

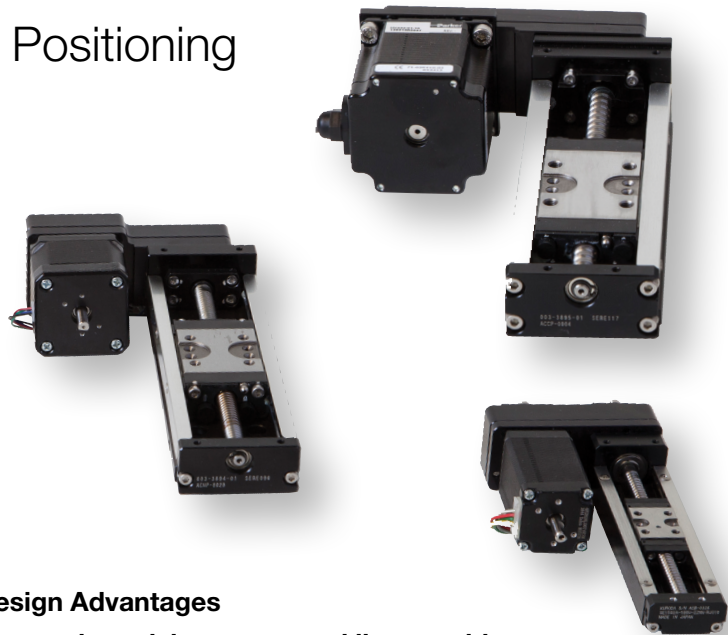
XE Series Positioners

Dependable, Cost-Effective Positioning

FEATURES

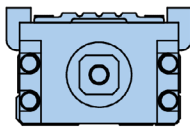
Screw Driven
Tables

- Integrated bearing and carriage assembly
- Rigid U-channel, steel body
- High force per dollar value
- Easily adapted into multi-axis configuration
- Small package size as compared to actuators with separate bearing arrangements

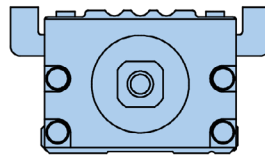


Key Design Advantages

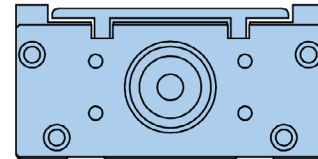
- Integrated precision screw and linear guidance
- Flexible motor mounting options
- Rigid steel U-Channel body
- Packaged adjustable limit sensors
- Precision ballscrew drive train



401XE



402XE



403XE

	401XE	402XE	403XE
Maximum Travel (mm)	160	220	655
Maximum Payload (N)	156	882	1,569
Maximum Acceleration (m/s²)	20	20	20

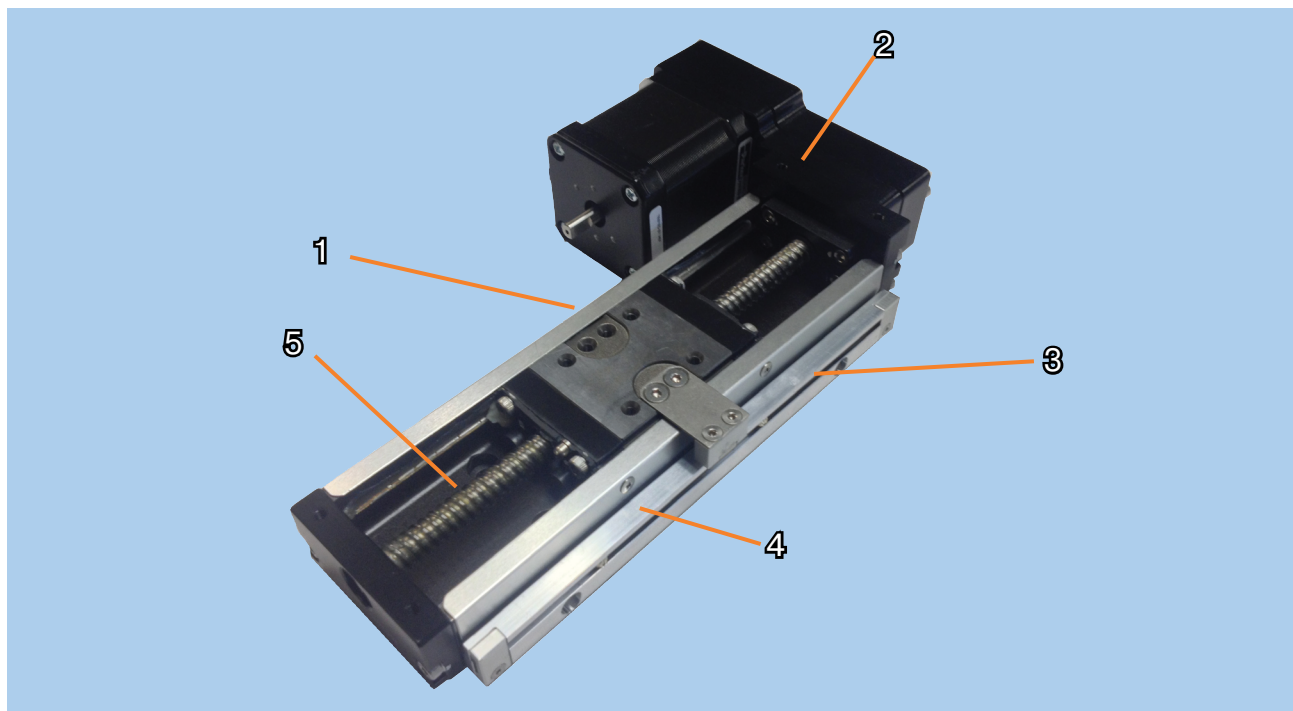
Parker's XE series, mono-carrier style linear positioners combine a rugged steel body with an integrated precision ball screw and bearing guide – producing a highly accurate, cost-effective line of linear positioners.

The XE series is the ideal linear positioner for applications in the manufacturing of electronics, semi-conductors, or life science applications requiring high precision, long life and compact packaging.

OEM's looking to produce machines that position moderate payloads with tight space constraints should look no further than the XE series of linear positioners. The XE series has superior load-life characteristics

The XE Series offers complete flexibility, from motor-mounting options to cleanroom compatibility and a variety of offerings in between. Whether the application calls for a hardcover protection for the linear guide, cleanroom compatible solutions,

custom motors mounted at the factory, or an aesthetically appealing engineered limit sensor package, the 401/402/403XE can be customized to fit the task at hand. When compared to a lead screw driven positioner in similar packaging, the mono-carrier style arrangement of the XE series gives it the highest payload per packaging of any Parker ball screw driven linear stage.



1 Integrated Precision Screw and Linear Guidance

Bearing provides a low profile, high accuracy, smooth motion, and robust adjustment free design over the life of the actuator.

2 Flexible Motor Mounting Options

Provides a variety of motor drive options, including servo and stepper motors, which can either be mounted inline or parallel to the stage.

3 Rigid Steel U-Channel Body

Provides structural rigidity for minimal deflection. With the steel U channel body and integrated bearing design, the structural rigidity of the 401/402/403XE is significantly stiffer than most aluminum body positioners. The increased stiffness results in reduced overall cost due to the elimination of support structures.

4 Packaged Adjustable Limit Sensors

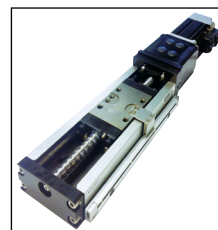
Provide adjustable stroke lengths, easily connected, fewer cables to manage, and no pinch points in an aesthetically pleasing manner.

5 Precision Ballscrew Drive Train

Provides smooth motion with high accuracy and high mechanical efficiency.

Motor Mounting Flexibility

With standard inline and parallel motor mounting options for the NEMA 11, NEMA 17, NEMA 16, NEMA 23, and other Parker Automation motors, the XE Series allows the user to select the motor of their choice without being restricted to one model. To further customize the application solution, the 401/402/403XE can be ordered ready to mount onto most other manufacturers' motors as well.



Low-Profile Design

The highly integrated ballscrew and guide bearing design allows for a greatly reduced overall height when compared to traditional stacking of a bearing and screw assembly. This results in a more compact footprint.



Hardcover Protection

or added protection to the bearing system and drive train, an optional hardcover is available. This will bring the positioner to an IP20 rating and prevent large particles from entering and damaging the screw or bearings.



SPECIFICATIONS

SPECIFICATIONS

The XE series combines a rugged steel body construction with an integrated precision ball screw and bearing guide producing a highly accurate, cost effective line of tables ideal for applications in the hard disk, semiconductor, medical, machine building and many other industries.



Series	Units	401	402		403	
		2 mm lead	2 mm lead	5 mm lead	5 mm lead	10 mm lead
Travel (max)	mm	160	220	220	655	655
Repeatability						
Inline Motor Mount	µm	±10	±5	±5	±5	±5
Parallel Motor Mount		±30	±15	±30	±30	±60
Breakaway Torque	Nm	0.012	0.06	0.06	0.15	0.15
Maximum Input Speed	rev/sec	50	50	50	50	50
Maximum Velocity	mm/sec	100	100	250	250	500
Maximum Load (Normal and Inverted)	kg	16	90	90	160	160
Maximum Moment						
Pitch	Nm	10	46	46	101	101
Yaw		11	51	51	120	120
Roll		28	134	134	260	260
Screw Diameter	mm	6	8	8	10	10
Screw Efficiency						
Inline Motor Mount	%	90	90	90	90	90
Parallel Motor Mount		86	86	86	86	86
Linear Bearing Coefficient of Friction	-	0.01	0.01	0.01	0.01	0.01
Running Torque	Nm	0.011	0.05	0.05	0.1	0.1
Maximum Axial Load	kg	5	13	17	31	27
Moment of Inertia						
I_x of Guide Rail	mm ⁴	2710	14,400	14,400	38,800	38,800
I_y of Guide Rail		23,600	137,000	137,000	314,000	314,000
Weight of Carriage	kg	0.05	0.26	0.26	0.3	0.3
Maximum Acceleration	G's	2	2	2	2	2
Rated Duty Cycle	%	100	100	100	100	100

Travel-Dependent Performance Specifications

401 XE

Travel Length (Order Option Code)

Performance Specification		Units	01	02	03
2 mm Lead	Travel	mm	60	110	160
	Flatness	μm	15	15	15
	Straightness	μm	15	15	15
	Accuracy				
	Inline Motor Mount	μm	65	70	75
	Parallel Motor Mount		95	100	105
	Input Inertia				
	Inline Motor Mount	kg-m ² x 10 ⁻⁶	0.122	0.171	0.224
	Parallel Motor Mount		0.327	0.376	0.429
	Weight				
	Inline Motor Mount*	kg	0.41	0.49	0.58

* Adding the parallel motor mount option adds 0.08 kg for the NEMA 11 option, and 0.10 kg for the NEMA 17 option.

402 XE

Travel Length (Order Option Code)

Performance Specification		Units	01	02	03	04
2 mm Lead	Travel	mm	70	120	170	220
	Flatness	μm	15	15	15	15
	Straightness	μm	15	15	15	15
	Accuracy					
	Inline Motor Mount	μm	70	75	85	90
	Parallel Motor Mount		85	90	100	105
	Input Inertia					
	Inline Motor Mount	kg-m ² x 10 ⁻⁶	0.615	0.772	0.929	1.090
	Parallel Motor Mount		0.820	0.977	1.134	1.295
	Weight					
	Inline Motor Mount*	kg	1.19	1.40	1.60	1.81
5 mm Lead	Travel	mm	70	120	170	220
	Flatness	μm	15	15	15	15
	Straightness	μm	15	15	15	15
	Accuracy					
	Inline Motor Mount	μm	70	75	85	90
	Parallel Motor Mount		85	90	100	105
	Input Inertia					
	Inline Motor Mount	kg-m ² x 10 ⁻⁶	0.741	0.898	1.060	1.210
	Parallel Motor Mount		0.946	1.103	1.265	1.415
	Weight					
	Inline Motor Mount*	kg	1.19	1.40	1.60	1.81

* Adding the parallel motor mount option adds 0.11 kg for the NEMA 17 option, 0.15 kg for the NEMA 23 option, and 0.12 kg for the SM16 option.

