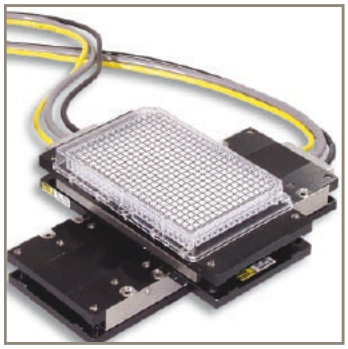
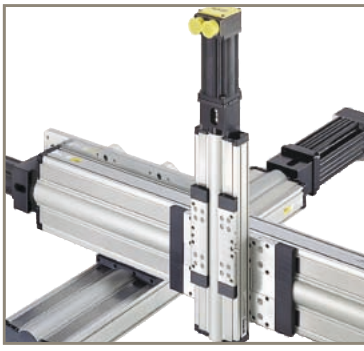


aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Precision Technology

XE Series Screw Driven Positioners



Parker

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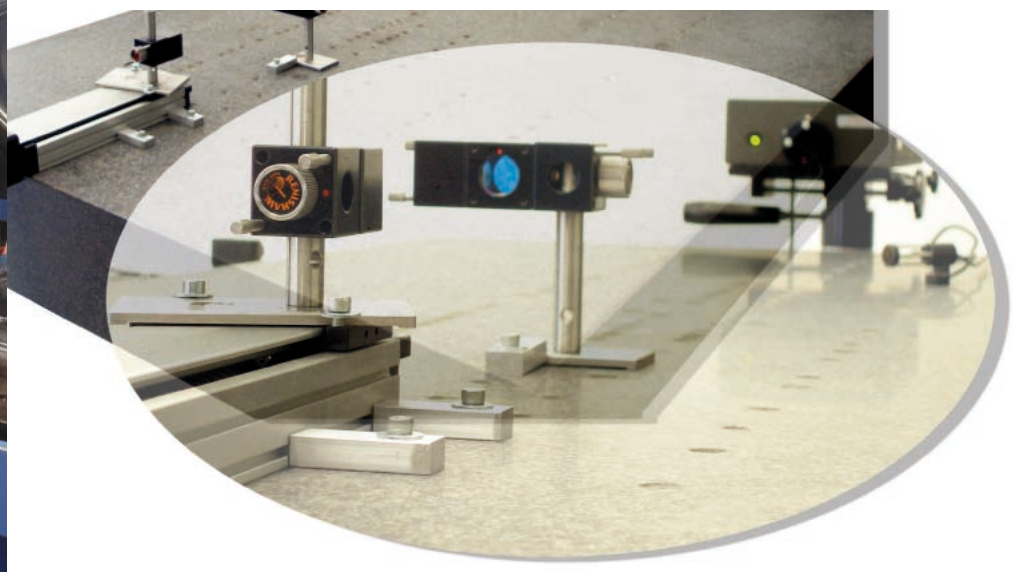
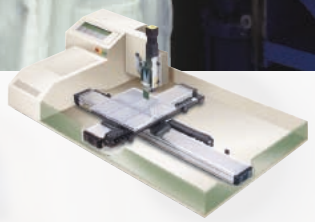
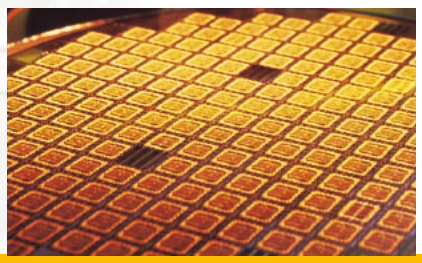




Parker Facility in Offenburg, Germany
Manufacturing and Service for Precision Components in Europe



Precision Automation

Applications and industries integrating precision motion control have requirements that exceed most motion product capabilities - levels of accuracy, repeatability, straightness, flatness and orthogonality that demand specialized product designs and manufacturing capabilities. With more than 25 years of product design and manufacturing experience in the most demanding precision motion markets, Parker is ready to provide the products and systems to serve our customers' most challenging needs.

Customization and Services

Unlike many other motion technologies, precision electromechanical applications often require custom solutions. Many solutions are complete one-of-a kind systems.

Our experienced engineers and technicians provide:

- Application advice
- Product sizing and selection, including mechanics, motors, drives and controls
- System design
- System manufacturing including testing and axis alignment
- System commissioning
- System maintenance

Parker Precision Automation customers can receive many optional services such as:

- 3D Custom assembly drawings
- Matches motor control systems
- Life-load diagrams
- Customized cabling systems

Advanced Manufacturing Capabilities

Our advanced manufacturing and assembly process allows us to build quality and consistency into every element of your motion system. Each mechanical system is fully assembled prior to shipment and each component is properly handled to protect finish and appearance. While providing advanced manufacturing capabilities, we also strive to maintain the industry's best lead times for precision motion products.

Performance and specifications are verified with state-of-the-art testing, including

- **Cleanroom-approved versions** - Parker is equipped with in house particulate testing facilties to certify materials for cleanroom ratings.
- **EMI testing** - Parker has an EMI test chamber, which allows us to test equipment to verify levels of electromagnetic interference.
- **Precision Metrology Lab** - When precision is critical to your process, you need validated, proven performance data. Parker certifies all precision-grade positioners using state-of-the-art laser interferometers, and provides reports to validate accuracy and bidirectional repeatability.

Parker Automation Technology Centers

Parker Automation Technology Centers are a network of premier product and service providers who can serve you locally for your automation needs. Each Automation Technology Center is certified to have completed significant product training and has the ability to provide subsystem solutions with local support. Parker Automation Technology Centers are located throughout Europe, and are served by our European manufacturing facility in Offenburg, Germany.

Selectable Levels of Integration

Parker's **Selectable Levels of Integration** is a philosophy of product development and management that allows the machine builder to select an appropriate system, subsystem, or component to meet a specific need. Parker has solutions for machine builders of all types, from those who want a complete integrated system to those who want to build their own system from "best of breed" components.

Systems

Machine builders and OEMs often choose to integrate a complete electromechanical system into their machine. They have confidence in knowing that our knowledge, experience, and support will ensure that their goals are met. Minimal design engineering ensures component compatibility from a single source.

Subsystems and Bundled Products

For a cost-effective and efficient solution, Parker offers bundled or kitted systems. We can combine motors, gearheads, and positioning systems to deliver a configured subsystem ready for installation. Parker configuration and setup software accommodates the rest of the product line, making start-up a snap. Combining this with our custom product modification capabilities gives the machine builder an economical custom-fit solution, with reduced engineering effort, straightforward integration, and modular compatibility.

Component Products

We offer the broadest range of linear and rotary motion products available for automation systems. If you have the capability and experience to develop your own systems, our innovative, easy-to-use products will help you get the job done. Parker provides short lead times, large selection, and proven reliability.

