

Features

- Velocity to 4.5 m/sec
- Acceleration to 5 Gs
- Encoder resolution to 0.1 micron
- Cleanroom compatible
- Easy multi-axis mounting
- Cable management system
- Proven strip seal



Performance Matched Components

The 400LXR Series linear servo motor tables achieve optimum performance by combining slotless or ironcore motor technology with performance matched mechanical elements and feedback devices. Fast response, high acceleration, smooth translation, high velocity, and quick settling time describe the performance characteristics found in the 400LXR while high repeatability, precise accuracy, and sub-micron resolution define the positioning attributes.

Sized to fit



The 400LXR Tables are offered in three widths (100, 150, and 300 mm), and travel lengths up to 3 meters to accommodate the size and performance requirements of many industries

including life sciences, photonics, semiconductor and general automation.

“Designer Friendly” Features and Options

A vast assortment of “designer friendly” features and options simplify the engineering challenges often confronted with “base model” positioning devices. Features like the IP30 protective strip seal and long life cable management system, exemplify the built-in value found in the 400LXR units. Other selectable enhancements like cleanroom compatibility, travel limit sensors, motor drives, encoder resolution, and pinning holes for tooling location, simplify machine design and integration efforts.



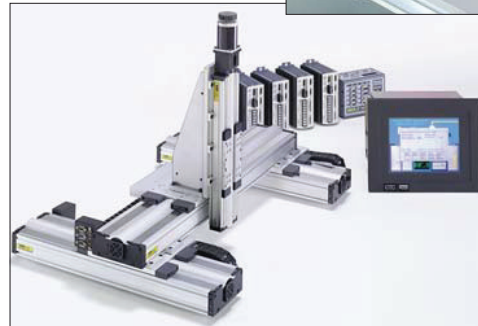
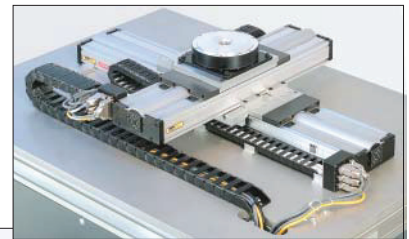
Flexibility and Multi-Axis Compatibility

The 400LXR’s selection flexibility and mounting compatibility with the 400XR ballscrew driven tables enables single axis or complex multi-axis units to be configured in a straightforward manner. Parker’s matching servo drives and motion controllers can be included to complete the motion system.



Customs and Systems

For specialized applications requiring customization, Parker design engineers can easily modify these tables to suit, or engineer complete interactive linear motion systems to desired specifications. Parker’s 400LXR series tables have taken the mystery, difficulty and cost out of integrating linear motor tables into high throughput precision positioning applications.





Specifications

Model Motor	404LXR 8 Pole	406LXR 8 Pole	406LXR 12 Pole	412LXR 12 Pole	412LXR 24 Pole (no cooling)
Rated Load kg (lb)	45(99)	180(396)	180(396)	950(2090)	1148(2526)
Maximum Acceleration	5 Gs				
Maximum Velocity (m/sec.)					
Encoder Resolution: 0.1 μm	0.3	0.3	0.3	0.3	0.3 [0.3]*
0.5 μm	1.5	1.5	1.5	1.5	1.5 [1.5]*
1.0 μm	3.0	3.0	3.0	3.0	2.0 [3.0]*
5.0 μm	3.0	3.0	3.0	3.0	2.0 [4.5]*
Sine Output	3.0	3.0	3.0	3.0	2.0 [4.5]*
Positional Repeatability					
Encoder Resolution: 0.1 μm	+ 1.0 μm				
0.5 μm	+ 1.0 μm				
1.0 μm	+ 2.0 μm				
5.0 μm	+10.0 μm				
Sine Output	(interpolation dependent)				
Peak Force N (lb)	180 (40)	225 (50)	330 (75)	1000 (225)	2650 (595)
Continuous Force N (lb)	50 (11)	75 (17)	110 (25)	355 (80)	750 (169)
Carriage Mass (kg)	1.4	3.2	4.1	12.3	23



* Bracketed velocity values [] apply to 675VDC bus (480 VAC drive input).

