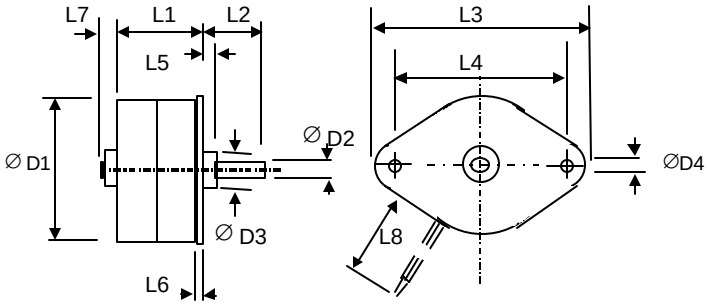
Permanent magnet stepper motors

Commercial series

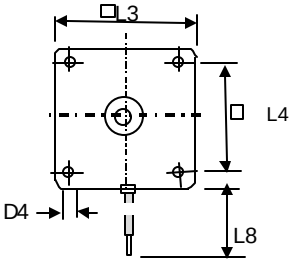
The M series instrument stepper motors are high quality permanent magnet types providing a choice of 18,15, 7.5 or 3.6 degree step angle.

The motors may be specified fitted with gearheads where increased torque and resolution are required at reduced operating speed. The M series *Airpax* motors offer excellent performance combined with low pricing. They are ideally suited to instrumentation applications where large production volumes are likely. A comprehensive programme of drives, power supplies and controllers are available for the small volume user to construct advanced single and multi-axis positioning systems.

Dimensions:



Form 1A



Form 2

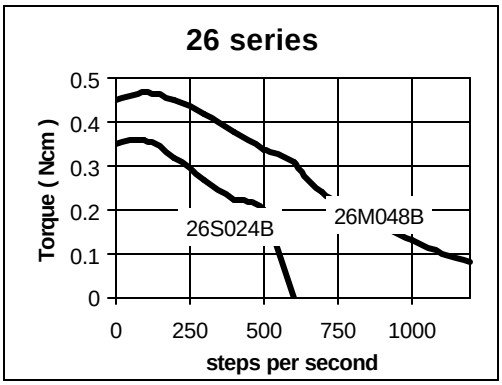
motor type	form	dimensions mm											
		D1	D2	D3	D4	L1	L2	L3	L4	L5	L6	L7	L8
15M020D	1 A	15.01	1.5	5.97	2.2	15.11	10	24	20	1.5	0.8	2.1	90
26S024B	1 A	26.2	2.0	7.92	3.3	13.3	12.7	42.8	35	3.8	0.8	Nil	191
26M048B				10		13.72	11.3			1.52		3.4	
35L048B	1 A	36	2.0	10	3.2	21.1	11.3	50	42	1.8	0.8	2	191
42M048C	1 A	42	3.0	10	3.5	22.0	11.4	56.5	49.5	1.52	0.8	3.5	305
60L 048B	1 A	59.2	6.35	12	4.3	37.9	19.1	79.4	66.68	2.0	1.6	Nil	305
42M100B-2U	2	42	3.0	10	3.5	15.5	11.4	42	35	1.52	0.8	3.4	305
42M100B-1U	1 A	42	3.0	10	3.5	15.5	11.4	56.5	49.48	1.52	0.8	3.4	305
MV82801	2	59.2	6.0	12	4.3	37.9	18	65	56	2.03	1.6	2.23	305

Specification

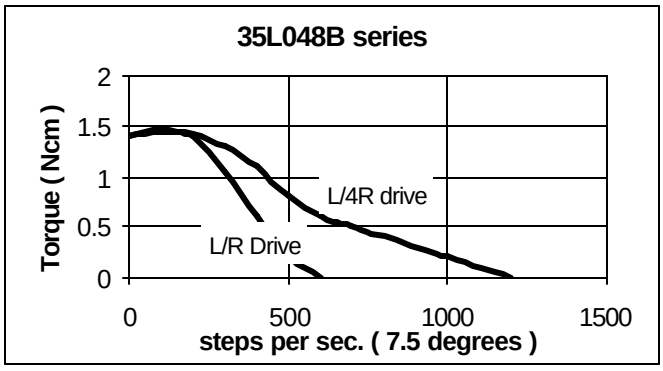
motor type	step angle degrees	holding torque Ncm	rotor inertia $Kgcm^2$	resistance per phase ohms	current per phase amps	inductance per phase mH	number of leads or terminals	mass gms
15M020D-1B	18	0.388	0.00011	40	0.125	14	4	14
26S024B-2U	15	0.5	0.00045	118	0.1	33.8	6	28
26M048B-2U	7.5	0.9	0.0011	110	0.1	36.5	6	28
26M048B-1U				19.6	0.25	5.3		
35L048B-2U	7.5	2.5	0.004	64	0.18	40	6	88
35L048B-1U	7.5	2.5	0.004	11	0.45	7.8	6	88
42M048C-2U	7.5	6.6	0.0134	52.4	0.23	51.7	6	144
42M048C-1U	7.5	6.6	0.0134	9.1	0.55	8.1	6	144
60L048B-2U	7.5	16.9	0.095	26.2	0.46	26.2	6	478
60L048B-1U	7.5	16.9	0.095	4.55	1.0	6.4	6	478
MV82801-P2	7.5	19.8	0.095	26	0.46	33	6	440
MV82801-P1	7.5	19.8	0.095	4.6	1.0	6	6	440
42M100B-2U	3.6	4.5	0.0118	75	0.16	37.7	6	87
42M100B-1U	3.6	4.5	0.0118	12.5	0.40	6.6	6	87

