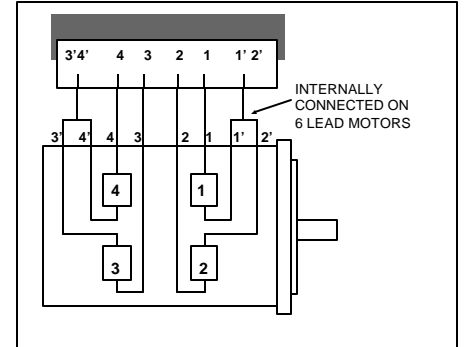


# Connecting the stepper motor to *Digitran* Drives

The motors in the range are, in most cases, 4 phase Uni-polar types which can also be connected for operation as 2 phase Bi-polar machines. In all cases the windings are rated for Uni-polar operation. When operated as a Bi-polar motor the maximum allowable phase current will depend on the way in which the motor is connected. Depending on the model, the motor will either have 6 or 8 leads and can be connected as follows:

## Uni-polar operation

Both 6 & 8 lead motors may be connected as shown for Uni-polar operation. The 6 lead types already have the windings comprising phases 1-2 & 3-4 centre tapped internally. When using an 8 lead motor it is necessary to make these interconnections externally as shown. Uni-polar driven motors offer a simple and economic drive solution and good performance over a wide speed range.

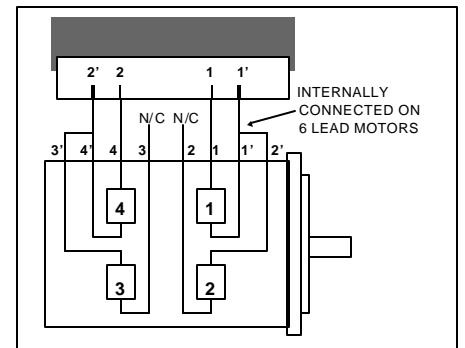


## Bi-polar operation

There are three ways to connect a motor for operation with a bi-polar drive circuit as follows:

### single winding

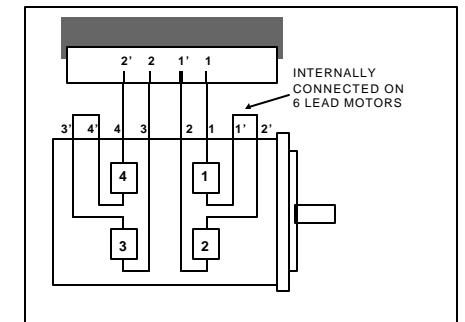
6 & 8 lead motors can be connected as shown. This arrangement enables the motor to be run up to it's maximum Uni-polar current rating and therefore provides similar performance with the possibility for reduced radiated electrical emissions. When using a 6 lead motor, single winding operation provides the highest step rate capability using bi-polar drive circuits.



### coils in series

6 & 8 lead motors can be connected as shown. When operating a 4 phase motor with series connected coils the maximum allowable phase current is reduced as follows:  
 Max allowable phase current =  $\frac{\text{Uni-polar rating}}{1.41}$

When operating a 6 lead motor with coils in series, the centre tap leads are not connected to the drive circuit. Series connected motors provide enhanced low speed torque



### coils in parallel

This method of connection can only be applied to motors having 8 leads. It is particularly advantageous in providing a combination of strong mid range torque and high speed operation since the effective inductance of the parallel connected winding is halved. When using parallel connected coils it is normal to operate the motor at uni-polar rated current.

However the maximum allowable phase current may be increased as shown below if increased torque is required.

Maximum allowable current = 1.41 x Uni-polar rating

