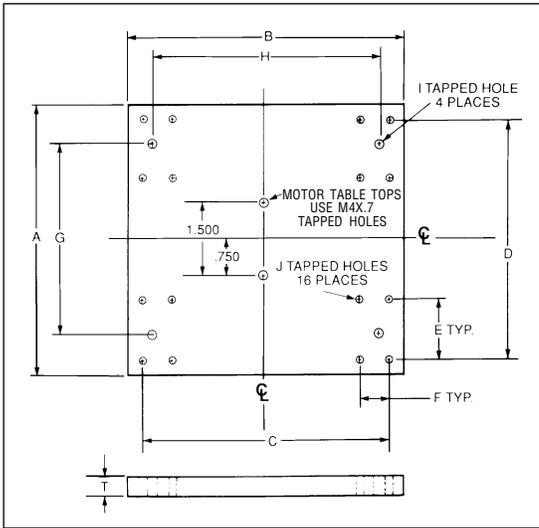


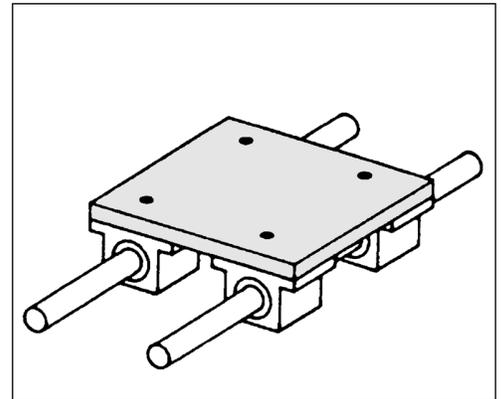
MOUNTING CARRIAGE TOPS

Linear Motion Systems



"I" Holes (4) are for customer mounting purposes.

Material: Aluminum Alloy (6061)
Finish: Black Anodized



Note: Mounting carriage tops are designed for use with PIC inch size linear bearing housings and lead screw mounting nut. Consult PIC for availability of metric size carriage tops.

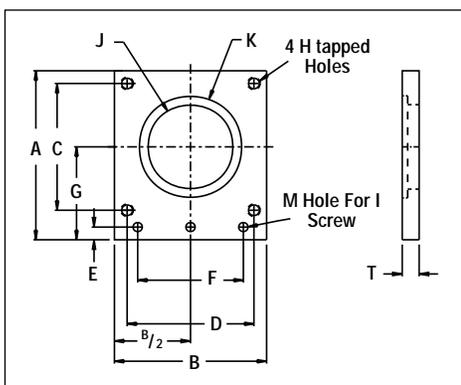
INCH SIZES

SHAFT CENTER DISTANCE	NOMINAL SHAFT DIA.	A ±1/32	B ±1/32	C ±.010	D	E	F	G	H	I	J	T	PART NUMBER
2 ⁵ / ₈	1/4	4	4	3.375	3.500	.875	—	2.50	2.50	#10-32	#6-32	1/4	LMT 25-40
2 ⁵ / ₈	3/8	4	4	3.375	3.625	1.000	—	2.50	2.50	#10-32	#6-32	1/4	LMT 37-40
3 ⁵ / ₈	1/2	5 1/2	5 1/2	5.00	4.812	1.187	.562	3.00	3.50	#10-32	#6-32	3/8	LMT 50-55
3 ⁵ / ₈	5/8	5 1/2	5 1/2	5.00	5.050	1.425	.700	3.00	3.50	#10-32	#8-32	3/8	LMT 62-55
5 1/2	3/4	7 1/2	7 1/2	7.00	7.062	1.562	.750	5.00	5.50	1/4-20	#8-32	1/2	LMT 75-75
5	1	7 1/2	7 1/2	7.00	7.000	2.000	1.250	5.00	5.50	1/4-20	#10-32	1/2	LMT 100-75
7 1/4	1 1/4	10	10	9.38	9.630	2.380	1.500	7.50	8.00	1/4-20	#10-32	3/4	LMT 125-100
9 1/4	1 1/2	13	13	12.50	12.530	3.280	1.750	9.00	9.00	1/4-20	#10-32	3/4	LMT 150-130