XE Series

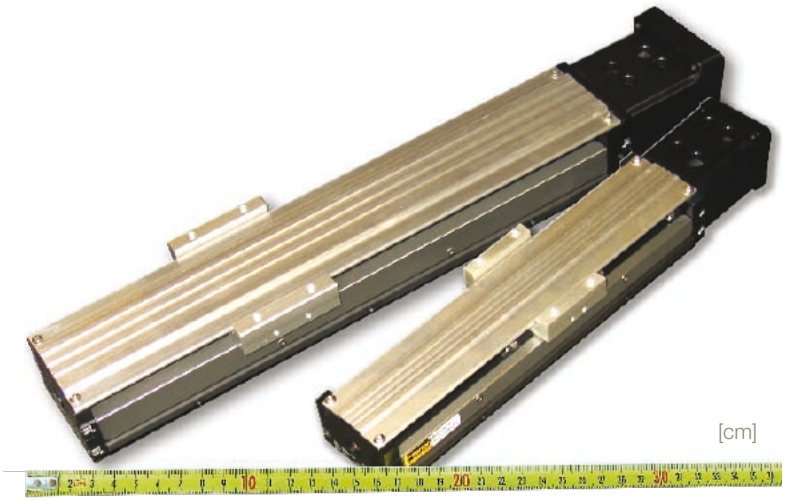
www.parker-eme.com/XE

XE Series Features

402/403XE Series Positioners

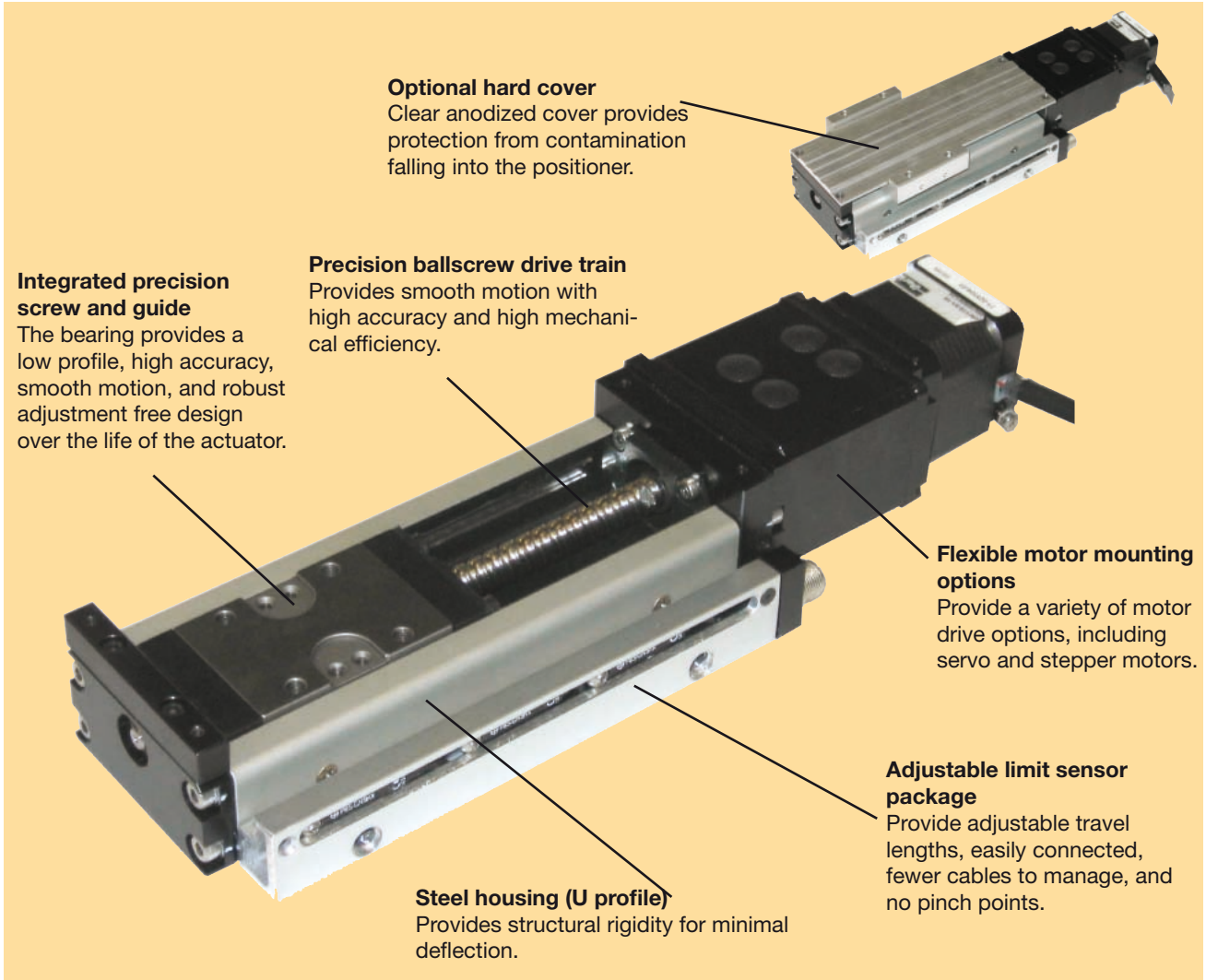
Features

- Integrated bearing
- Rigid steel body
- Significant force per dollar value
- Easily integrated into multi-axis systems
- Without adjustment
- Small package size



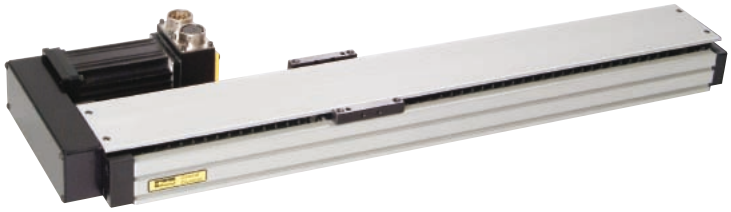
Reliable and cost effective positioning

The 402/403XE series of positioners combines a rugged steel body construction with an integrated precision ballscrew and bearing guide to produce a highly accurate, cost-effective line of positioners ideal for applications in the hard disk, semiconductor, medical, machine building and many other industries.



404XE Series positioners

(95 mm wide profile)



Features

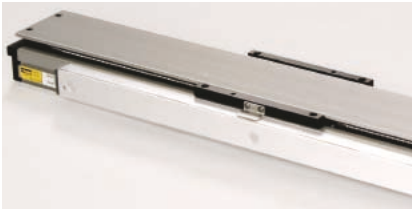
- Cost effective positioning
- 100 % duty cycle
- High strength design
- Simple creation of multi axis systems
- Locating dowel holes

Reliable and cost-efficient 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

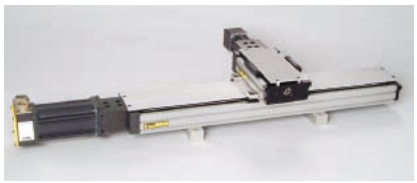
A vast assortment of „designer friendly“ features and options simplify the engineering challenges often confronted with „base model“ positioning devices. Features like precision dowel holes, linear feedback, sensor packs,



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 manage-



ment 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.

XE Series Technical Data

402/403XE Series Technical Data

www.parker-eme.com/402-403XE

Common performance specifications

Technical data	Unit	402XE		403XE	
		2 mm lead	5 mm lead	5 mm lead	10 mm lead
Repeatability	[µm]	± 5		± 5	
Flatness	[µm]	15		see below	
Straight line accuracy	[µm]	15		see below	
Breakaway torque	[Nm]	0.06		0.15	
Maximum input speed	[s^{-1}]	90		see below	
Maximum normal load	[kg]	90		160	
Maximum inverted load	[kg]	90		160	
Static permissible pitch moment	[Nm]	46		101	
Static permissible roll moment	[Nm]	134		260	
Static permissible yaw moment	[Nm]	51		120	
Torsional pitch stiffness	[arcsec/Nm]	17.7		9.2	
Torsional yaw stiffness	[arcsec/Nm]	11.8		6.1	
Torsional roll stiffness	[arcsec/Nm]	5.9		5.9	
Drive screw diameter	[mm]	8		10	
Drive screw efficiency	[%]	90		90	
Linear bearing coefficient of friction		0.01		0.01	
Running torque	[Nm]	0.05		0.10	
Maximum axial load	[kg]	13	17	31	27
Moment of inertia X of guide rail	[mm^4]	14 400		38 800	
Moment of inertia Y of guide rail	[mm^4]	137 000		314 000	
Carriage mass	[kg]	0.26		0.3	
Maximum acceleration	[m/s^2]	19.62		19.62	
Allowable duty cycle	[%]	100		100	

402XE Specifications

Technical data	Unit	T01 70 mm	T02 120 mm	T03 170 mm	T04 220 mm
402XE with 2 mm lead					
Accuracy	[µm]	70	75	85	90
Input inertia	[$10^{-6}kgm^2$]	0.615	0.772	0.929	1.09
Weight of total table	[kg]	1.19	1.40	1.60	1.81
402XE with 5 mm lead					
Accuracy	[µm]	70	75	85	90
Input inertia	[$10^{-6}kgm^2$]	0.741	0.898	1.06	1.21
Weight of total table	[kg]	1.19	1.40	1.60	1.81