Travel Dependent Specifications

Travel (mm)	Accuracy* (μm)			Unit Weight (Kg)				
	Positional		Straightness & Flatness Accuracy* (μm)	404LXR 8 Pole	406LXR 8 Pole	406LXR 12 Pole	412LXR 12 Pole	412LXR 24 Pole
	0.1,0.5,1.0 resolution (μm)	5.0 resolution (μm)						
50	6	16	6	4.4	8.7	11.1	-	-
100	7	17	6	4.8	-	-	-	-
150	8	18	9	5.2	10.3	13.4	41	-
200	10	20	10	5.6	-	-	-	49
250	12	22	12	6.0	12.6	14.1	45	-
300	14	24	13	6.4	-	-	-	-
350	16	26	15	6.8	13.3	15.7	49	-
400	18	28	16	7.2	-	-	-	-
450	20	30	18	-	14.8	17.2	-	-
500	21	31	19	8.0	-	-	-	61
550	23	33	21	-	16.4	18.7	-	-
600	25	35	22	8.9	-	-	-	-
650	26	36	24	-	17.9	20.2	61	67
700	28	38	25	9.7	-	-	-	-
750	29	39	27	-	19.4	21.8	-	-
800	31	41	29	10.6	-	-	67	-
850	32	43	30	-	20.9	23.3	-	75
900	33	44	32	11.5	-	-	-	-
950	34	44	33	-	22.5	-	-	-
1000	35	45	35	12.4	-	27.1	75	-
1050	37	47	36	-	-	-	-	83
1200	39	49	41	-	26.3	-	83	-
1350	42	52	45	-	-	30.9	-	95
1450	43	53	48	-	30.1	-	-	-
1500	44	54	50	-	-	-	95	-
1600	45	55	53	-	-	34.7	-	105
1700	46	56	56	-	33.9	-	-	-
1750	46	56	57	-	-	-	105	-
1850	47	57	60	-	-	38.6	-	113
1950	48	58	63	-	37.7	-	-	-
2000	48	58	65	-	-	-	113	-
2350	49	59	76	-	-	-	-	133
2500	50	60	80	-	-	-	133	-
2850	50	60	84	-	-	-	-	153
3000	50	60	84	-	-	-	153	-

* Accuracy stated is at 20 degrees C, utilizing slope correction factor provided

Encoder Specifications

Description	Specification
Input Power	5 VDC +/- 5% 150 mA
Output (Incremental)	Square wave differential line driver (EIA RS422) 2 channels A and B in quadrature (90) phase shift.
Reference (Z channel)	Synchronized pulse, duration equal to one resolution bit. Repeatability of position is unidirectional moving toward positive direction.

Limit and Home Sensor Specifications

Description	Specification
Input Power	+5 to +24 VDC 60 mA (20 mA per sensor)
Output	Output form is selectable with product: Normally Closed Current Sinking Normally Open Current Sinking Normally Closed Current Sourcing Normally Open Current Sourcing All types Sink or Source maximum of 50 mA
Repeatability	Limits: +/- 10 microns (unidirectional) Home: See Z channel specifications

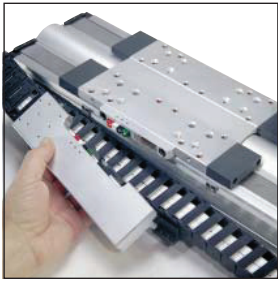
Hall Effect Specifications

Description	Specification
Input Power	+5 to +24 VDC, 30 mA
Output	Open Collector, Current Sinking, 20 mA Max