METRIC SIZES

SHAFT CENTER DISTANCE	NOMINAL SHAFT DIA.	A ±.8	B ±.8	C ±.25	D	E	F	G	H	I	J	T	PART NUMBER
80	12	125	125	104	112	32	—	80	104	M6X1	M4X.7	10	MLMT12-125
70	16	125	125	114	110	40	12	70	102	M6X1	M5X.8	10	MLMT16-125
140	20	200	200	185	185	45	14	140	171	M6X1	M6X1	12	MLMT20-200
120	25	200	200	181	180	60	22	120	159	M6X1	M8X1.25	12	MLMT25-200
160	30	250	250	227	228	68	26	160	201	M6X1	M8X1.25	20	MLMT30-250
210	40	320	330	295	296	86	32	210	263	M6X2	M10X1.5	20	MLMT40-320

MOTOR ADAPTOR



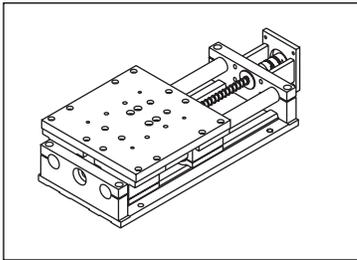
PART NUMBER	A	B	C	D	E ±.003	F	G ±.001	H	I	J	K ±.002	M	T	MOTOR FRAME
LMA23-4	2.25	2.25	1.856	1.856	.313	1.062	1.125	10-32	#8	1.25	1.504	2	.25	23
LMA23-6	2.50	2.25	1.856	1.856	.188	1.562	1.375	10-32	#8	1.25	1.504	3	.25	23
LMA23-8	3.13	2.25	1.856	1.856	.250	1.875	2.000	10-32	#10	1.25	1.504	3	.25	23
LMA34-10	4.46	3.42	2.740	2.740	.375	2.750	2.750	10-32	#10	2.88	—	3	.25	34

LMA23-6 shown

Material: Aluminum
Finish: Black Anodized

TECHNICAL SECTION

System 9 — Economical and Quick Delivery



SYSTEM 9

PIC Design has developed a modular pre-assembled precision product similar to System 7.

This unit is ideal for vertical applications. It is made with $\frac{3}{4}$ inch suspended shafting with a $\frac{1}{2}$ inch diameter lead screw.

Specifications

Flatness (No Load): $\pm .0002$ in./in.

Straightness: $\pm .0002$ in./in.

Repeatability: $\pm .0005$ in.

Positional Accuracy: ± 0.0006 in./in.

Coef. of Friction: .01 recirculating ball linear bearings
.2 for engineered plastic linear bearings

Break Away Torque Typ.: 10 to 25 inch-ounces

Weight: System 9 with 4 inches of travel = 11.6 pounds
For longer travels add 0.5 pounds per inch of travel
(carriage assembly 3.5 pounds)

Material:

- Aluminum base, carriage and pillow blocks
- 303 Stainless steel lead screw with engineered plastic nut
- C1060 hardened & ground shafting & self-aligning recirculating linear ball bearings or 303 stainless steel shafting & engineered plastic bearings
- Stainless steel radial bearings ABEC 7
- Aluminum zero backlash coupling

Finish: Aluminum; black anodize

Maximum Loads — Load Centered On Carriage Top (pounds)

Recirculating Ball Linear Bearings

Travel (Inches)	20	16	12	8	4
Loads Static & Dynamic*	190	220	270	350	480

Engineered Plastic Linear Bearings

Travel (Inches)	20	16	12	8	4
Loads Static	190	220	270	350	480
Loads Dynamic**	360	360	360	360	360

Deflection — Load Centered On Carriage Top

Travel (Inches)	20	16	12	8	4
Deflection (Inch/100 lb.)	.013	.008	.005	<.001	<.001

Maximum Moments — Ft. - lbs.