403XE Specifications

Technical data	Unit	T01 55 mm	T02 105 mm	T03 205 mm	T04 305 mm	T05 405 mm	T06 505 mm	T07 605 mm	T08 655 mm
403XE with 5 mm lead									
Accuracy	[µm]	70	80	90	95	100	110	120	n/a
Flatness	[µm]	15	15	15	15	25	25	25	n/a
Straight line accuracy	[µm]	15	15	15	15	25	25	25	n/a
Maximum input speed	[s^{-1}]	80	80	80	80	80	80	60	n/a
Input inertia	[$10^{-6}kgm^2$]	1.72	2.10	2.87	3.63	4.40	5.17	5.93	n/a
Weight of total table	[kg]	1.85	2.25	2.85	3.55	4.25	4.85	5.55	n/a
403XE with 10 mm lead									
Accuracy	[µm]	70	80	90	95	100	110	120	130
Maximum input speed	[s^{-1}]	80	80	80	80	80	80	60	42
Input inertia	[$10^{-6}kgm^2$]	2.50	2.88	3.65	4.42	5.18	5.95	6.7	7.10
Weight of total table	[kg]	1.85	2.25	2.85	3.55	4.25	4.85	5.55	5.85

404XE Series Technical Data

www.parker-eme.com/404XE

Common performance specifications

	Unit	404XE
Bidirectional repeatability T01 to T11 models T12 to T15 models	[µm]	 ±20 ±30
Duty cycle	[%]	100
Max acceleration(1)	[m/s^2]	20
Normal force(2) NL (short carriage) VL (long carriage)	[N]	 601 1202
Axial force(2) 5 mm lead 10 mm lead 20 mm lead	[N]	 588 686 686
Drive screw efficiency	[%]	90
Max. breakaway torque	[Nm]	0.25
Max running torque (rated @ 2 s^{-1})	[Nm]	0.21
Linear bearing – coefficient of friction		0.01
Ballscrew diameter 5 & 10 mm lead 20 mm lead	[mm]	 16 15
Carriage mass NL (short carriage) VL (long carriage)	[kg]	 0.215 0.495

(1) Applies to units with VL carriage.
(2) Refer to life/load charts.

Travel dependent characteristics

Code	Travel		Positional accuracy (3) (4)	Input inertia NL carriage units			Input inertia VL carriage units			Max. screw speed	Max. speed			Total weight of axis	
	[mm]		[µm]	[10^{-5}kgm^2]			[10^{-5}kgm^2]			[s^{-1}]	[m/s]			[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	0.81	–	–	–	–	–	72	0.36	0.73	1.50	1.42	1.70
T02	50	–	50	0.94	0.98	–	–	–	–	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) Positioning accuracies refer only to direct motor mounting configurations, position specifications are based on conditions without load and do apply only to individual axes.
(4) Consult factory for specs with linear feedback.

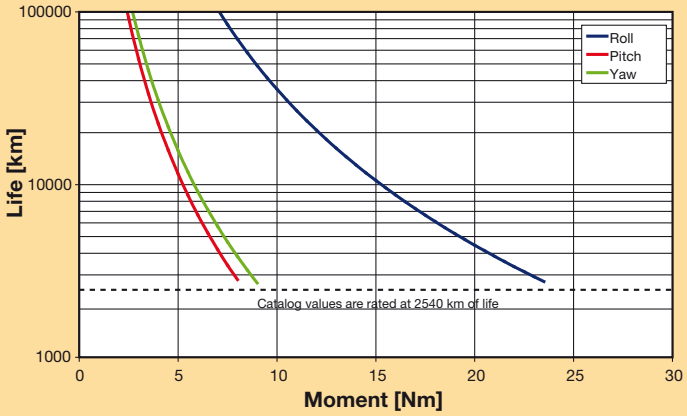
XE Series Life / Load Diagrams

402/403XE Life-Load Performance

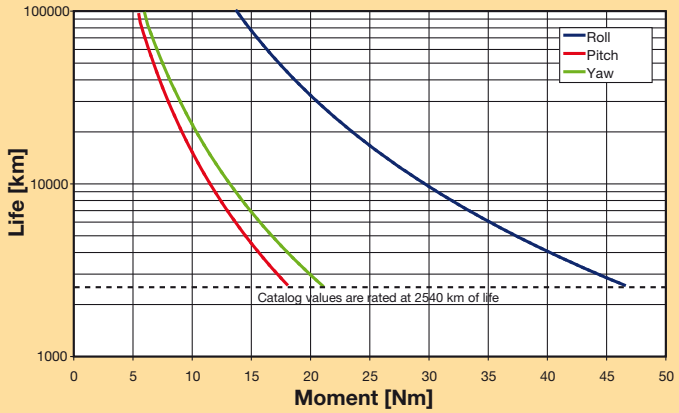
The following performance information is provided as a supplement to the product specification pages. The useful life of a linear table at full catalog specifications is dependent on the forces acting upon it. These forces include both static components resulting from payload weight and dynamic components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

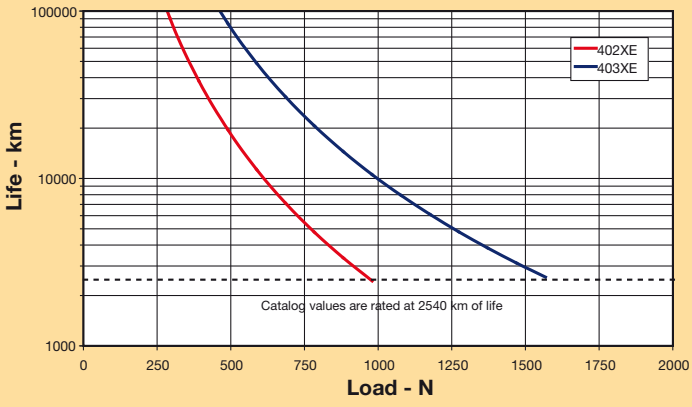
402XE Carriage Life with Moment

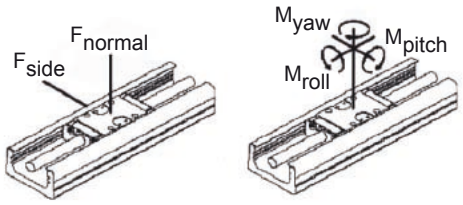


403XE Carriage Life with Moment

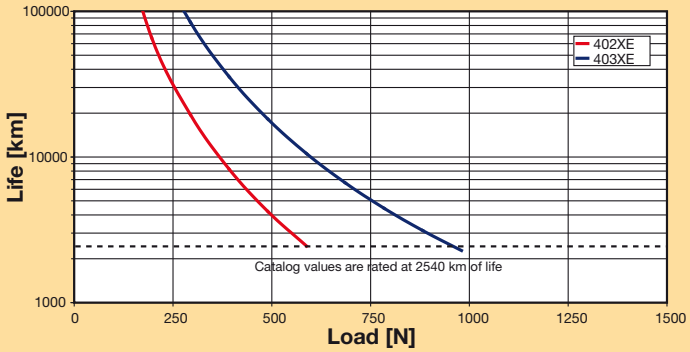


402/403XE Carriage Life with Normal or Inverted Load

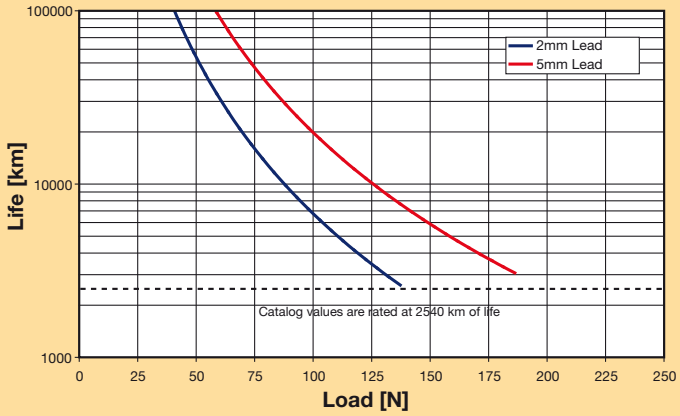




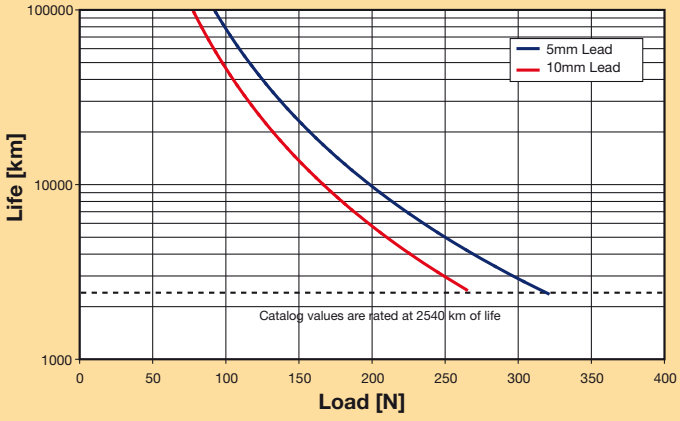
402/403XE Carriage Life with Side Load



402XE Ballscrew Life with Axial Load



403XE Ballscrew Life with Axial Load



404XE Life-Load 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 and formulas are used to establish the table life relative to the applied loads.

