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Find the *Bodine Electric 24A4BEPM* at our website: *Click HERE*

DC Technical Information

PM Advantages

Permanent magnet DC (PMDC) motors and gearmotors are compact, mathematically predictable, can produce high starting torque and can be decelerated rapidly.

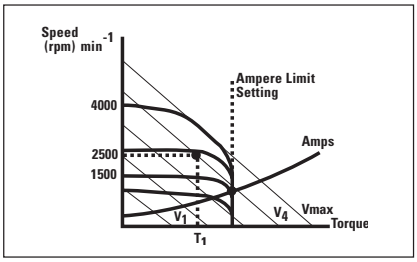
CE certification

Bodine PMDC motors and gearmotors have CE marks. See page 2 for more information.

Speed Regulation

In a PMDC motor, speed is proportional to voltage and torque is proportional to current. When voltage is held constant, the amount that speed drops due to increasing torque is called "speed regulation". The thin lines in Figure 1 illustrate motor performance without the aid of a regulating electronic control. The heavy lines illustrate performance from a control with "excellent" (1-3%) speed regulation.

Figure 1: Speed Regulation



Regulated speed curves for a typical DC motor and speed control.

Speed controls such as those presented on page 86 provide several functions: (a) converting input AC voltage to DC for the motor, (b) a potentiometer enables the user to select the motor operating speed, (c) "automatic" circuitry regulates the motor speed, (d) other functions, such as braking/reversing, temperature and line voltage compensation, can be provided at additional cost.

The design of the electronic speed control has a dramatic effect on motor speed performance and life. SCR speed controls can be: (a) 1/2 wave or full-wave; (b) filtered or unfiltered. Most industrial controls are full-wave. We will assume full-wave rectification and discuss differences between filtered and unfiltered.

Form Factor (FF)

Form Factor for a DC voltage electronic control is a measure of the amount of current (ampere) filtering (smoothing) provided by the control to a motor. Form Factor cannot be determined until a motor and control combination are driving a load. However, most control manufacturers catalog their controls with a FF rating. Most small motor and control combinations exhibit FF=1.0 to 1.05 with a filtered control and FF=1.6-1.8 with an unfiltered control at rated torque.

Most Bodine permanent magnet DC motors in this catalog are rated for continuous duty on 130 VDC, FF=1.05 current as supplied by Bodine type FPM and WPM controls. These motors and gearmotors can be successfully operated from unfiltered controls at FF=approximately 1.6, at speed not less than 1700 rpm. For intermittent duty operation, full nameplate torque may be available. The designers should test for each individual application.

Peak torque

Peak torque indicates the maximum torques above rated that are acceptable when gearmotors are used with Bodine Controls. Peak torque is based on the load causing the motor portion to briefly exceed its rated horsepower and are limited by either 200% of rated torque or the approximate short term capacity of the gearhead. The user is cautioned that output torques higher than rated will reduce the life of the gearhead below its "design life." Also, winding life will be reduced when rated load (rated temperature rise) is exceeded.

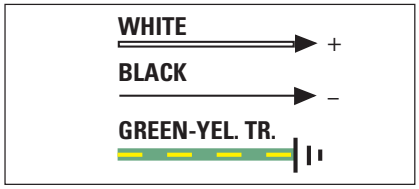
Motor Insulation Ratings

All Bodine PMDC motors are built with Class "F" insulation material (155°C total) for greater torque capability. However, the performance ratings of some models in this catalog are based on Class "B" (130°C total) for extended life.

Speed Controls

Speed Controls for Bodine PMDC motors and gearmotors are featured beginning on page 86.

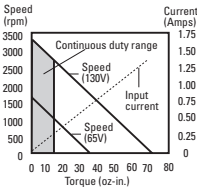
DC Connection Diagram 074 10101



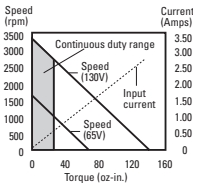
Connect as shown for clockwise rotation while viewing output shaft. To reverse direction, transpose white and black leads.

Performance Curves

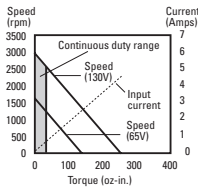
The performance curves below show motor performance on pure DC (FF=1.0).



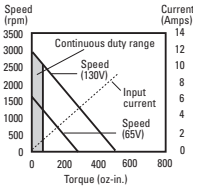
24A2BEPM, model 0041



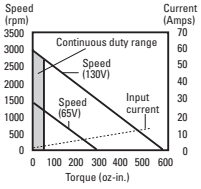
24A4BEPM, models 0043/0047



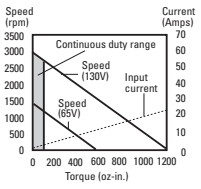
33A3BEPM, models 6016, N6416



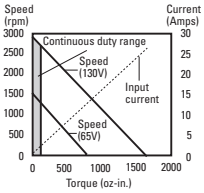
33A5BEPM, model 6020, 6420



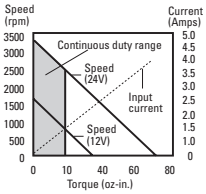
42A3BEPM



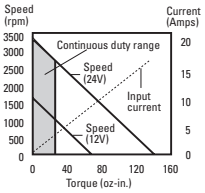
42A5BEPM, models 4035, 4435



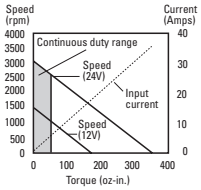
42A7BEPM, model 4037



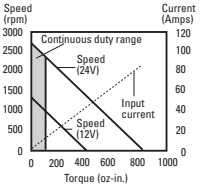
24A0BEPM, model 0040



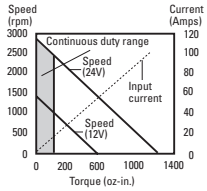
24A4BEPM, model 0044



33A5BEPM, model 6019



42A5BEPM, model 4021



42A7BEPM, model N4022

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