Travel-Dependent Performance Specifications

403 XE

		Travel Length (Order Option Code)								
Performance Specification		Units	01	02	03	04	05	06	07	08
5 mm Lead	Travel	mm	55	105	205	305	405	505	605	655
	Flatness	μm	15	15	15	15	25	25	25	25
	Straightness	μm	15	15	15	15	25	25	25	25
	Accuracy									
	Inline Motor Mount	μm	70	80	90	95	100	110	120	130
	Parallel Motor Mount		100	110	120	125	130	140	150	160
	Input Inertia									
	Inline Motor Mount	kg-m ² x 10 ⁻⁶	1.720	2.100	2.870	3.630	4.400	5.170	5.930	6.690
10 mm Lead	Parallel Motor Mount		1.925	2.305	3.075	3.835	4.605	5.375	6.135	6.900
	Weight									
	Inline Motor Mount*	kg	1.85	2.25	2.85	3.55	4.25	4.85	5.55	6.20
	Travel	mm	55	105	205	305	405	505	605	655
	Flatness	μm	15	15	15	15	25	25	25	25
	Straightness	μm	15	15	15	15	25	25	25	25
	Accuracy									
	Inline Motor Mount	μm	70	80	90	95	100	110	120	130
	Parallel Motor Mount		130	140	150	155	160	170	180	190
	Input Inertia									
	Inline Motor Mount	kg-m ² x 10 ⁻⁶	2.500	2.880	3.650	4.420	5.180	5.950	6.700	7.100
	Parallel Motor Mount		2.705	3.085	3.855	4.625	5.385	6.155	6.905	7.305
	Weight									
	Inline Motor Mount*	kg	1.85	2.25	2.85	3.55	4.25	4.85	5.55	6.20

* Adding the parallel motor mount option adds 0.11 kg for the NEMA 17 motor option, 0.15 kg for the NEMA 23 option, and 0.12 kg for the SM16 option.

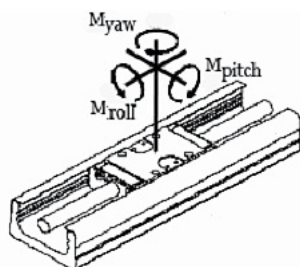
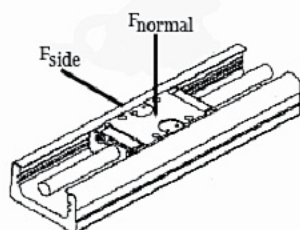
Standard XY Mounting Configurations with
other XE products

Bottom Stage	Top Stage			
	401XE	402XE	403XE	404XE
401XE	X			
402XE	X	X		
403XE	X	X	X	
404XE		X	X	X

XE Series Load-Life Performance

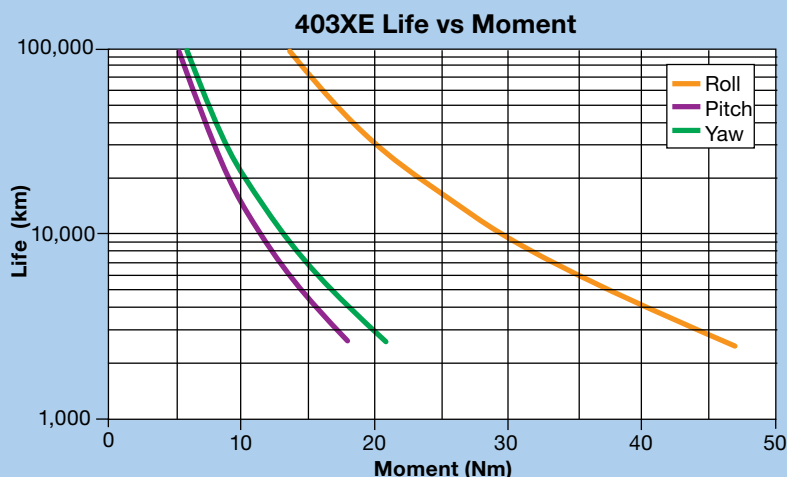
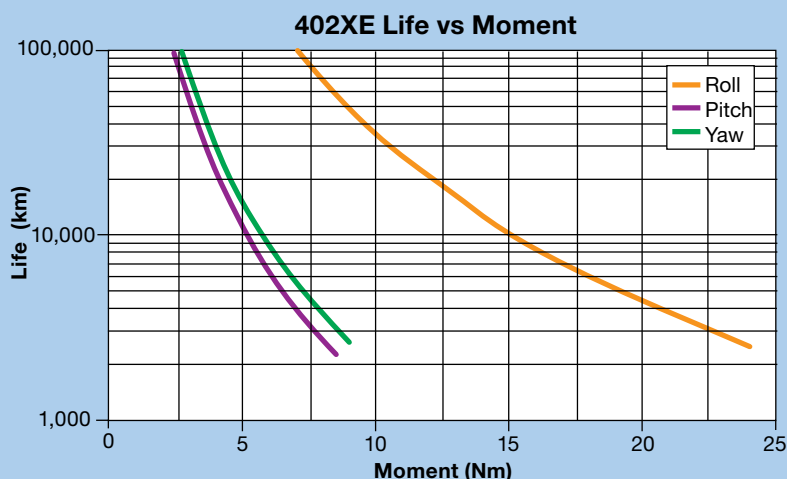
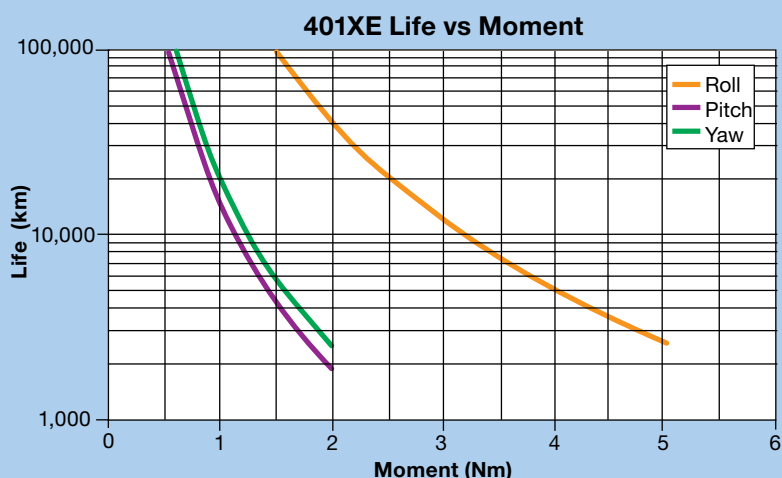
The following performance information is provided as a supplement to the product specification pages. The useful life of a linear table at full catalog specifications is dependent on the forces acting upon it.

These forces include both static components resulting from payload weight, and dynamic components due to acceleration/deceleration of the load. In multi-axis applications, the primary positioner at the bottom of the stack usually establishes the load limits for the combined axes.



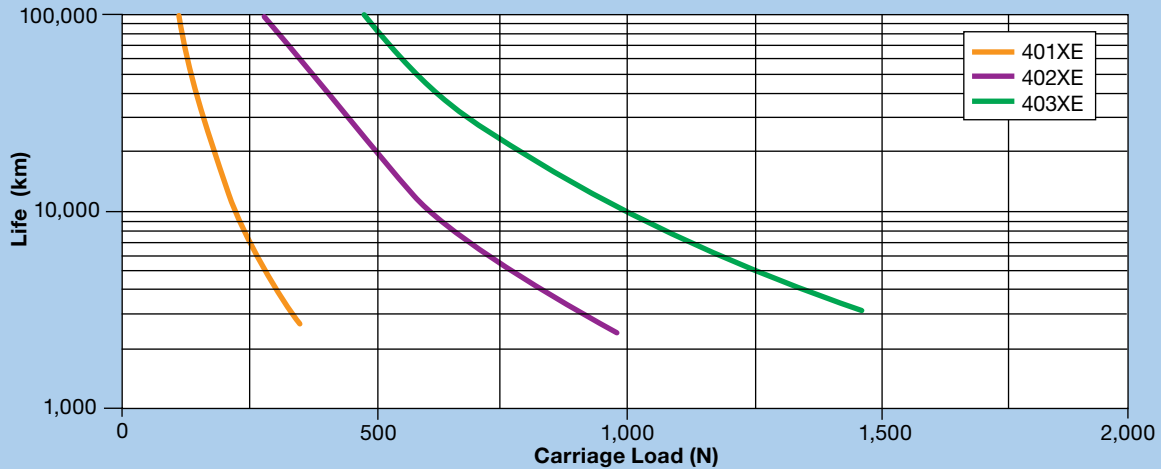
When evaluating life versus load, it is critical to include the weight of all positioning elements that contribute to the load supported by the primary axis. The following graphs are used to establish the table life relative to the applied loads. For more information, download the product manual at parker.com/emc or contact our applications department at (800) 245-6903.

Carriage Life with Moment

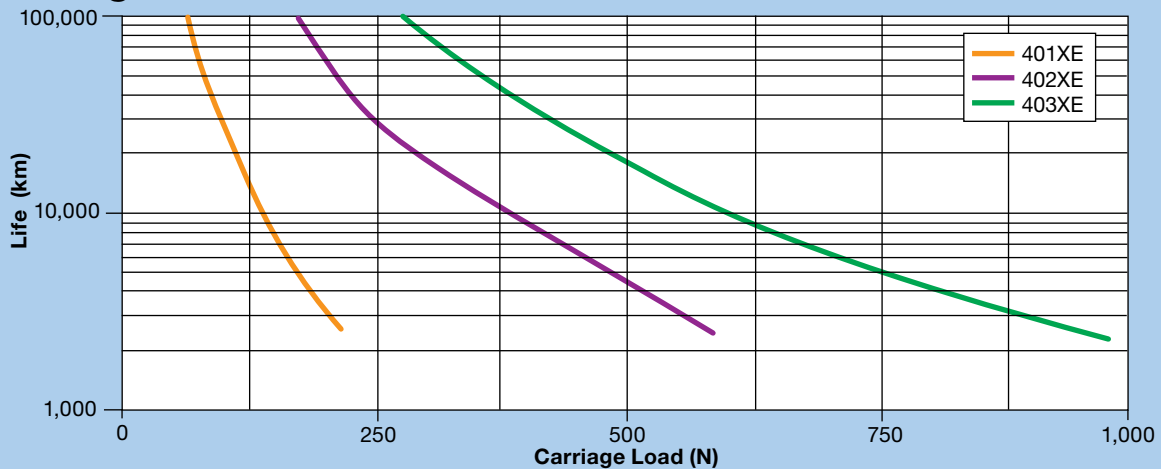


XE Series Load-Life Performance

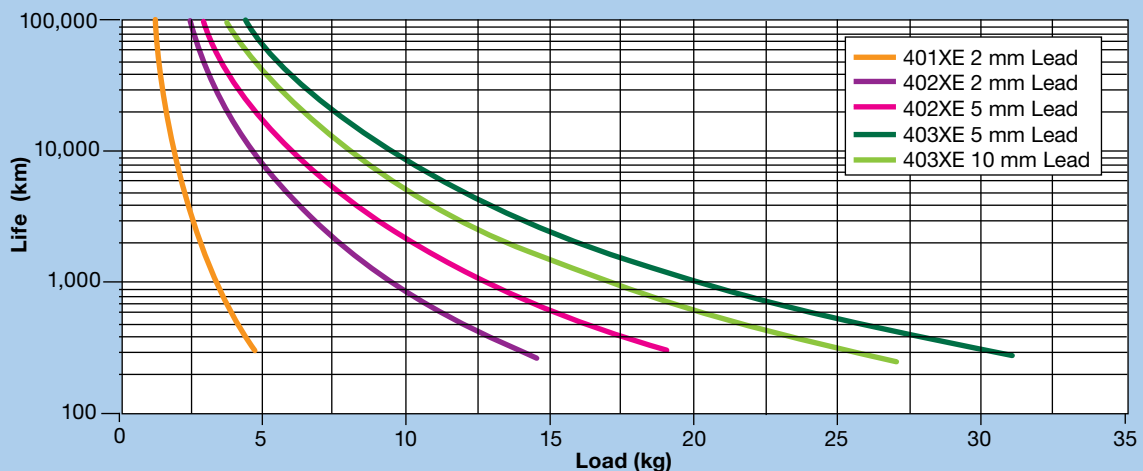
Carriage Life with Normal or Inverted Load



