

# 250 rpm Synchronous Motor

9904 111 31813

The 31813 series low speed synchronous motor is a development of the standard industrial series specifically designed for use in high quality record decks that utilise the belt drive principle.

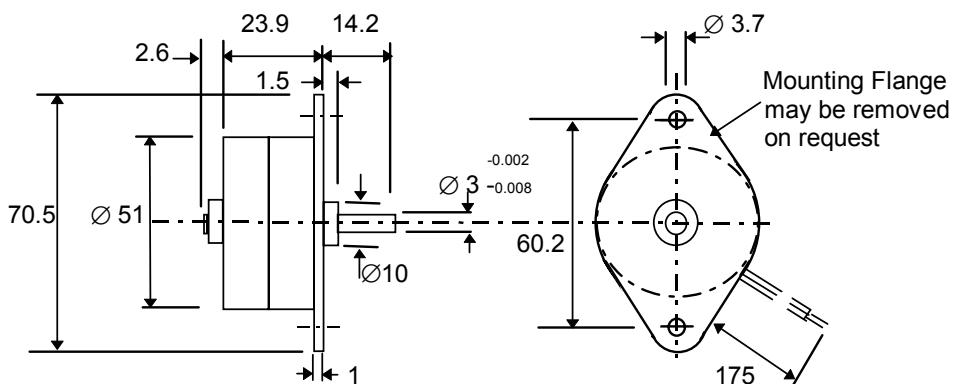
Particular attention has been given to the magnetisation of the 24 pole rotor to optimise smooth running. This, together with the high accuracy of stator pole placement minimises torque ripple and provides low audible noise.

The motor which is designed for mounting horizontally with output shaft vertically up is provided with an increased shaft length and a 3 mm diameter to aid the fitting of the drive pulley. When fitting the drive pulley the shaft rear end should be supported to ensure that the axial load limitation is not exceeded.

The windings have been specifically designed to facilitate dual voltage operation, a 6.8K Ohm resistor being used in series when operation from a 220 Vac supply is required.



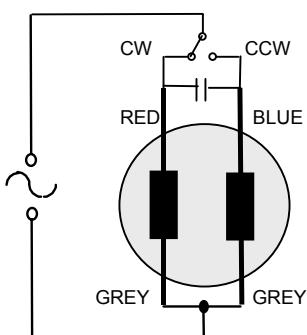
## Dimensions mm.



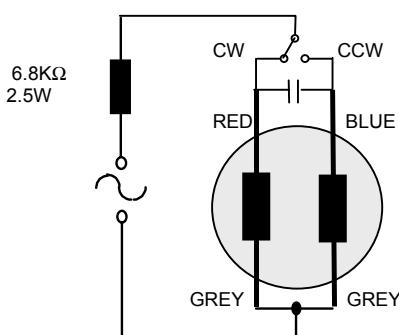
## Specification

Nominal Voltage	Vac	110	Max Working temperature	deg. C	105
Permissible voltage fluctuation	%	-15 / +10	Ambient temperature range	deg. C	-5 to +70
Supply Frequency	Hz	50	Torque derating	%/ $^{\circ}$ C	0.25
Speed @ 50 Hz	rpm	250	Insulation according to CEE10		Class 2
Direction of rotation		reversible	Insulation test voltage	V	2500
Direction control capacitor	$\mu$ F	0.22 ( 250 Vac )	Maximum radial force	N	5
Input Power	W	1.8	Maximum axial force	N	1.5
Input current	mA	18	Mass	g	16
Housing		zinc plated	Bearings		slide