Catalog load specifications are rated for 2540 km of travel.

Table Life/Axial Force
This graph illustrates table ballscrew life relative to the axial force.

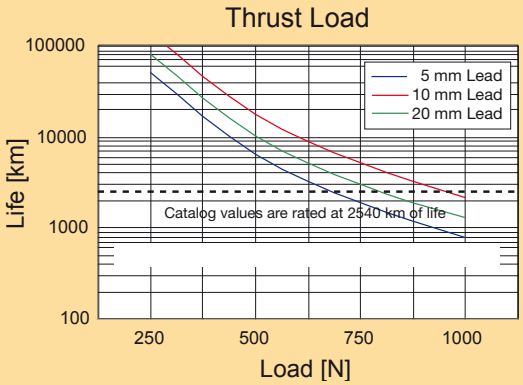


Table Life/Load Chart
Pitch moment - NL (short carriage)
This graph illustrates table linear bearing life as a result of pitch moment.

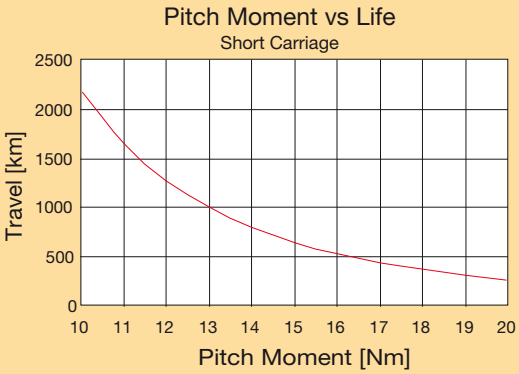
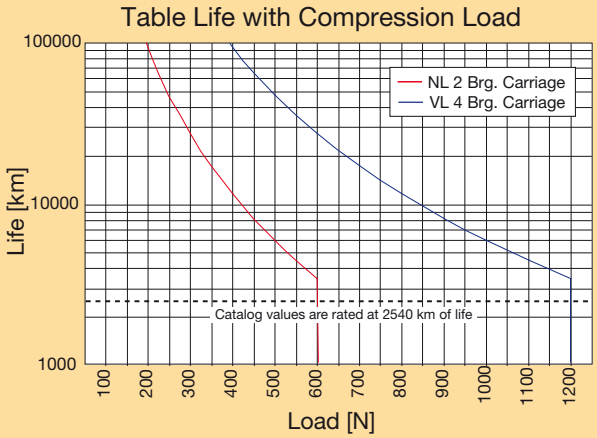


Table Life/Load at compression (normal force)
This graph provides evaluation of the support bearing life/load characteristics. The curves show the life/load relationship when the applied load is centered on the carriage, normal (perpendicular) to the carriage mounting surface
For final evaluation of life vs 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.

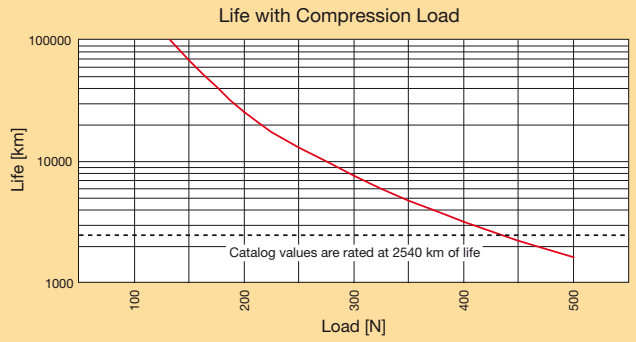


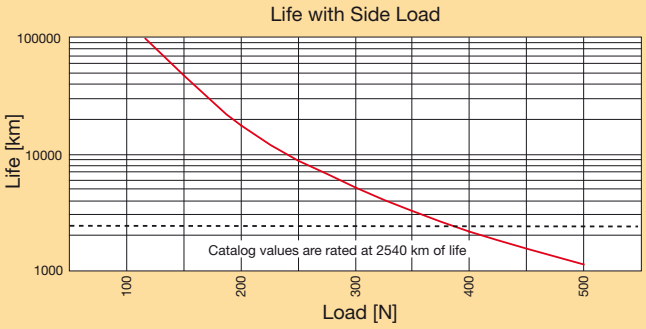
Bearing Life/Load for VL long carriage units
These charts are to be used to evaluate the VL Carrige units. They should be used in conjunction with the corresponding formulas found in the product manual at www.parker-eme.com/xe to establish the life/load for each bearing (4 per table).

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
	[mm]		
404XE	80	57	28





XE Series Options

402/403XE Series

The 402/403XE series offers complete flexibility, from motor-mounting options to cleanroom compatibility. Whether the application calls for a hardcover protection for the linear guide, custom motors mounted at the factory, or a matching limit sensor package, the 402/403XE can be customized to fit the task at hand.

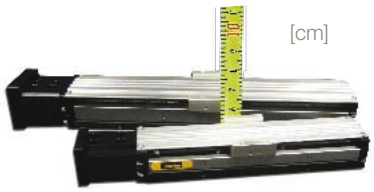
Motor mounting flexibility

With standard options for the NEMA 17, NEMA 16, NEMA 23, and other Parker Automation motors, the

402/403XE allows the user to select the motor of their choice without being restricted to one model. To further customize the application solution, the 402/403XE can be ordered ready to mount onto most other manufacturers' motors as well.

Low-profile design

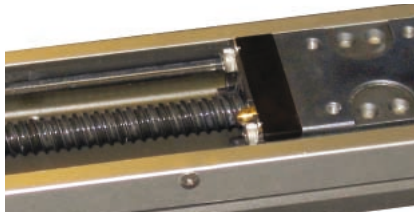
The highly integrated ballscrew and guide bearing design allows for a greatly reduced overall height when compared to traditional stacking of



a bearing and screw assembly. This results in a more compact footprint.

Rigidity

With the steel U channel body and integrated bearing design, the structural rigidity of the 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.

Hard cover

For added protection to the bearing system and drive train, an optional hardcover is available. This will bring the 402/403XE to an IP20 rating and

prevent large particles from entering and damaging the screw or bearings.

Cleanroom & Raydent coatings

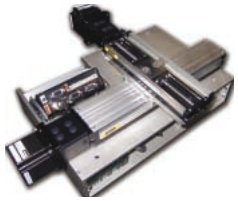
Cleanroom ratings are possible with the XE product. The actual cleanroom rating will be dependent upon such variables as the location of the sniffer device, the velocity of the table, etc. Consult the factory for specific cleanroom-capability details or test results.

Riser plates

Most of the motors used with the 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.

402/403XE Demo units

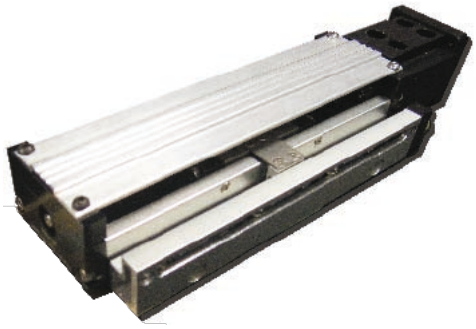
Order 803-0346 for a multi-axis demo unit to learn the product and display for shows and presentations. The demo will come in a watertight pelican carrying case and will be ready

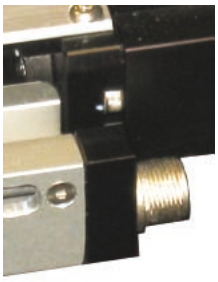


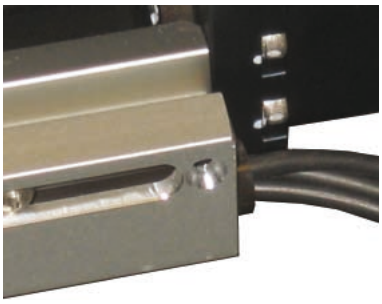
for demonstration programmed from the factory.

