

Single-Axis Stepper

The open-loop linear stepper motor provides the most economical linear motor positioning package. It is possible to stack the single axis linear stepper to provide multiple axes. Linear single axis packages are made up of two components: a moving forcer (with bearings) and a stationary platen. A position verification system is available to close the loop.



Design Specifications

- 1g [9.8 m/s²] acceleration typical
- Force to 50 Lbs. [222.4N]
- High repeatability 0.0004 in [10 µm]
- Resolution = $\frac{\text{Full Step}}{\text{Number of Microsteps}}$
 - 2-phase min. 0.0002 in [5 µm]
 - 4-phase min. 0.0001 in [2.5 µm]
- Air gap <0.001 in [25 µm]

Features

- For open loop systems
- No tuning necessary
- Multiple forcers with overlapping trajectories on a single platen
- Roller bearings on 0600 and 1300 series. High stiffness air bearings on 2000 and 2500 series
- Ceiling or wall mounted
- Lowest cost positioning stage
- Use with Microstepping driver (Refer to Baldor LinStep and LinStep+)

The 2 or 4-phase single-axis linear stepper motor consists of a moving forcer and a stationary platen. The forcer is made of two laminated steel cores precisely slotted with teeth and a single permanent magnet. The coil is inserted into the laminated assembly. Leads are provided at the beginnings and ends of the coils. Two interconnected assemblies result in a 2-phase motor. Four interconnected assemblies result in a 4-phase motor. The laminated assembly is encapsulated in an aluminum housing. The forcer is available in different sizes, depending on the application's force requirements.

The platen is a photo-chemically etched teeth on a steel bar filled with epoxy, ground and hard-chrome plated. Standard mounting holes are provided on forcer and platen. The platen is available in lengths over 100 in [2.54m]. The magnetic-attractive force between the forcer and platen is used as a preload for the bearing system. The platen to forcer air gap is maintained by the integral bearing system. The customer must bring power to the forcer with an umbilical cable.

Overview

Software

Motion Controls

AC Controls

AC Motors

DC Controls

DC Motors

Linear Motors

Linear Stages

Engineering Information

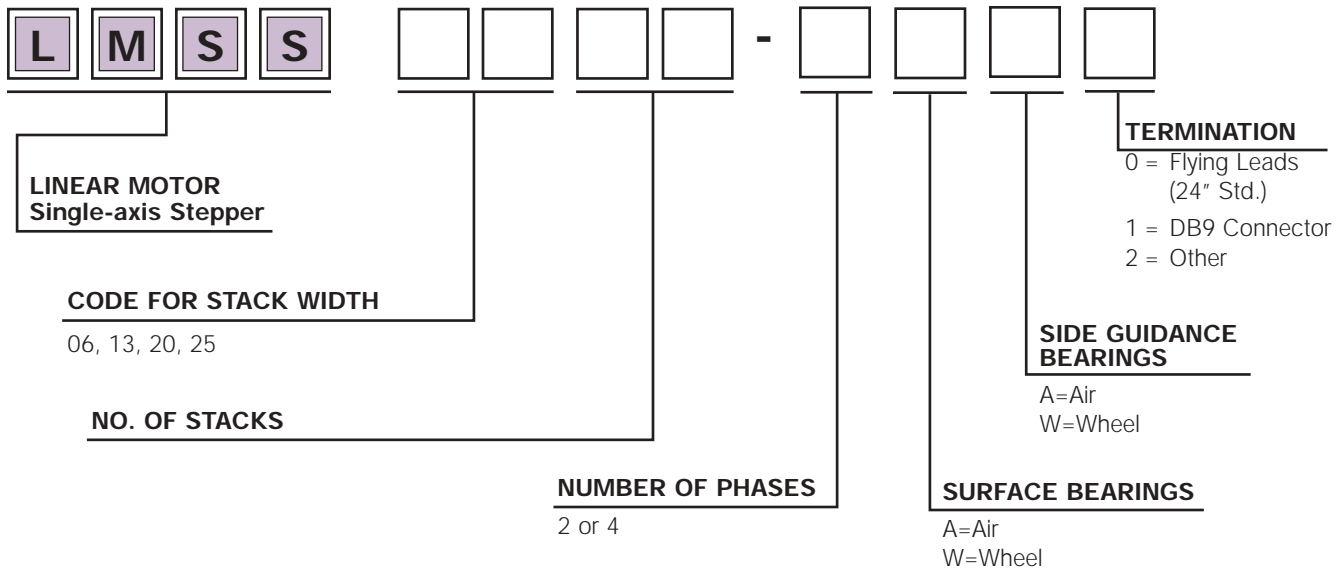
Single-Axis Linear Stepper Motor Technical Data