Recirculating Ball Linear Bearing

	Static	Dynamic*
Roll Axis	300	80
Pitch Axis	350	100
Yaw Axis	350	100

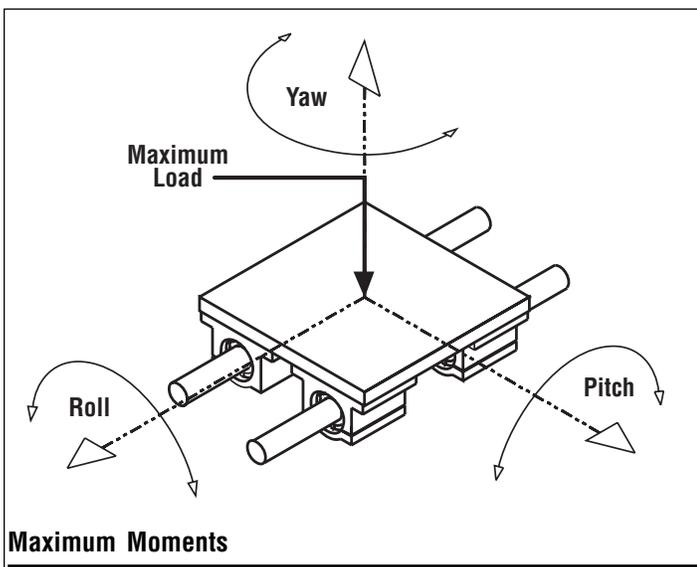
Engineered Plastic Linear Bearing

Travel	20	16	12	8	4
Roll Axis Static	110	130	160	200	270
Roll Axis Dynamic	50	50	50	50	50
Pitch Axis Static	480	480	480	480	480
Pitch Axis Dynamic	60	60	60	60	60
Yaw Axis Static	480	480	480	480	480
Yaw Axis Dynamic	60	60	60	60	60

Notes

* Dynamic loads for recirculating ball linear bearings are based on 50 Million inches of life.