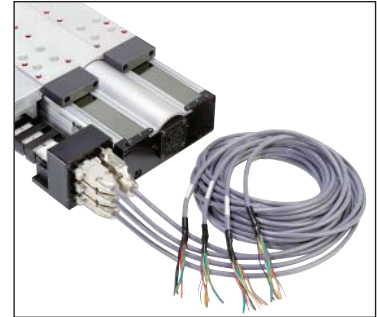
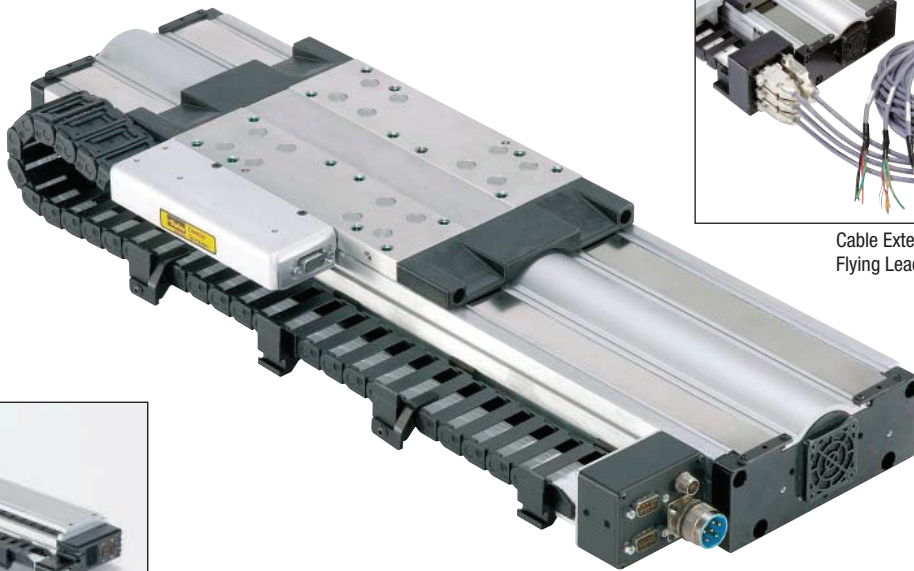
Cable Transport Module

The LXR’s Cable Transport Module offers the convenience of “plug and play” connectivity for fast, easy table installation and “quick change” replacement. This system of cable management includes the highest quality high-flex ribbon cable with a life rating of 30 million cycles, a cable track with support brackets, a “quick change” carriage cartridge, and a plug-in connector panel housing. It also provides a “pass-through” connection and cabling for customer application. This transport module option is ideal for high throughput continuous duty requirements where downtime is not acceptable.

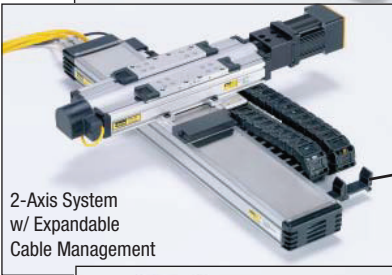
The high-flex ribbon cable permits a cable track bend radius that is small enough to clear payloads of large dimension. The cable transport can be ordered with a variety of extension cable options. These cables provide extensions from the connector panel on the cable transport module, to the motor drive amplifier and controller. The cables are high-flex, long life cables so they can be utilized on a second or third axis unit.



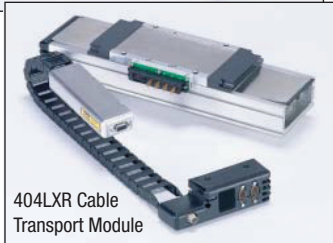
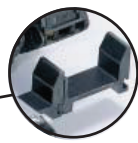
“Quick Change” Cartridge



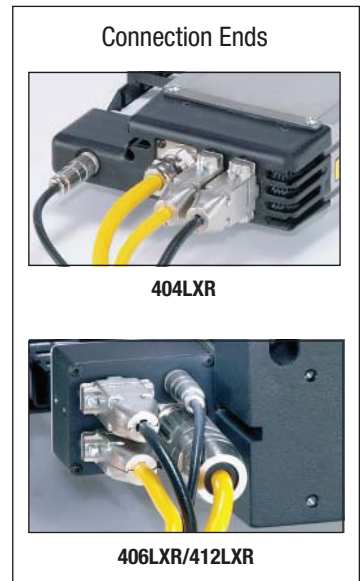
Cable Extensions – Flying Leads Terminations



2-Axis System w/ Expandable Cable Management



404LXR Cable Transport Module



Connection Ends

404LXR

406LXR/412LXR

Cable Transport Module – Order Code

Order Code	Extension Cable Length	Extension Cable Termination
CM02	No Extension Cables	
CM07	3.0 meters	flying leads
CM08	7.5 meters	flying leads
CM09	3.0 meters	Gemini Conn.
CM10	7.5 meters	Gemini Conn.
CM13	3.0 meters	Aries/Vix Conn.
CM14	7.5 meters	Aries/Vix Conn.
CM22*	3.0 meters	Compax Conn.
CM23*	7.5 meters	Compax Conn.

* 24 Pole motor models only



OEM Cable System

The LXR's unharnessed cable system is offered for OEMs and others who have independent methods of routing and managing cables. These systems offer the “quick change” cartridge, “pass-through” connection and round high-flex cables in lengths of 3.0 or 7.5 meters. They are available with flying lead end terminations, Gemini, Aries, or Compax3 Connectors.



