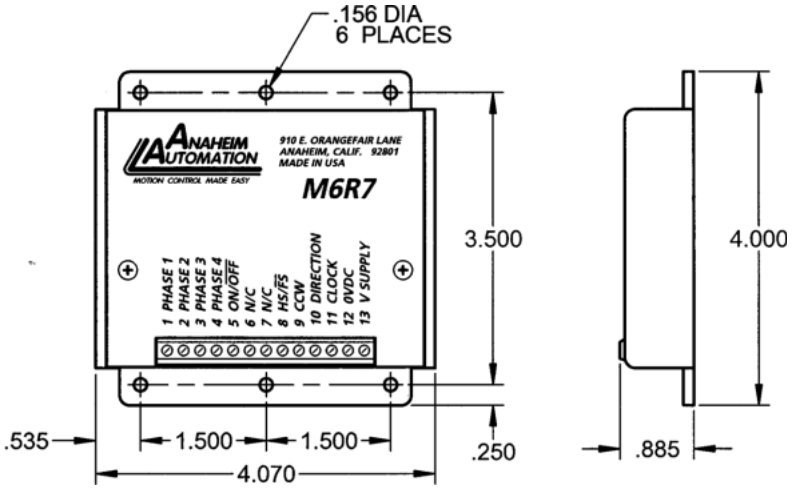
M6R7 - Stepper Motor Driver

FEATURES

- ***Drives 4 Phase Motors with 5, 6 or 8 Leads***
- ***Proven Reliability - Low Cost***
- ***Versatile Applications***
- ***Clockwise Clock with Direction Control***
- ***Clockwise and Counterclockwise Control***
- ***Full and Halfstep Operation***
- ***Operates Over Wide Voltage Range***
- ***Motor Turn-off Provisions***
- ***TTL/CMOS - Compatible Inputs***
- ***Compact and Rugged Package***

DIMENSIONS



DESCRIPTION

This design was the basis for classic drive designs and is still used on older systems with 5 lead motors, or very high voltage (24-30Vdc) motors. It allows for full/half step operation with a dropping resistor between the supply voltage and motor to limit the current. While the L/R technique is simple and inexpensive, it is also inefficient due to the large power losses from the dropping resistor.

A positive or negative going pulse (or train of pulses) with a minimum pulsewidth of 15 microseconds is required to step the motor. The driver phase outputs change state and the motor steps on the leading edge of the input pulse. The maximum control pulse rate is limited by motor performance. The M6R6 driver has jumper selectable positive or negative pulse inputs.

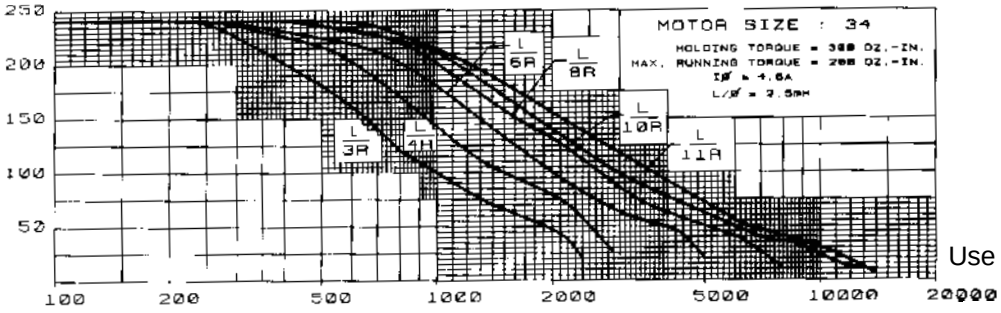
The direction input is pulled up to +5 Vdc through an internal 10K ohm resistor. When the Direction Control is not connected or a Logic “1” level is applied, the motor will step in the CLOCKWISE direction when the step control pulses are applied to the Step Input. Similarly, when a Logic “0” is applied the motor steps in the COUNTERCLOCKWISE direction.