Carriage Life with Side Load



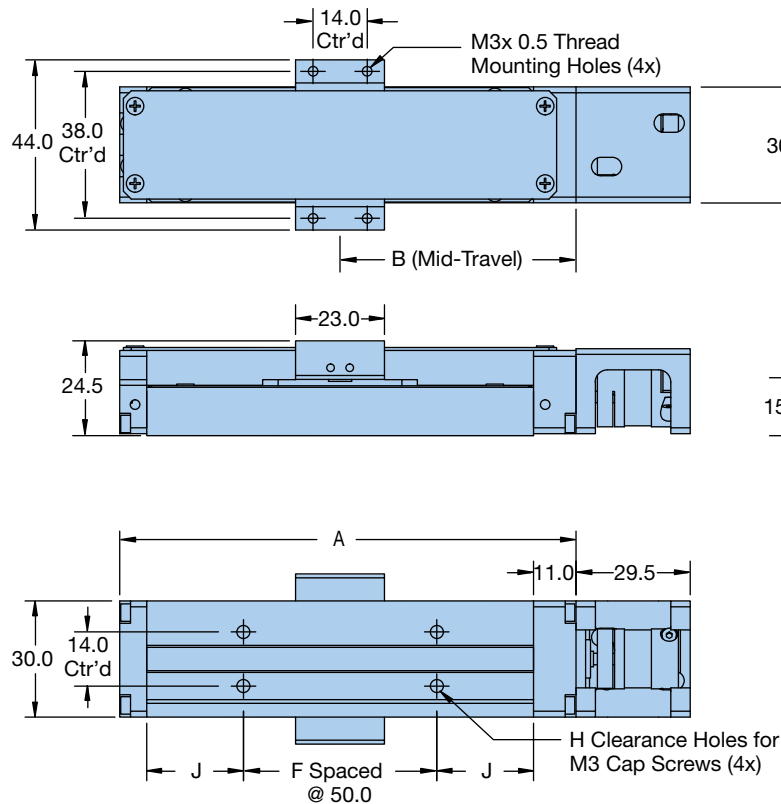
Ballscrew Life with Axial Load



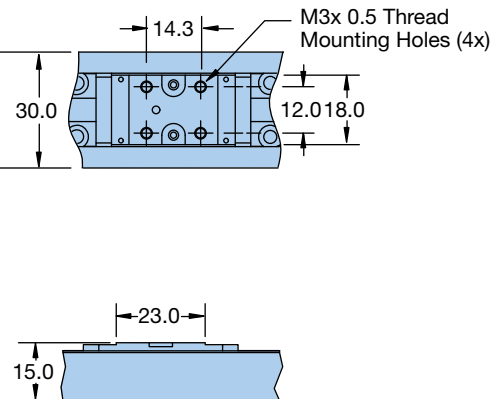
DIMENSIONS

401XE Dimensions (mm)

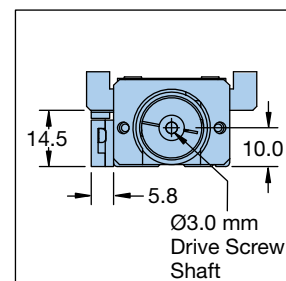
401XE with Hard Cover



401XE without Hard Cover



Optional Limit/Home Sensor

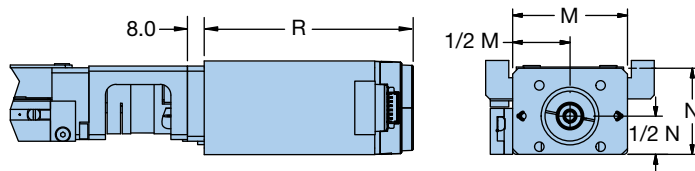


Order Code	Travel (mm)	A	B	F	H	J
01	60	118	61	1	4	25
02	110	168	86	2	6	25
03	160	218	111	3	8	25

Free sizing and selection support
from Virtual Engineer at
virtualengineer.com



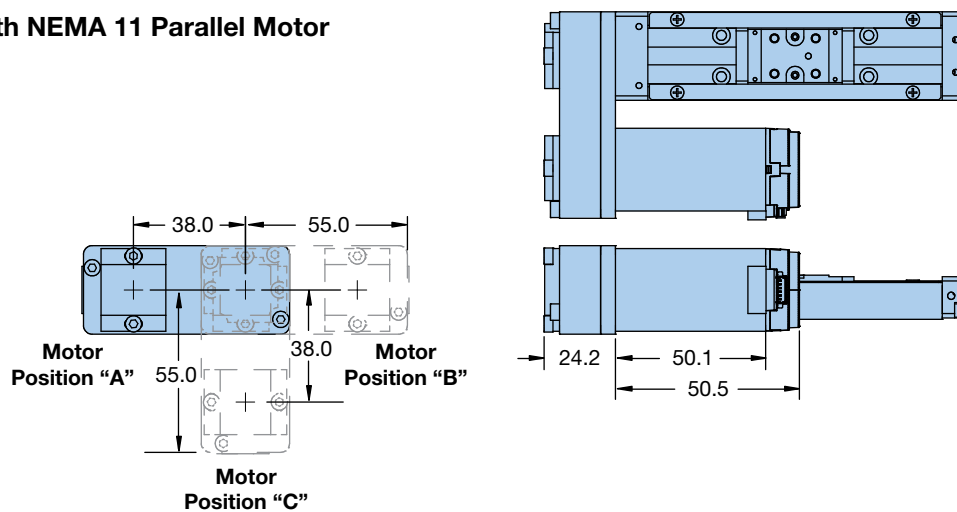
401XE with NEMA 11 & 17 Inline Motor



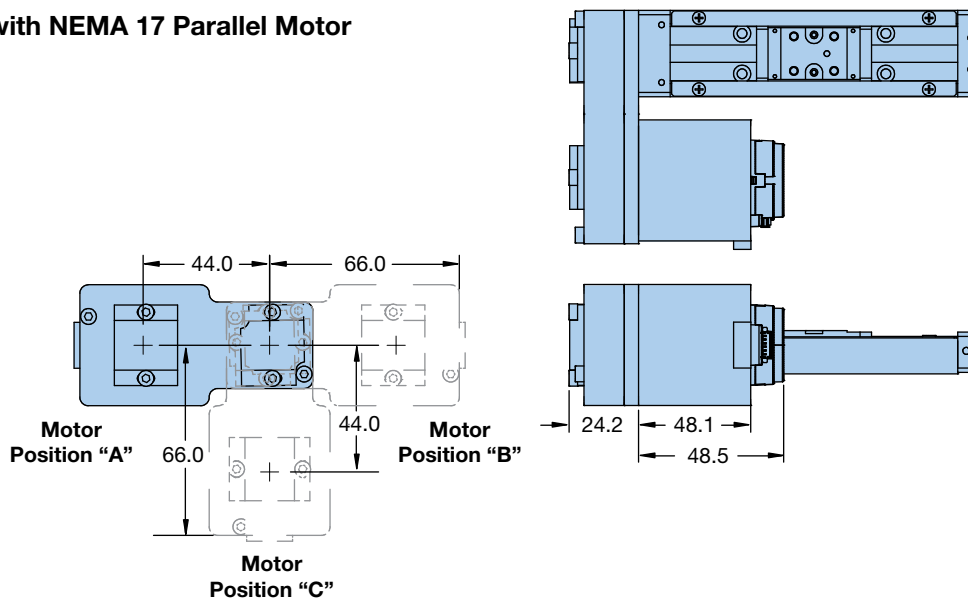
Motor Option*	Motor Size	M	N	R
M11	NEMA 11	28.2	28.2	50.5
M17	NEMA 17	43.0	37.0	48.5

*When configuring an XE stage and selecting your motor option in Ordering Information, note that the "M" motor options come with motors while "N" options are only prepped for those motors.

401XE with NEMA 11 Parallel Motor

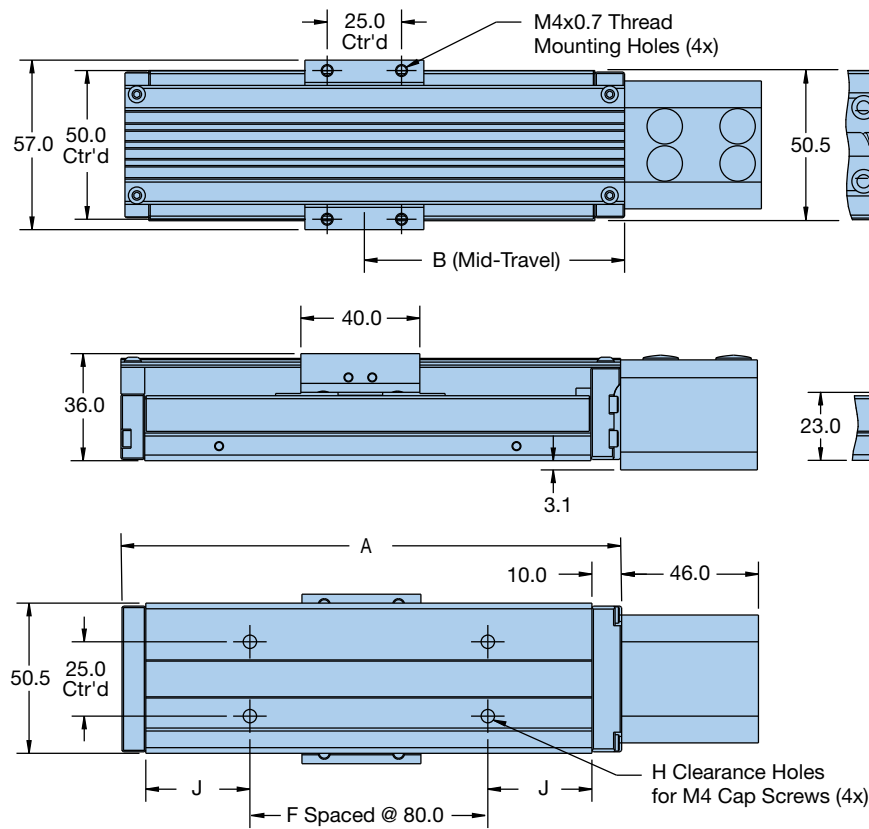


401XE with NEMA 17 Parallel Motor

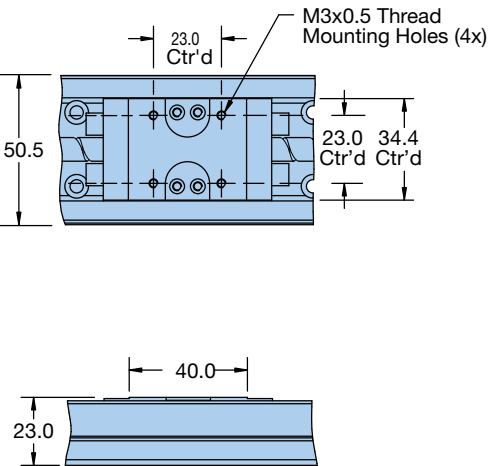


402XE Dimensions (mm)

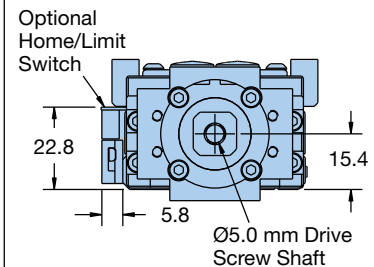
402XE with Hard Cover



402XE without Hard Cover

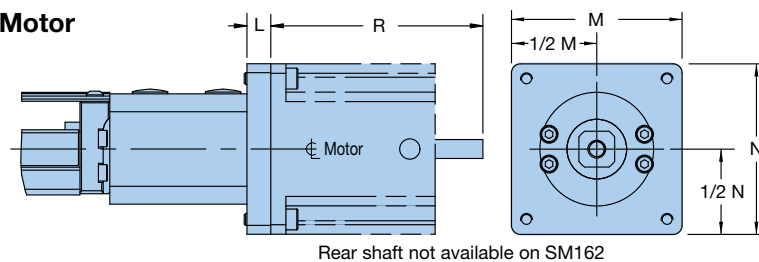


Optional Limit/Home Sensor



Order Code	Travel (mm)	A	B	F	H	J
01	70	168.0	87.5	1	4	35.0
02	120	218.0	112.5	2	6	20.0
03	170	268.0	137.5	2	6	45.0
04	220	318.0	162.5	3	8	30.0

402XE with Inline Motor

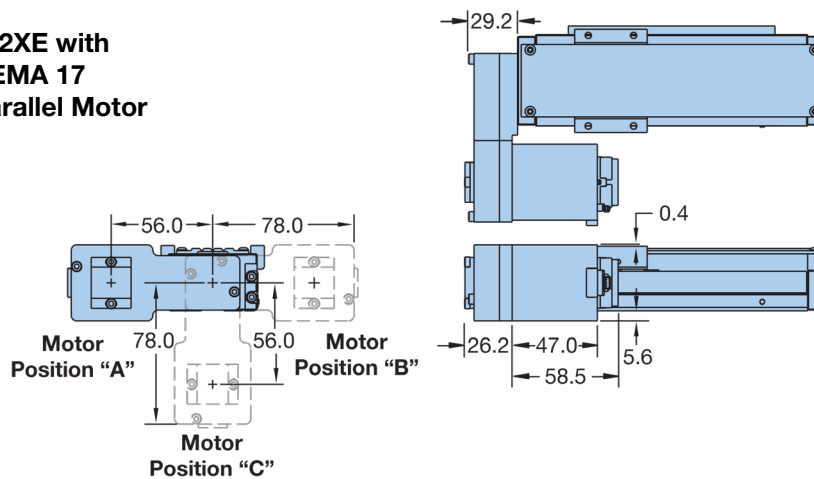


Motor Option*	Motor Size	L	M	N	R
M17	NEMA 17	8.0	43.0	37.0	58.5
M16	SM162AE-N10N	8.0	42.2	42.2	136.5
M23	NEMA 23	8.0	57.2	57.2	51.2

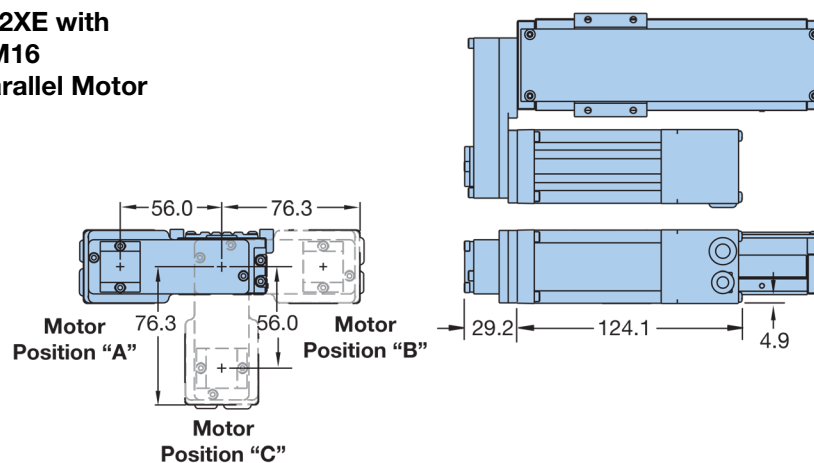
*When configuring an XE stage and selecting your motor option in Ordering Information, note that the "M" motor options come with motors while "N" options are only prepped for those motors.