Limit sensor pack

Two different sensor packs are available. A complete sensor pack which is especially suited for multi-axis systems combining the individual sensor cables in a single connector. Therefore, only one connection cable is required.
Or a simplified sensor pack with a 3 m connection cable with flying leads on the individual sensors.
To further accommodate each application's unique needs, the sensors can be specified as NPN, PNP, normally open, or normally closed varieties. With the unmatched design, the sensor pack on the 402/403XE 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 402XE and 403XE is a Hall effect sensor tripped by a magnet located in a housing attached to the carriage. On the switch body is an LED to indicate activation. Normally open sensors are typically used for home 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 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.

402/403XE Wiring code

Power (+)	brown
Output signal	black
Ground (-)	blue

402/403XE Sensor pack wiring code

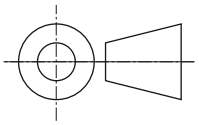
Power (+)	red
Limit sensor 1(1) Output signal	blue
Limit sensor 2(1) Output signal	orange
Home Output signal	green
Ground (-)	blue
Shield (connect to earth ground)	green / yellow

(1) Limit 1 is the switch farthest from the connector on the sensor pack housing; Limit 2 is the switch closest to the connector.

402/403XE Home/limit sensor specifications

	Unit	Option H2 or L2	Option H3 or L3	Option H4 or L4	Option H5 or L5	Option H11 or L11	Option H12 or L12	Option H13 or L13	Option H14 or L14
Switch type		N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.
Logic		NPN	NPN	PNP	PNP	NPN	NPN	PNP	PNP
Operating voltage	[VDC]	10-30							
Voltage drop (max.)	[VDC]	2.5							
Continuous current	[mA]	100							
Repeatability (max.)	[µm]	100							
Reverse polarity protection		Ja							
Short-circuit protection		Ja							
Power-up pulse suppression		Ja							
Enclosure rating		IP67							
Operating Temperature	[°C]	-25 thru +75							
Cable length	[m]	3.0 m from switch				3.0 m from end of sensor pack			

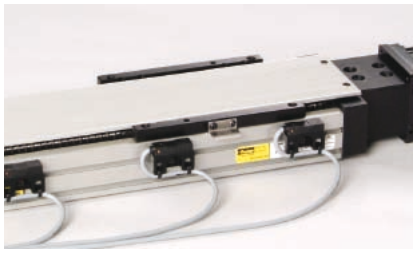
Dimensions [mm]



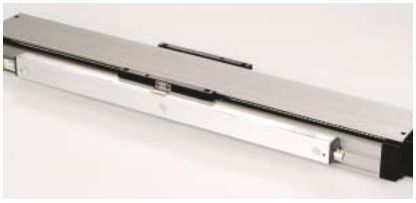
Home or limit sensor

End of Travel and Home Sensors for the 404XR 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 a sensor pack. A 5 m high-flex extension cable (Part No. 003-2918-01) is available for use with models having the locking connector option.

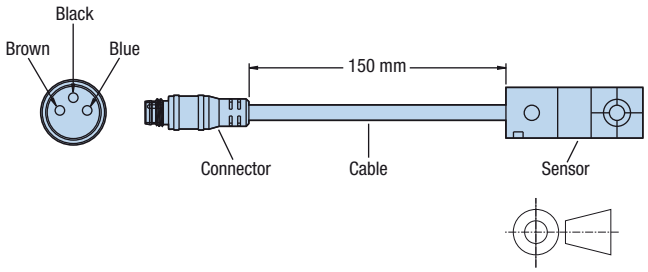
- NPN (Sinking) or PNP (Sourcing)
- Normally closed contact (N.C.) or normally open contact (N.O.)
- Flying Leads or Locking Connector



With limit and home sensors



With limit and home sensor pack



Input voltage	5-30 VDC, 20 mA
Output	100 mA max.
Wire color code	Input power: (+) brown (-) blue N.O. output: black N.C. output: white

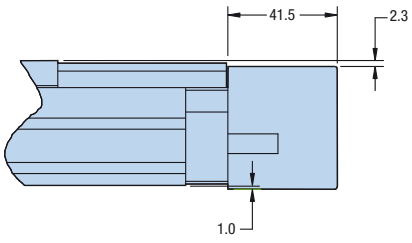
Order code	Part No.* (Includes mounting bracket)	Switch type	Logic	Cable length	Connection option
H2 or L2	006-1639-01	N.C.	NPN	2.0 m	Flying leads
H3 or L3	006-1639-02	N.O.	NPN	2.0 m	
H4 or L4	006-1639-03	N.C.	PNP	2.0 m	
H5 or L5	006-1639-04	N.O.	PNP	2.0 m	
H6 or L6	006-1639-09	N.C.	NPN	150 mm	Locking connector
H7 or L7	006-1639-08	N.O.	NPN	150 mm	
H8 or L8	006-1639-11		PNP	150 mm	
H9 or L9	006-1639-10		PNP	150 mm	

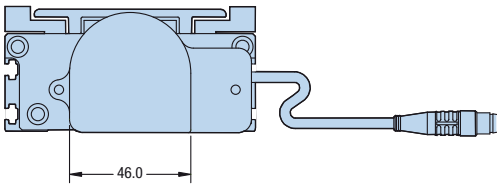
*Sensor triggers (targets) ordered separately.

Brake assembly

An electromagnetic brake assembly prevents backdriving in vertical applications. It is furnished with a 5 m connection cable.

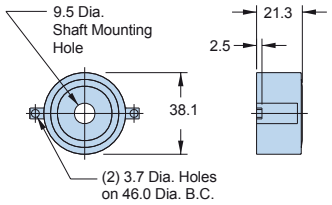
Table series	Part No.	Power input	Holding torque
404XE	006-1627-01	24 VDC, 0.46 A	2.0 Nm





Rotary encoder

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

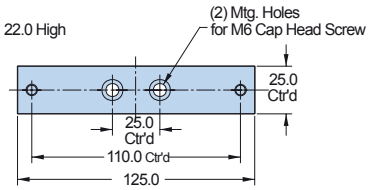


Part number 06-1629-01

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

Riser plate

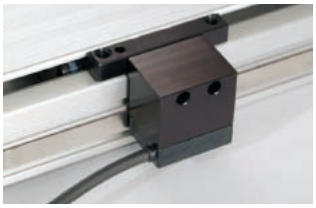
Used to raise the table base to provide clearance for motors larger than NEMA 23 frame size.



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

Linear feedback

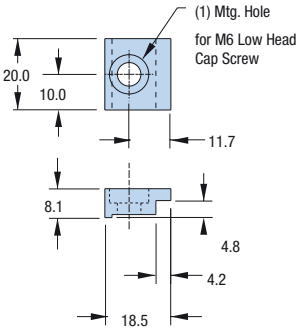
A magnetic linear position feedback device which mounts directly to the table carriage. (factory installation required).



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

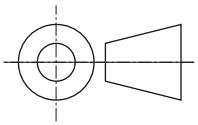
Toe clamps

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



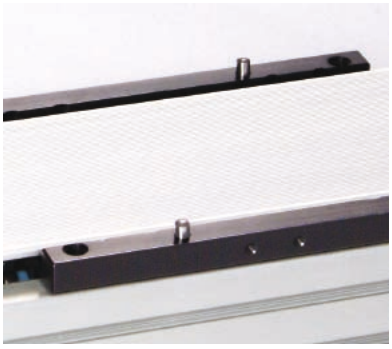
Part Number 002-3618-01

Dimensions [mm]



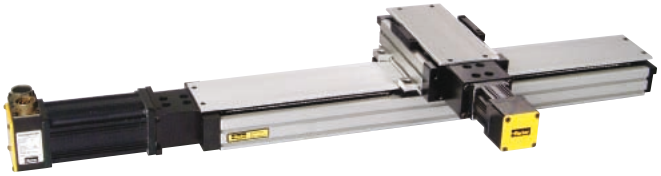
Dowel pinning

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



Two locating dowel pins shown in carriage

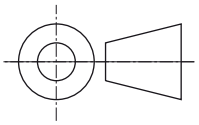
Multi-axis options are offered with P20 option for the base 'X' Axis and P33-59 for the 'Y' orientation for different mounting methods. Information on the "profile orientation" refer to the position of the motor side at the axis end. The multi-axis option allows the user to choose the motor orientation and mounting style.
P43 & P49 offer 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 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