## Connections



110 V ac-50Hz : C=0.22 $\mu$ F :speed = 250 rpm  
117 V ac-60Hz: C= 0.18 $\mu$ F :speed = 300 rpm

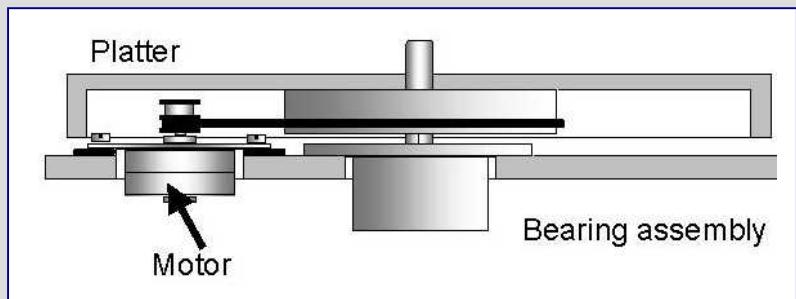


220 Vac 50 Hz: C= 0.22 $\mu$ F speed = 250 rpm

# Record deck Motor installation

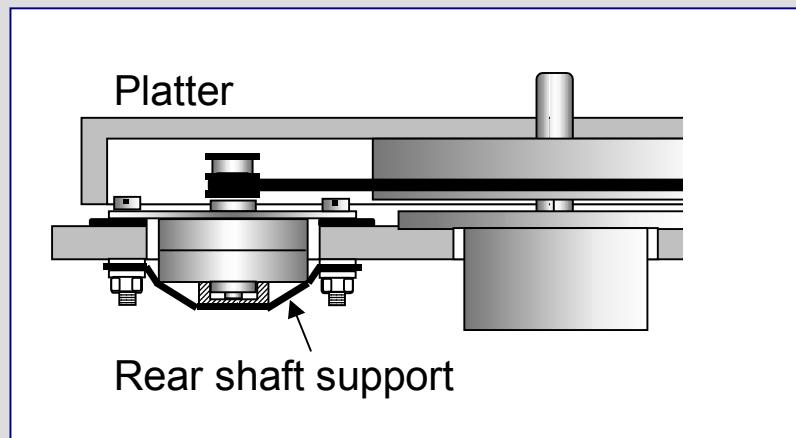
## Mechanical installation

Although the diagram shows a typical installation there are a number of methods to obtain optimum low vibration that will depend on the design of the record deck. Although the motor has been specifically designed to generate low vibration, as a general guide it is recommended that it is mounted to the motor board via an anti-vibration pad as shown.



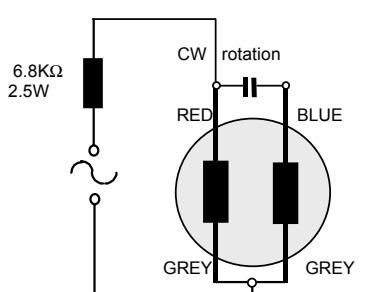
Since the pulley design of some record decks impose a vertical force on the motor shaft the motor shaft is not preloaded axially within the motor. In some installations it will be necessary to apply a slight pre-load to the shaft so that it runs in the fully 'up' position.

This is best achieved by means of a rubber strap and a small cup that holds the shaft in the fully up position as shown



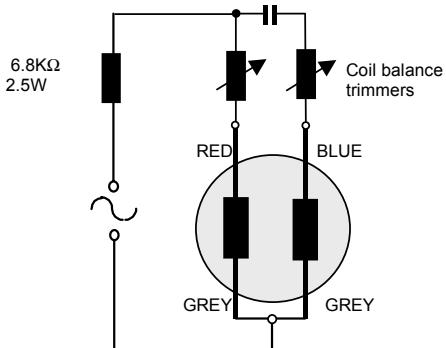
## Electrical installation of motor

### Basic connections



220 Vac 50 Hz:  $C = 0.22\mu F$  speed = 250 rpm

### Connections for reduced vibration



### Reducing motor vibration by means of additional trim circuit

The optimum torque provided by the motor should only be sufficient to accelerate the platter to synchronous speed, since the lower the motor torque is during fixed speed operation, the lower the vibration inducing torque ripple will be.

For a given installation it may be possible to increase the value of the series resistor ( nominally 6.8 Ohms ) in the basic circuit to optimise motor performance while a lower value of the phasing capacitor ( nominally 0.22 µF ) may prove beneficial. For optimum results trimmers may be added in series with each motor coil to electrically balance the motor.