The CCW separate input for Counterclockwise clocks is jumper selectable for positive or negative pulse input. Pulses applied to this step input cause the motor to step in the counterclockwise direction.

The HS/FS SELECT input is used to select either Half-Step or Full-Step operation. Half-step operation is generally preferred because this mode provides better resolution and reduces motor resonance. The motor steps in increments of half the natural step angle, e.g. in 0.9 degree steps for a 1.8 degree step motor. In full-step operation, the motor steps in 1.8 degree steps.

The motor On/Off input is used to turn off all four phases of the motor in applications where holding torque is not required.

910 East Orangefair Ln. Anaheim, CA 92801 Tel. (714) 992-6990 Fax. (714) 992-0471 www.anaheimautomation.com



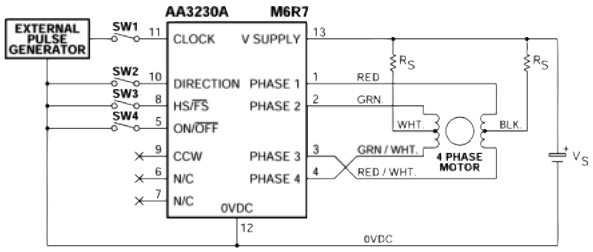
$$R_S = \frac{V_S - 1.5 - V_M}{Io}$$

$$P_{Rs} = Io^2 R_S$$

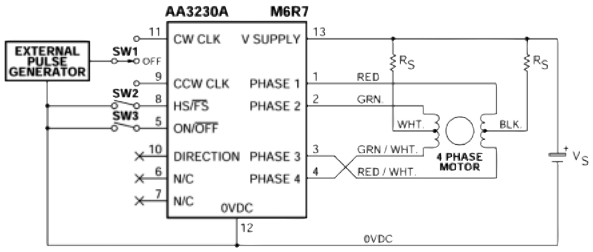
Use power rating twice the calculated value

Specifications

Power Requirements:	20 - 38 VDC
Output Current Range:	6.5 Amps Max.
Inputs (All):	TTL/CMOS - Compatible Logic "0" - 0 to 0.8 Vdc Logic "1" - 3.5 to 5.25Vdc
Input Clock Frequency:	20 KHz
Storage Temperature:	0° - 50° C
Absolute Maximum Driver Temperature:	70° C
Driver Type:	Unipolar, Compatible with 5, 6, and 8 Lead Motors.



4-Phase Motor Operation using Clock and Direction Control Inputs.



4-Phase Motor Operation using Clockwise and Counterclockwise Inputs.

Additional Ordering Information

Model #	Description	Input Voltage	Power (Watt)
PSK22784N	Power Supply Kit, 200VA	110 or 220 VAC	300

Additional Description
L/R Drive

The key factor in obtaining good overall performance (torque versus speed) in the L/R Ratio. The larger the L/R time constant, the better the performance. This fact is graghically illustrated by the curves below. If a step motor rated at 2.5Vdc is driven from a 2.5Vdc power supply (not possible with these drivers), without a series resistor, the performance would be limited. This is consideded a L/1R drive.

By increasing the drive power supply to 15VDC and adding a series resistor between the drive and motor to limit the current, the L/1R drive becomes an L/6R drive (power supply is 6 times the motor's rated voltage).

This results in the improved L/6R speed-torque curve. Further, an even greater increase in performance can be realized by increasing the power supply voltage to 30Vdc and increasing the value of the series resistor. This would result in an L/13R drive when using the same 2.5Vdc motor and a significantly improved performance shown in the L/11R curve. L/10R is usually considered excellent. These drivers may be operated at voltages ranging from 20Vdc minimum to 38Vdc maximum.

The examples given show how performance can be improved by varying the L/R time constant. The power supply voltage could be increased to higher levels; however, practical limitation of power supply size, power dissipation in the series resistors, and motor driver constraints must be considered.