402XE Dimensions (mm)

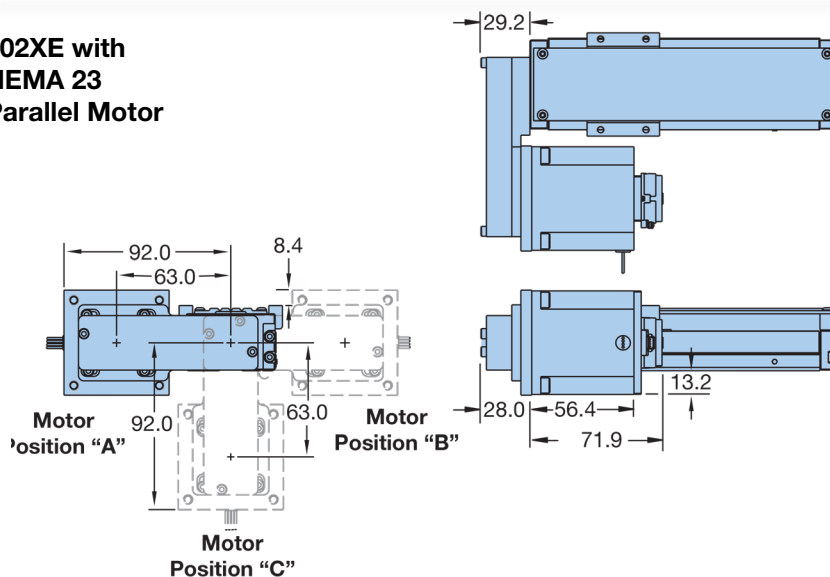
402XE with NEMA 17 Parallel Motor



402XE with SM16 Parallel Motor



402XE with NEMA 23 Parallel Motor

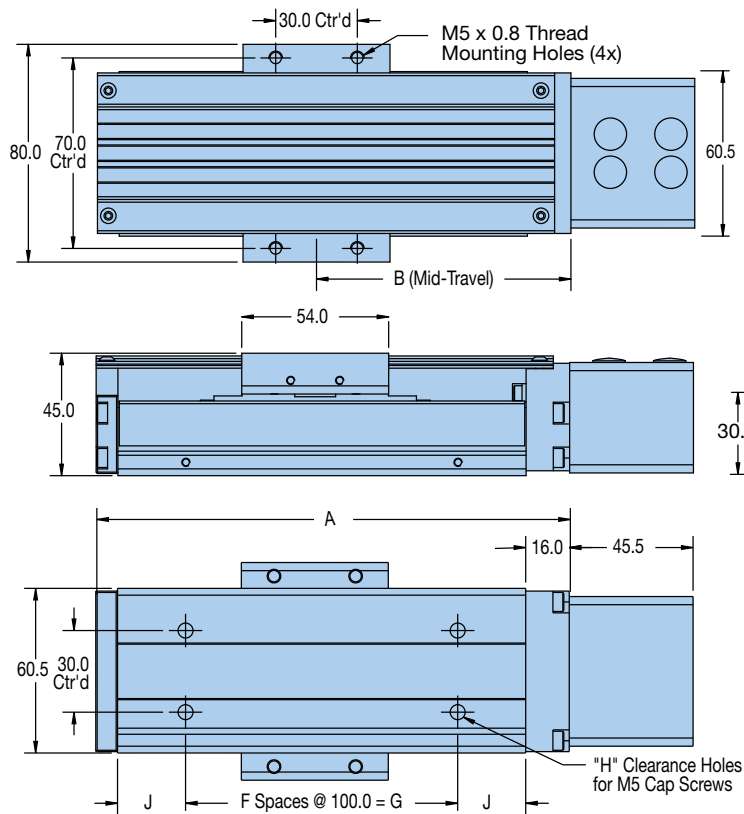


Free sizing and selection support
from Virtual Engineer at
virtualengineer.com

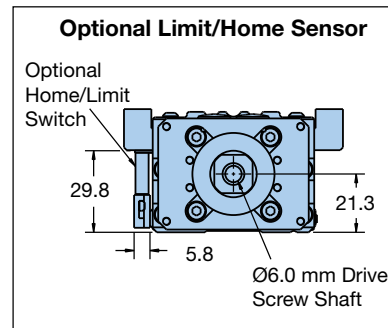
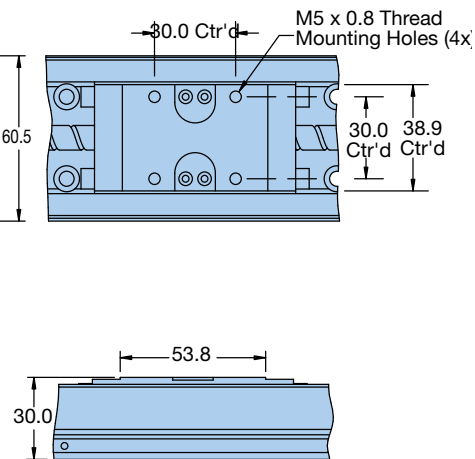


403XE Dimensions (mm)

403XE with Hard Cover

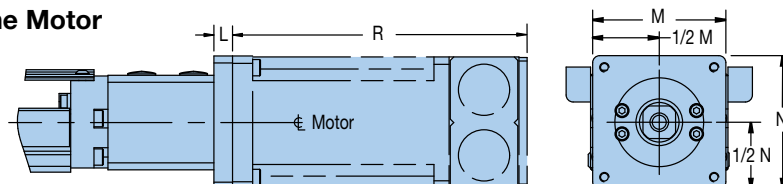


403XE without Hard Cover



Order Code	Travel (mm)	A	B	F	G	H	J
01	55	174.0	93.5	1	100.0	4	25.0
02	105	224.0	118.5	1	100.0	4	50.0
03	205	324.0	168.5	2	200.0	6	50.0
04	305	424.0	218.5	3	300.0	8	50.0
05	405	524.0	268.5	4	400.0	10	50.0
06	505	624.0	318.5	5	500.0	12	50.0
07	605	724.0	368.5	6	600.0	14	50.0
08	655	774.0	383.5	7	700.0	16	25.0

403XE with Inline Motor

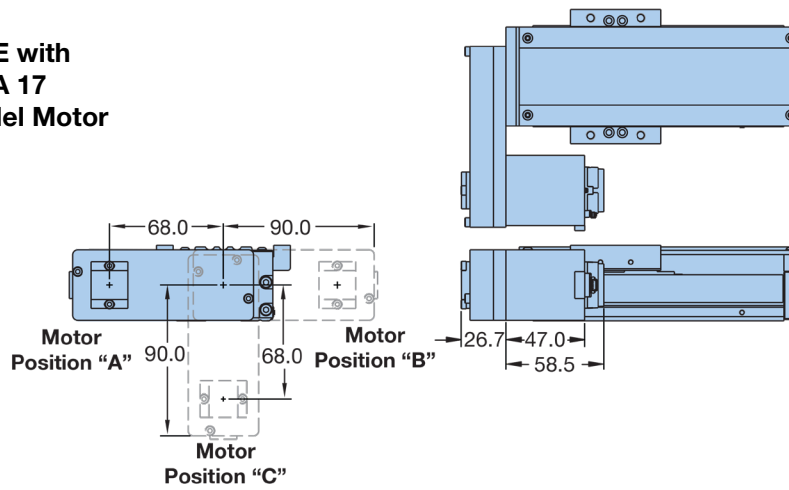


Motor Option*	Motor Size	L	M	N	R
M17	NEMA 17	8.0	43.0	37.0	58.5
M16	SM162AE-N10N	8.0	42.2	42.2	136.5
M23	NEMA 23	9.5	57.2	57.2	51.2

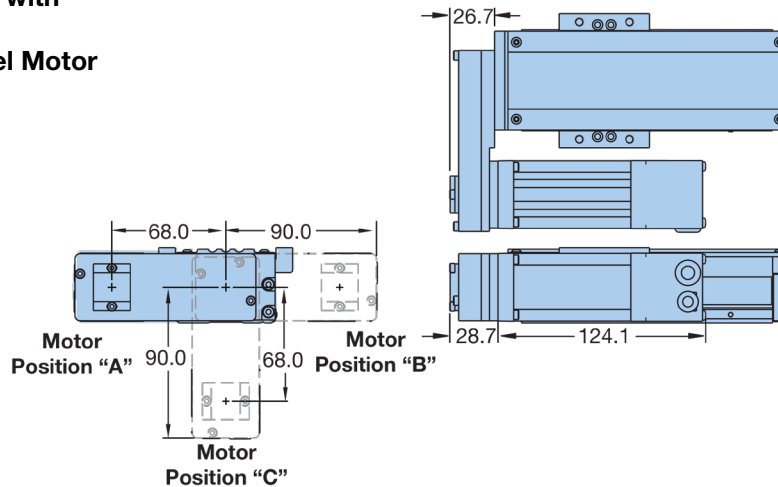
*When configuring an XE stage and selecting your motor option in Ordering Information, note that the "M" motor options come with motors while "N" options are only prepped for those motors.

403XE Dimensions (mm)

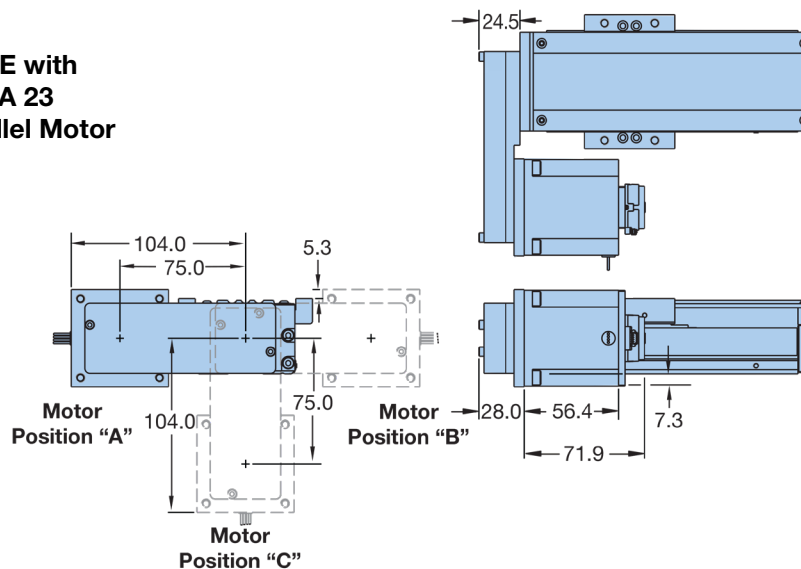
403XE with NEMA 17 Parallel Motor



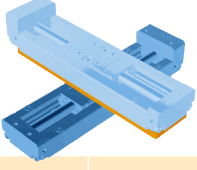
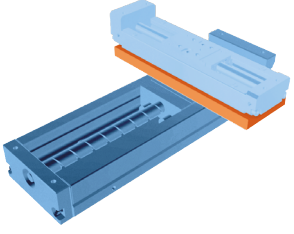
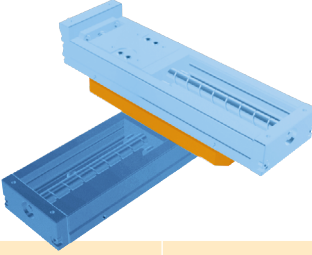
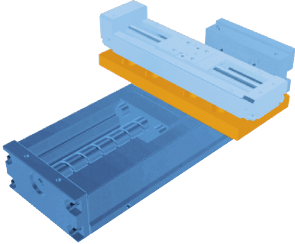
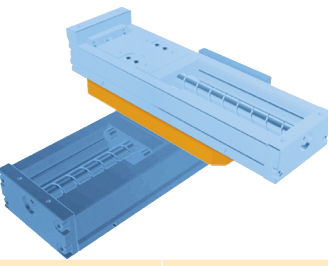
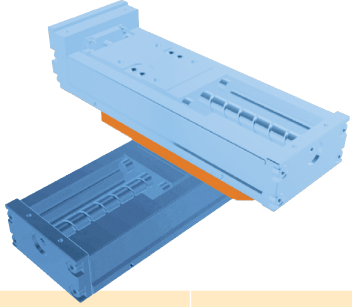
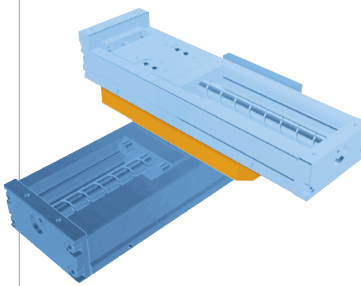
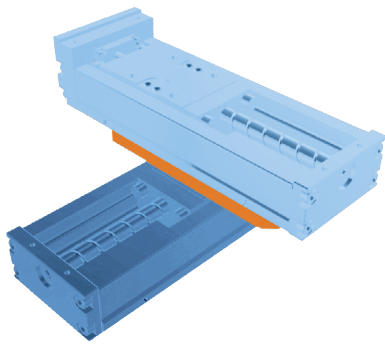
403XE with SM16 Parallel Motor