OEM Cable System – Order Code

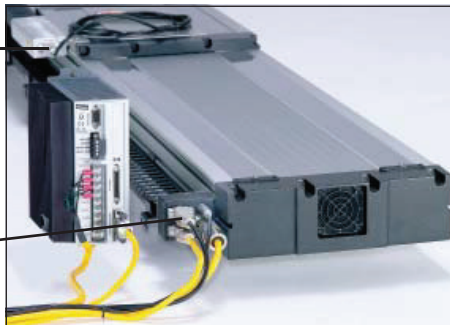
Order Code	Extension Cable Length	Extension Cable Termination
CM03	3.0 meters	flying leads
CM04	7.5 meters	flying leads
CM05	3.0 meters	Gemini Conn.
CM06	7.5 meters	Gemini Conn.
CM11	3.0 meters	Aries/Vix Conn.
CM12	7.5 meters	Aries/Vix Conn.
CM20*	3.0 meters	Compax Conn.
CM21*	7.5 meters	Compax Conn.

* 24 Pole motor models only



406LXR with OEM cables and flying leads

User “Pass-Through” Cabling Feature



- Pre-wired plug-in connection to the moving payload
- Nine user conductors for end-effectors or instruments
- High-Flex long life cables:
Ribbon Cable – Transport Module System
Round Cable – OEM System

Cable concerns regarding routing and durability for payload or instrument signals are addressed by the pass-through connectivity feature included with both of the LXR cable management systems. Nine pin D-connectors provided on the carriage (with the transport module units) and the cable connecting block combine with high-flex, long life cables for easy setup and dependable performance.

Note: Extension Cables are available and can be ordered separately:
006-1743-01 (3 meters); 006-1743-02 (7.5 meters).

400LXR Cleanroom Preparation R2



400LXR with cleanroom class 10 modification

Cleanroom compatible linear tables are often required for laboratory and production applications in industries such as semiconductor, life science, electronics, and pharmaceuticals.

400LXR tables with cleanroom preparation, were tested in Parker's vertical laminar flow work station, which utilizes ULPA filters to produce an environment having a cleanliness of class 1 prior to testing. Tables were tested in a variety of orientations with sampling both below the table and at the carriage mounting surface. Laminar flow rate is 0.65 inches W.C.

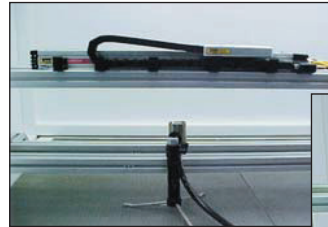
Special cleanroom testing can be provided upon request. For more information on cleanroom testing, contact a Parker Applications Engineer at 800-245-6903.

Standard Cleanroom Preparation

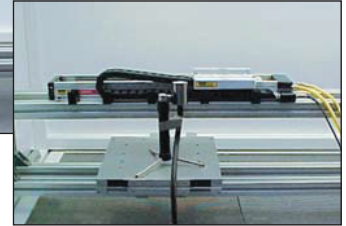
- Stringent cleaning and handling measures
- Cleanroom rated lubrication
- Strip seal replaced with hard shell cover

400LXR Cleanroom Compatibility

Table Velocity	Class	
	4.5" below table	At carriage surface
250	mm/sec	10 1
500	mm/sec	25 1
1000	mm/sec	50 5
2000	mm/sec	250 25
3000	mm/sec	500 100



Testing at 4.5 inches below table



Testing at carriage mounting surface

About Cleanrooms

A room in which the concentration of airborne particles is controlled within defined limits. Federal Standard 209E statistically defines the allowable number of particles per cubic foot of air.

The chart (right) describes the conditions that must be maintained for the cleanroom to have a specific "class" rating.

Class	Number of Allowable Particles				
	0.1	0.2	0.3	0.5	5
	(Measured particle size in microns [µm])				
1	35	7.5	3	1	0
10	350	75	30	10	0
100	n/a	750	300	100	0
1000	n/a	n/a	n/a	1000	7
10000	n/a	n/a	n/a	10000	70
100000	n/a	n/a	n/a	100000	700

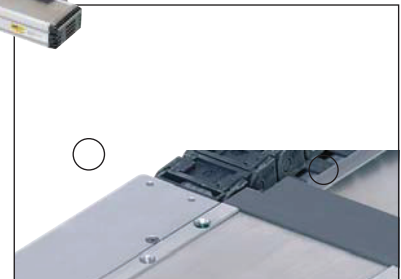
Dowel Pinning P_

Standard dowel pin locating holes P1 are offered on all 400LXR units to facilitate repeatable mounting of tooling or payload.