** Dynamic loads for engineered plastic linear bearings are based on PV = 16,000 with a V = 100 FPM.

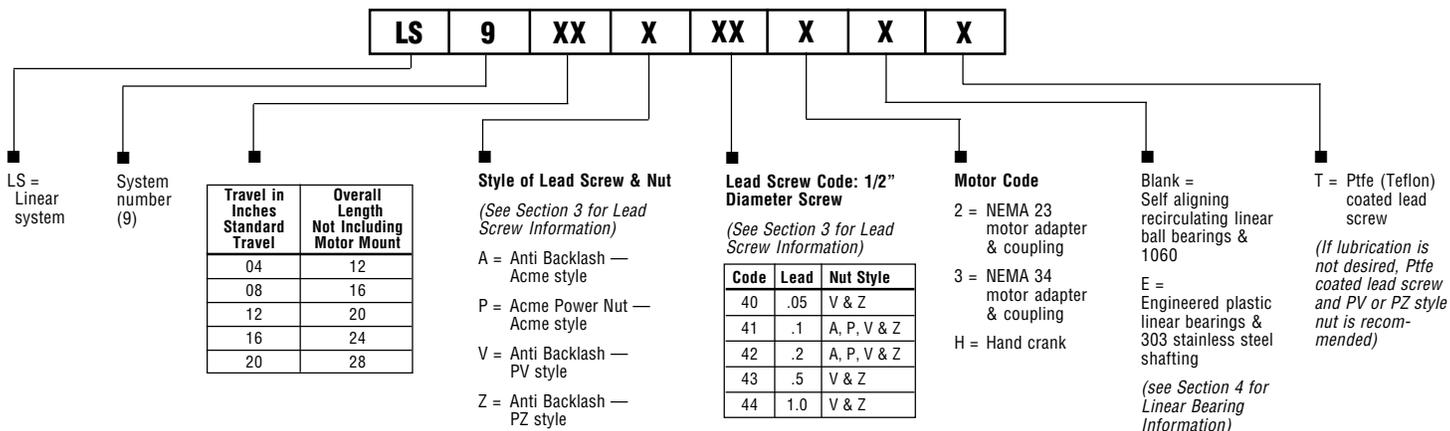


LINEAR MOTION SYSTEMS

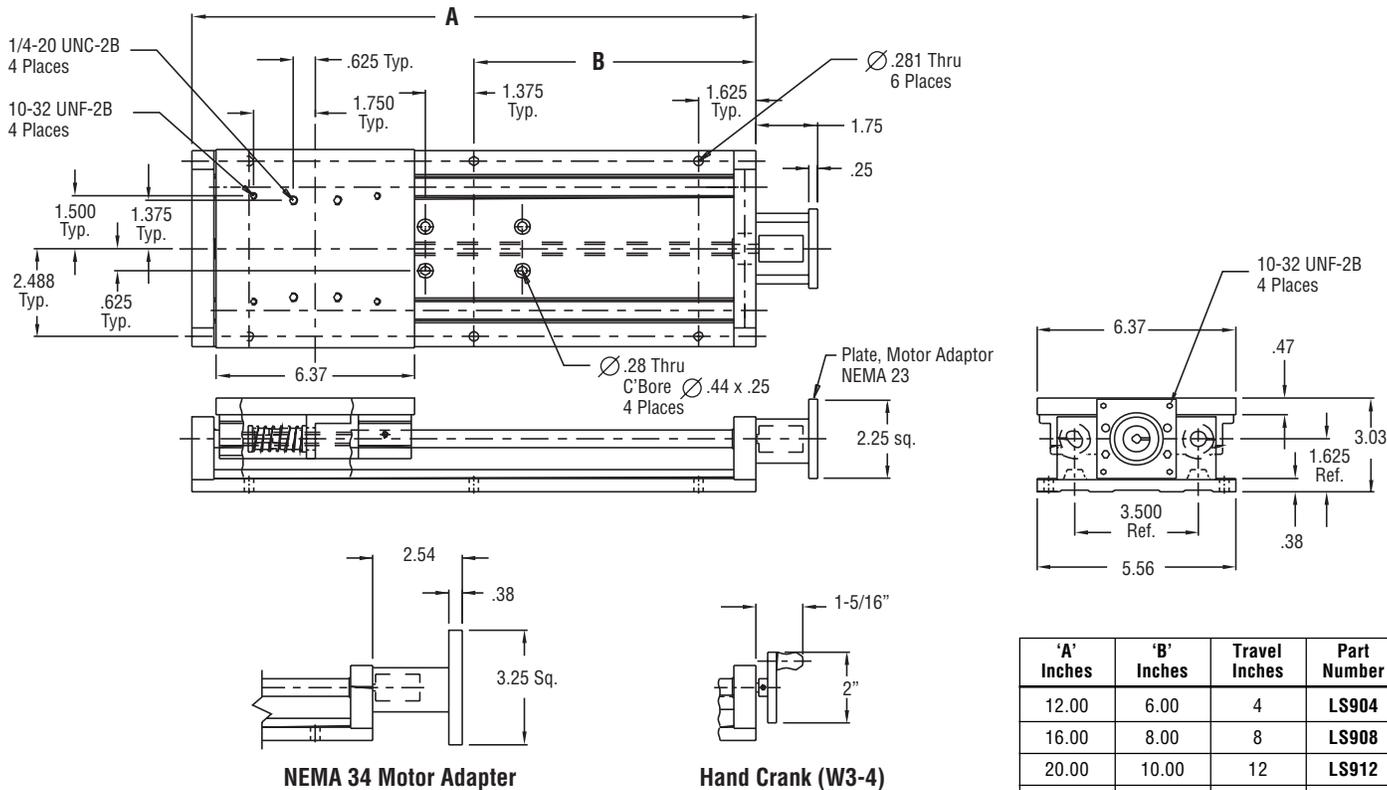
System 9 Ordering Code

System Ordering Code

System 9 ordering code is as follows:



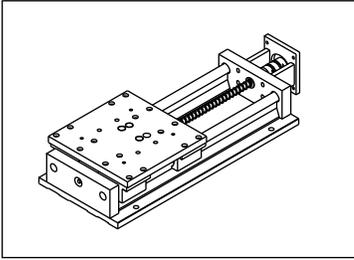
Model LS94 Thru LS920



(Shown with NEMA 23 motor adaptor plate.
Options: NEMA 34 motor adaptor plate or hand crank)