Catalog Number ①	Units	LMSS0602-2WW0	LMSS0604-2WW0	LMSS1302-2WW1	LMSS-1304-2WW1
No. of phases		2	2	2	2
Static Force	Lbs [N]	2.0 [8.9]	4.0 [17.8]	5.0 [22.2]	10 [44.5]
Force @ 40 in/sec $\frac{\text{Static Force}}{2}$	Lbs[N]	1.0 [4.45]	2.0 [8.9]	2.5 [11.1]	5 [22.2]
Resistance/Coil	ohms	1.5	3.1	2.2	1.1
Inductance/Coil	mH	1.22	0.5	2.6	1.3
Amps/Phase	amps	1.5	3.0	2.0	4.0
Weight	Lbs [kg]	0.4 [0.18]	0.6 [0.27]	0.7 [0.32]	0.9 [0.41]
Bearing Type		Wheel	Wheel	Wheel	AIR ②
Air Bearing Rqmts	CFM [L/min]	N/A	N/A	N/A	2.5 [70.8]
Attractive Force	Lbs [N]	16 [71]	32 [142]	40 [178]	72 [320]

Catalog Number ①	Units	LMSS2004-2AW1	LMSS2504-2AW1	LMSS2508-2AW1
Number of Phases		2	2	2
Static Force	Lbs [N]	20.0 [89.0]	25.0 [111.2]	50.0 [222.4]
Force @ 40 in/sec = $\frac{\text{Static Force}}{2}$	Lbs [N]	10.0 [44.5]	12.5 [55.6]	25.0 [111.2]
Resistance/Coil	ohms	1.6	1.9	3.2
Inductance/Coil	mH	1.6	2.2	3.3
Amps/Phase	amps	4.0	4.0	8.0
Weight	Lbs [kg]	1.2 [0.54]	1.1 [0.50]	2.4 [1.1]
Bearing Type		AIR ②	AIR ②	AIR ②
Air Bearing Rqmts	CFM [L/min]	3.5 [99.1]	3.5 [99.1]	3.5 [99.1]
Attractive Force	Lbs [N]	144 [641]	180 [801]	360 [1,601]

NOTES: ① Four phase is available with the same force ratings and physical size except LMSS0602 and LMSS1302
 ② Air bearing units use a side ball bearing for lateral guidance as standard. Side air bearings are optional and requires using a tube platen.
 Repeatability = +0.0004 in (10µm). Resolution= +0.0001 in (2.5µm), Cyclic error= ±0.0002 in (±5µm) *dependent on drive electronics and system implementation Wheel Bearing Airgap= 0.0015 in (38µm), Air Bearing Airgap= 0.0008 in (20µm), Air Pressure= 60-80 psi with a 3 micron filter.
 All specifications are for reference only.

Single-Axis Stepper Forcer Catalog Number Identification Matrix



LMSS Series Linear Stepper Motor Forcer Dimensions

(Inches [mm])

