to drive the system backwards.



## 3. Which Gearheads Are Self-locking?

**A:** Right angle gearheads with ratios greater than 20:1 are often considered to be self-locking. They will resist movement up to their torque rating. As the gearing nears the end of its useful life or if it is subjected to overload conditions, it may wear to the point where it is no longer self-locking. Self-locking gearing is not a recommended method for preventing movement in applications where this movement may cause injury or damage. An external brake is recommended for those applications.

## 4. What is a Synchronous AC Induction Motor?

**A:** A synchronous AC induction motor is a motor that operates directly from AC power and rotates at an exact multiple of the line frequency. This feature is provided through a unique winding and rotor design. Common synchronous induction motor speeds on 60 Hz are 1800 and 3600 RPM (4- and 2-pole).

Synchronous (variable speed) gearmotors and motors are ideal for applications where multiple drive motors are operated from one AC speed control (VFD). Because each motor or gearmotor will run at the exact same output speed, multiple axes can operate in synchronism without the need for a feedback device (encoder) or servo drive system. If multiple AC synchronous gearmotors are operated from one variable frequency drive (VFD), the sum of rated motor power for all synchronized axes must be equal or less the rated output power of the VFD.



Different rotor types for AC synchronous motors

## 5. Can Continuous Duty Motors/Gearmotors Be Used Intermittently?

**A:** All rated torques shown in our catalog and on our web site are for continuous duty operation. Continuous duty products can be used intermittently. Operation at loads higher than nameplate ratings is possible for short periods as long as there are rest periods for cooling. Loads higher than obtainable torque for gearmotors are never recommended. The temperature of the motor should be monitored during testing to make sure it is not overheating.

Duty cycles are typically defined per IEC 34-1. S1 represents continuous duty operation (constant load over a period of time that allows the motor to reach its thermal equilibrium). S2 represents short time duty (the motor can completely cool off between starts). S3 indicates intermittent duty operation where the off-periods are long enough that starting current does not cause motor overheating.