TECHNICAL SECTION

System 10 — Economical, Quick Delivery & Accuracy



SYSTEM 10

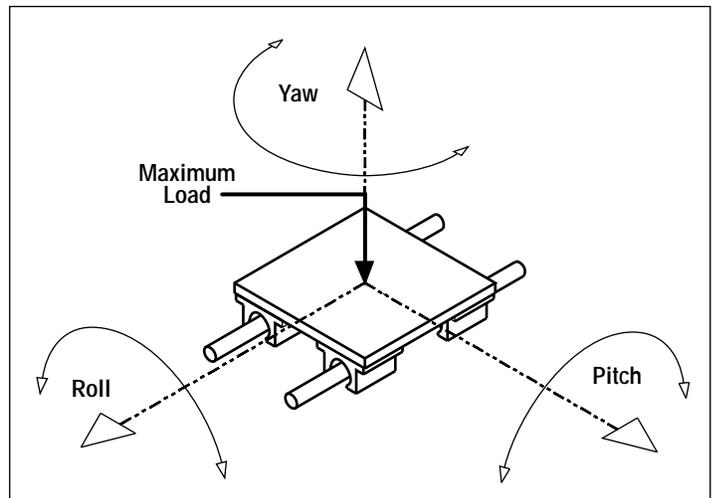
PIC Design has incorporated rail supports in an integral base plate and rail support system. Standardizing on 1/2" diameter shafting and lead screw allows for lower production costs and ease of stocking of the components which transfers to lower prices and quicker deliveries. Travels over 17 inches incorporates two standard base plates without jeopardizing the integrity of the system.

Specifications

- Flatness:** ± .0002 in/in
Straightness: ± .0002 in/in
Positional Repeatability: ± .0005 in.
Positional Accuracy: ± .0006 in/in
Coefficient of Friction: .01 recirculating ball linear bearing
 .20 for engineered plastic linear bearing
Break Away Torque Typical: 10 to 25 inch-ounces
Weight: System 10 with 5 inches of travel: 8.1 pounds.
 For longer travels add 0.4 pounds per inch of travel.
 (Carriage assembly 2.4 pounds)
Material:
- Aluminum base, carriage and pillow blocks
 - 303 stainless steel lead screw with engineered plastic nut
 - C1060 hardened & ground shafting & self-aligning recirculating linear ball bearings or 303 stainless steel Shafting & engineered plastic bearings
 - Stainless steel radial bearings ABEC 7
 - Aluminum zero backlash coupling
- Finish:** Aluminum black anodize
Loads Maximum:
- Loads centered on carriage
 - Static 700 pounds
 - Dynamic 300 pounds for recirculating ball (50 million inches of life)
 - Dynamic 240 pounds for engineered plastic (PV = 10,000, V = 100 Fpm)

Maximum Moments

	Recirculating Ball Ft-Lb.	Engineered Plastic Ft-Lb.
Roll Axis — Static	44	44
Dynamic	15	12
Pitch Axis — Static	52	52
Dynamic	17	14
Yaw Axis — Static	110	110
Dynamic	28	22



Life With Recirculating Ball Linear Bearings $L = [C/F]^3 (B)$

- L = Normal travel life
- C = Rated dynamic load capacity of carriage
- F = User applied load
- B = 50 million inches of travel

Example: User is using recirculating ball bearing and has a 200 pound load center on carriage top. How many inches of travel can he expect?

$$L = (300/200)^3(50 \text{ million}) = 168 \text{ million inches or about 2660 miles.}$$

Velocity = rpm x lead of lead screw

Example: Determine the velocity of a system with a motor running at 1750 rpm if a lead screw with a one-inch lead is used.

$$\text{Velocity} = 1750 \text{ rpm} \times 1 \text{ inch lead} = 1750 \text{ inches per minute or 146 feet per minute.}$$