Overview

Software

Motion Controls

AC Controls

AC Motors

DC Controls

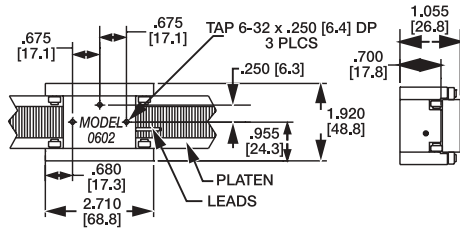
DC Motors

Linear Motors

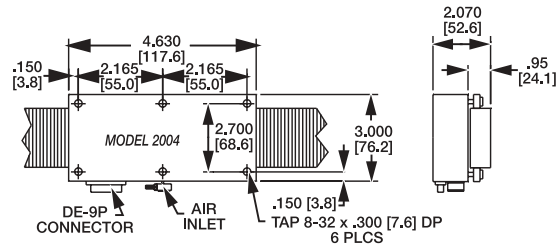
Linear Stages

Engineering Information

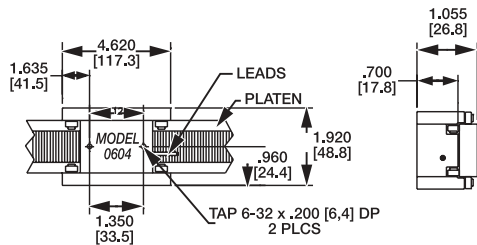
Model 0602



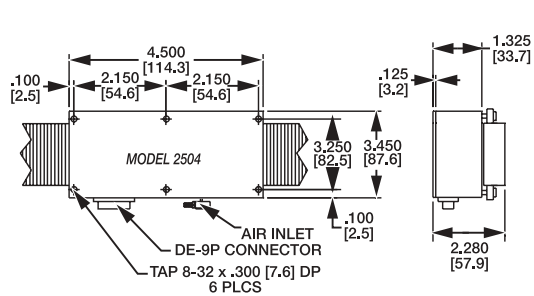
Model 2004



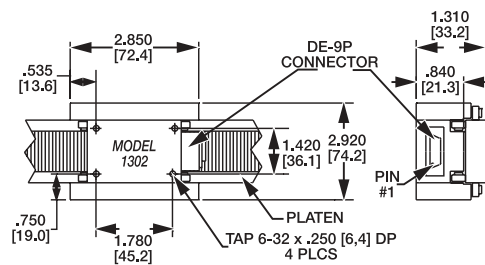
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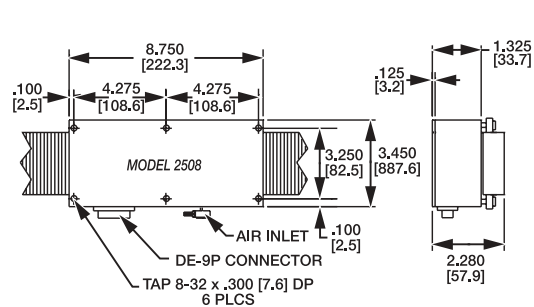
Model 2504



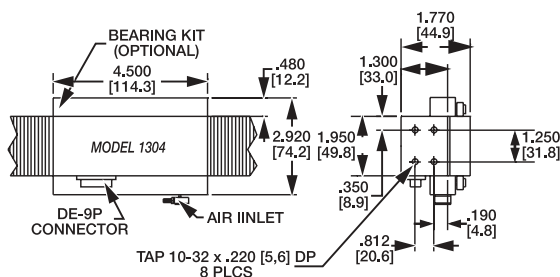
Model 1302



Model 2508

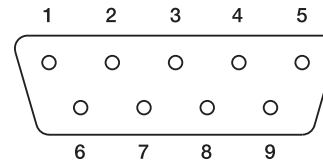


Model 1304



Connections

(View facing male connector)