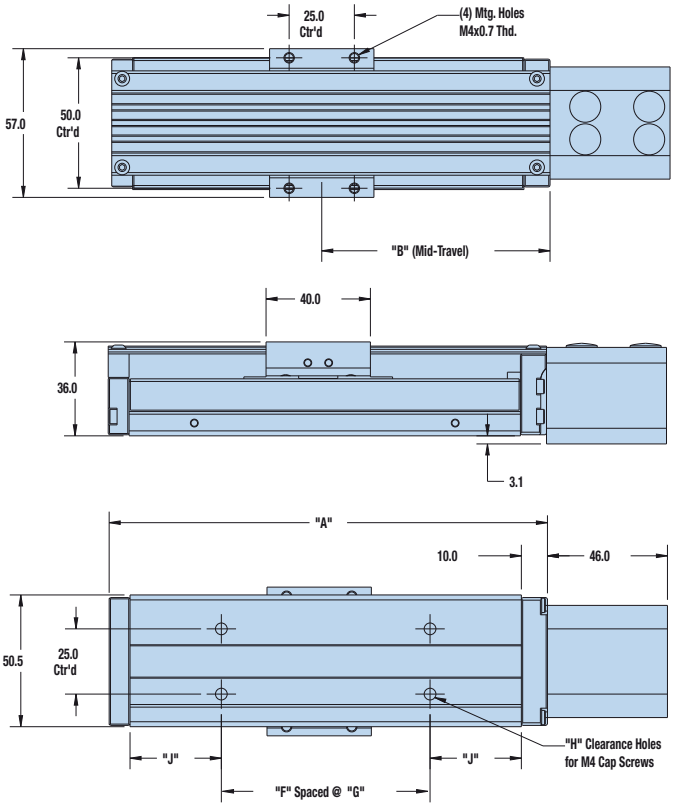
XE Series Dimensions

Dimensions [mm]



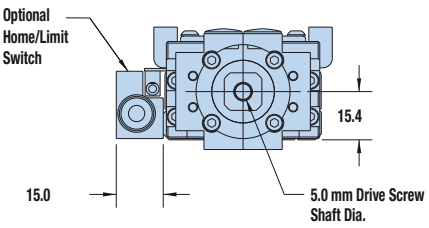
402XE Dimensions

402XE with hardcover

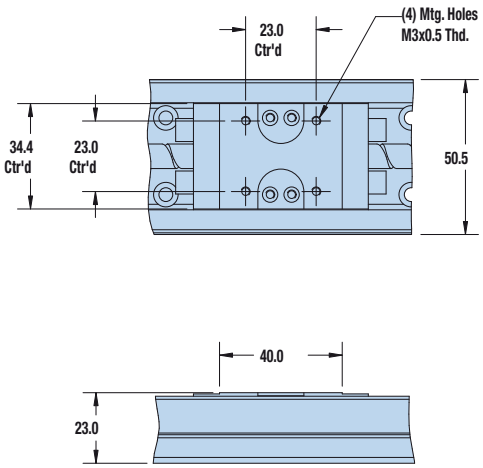


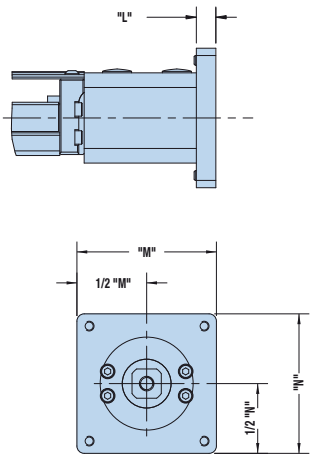
Order No.	Travel	A	B	F*	G	H	J
	[mm]						
T01	70	168.0	87.5	1	80.0	4	35.0
T02	120	218.0	112.5	2	160.0	6	20.0
T03	170	268.0	137.5	2	160.0	6	45.0
T04	220	318.0	162.5	3	240.0	8	30.0

* F = Number of spaces



402XE without hardcover

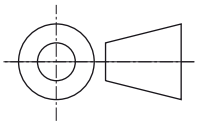




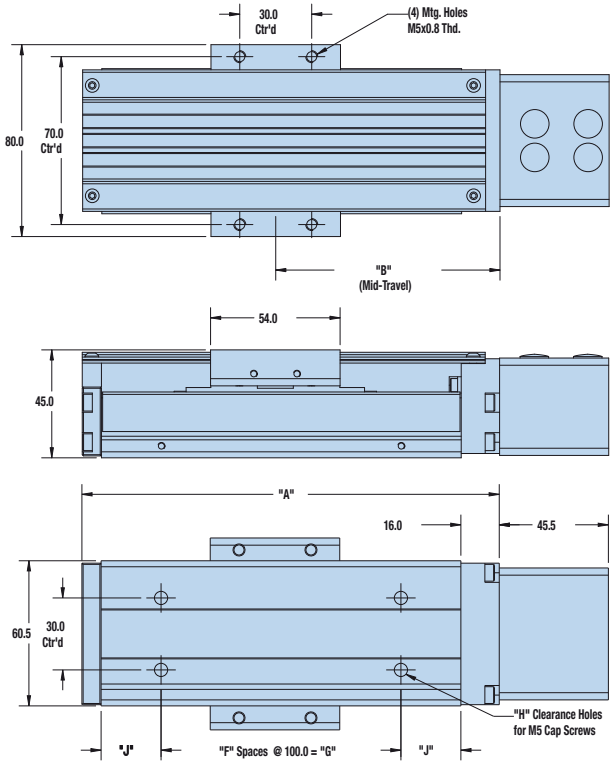
Motor flange Order No.	Flange / motor size	L	M	N
		[mm]		
M2	SM16/BE16	8.0	40.6	40.6
M3	NEMA 23/SM23	8.0	57.2	57.2
M37	NEMA 17	8.0	43.0	37.0
M61	BE23	15.0	57.2	57.2

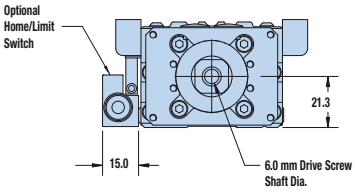
403XE Dimensions

Dimensions [mm]



403XE with hardcover

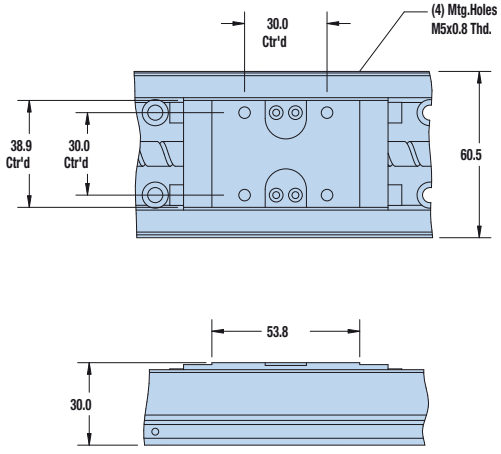


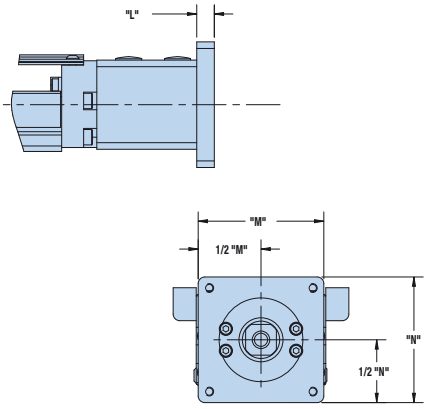


Order No.	Travel	A	B	F*	G	H	J
	[mm]						
T01	55	174.0	93.5	1	100.0	4	25.0
T02	105	224.0	118.5	1	100.0	4	50.0
T03	205	324.0	168.5	2	200.0	6	50.0
T04	305	424.0	218.5	3	300.0	8	50.0
T05	405	524.0	268.5	4	400.0	10	50.0
T06	505	624.0	318.5	5	500.0	12	50.0
T07	605	724.0	368.5	6	600.0	14	50.0
T08	655	774.0	383.5	7	700.0	16	25.0