403XE with NEMA 23 Parallel Motor



Design Flexibility with Standard X-Y Bracket Options

X-Axis	Y-Axis					
	401XE		402XE		403XE	
	Y-Axis Travel Length Order Code	X-Y Bracket Part Number	Y-Axis Travel Length Order Code	X-Y Bracket Part Number	Y-Axis Travel Length Order Code	X-Y Bracket Part Number
401XE						
	01 – 03	002-2975-01				
402XE						
			01	002-2819-01		
	01 – 03	002-2976-01	02 – 04	002-2820-01		
403XE						
			01	002-2821-01	01	002-2821-01
	01 – 03	002-2977-01	02 – 04	002-2822-01	02 – 04	002-2822-01
404XE						
			02 – 08	002-2823-01	02 – 08	002-2823-01

OPTIONS & ACCESSORIES

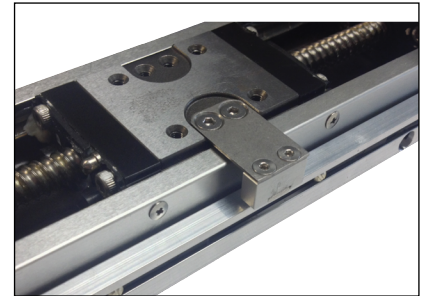
OPTIONS & ACCESSORIES

Screw Driven
Tables

Packaged Limit Sensors

The XE series uses the Parker global mini sensors for home and limit sensing. These sensors are packaged within a miniature sensor housing which allows the flying-leads style cables to exit with 3 meters of cable from the point of the sensor. To further accommodate each application's unique needs, the sensors can be specified as either NPN, PNP, normally open, or normally closed varieties. The unmatched design of the sensor pack on the XE series, allows for fully adjustable sensors along the travel length of the positioner, which creates no pinch points for other cables or hoses to be sliced.

The limit/home switch installed on the XE series is a Hall effect sensor tripped by a magnet located on a flag which is attached to the moving carriage. On the switch body an LED indicates activation. Normally open sensors are typically used for home sensing and normally closed are typically used for limits. With a current sinking sensor, the output lead provides a path to ground when activated, and with a current sourcing sensor, the output lead provides a positive (+) voltage potential relative to ground. Refer to your controller's manual for sensor compatibility. Limit/home switch information is below.



Limit sensor mounting screws are reverse-thread style so tightening the screw loosens the limit sensor in the track and vice versa.

Specifications

Operating Voltage: 10-30 VDC

Repeatability: $\leq \pm 0.1$ mm

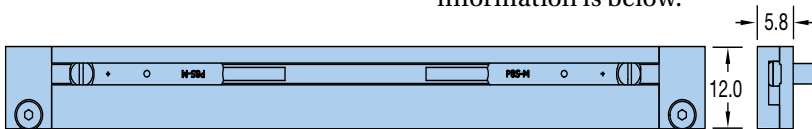
EMC: EN 60 947-5-2

Short circuit protections: Yes

Reverse Polarity Protection: Yes

Enclosure Rating: IP 67

Operating Temperature Range:
-25° to 75° C (-13° to 167° F)



Spare Limit/Home Sensors

Part Number	Switching		Cabling
	Type	Logic	
P8SAMMFAZ	NPN	NC	3 Meter, Flying Leads
P8SAMNFAZ	NPN	NO	
P8SAMPFAZ	PNP	NO	
P8SAMQFAZ	PNP	NC	

Wiring Connection

Pin	Wire	Function
1	Brown	+ VDC
4	Black	NO
3	Blue	- VDC

Riser Plates

Most of the motors used with the 401/402/403XE and some of the 404XE motors have a taller profile than the positioner. Thus the motor can interfere with the positioner mounting surface.

To accommodate riser plates can be provided to space the unit above the mounting surface. See XE product manual for dimensional details and part numbers. Also available are X-Y transition plates for XE to XE mounting.

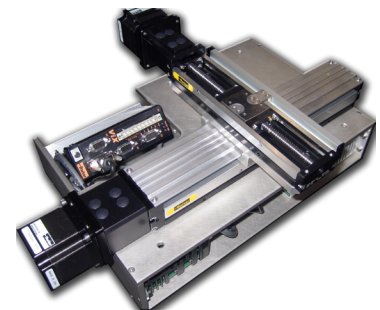
Cleanroom & Raydent Coatings

Cleanroom ratings are possible with the XE product. The actual cleanroom rating will be dependent upon such variables as the location of the sniffer device, the velocity of the table, etc. Consult the factory for specific cleanroom-capability details or test results.



Demo Units

Order 803-0346 for a multi-axis demo unit to learn the product and display for shows and presentations. The demo will come in a watertight pelican carrying case and will be ready for demonstration programmed from the factory.



ORDERING INFORMATION

XE Series

ORDERING INFORMATION

Fill in an order code from each of the numbered fields to create a complete model order code.

Order Example: **401** **01** **XE** **S** **D9** **H0** **L0** **L** **N00** **C1** **E0** **R0**

Series

401

402

403

Travel (mm)

	401XE	402XE	403XE
01	60	70	55
02	110	120	105
03	160	170	205
04	—	220	305
05	—	—	405
06	—	—	505
07	—	—	605
08	—	—	655

Family

XE XE Series

Grade

S Standard

Drive Screw [□]

D9 2 mm lead (401, 402 only) ¹⁾

D2 5 mm lead (402, 403 only) ²⁾

D3 10 mm lead (403 only) ³⁾

¹⁾ D9 is a quick ship option for all 401XE travel options and 01 – 02 options for the 402XE.

²⁾ D2 is a quick ship option for the 03 – 04 for the 402XE, and the 01, 02 and 03 option for the 403XE.

³⁾ D3 is a quick ship option for the 04 – 06 options for the 403XE

Home Sensor (Qty 1)

H0 No home sensor [□]

HA NPN, N.C., flying leads [□]

HB NPN, N.O., flying leads [□]

HC PNP, N.C., flying leads [□]

HD PNP, N.O., flying leads [□]

Limit Sensors (Qty 2)

L0 No limits sensors [□]

LA NPN, N.C., flying leads [□]

LB NPN, N.O., flying leads [□]

LC PNP, N.C., flying leads [□]

LD PNP, N.O., flying leads [□]

Motor Mount Orientation

L Inline motor mounting [□]

A Parallel motor mounting*

B Parallel motor mounting*

C Parallel motor mounting*

* Refer to dimension drawings for orientation

Motor option

N00 No motor mount[□]

N11 NEMA 11 motor mount^{1) □}

N17 NEMA 17 motor mount[□]

N16 SM 16 servo motor mount^{2) □}

N40 PM-FAL servo motor mount^{2) □}

N23 NEMA 23 inline motor mount²⁾

M11 NEMA 11 stepper motor¹⁾

M17 NEMA 17 stepper motor

M16 SM162AE-N10N servo motor, 1000 line encoder²⁾

M40 MPE 0402A4E-KC1N²⁾

M23 NEMA 23 stepper motor²⁾

¹⁾ 401XE only

²⁾ Not available on 401XE

Motor Coupling

C1 No coupler

C2 0.25" Oldham

C3 0.25" Bellows

C4 0.375" Oldham

C5 0.375" Bellows

C6 5 mm Oldham

C7 5 mm Bellows

C8 8 mm Oldham

C9 8 mm Bellows

Motor Encoder

E0 No encoder

E2 500 line encoder
(Available only with M11, M17, M23 motor options)

Environmental Option

R0 No cover [□]

R1 Hard cover [□]

[□] Need an XE in a Hurry?

The [□] above designates quick ship options, that will give fastest delivery possible. These options are only good for the stroke and screw combinations denoted above, with any home and limit sensor option, inline motor mounts only, and are available with or without the hard cover option.

Free sizing and selection support
from Virtual Engineer at
virtualengineer.com



404XE Series Positioners

(95 mm wide profile)

Versatile Compact Motion Platform

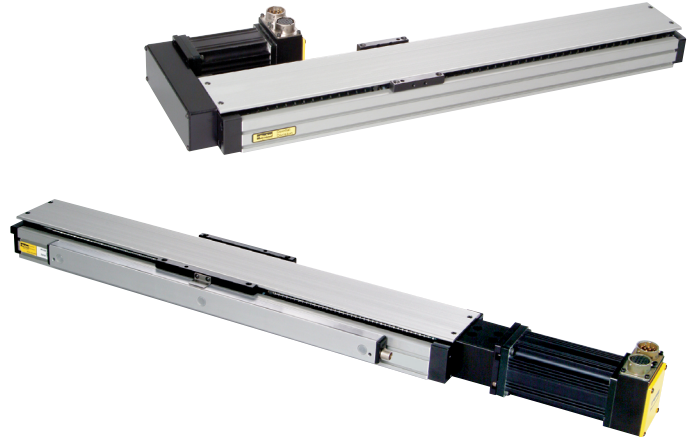
FEATURES

Screw Driven
Tables

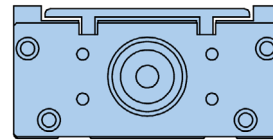
- Economy Grade Positioning
- 100% Duty Cycle
- High Strength Design
- Easy Multi-Axis Mounting
- Locating Dowel Holes

Key Design Advantages

- Three leadscrew options
- Two carriage options
- Standard inline and parallel motor mounting
- Optional hardcover available
- LXR and XR mounting compatible (toe clamp only)



	404XE
Maximum Travel (mm)	700
Maximum Payload (N)	1,202
Maximum Acceleration (m/s ²)	20



404XE

Reliable and Cost Effective Positioning

The 404XE positioners combine versatility with rugged construction in a compact motion platform that is ideal for 24/7 process automation. A high efficiency ballscrew drive, recirculating square rail bearings and high strength aluminum body are the result of innovative engineering that has reduced costs while improving performance.

Unmatched Options and Features

A vast assortment of “designer friendly” options and features simplify the engineering challenges often confronted with “base model” positioning devices. Features like precision dowel holes, linear feedback, sensor packs, parallel motor mounting, brakes, and cleanroom preparation simplify and speed your machine design process.