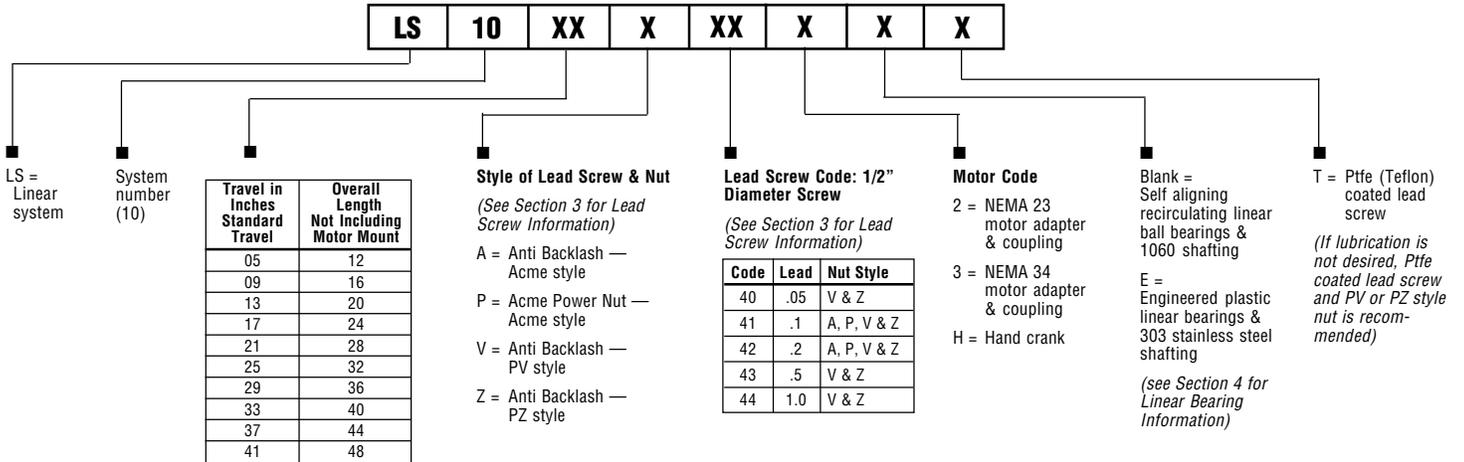
High lead screw rpm and/or low lead screw leads may require lubrication of the lead screw.

LINEAR MOTION SYSTEMS

System 10 Ordering Code

System Ordering Code

System 10 ordering code is as follows:

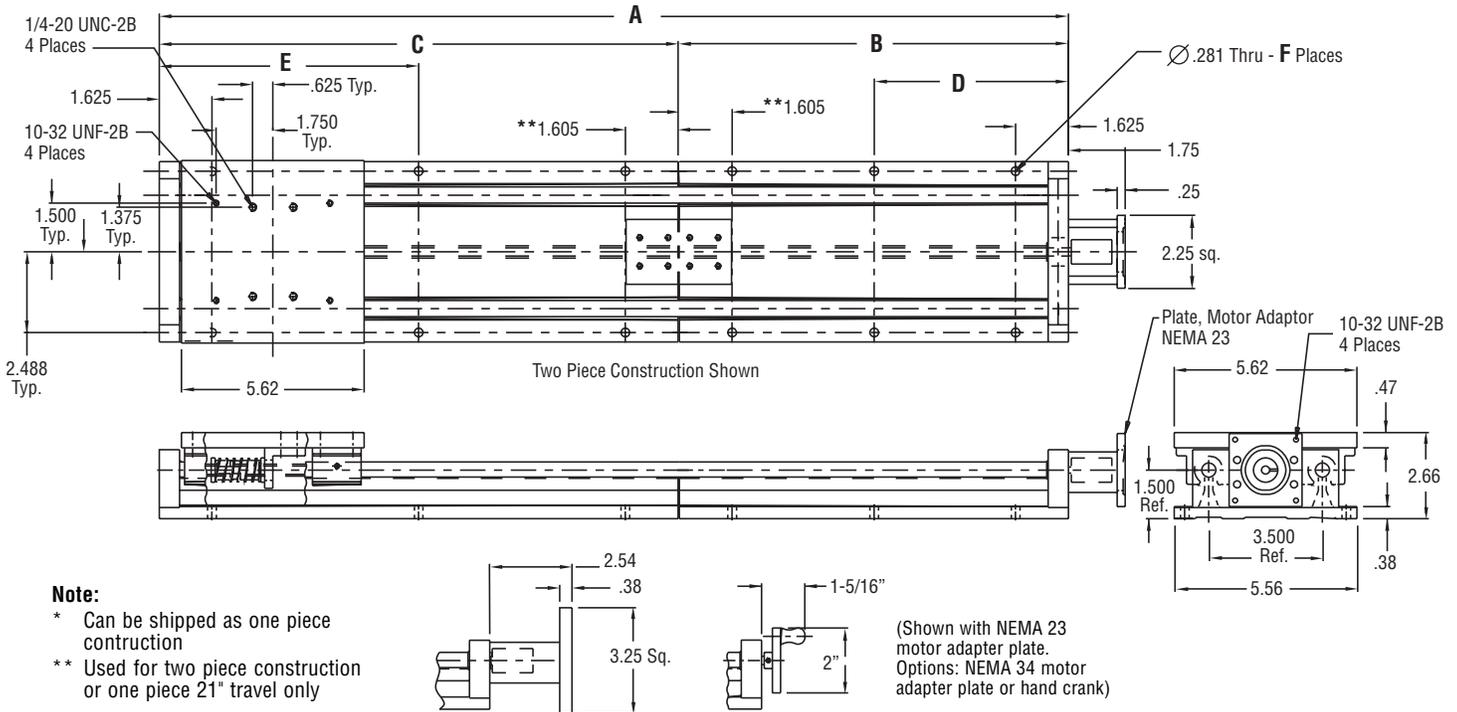


Model LS1021 Thru LS1041 - Two Piece Construction

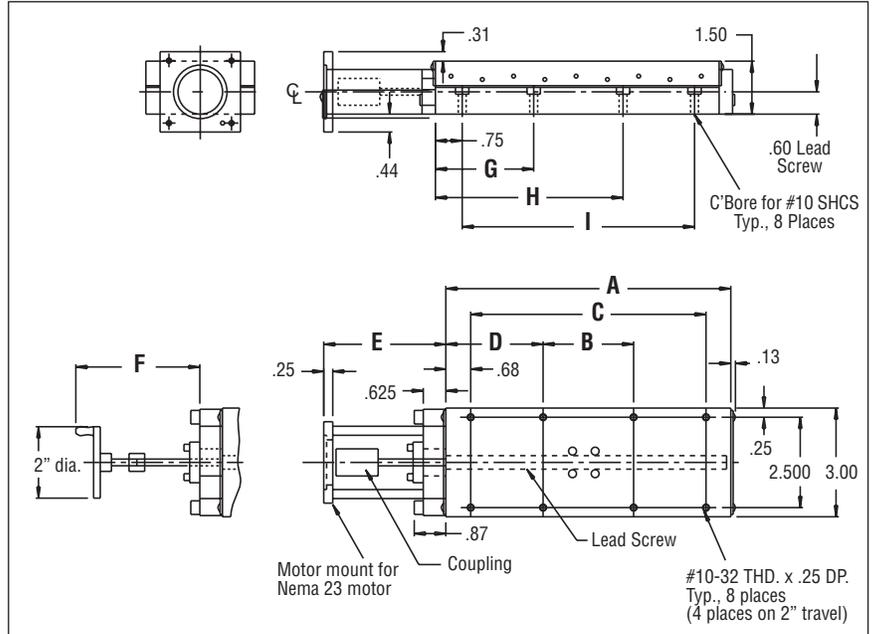
A Inches	B Inches	C Inches	D Inches	E Inches	F	Travel Inches	Part Number
*28.00	11.98	15.98	6.00	8.00	12	21	LS1021
32.00	15.98	15.98	8.00	8.00	12	25	LS1025
36.00	15.98	19.98	8.00	10.00	12	29	LS1029
40.00	19.98	19.98	10.00	10.00	12	33	LS1033
44.00	19.98	23.98	10.00	12.00	12	37	LS1037
48.00	23.98	23.98	12.00	12.00	12	41	LS1041

Model LS1005 Thru LS1017 - One Piece Construction

A Inches	D Inches	F	Travel Inches	Part Number
12.00	6.00	6	5	LS1005
16.00	8.00	6	9	LS1009
20.00	10.00	6	13	LS1013
24.00	12.00	6	17	LS1017