* F = Number of spaces

403XE without hardcover

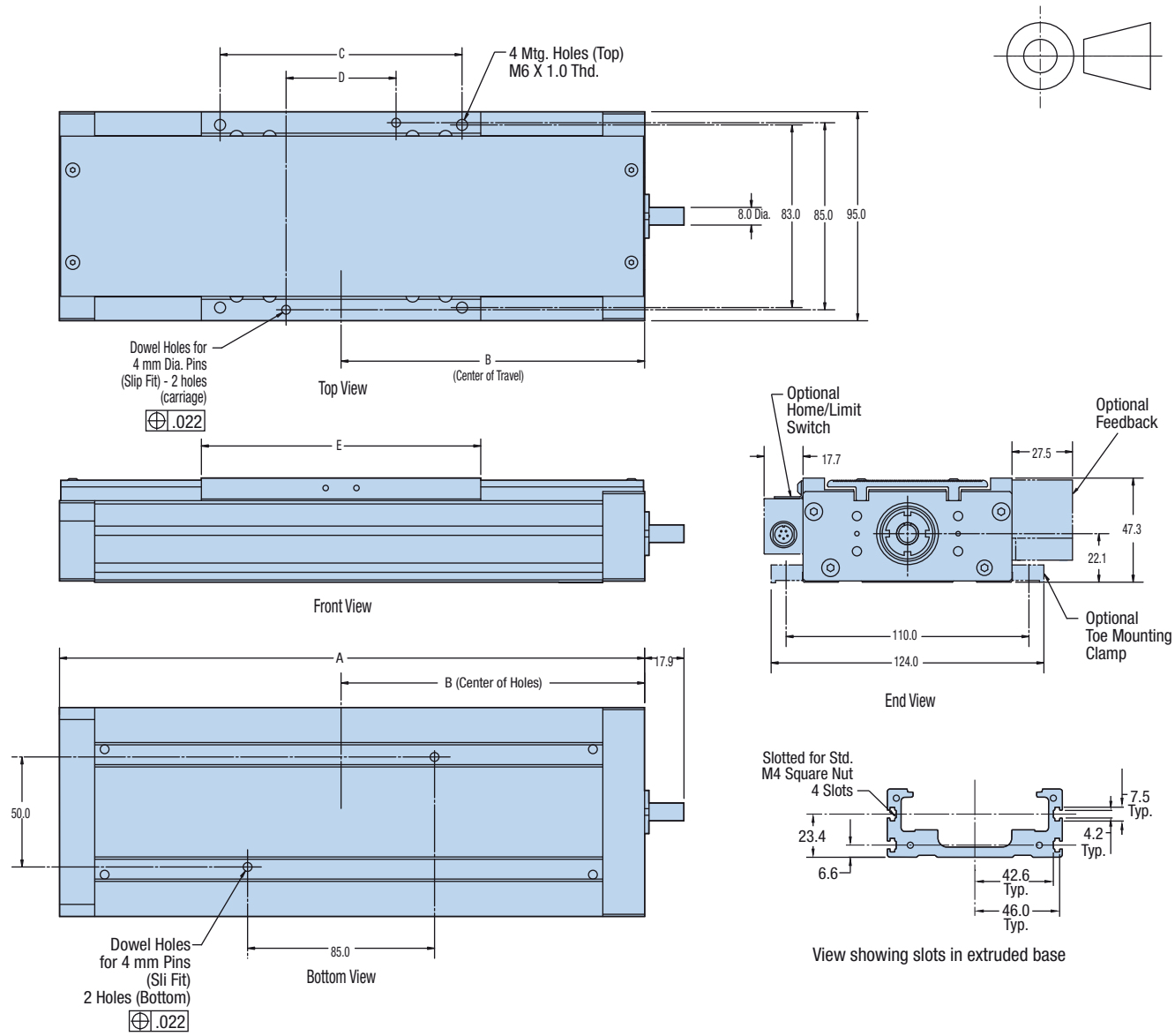




Motor flange Order No.	Flange / motor size	L	M	N
		[mm]		
M2	SM16/BE16	8.0	40.6	40.6
M3	NEMA 23/SM23	8.0	57.2	57.2
M37	NEMA 17	8.0	55.0	37.0
M61	BE23	15.0	57.2	57.2

404XR Dimensions

Dimensions [mm]



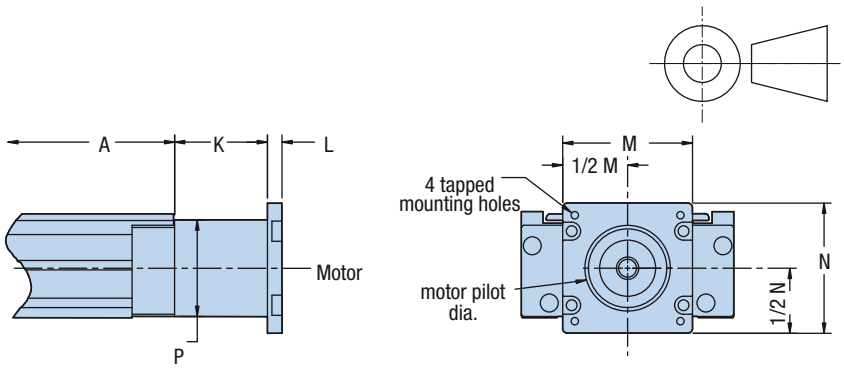
Order No.	Dimensions [mm]			
	Carriage travel			
	NL (short)	VL (long)	A	B
T01	25	–	141.0	75.5
T02	50	–	166.0	88.0
T03	100	33	216.0	113.0
T04	150	83	266.0	138.0
T05	200	133	316.0	163.0
T06	250	183	366.0	188.0
T07	300	233	416.0	213.0
T08	350	283	466.0	238.0
T09	400	333	516.0	263.0
T10	450	383	566.0	288.0
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

	C	D	E
	[mm]		
NL	50.0	36.0	60.0
VL	110.0	50.0	127.0

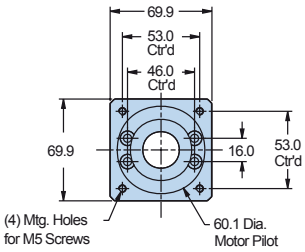
404XE Series Motor Mounting Dimensions

Dimensions [mm]

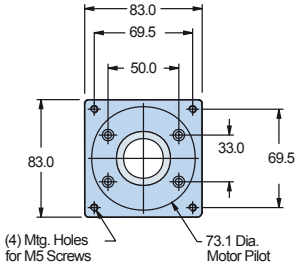
In-line motor mount
In-line motor mounting allows the motor to be mounted directly to the drive screw via the selected motor coupling.
Adaptor plates for additional motors on request.



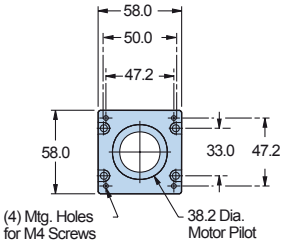
Motor flange Order No.	Flange / motor size	Dimensions [mm]					
		Max. Motor shaft Ø	K	L	M	N	P
M51	SMH60B8/9	9.0	44.5	0.0	58.0	55.0	55.0
M21	SMH60B5/11/ Neometric70	11.0	53.0	0.0	69.9	69.9	69.9
M4	NEMA 34	9.5	41.0	12.5	83.0	83.0	45.0
M3	NEMA 23	9.5	41.0	6.5	58.0	58.0	45.0



SMH60B5

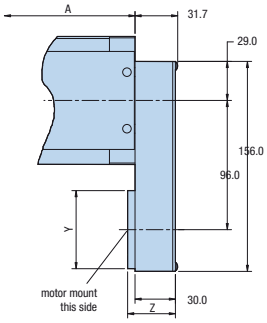


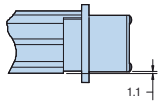
NEMA 34

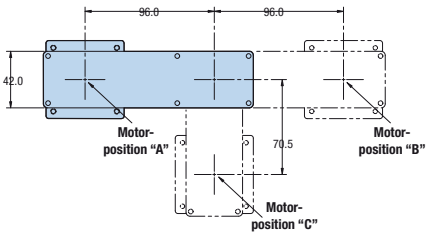


NEMA 23

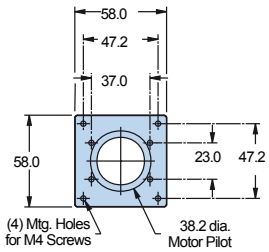
Parallel motor mounting







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).