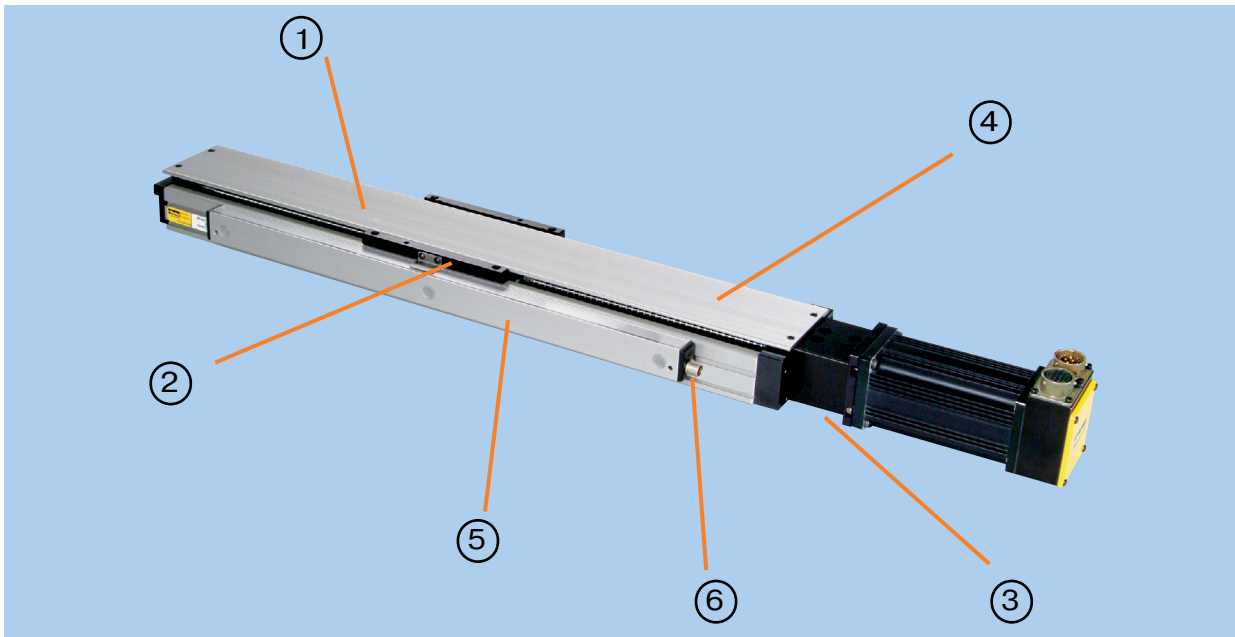
Multi-Axis Systems

XY and XYZ systems are easily configured and pinned so that

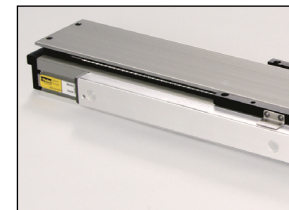
factory orthogonality can be reproduced in the field. Motors and cable management systems connect to the XE tables in a straightforward and simple manner.

Technology Evolution

The XE is direct mounting compatible with our precision series XR ballscrew tables and our LXR linear motor tables. It is possible to mix-and-match various levels of technology on a per axis basis allowing the most cost effective optimized application solutions.



- ① **Three leadscrew options**
Providing travel up to 700mm
- ② **Two carriage options**
Two choices available – short (2 bearing trucks) and long (4 bearing trucks)
- ③ **Standard inline and parallel motor mounting**
Options for Parker and non-Parker Automation motors
- ④ **Optional hardcover**
An optional hardcover is available. This will bring the positioner to an IP20 rating and prevent large particles from entering and damaging the screw or bearings.
- ⑤ **Standard mounting**
Compatible with XR and LXR Series (Toe Clamp Only)
- ⑥ **End of travel and home sensors**
Sensors for the 404XE series are available in a variety of styles.



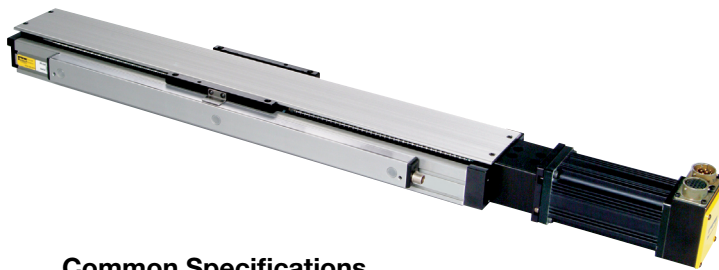
Standard XY Mounting Configurations with other XE products

Bottom Stage	Top Stage			
	401XE	402XE	403XE	404XE
401XE	X			
402XE	X	X		
403XE	X	X	X	
404XE		X	X	X

SPECIFICATIONS

SPECIFICATIONS

The 404XE is the largest of the XE positioning table line, with a width of approximately 4" and travel length up to 700mm depending on selected carriage size. Ballscrew options range from 5mm lead to 20mm lead, and several motor mount and limit/home switch options are available, as well as feedback and brake options.



Common Specifications

Bidirectional Repeatability	
T01 to T11 models	±20 micron
T12 to T15 models	±30 micron
Duty Cycle	100%
Max Acceleration⁽¹⁾	20 m/sec ² (773 in/sec ²)
Normal Load Capacity⁽²⁾	
NL (short carriage)	61.3 kgf (135 lbs)
VL (long carriage)	122.6 kgf (270 lbs)
Axial load capacity⁽²⁾	
5 mm lead ballscrew	60 kgf (132 lbs)
10 mm lead ballscrew	70 kgf (154 lbs)
20 mm lead ballscrew	70 kgf (154 lbs)
Drive Screw Efficiency	90%
Max Break-Away Torque	0.25 Nm (35in-oz)
Max Running Torque (rated @ 2 RPS)	0.21 Nm (30in-oz)
Linear Bearing – Coefficient of Friction	0.01
Ballscrew Diameter	
5 & 10 mm lead	16 mm
20 mm lead	15 mm
Carriage Weight	
NL (short carriage)	0.215 kg (0.47 lbs)
VL (long carriage)	0.495 kg (1.09 lbs)

(1) Applies to units with VL carriage

(2) Refer to life/load charts.

Travel Dependent Characteristics

Code	Travel (mm)		Positional Accuracy ^{(3) (4)} (µm)	Input Inertia NL Carriage Units (10 ⁻⁵ kg-m ²)			Input Inertia VL Carriage Units (10 ⁻⁵ kg-m ²)			Max. Screw Speed (RPS)	Max. Velocity (meters/sec.)			Total Table Weight (kg)	
	NL	VL		5 mm	10 mm	20 mm	5 mm	10 mm	20 mm		5 mm	10 mm	20 mm	NL	VL
T01	25	–	42	.81	–	–	–	–	–	72	0.36	0.73	1.50	1.42	1.70
T02	50	–	50	.94	.98	–	–	–	–	72	0.36	0.73	1.50	1.61	1.89
T03	100	33	58	1.19	1.23	1.12	1.21	1.30	1.4	72	0.36	0.73	1.50	1.95	2.23
T04	150	83	66	1.44	1.48	1.32	1.46	1.55	1.6	72	0.36	0.73	1.50	2.35	2.63
T05	200	133	74	1.69	1.73	1.51	1.71	1.80	1.79	72	0.36	0.73	1.50	2.59	2.87
T06	250	183	82	1.94	1.99	1.70	1.96	2.06	1.99	72	0.36	0.73	1.50	2.97	3.25
T07	300	233	90	2.20	2.24	1.90	2.21	2.31	2.18	72	0.36	0.73	1.50	3.34	3.62
T08	350	283	98	2.45	2.49	2.09	2.47	2.56	2.37	72	0.36	0.73	1.50	3.50	3.78
T09	400	333	106	2.70	2.74	2.29	2.72	2.81	2.57	72	0.36	0.73	1.50	3.83	4.11
T10	450	383	114	2.95	2.99	2.48	2.97	3.07	2.76	72	0.36	0.73	1.50	4.09	4.37
T11	500	433	122	3.21	3.25	2.67	3.22	3.32	2.96	72	0.36	0.73	1.50	4.22	4.50
T12	550	483	130	3.46	3.50	2.87	3.48	3.57	3.15	72	0.36	0.73	1.50	4.55	4.83
T13	600	533	138	3.71	3.75	3.06	3.73	3.82	3.34	69	0.34	0.68	1.32	4.87	5.15
T15	700	633	154	4.21	4.25	3.45	4.23	4.33	3.73	52	0.26	0.52	1.00	5.12	5.40

(3) Positional accuracy applies to in-line motor configurations only. Positional specifications are based on "no-load" conditions and apply to individual axes only.

(4) Consult factory for specs with linear feedback.

404XE Life/Load Performance

The following performance information is provided as a supplement to the product specifications pages. The useful life of a linear table at full catalog specifications is dependent on the forces acting upon it. These forces include both static components resulting from payload weight and

dynamic components due to acceleration/deceleration of the load. In multi-axes applications, the primary positioner at the bottom of the stack usually establishes the load limits for the combined axes.

When determining life/load, it is critical to include the weight of all positioning elements that contribute

to the load supported by the primary axis. The following graphs and formulas are used to establish the table life relative to the applied loads. **Catalog load specifications are rated for 100 million inches of travel or 2.540 km.**

Table Life/Thrust (Axial) Load

This graph illustrates table ballscrew life relative to the axial load.

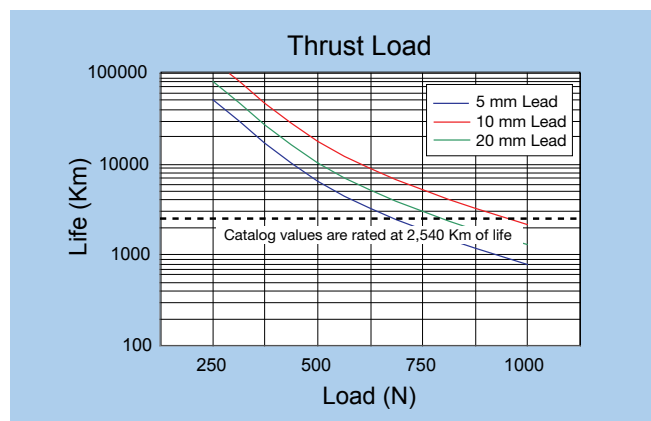


Table Life/Load Chart Pitch Moment - NL (Short Carriage)

This graph illustrates table linear bearing life as a result of pitch moment.

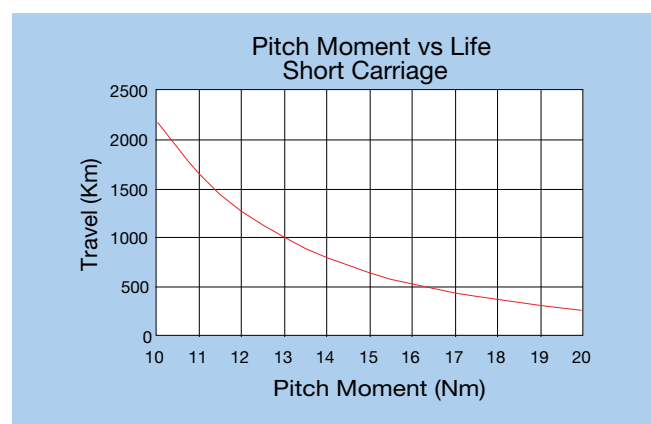
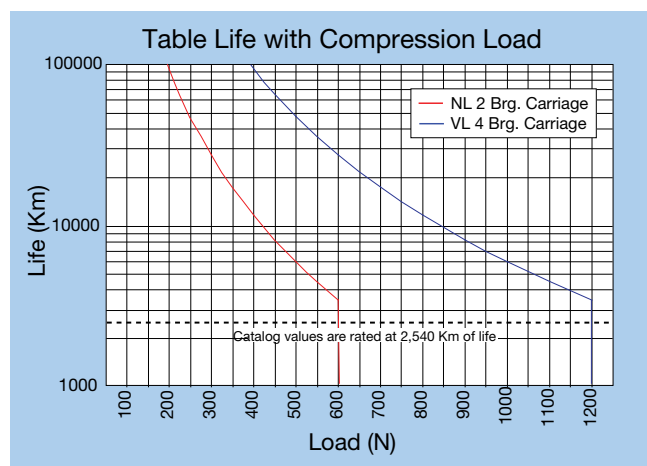


Table Life/Compression (Normal) Load

This graph provides an evaluation of the support bearing life/load characteristics. The curves show the life/load relationship when the applied load is centered on the carriage, normal (perpendicular) to the carriage mounting surface.

For final evaluation of life versus load, including off-center, tension, and side loads, refer to the pitch/moment chart for the NL carriage units or the bearing load charts (next page) for the VL carriage units.