note The above motors are 4 phase units suitable for use with uni-polar or bi-polar drive circuits with the exception of the 15M029D-1B motor which is designed specifically for Bi-polar operation .
Bi-polar versions of the other motors in the range are available to special order.

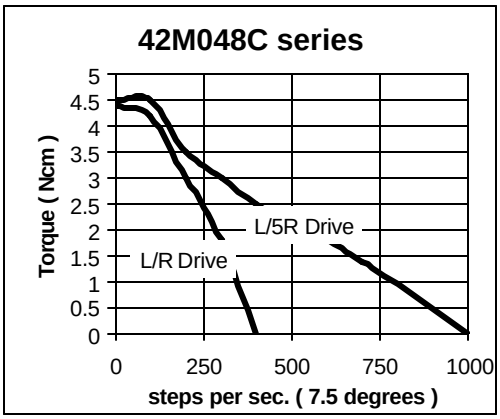
Typical permanent magnet stepper motor performance



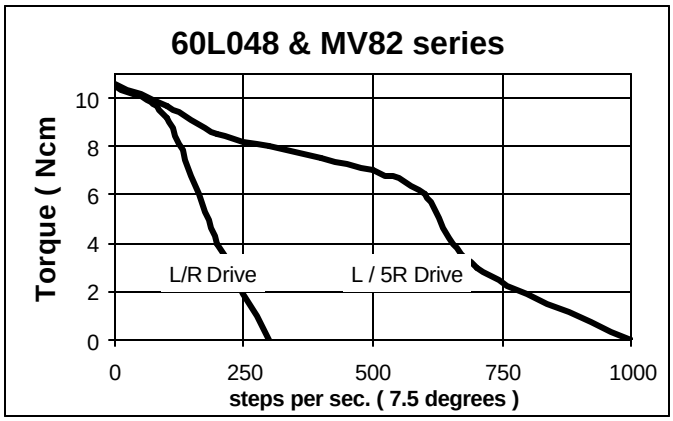
Uni-polar drive



Uni-polar drive



Uni-polar drive



Uni-polar drive

Suitable modular drives for above motors: EM162 TM162C MSE422

Explanation of terminology

The motors may be connected directly to a dc supply of the same value as the motor rating. For example, the 35L048B-2U motor is a 12 Volt rated unit and therefore may be connected directly to a 12 Vdc supply as shown in Fig 1. This is often referred to as **L/R Drive**

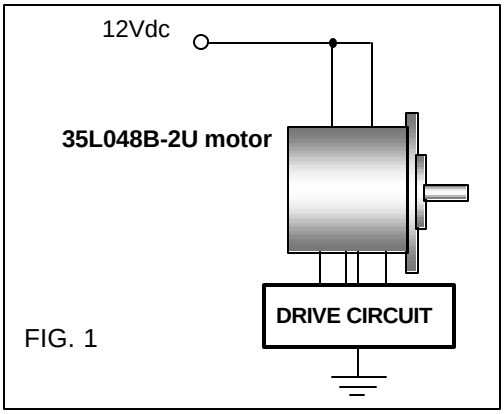


FIG. 1

For increased high speed performance however it is quite usual to connect the motor to a higher supply voltage via series resistors since the current rise time in the motor's coils is proportional to the inductance (L) divided by the resistance (R) in the drive circuit.

For example, the 42M048C-1U motor is a 5 Volt rated unit. When connected to a 24 Vdc supply via series resistors the ratio of inductance/ resistance will be greatly improved. In this case the system, as shown in Fig 2 would approximate an **L/5R** drive.

A suitable module for this type of drive is EM162 used in conjunction with 47 Ohm series resistors.

Alternatively a more sophisticated drive system can be employed using chopped constant current techniques when the series resistors are not required. A suitable drive of this type is TM162C

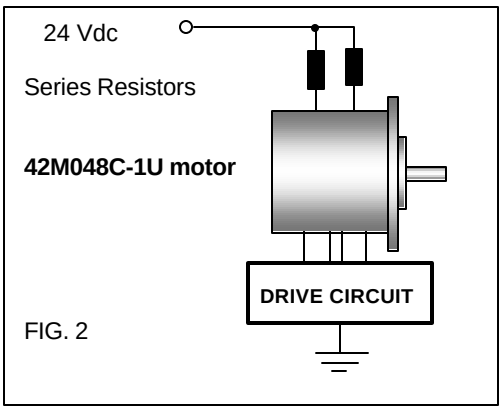


FIG. 2