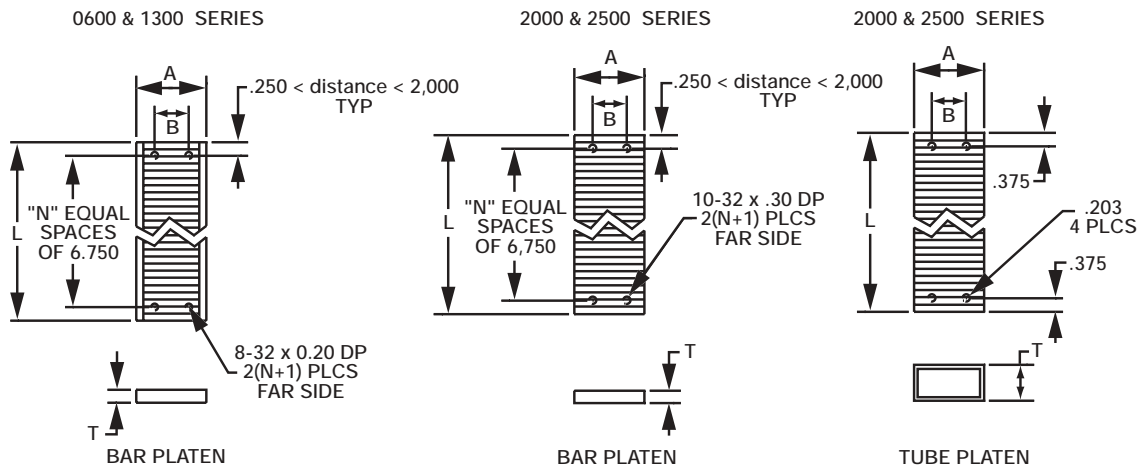


2-Phase Forcer	Pin No.	Function
White	Pin 1	A1 + Winding
Green	Pin 3	B1 + Winding
Red	Pin 7	A1 - Winding
Orange or Yellow	Pin 9	B1 - Winding
Black	Pin 5	Ground

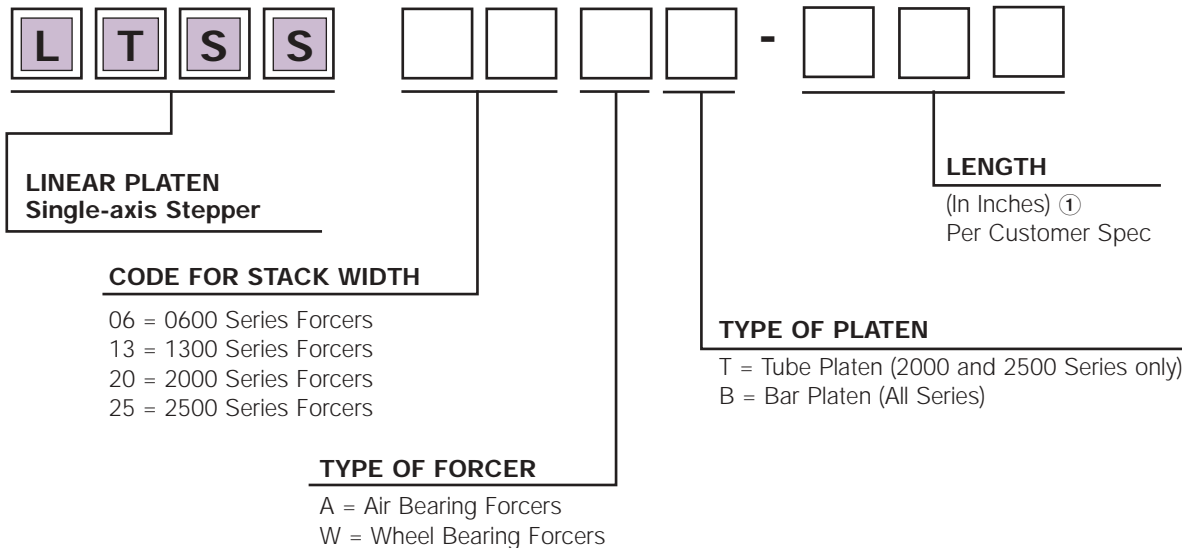
LTSS Series Stepper Motor Platen Dimensions (Inches [mm])

Platen will be cut to length per customer specification.
Bottom mounting holes pattern is as shown.

Series	Catalog Number	A In [mm]	T In [mm]	B In [mm]	Weight (lbs/in)	Mass (kg/m)
0600 Bar	LTSS06WB-XXX	1.21 [30.7]	.35 [8.9]	0.96 [24.4]	0.118	2.11
1300 Bar	LTSS13XB-XXX	1.96 [49.8]	.468 [11.9]	0.96 [24.4]	0.264	4.72
2000 Bar	LTSS20XB-XXX	1.96 [49.8]	.468 [11.9]	0.96 [24.4]	0.264	4.72
2000 Tube	LTSS20XT-XXX	1.96 [49.8]	.468 [24.4]	0.96 [24.4]	0.153	2.73
2500 Bar	LTSS25XB-XXX	3.0 [76.2]	0.96 [24.4]	2.0 [50.8]	0.680	12.15
2500 Tube	LTSS25XT-XXX	3.0 [76.2]	0.96 [24.4]	2.0 [50.8]	0.223	3.99



LTSS Series Stepper Motor Platens Catalog Identification Matrix



NOTE: ① Length rounded up to nearest whole inch. Platen with length greater than 58.0 inches will only be available in modular form.