404XE Life/Load Performance

Bearing Life/Load for VL Long Carriage Units

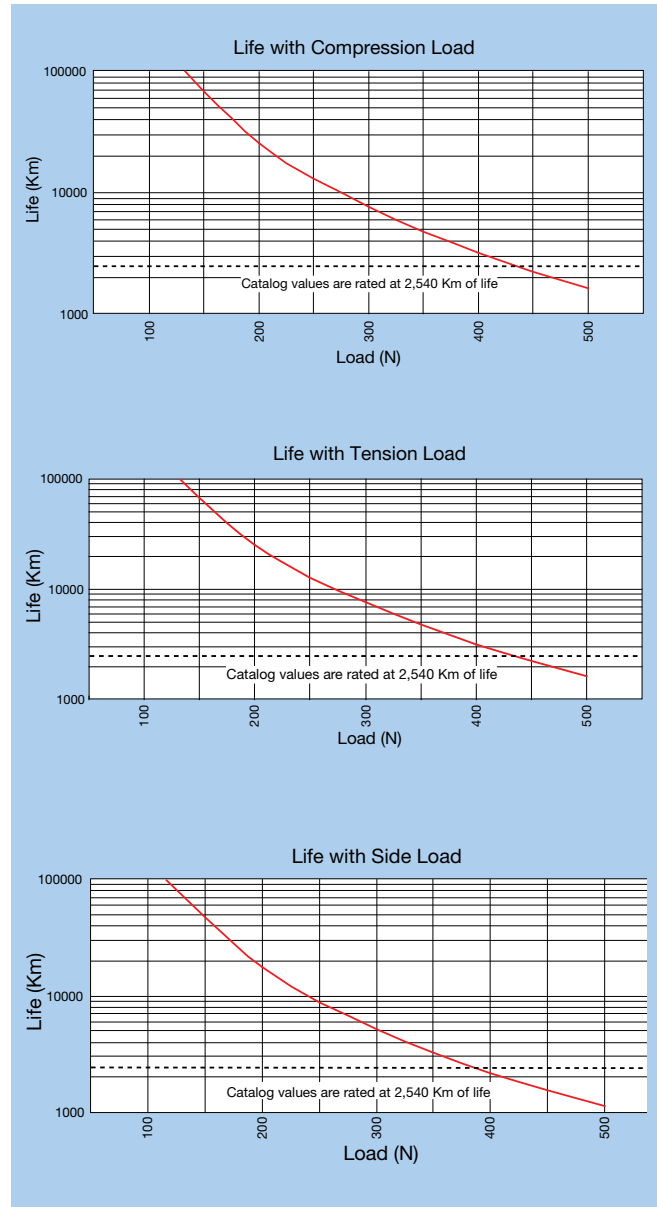
These charts are to be used to evaluate the VL Carriage units. They should be used in conjunction with the corresponding formulas (found under “Product Information” at parker-motion.com) to establish the life/load for each bearing (4 per table).

Several dimensions, which are specific to each linear positioning table model, and the load geometry are required for these computations. These dimensions are supplied in the catalog information for each positioner. The dimensions are referenced as follows:

- d1 – Bearing block center-to-center longitudinal spacing
- d2 – Bearing rail center-to-center lateral spacing
- da – Rail center-to-carriage mounting surface

	d1	d2	da
404XE	80	57	28

Refer to Parker’s website parker.com/emc for moment loading and other engineering data.

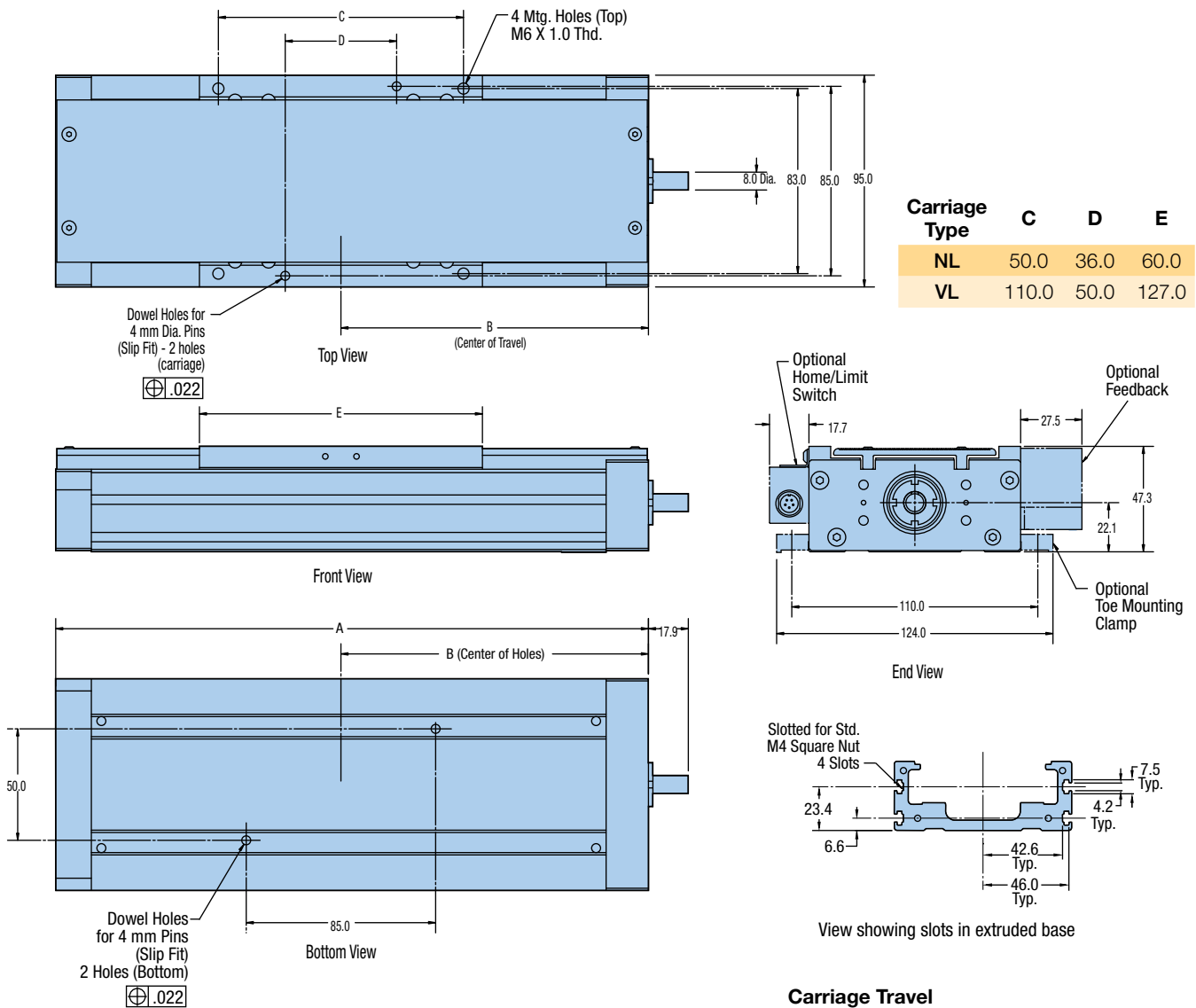


DIMENSIONS

Download 2D & 3D files from
parker.com/emc



DIMENSIONS



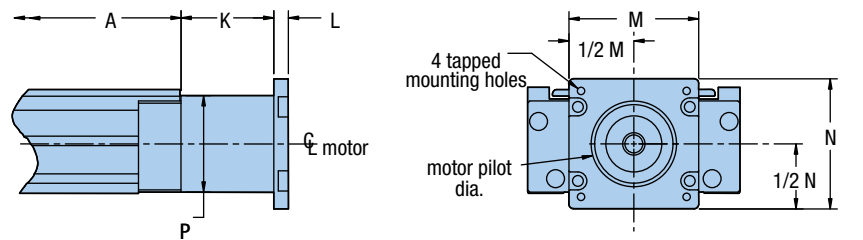
Carriage Type	C	D	E
NL	50.0	36.0	60.0
VL	110.0	50.0	127.0

Carriage Travel				
Designation	NL (short)	VL (long)	A	B
T01	25	—	141.0	75.5
T02	50	—	166.0	88.0
T03	100	33	216.0	113.0
T04	150	83	266.0	138.0
T05	200	133	316.0	163.0
T06	250	183	366.0	188.0
T07	300	233	416.0	213.0
T08	350	283	466.0	238.0
T09	400	333	516.0	263.0
T10	450	383	566.0	288.0
T11	500	433	616.0	313.0
T12	550	483	666.0	338.0
T13	600	533	716.0	363.0
T15	700	633	816.0	413.0

400XE Series Motor Mount Dimensions

In-Line Motor Mount

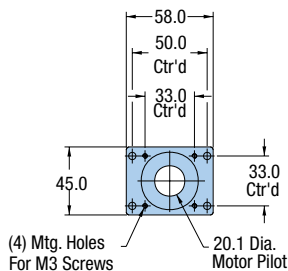
In-line motor mounting allows the motor to be mounted directly to the drive screw via the selected motor coupling.



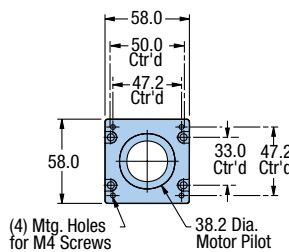
In-Line Adaptor Plates

Used to easily accommodate the mounting of different frame sizes. These adapter plates can be ordered separately by part number below.

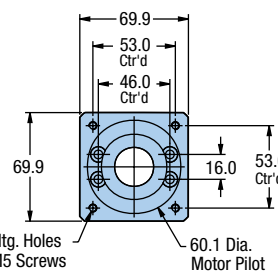
SM16	M2	9.5	41.0	4.3	58.0	45.0	45.0
NEMA 23	M3	9.5	41.0	6.5	58.0	58.0	45.0
NEMA 34	M4	9.5	41.0	12.5	83.0	83.0	45.0
Neometric 70	M21	11.0	53.0	0.0	69.9	69.9	69.9



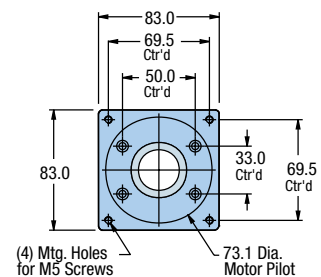
In-line SM 16



In-line NEMA 23

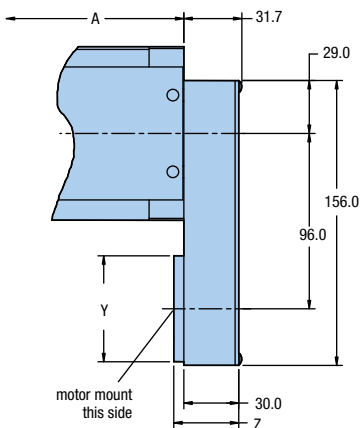


In-line NEOMETRIC 70 / SMN060

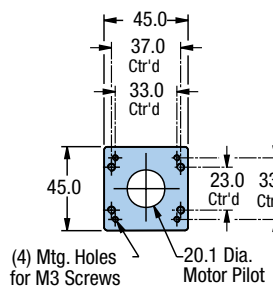


In-line NEMA 34

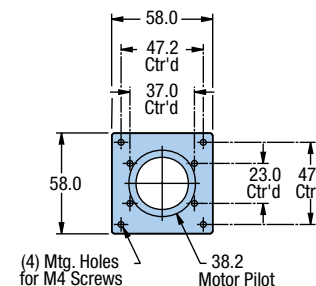
Parallel Motor Mounting



Parallel motor mounting is employed whenever a shorter overall unit length is needed. The motor is positioned along the sides or bottom of the table as designated by position A, B, or C. (No coupling required)

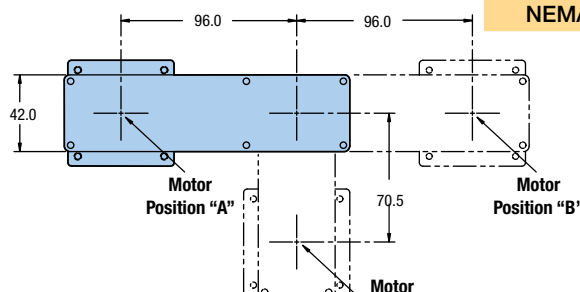
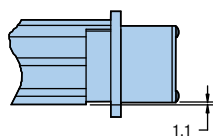


Reverse SM 16



Reverse NEMA 23

Motor Size	Y	Z	Motor Shaft Dia.
SM 16	45.0	34.5	0.250"
SM 23 / BE 23	58.0	35.5	0.375"
NEMA 23	58.0	35.5	0.250"

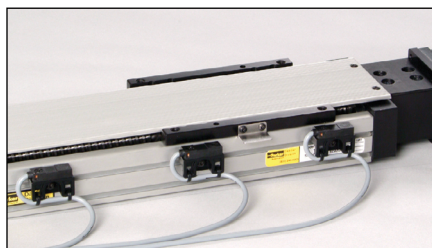
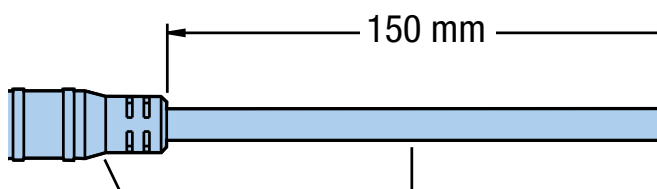


Note: Some sensor pack and encoder restriction apply when mounting motors larger than NEMA 23 in the A or B positions. Please consult factory.

Home or Limit Sensor

End of Travel and Home Sensors for the 404XE series are available in a variety of styles. The sensors can be ordered as part of the table or as separate components with the associated mounting hardware or in an enclosed sensor pack. A 5 meter high-flex extension cable (Part No. 003-2918-01) is available for use with models having the locking connector option.