NEMA 23

Motor flange Order No.			Flange / motor size	Dimensions [mm]		
Pos. A	Pos. B	Pos. C		Motor shaft Ø	Y	Z
M52	M53	M54	SMH60B8/9	9.0	55.0	37.0
M8	M9	M10	NEMA 23	6.3	58.0	35.5

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

XE Series Ordering Informations

402XE Ordering Information

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

	1	2	3	4	5	6	7	8	9	10	11
Order example	**402**	**T03**	**XE**	**S**	**D9**	**H4**	**L5**	**M2**	**C3**	**R11**	**P1**

1 Series

402 50 mm profile width

2 Travel – mm

T01* 70
T02 120
T03 170
T04 220

* Limited to H1L2, H1L3, H1L4, H1L5, H1L1, or H2L1, H3L1, H4L1, or H5L1 home and limit options

3 Family

XE XE series

4 Grade

S Standard grade

5 Drive screw

D2 5 mm
D9 2 mm

6 Home sensor

H1 None
H2 N.C. sinking, flying leads
H3 N.O. sinking, flying leads
H4 N.C. sourcing, flying leads
H5 N.O. sourcing, flying leads
H11* N.C. sinking, sensor pack
H12* N.O. sinking, sensor pack
H13* N.C. sourcing, sensor pack
H14* N.O. sourcing, sensor pack

* Must be ordered with L11, L12, L13, or L14 limit option

7 Limit sensors

L1 None
L2 N.C. sinking, flying leads
L3 N.O. sinking, flying leads
L4 N.C. sourcing, flying leads
L5 N.O. sourcing, flying leads
L11 N.C. sinking, sensor pack
L12 N.O. sinking, sensor pack
L13 N.C. sourcing, sensor pack
L14 N.O. sourcing, sensor pack

8 Motor mount

M1 None - Motor block coupling housing only
M2 Motor block with flange kit for SM16
M3 Motor block with flange kit for NEMA 23
M37 Motor block with flange kit for NEMA 17
M61 Motor block with flange kit for BE23

9 Motor coupling

C1 None
C2 6.3 mm Oldham
C3 6.3 mm Bellows
C4 9.5 mm Oldham
C5 9.5 mm Bellows
C24 5 mm Oldham
C25 5 mm Bellows

10 Environmental options

R11 Hard cover
R12* Hard cover, cleanroom preparation
R13 No cover
R14* No cover, cleanroom preparation

* Cleanroom class rating should be checked for each application due to variation of compatibility at different speeds.

11 Orthogonality options

P1 X axis – for single axis use
P20* X axis for X-Y assembly motor @ 12:00
P43* Y axis for X-Y assembly motor @ 3:00
P49* Y axis for X-Y assembly motor @ 9:00

* Pinning orthogonality 120 arcsec additional mounting brackets required. Contact factory for details.

403XE Ordering Information

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

	1	2	3	4	5	6	7	8	9	10	11
Order example	**403**	**T04**	**XE**	**S**	**D2**	**H3**	**L2**	**M2**	**C3**	**R13**	**P1**

1 Series

403 60 mm profile width

2 Travel – mm

T01* 55
T02* 105
T03 205
T04 305
T05 405
T06 505
T07 605
T08** 655

* Limited to H1L2, H1L3, H1L4, H1L5, H1L1, or H2L1, H3L1, H4L1, or H5L1 home and limit options
** Only available with D3 drive option

3 Family

XE XE series

4 Grade

S Standard grade

5 Drive screw

D2 5 mm
D3 10 mm

6 Home sensor

H1 None
H2 N.C. sinking, flying leads
H3 N.O. sinking, flying leads
H4 N.C. sourcing, flying leads
H5 N.O. sourcing, flying leads
H11* N.C. sinking, sensor pack
H12* N.O. sinking, sensor pack
H13* N.C. sourcing, sensor pack
H14* N.O. sourcing, sensor pack

* Must be ordered with L11, L12, L13, or L14 limit option

7 Limit sensor

L1 None
L2 N.C. sinking, flying leads
L3 N.O. sinking, flying leads
L4 N.C. sourcing, flying leads
L5 N.O. sourcing, flying leads
L11 N.C. sinking, sensor pack
L12 N.O. sinking, sensor pack
L13 N.C. sourcing, sensor pack
L14 N.O. sourcing, sensor pack

8 Motor mount

M1 None - Motor block coupling housing only
M2 Motor block with flange kit for SM16
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M37 Motor block with flange kit for NEMA 17
M61 Motor block with flange kit for BE23

9 Motor coupling

C1 None
C2 6.3 mm Oldham
C3 6.3 mm Bellows
C4 9.5 mm Oldham
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10 Environmental options

R11 Hard cover
R12* Hard cover, cleanroom preparation
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R14* No cover, cleanroom preparation

* Cleanroom class rating should be checked for each application due to variation of compatibility at different speeds.

11 Orthogonality options

P1 X axis – for single axis use
P20* X axis for X-Y assembly motor @ 12:00
P43* Y axis for X-Y assembly motor @ 3:00
P49* Y axis for X-Y assembly motor @ 9:00

* Pinning orthogonality 120 arcsec additional mounting brackets required. Contact factory for details.

404XE Ordering Information

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

	1	2	3	4	5		6	7	8	9	10	11	12	13	14	15
Order example	**404**	**T08**	**XE**	**M**	**S**	**-**	**VL**	**D4**	**H8**	**L8**	**C3**	**M4**	**E1**	**B1**	**R11**	**P1**

1 Series

404 60 mm profile width

2 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.

3 Family

XE XE series

4 Mounting

M Metric

5 Grade

S Standard grade

6 Carriage style

NL short

VL long

7 Drive screw

D1 None - free travel/idler

D2 5 mm ballscrew

D3* 10 mm ballscrew

D4* 20 mm ballscrew

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

8 Home sensor (one sensor)

H1 None

H2 N.C. sinking, flying leads

H3 N.O. sinking, flying leads

H4 N.C. sourcing, flying leads

H5 N.O. sourcing, flying leads

H6 N.C. sinking, locking connector

H7 N.O. sinking, locking connector

H8 N.C. sourcing, locking connector

H9 N.O. sourcing, locking connector

H11 N.C. sinking, sensor pack*

H12 N.O. sinking, sensor pack*

H13 N.C. sourcing, sensor pack*

H14 N.O. sourcing, sensor pack*

* Must be ordered with L11-L14 sensor option.

9 Limit sensor assembly (two sensors)

L1 None

L2 N.C. sinking, flying leads

L3 N.O. sinking, flying leads

L4 N.C. sourcing, flying leads

L5 N.O. sourcing, flying leads

L6 N.C. sinking, locking connector*

L7 N.O. sinking, locking connector*

L8 N.C. sourcing, locking connector*

L9 N.O. sourcing, locking connector*

L11 N.C. sinking, sensor pack

L12 N.O. sinking, sensor pack

L13 N.C. sourcing, sensor pack

L14 N.O. sourcing, sensor pack

* Sensors with locking connector include 5 m extension cable.

10 Motor coupling

C1 None
C2 6.3 mm Oldham
C3 6.3 mm Bellows
C4 9.5 mm Oldham
C5 9.5 mm Bellows
C6 11 mm Oldham
C7 11 mm Bellows
C10 14 mm Oldham
C11 14 mm Bellows
C22 9 mm Oldham
C23 9 mm Bellows

11 Motor adapter options

M1 None

In-line motor mount

M51 prepared for SMH60B8/9
M21 prepared for SMH60B5/11 / Neometric70
M4 prepared for NEMA 34
M3 prepared for NEMA 23

Parallel position A

M52 prepared for SMH60B8/9
M8 prepared for NEMA 23

Parallel position B

M53 prepared for SMH60B8/9
M9 prepared for NEMA 23

Parallel position C

M54 prepared for SMH60B8/9
M10 prepared for NEMA 23

12 Feedback option

E1 None
E2 Linear feedback – 5 µm 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)

13 Brake option

B1 None
B2 Shaft brake
(cannot be used in conjunction with rotary encoder option)

14 Environmental protection

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

15 Multi-axis systems

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

WARNING — USER RESPONSIBILITY

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Ed. 2010-06-29

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192-540011N5 July 2010

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