POSITIONING STAGES



Material:

- Carriage & Base: Black, Anodized Aluminum
- Rolling Elements: Hardened Steel
- Acme Lead Screws: 303 Stainless Steel
- Nut: Anti-Backlash Engineered Plastic

Specifications:

- Straight Line Accuracy: .0007 inches / inch
- Repeatability: .0004"
- Lead Accuracy: .003 In/Ft
- Lead Screw Journal: 3/16" Diameter for 2, 4 & 6" Travel version
1/4" Diameter for 8, 10 & 12" Travel version

PIC's commercial grade positioning stages (tables) provide solutions for indexing where the strict requirements of precision stages are not needed. These positioning stages can achieve linear speeds of up to 50 ft. per minute. Mounting holes in top and base are positioned to easily allow two stages to be configured as an X-Y positioner.

The 2, 4 and 6-inch stages can be configured as a Y axis on any stage. Any Y or Z axis stage can be mounted on any X axis stage. An optional bracket is required to mount any table in a Z axis on an X, X-Y or as a stand-alone unit.

The motor mounting bracket and coupling are designed to interface with NEMA 23 frame size motors.

Optional Configurations:

For tables supplied without motor mounting bracket for manual applications, substitute "M" for "C" in part number. To add a crank to the manual operation, order one each of the following parts:

- 2, 4 or 6" travel — crank W3-2, shaft A2-10, collar D1-3
- 8, 10 or 12" travel — crank W3-3, shaft A3-21, collar D1-3.

Example:

Standard Version: PBC2-1X3710 is a 2" travel table with .1" lead with motor mount and coupling

Optional Version: PBM2-1X3710 is the same table and lead less motor mount and coupling

Travel	A	B	C	D	E	F PBM Style	G	H	I	Load Capacity (lbs.)	Part No. (Add Lead Screw Code)
2.00	4.00	2.50	—	.75	2.50	2.74				30	PBC2- <input type="checkbox"/>
4.00	6.00	2.50	4.50	1.75	2.50	2.74				50	PBC4- <input type="checkbox"/>
6.00	8.00	2.50	6.50	2.75	3.50	3.66				70	PBC6- <input type="checkbox"/>
8.00	12.41	2.50	10.50	4.75	4.56	5.56	3.75	8.25	10.50	80	PBC8- <input type="checkbox"/>
10.00	14.41	2.50	12.50	5.75	5.56	6.56	4.75	9.25	12.50	100	PBC10- <input type="checkbox"/>
12.00	16.41	2.50	14.50	6.75	6.56	7.56	5.75	10.25	14.50	120	PBC12- <input type="checkbox"/>

Select lead screw code from table below.

Lead Screw Code

Code	Screw Thread	Turns Per In. or Cm.	Advance Per Turn
1X3710	3/8 - 10	10	.100"
2X3710	3/8 - 10 (2 start)	5	.200"
5X3705	3/8 - 5 (5 start)	1	1.000"
1X102M	10 x 2 mm	5	2.0 mm

Choose Any X Axis Stage Below	Add These Axis Combinations For Systems Below					
	PBC2-	PBC4-	PBC6-	PBC8-	PBC10-	PBC12-
PBC2-	Y, Y-Z, Z	Y, Y-Z, Z	Y, Y-Z, Z	Z	Z	Z
PBC4-	Y, Y-Z, Z	Y, Y-Z, Z	Y, Y-Z, Z	Z	Z	Z
PBC6-	Y, Y-Z, Z	Y, Y-Z, Z	Y, Y-Z, Z	Z	Z	Z
PBC8-	Y, Y-Z, Z	Y, Y-Z, Z	Y, Y-Z, Z	Z	Z	Z
PBC10-	Y, Y-Z, Z	Y, Y-Z, Z	Y, Y-Z, Z	Z	Z	Z
PBC12-	Y, Y-Z, Z	Y, Y-Z, Z	Y, Y-Z, Z	Z	Z	Z

Note: Other configurations may be possible with the use of an adapter plate - consult factory