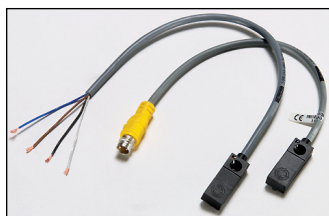
- NPN (Sinking) or PNP (Sourcing)
- Normally Closed (N.C.) or Normally Open (N.O.)
- Flying Leads or Locking Connector



With Limits and Home Sensors



With Limits and Home Sensor Pack



Input Power 5-30 VDC, 20 mA
Output 100 mA max
Wire Color Code (+) Supply: Brown
 (-) Supply: Blue
 NO Output: Black
 NC Output: White

Order Code	Part No.* (Includes Mounting Bracket)	Switch Type	Logic	Cable Length	Connection Option
H2 or L2	006-1639-01	N.C.	Sinking	3.0 m	Flying Leads
H3 or L3	006-1639-02	N.O.	Sinking	3.0 m	Flying Leads
H4 or L4	006-1639-03	N.C.	Sourcing	3.0 m	Flying Leads
H5 or L5	006-1639-04	N.O.	Sourcing	3.0 m	Flying Leads
H6 or L6	006-1639-09	N.C.	Sinking	150 mm	Locking Connector
H7 or L7	006-1639-08	N.O.	Sinking	150 mm	Locking Connector
H8 or L8	006-1639-11	N.C.	Sourcing	150 mm	Locking Connector
H9 or L9	006-1639-10	N.O.	Sourcing	150 mm	Locking Connector

*Sensor triggers (targets) ordered separately.

Brake Assembly

Electromagnetic brake assembly used to prevent "backdriving" in vertical applications. Includes 5 meter cable.

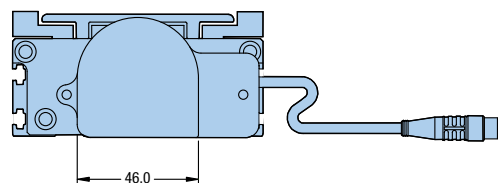
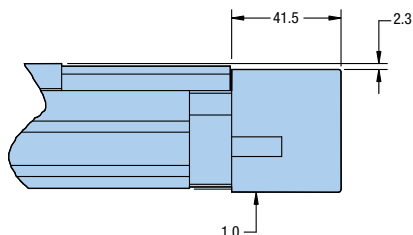
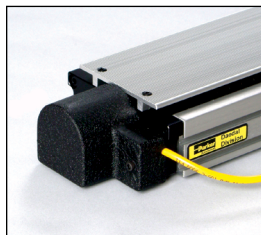
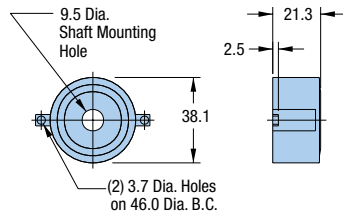


Table Series	Part Number	Input Power	Holding Torque
404XE	006-1627-01	24 VDC, 0.46 A	2.0 N-m

404XE

Rotary Encoder

Modular rotary encoder couples directly to the drive screw for position feedback. 150 mm cable included.

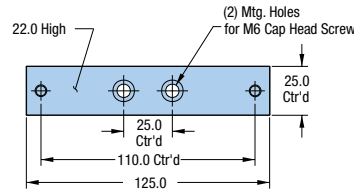


Part Number 06-1629-01

Input Power 5 VDC, 135 mA
Output A/B quadrature and reference mark, differential line drive output
Resolution 1250 lines/rev equals 5000 counts post quadrature (1 μ m with 5 mm lead ballscrew)

Riser Plate

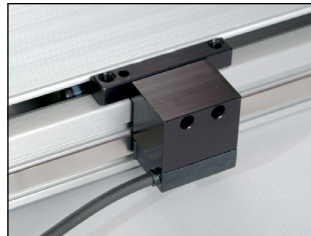
Used to raise the table base to provide clearance for motors larger than NEMA 23 frame size.



Part Number 002-3619-01
(All hardware included)

Linear Feedback

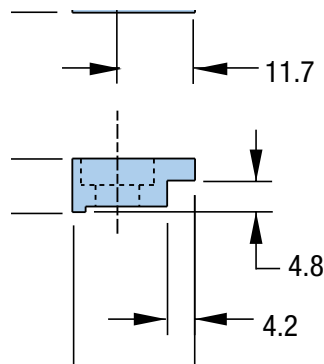
A magnetic linear position feedback device which mounts directly to the table carriage. (Factory installation required.)



Input Power 5 VDC, 240 mA
Output A/B quadrature and reference marks, differential line drive output
Resolution 5.0 μ m

Toe Clamp

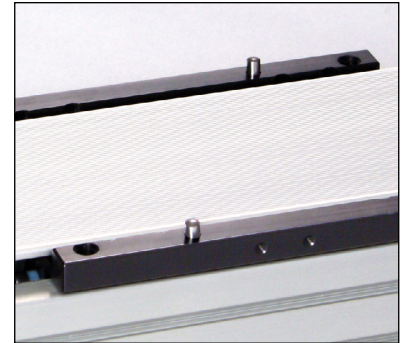
Used for convenient mounting of 404XE to a base plate, or riser plates.



Part Number 002-3618-01

Dowel Pinning

Standard dowel pin locating holes are offered on all 400XE units to facilitate repeatable mounting of tooling or payload.



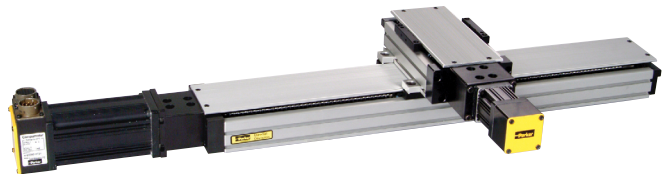
Two locating dowel pins shown in carriage

Multi-axis options are offered with P20 for the base 'X' Axis and P33-59 for the 'Y' orientation and mounting method. "Clock position" call-outs refer to the position of the motor end of the table. The multi-axis option allows the user to choose the motor orientation and mounting style.

P43 & P49 provide toe clamp mounting.

P33 & P39 offers standard pins on the carriage in addition to the toe clamps.

P53 & P59 offers uniquely pinned and toe clamp mounting to ensure the best orthogonality. This is offered for precise orthogonal mounting of the second axis in a multi-axis system. In this case, the bottom side of the table base is match drilled and reamed to the first axis to provide exact orthogonal location. This convenient option eliminates concerns regarding contamination or damage often associated with machining an assembled unit.



X-Y showing 12:00 and 9:00 positions

ORDERING INFORMATION

404XE

ORDERING INFORMATION

Fill in an order code from each of the numbered fields to create a complete model order code.

Order Example: 404 T08 XE M S – VL D4 H8 L8 C3 M4 E1 B1 R11 P1

Series

404

Table Travel (mm)

	NL Short Carriage	VL Long Carriage
T01*	25	n/a
T02**	50	n/a
T03***	100	33
T04	150	83
T05	200	133
T06	250	183
T07	300	233
T08	350	283
T09	400	333
T10	450	383
T11	500	433
T12	550	483
T13	600	533
T15	700	633

* VL carriage, D3 & D4 drives, and Limit/Home Sensor Pack option are not offered with T01 travel models.

** VL carriage, D4 drive options are not offered with T02 travel models.

*** If selecting T03 travel model with VL carriage, H1 must be chosen and options L11-L14 are not available; Consult factory if required.

Table Style

XE XE Series

Mounting

M Metric

Grade

S Standard Grade

Carriage Style

NL Short

VL Long

Drive Screw

D1 Free travel

D2 5 mm ballscrew

D3* 10 mm ballscrew

D4* 20 mm ballscrew

* D3 & D4 drives are not available with T01 travel. D4 drives are not available with T02 travels.

Home Sensor (one sensor)

H1	No home sensor
H2	N.C. current sinking, flying leads
H3	N.O. current sinking flying leads
H4	N.C. current sourcing, flying leads
H5	N.O. current sourcing, flying leads
H6	N.C. current sinking, with locking connector
H7	N.O. current sinking, with locking connector
H8	N.C. current sourcing, with locking connector
H9	N.O. current sourcing, with locking connector
H11	N.C. current sinking, sensor pack*
H12	N.O. current sinking, sensor pack*
H13	N.C. current sourcing, sensor pack*
H14	N.O. current sourcing, sensor pack*

* Must be ordered with L11-L14 sensor option.

Travel Limit Sensor Assembly (two sensors)

L1	No limit sensors
L2	N.C. current sinking, flying leads
L3	N.O. current sinking, flying leads
L4	N.C. current sourcing, flying leads
L5	N.O. current sourcing, flying leads
L6	N.C. current sinking with locking connector*
L7	N.O. current sinking with locking connector*
L8	N.C. current sourcing with locking connector*
L9	N.O. current sourcing with locking connector*
L11	N.C. current sinking, sensor pack
L12	N.O. current sinking, sensor pack
L13	N.C. current sourcing, sensor pack
L14	N.O. current sourcing, sensor pack

* Sensors with locking connector include 5 m extension cable.

Free sizing and selection support
from Virtual Engineer at
virtualengineer.com



Fill in an order code from each of the numbered fields to create a complete model order code.

Order Example: 404 T08 XE M S – VL D4 H8 L8 C3 M4 E1 B1 R11 P1

Motor Coupling

C1	No coupling (required for parallel mounting)
C2	0.25" Oldham
C3	0.25" Bellows
C4	0.375" Oldham
C5	0.375" Bellows
C6	0.43" Oldham
C7	0.43" Bellows
C10	14 mm Oldham (M75 motor option)
C11	14 mm Bellows (M75 motor option)
C22	9 mm Oldham
C23	9 mm Bellows
C24	5 mm Oldham (M37 NEMA 17)
C25	5 mm Bellows (M37 NEMA 17)
C26	8 mm Oldham (M71 NEMA motor option)
C27	8 mm Bellows (M71 NEMA motor option)
C28	0.19" Oldham (M37 NEMA 17)
C29	0.19" Bellows (M37 NEMA 17)

Motor Mount*

M1	No motor mount
M2	SM 16 In-line mounting
M3	NEMA 23 & SM 23 – In-line mounting
M4	NEMA 34 – In-line mounting
M5	SM16 – Parallel mounting, "A" location
M6	SM16 – Parallel mounting, "B" location
M7	SM16 – Parallel mounting, "C" location
M8	NEMA 23 – Parallel mounting, "A" location
M9	NEMA 23 – Parallel mounting, "B" location
M10	NEMA 23 – Parallel mounting, "C" location
M11	SM23 – Parallel mounting, "A" location
M12	SM23 – Parallel mounting, "B" location
M13	SM23 – Parallel mounting, "C" location
M21	Neometric 70 – In-line mounting
M37	NEMA 17 – In-line mounting
M42	SM232AQ-NPSN Servo motor – In-line mounting
M46	HV232-02-10 Stepper motor – In-line mounting
M49	Handcrank/no read out
M51	HDY55 – In-line mounting
M61	BE23 – In-line mounting
M62	BE23 – Parallel mounting, "A" location
M63	BE23 – Parallel mounting, "B" location
M64	BE23 – Parallel mounting, "C" location
M71	SGM01 – In-line mounting
M72	SGM01 – Parallel mounting, "A" location
M73	SGM01 – Parallel mounting, "B" location
M74	SGM01 – Parallel mounting, "C" location
M75	SGM02 – In-line mounting

* Refer to "Motor Mounting Dimensions" for maximum allowable motor shaft diameter.

Feedback Option

E1	None
E2	Linear feedback – 5 micron magnetic (not available on T01 units with H2-H9 "home" and L2-L9 "limit" sensors)
E5	Rotary shaft encoder (cannot be used with brake option)

Brake Option

B1	No brake
B2	Shaft brake (cannot be used with rotary encoder option)

Environmental Protection

R11	Hard cover
R12	Hard cover, cleanroom prep
R13	No cover
R14	No cover, cleanroom prep

Multi-Axis Selections

P1	X axis – for single axis use
P20*	X axis – for X-Y assembly (VL carriage units only) – motor @ 12:00
P33*	Y axis, standard dowel pinned & toe clamped to X axis – motor @ 3:00
P39*	Y axis, standard dowel pinned & toe clamped to X axis – motor @ 9:00
P43*	Y axis, toe clamped to X axis motor @ 3:00
P49*	Y axis, toe clamped to X axis motor @ 9:00
P53*	Y axis, precision dowel pinned & toe clamped to X axis motor @ 3:00
P59*	Y axis, precision dowel pinned & toe clamped to X axis motor @ 9:00

*Consult factory for multi-axis pinning options and quotation