In addition, pinning options P2 & P3 are 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 for locating pins in an assembled unit.

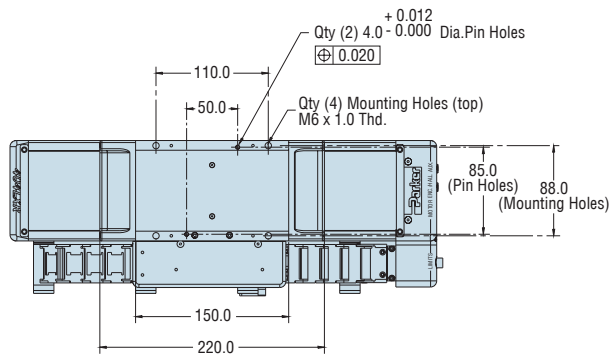


Two locating dowel holes (P1 option) shown in 404LXR carriage

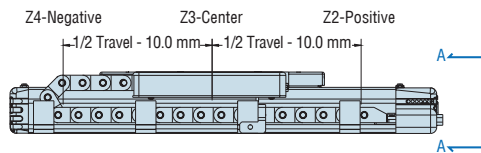




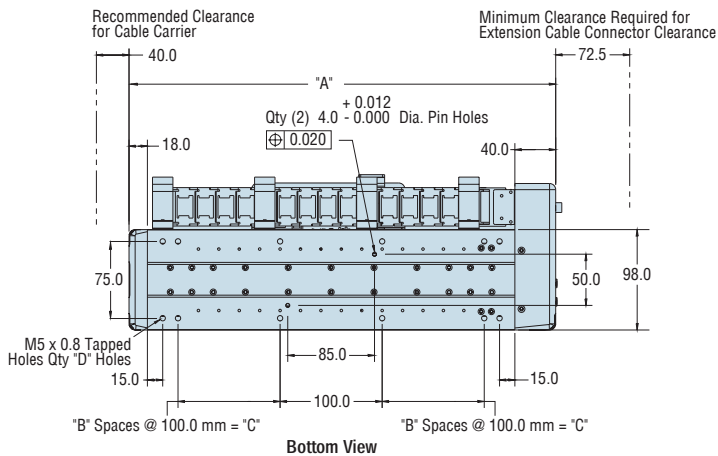
404LXR Series Dimensions (mm)



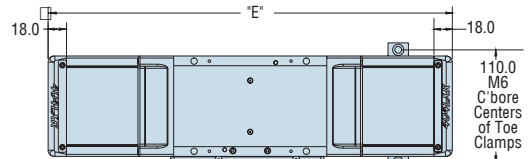
**Top View
(With Cable Transport Module)**



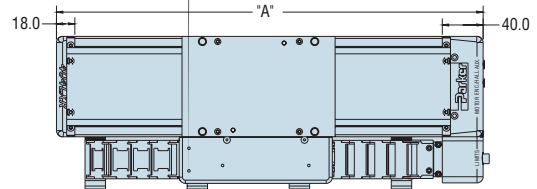
**Front View
Z-Channel Location**



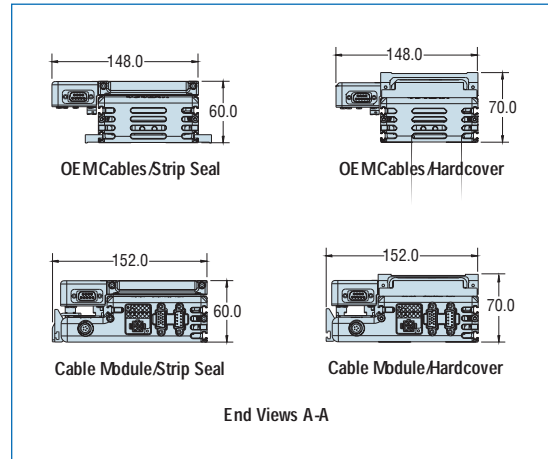
Bottom View



OEM Cables (Strip Seal/Hardcover)



Cable Module (Strip Seal/Hardcover)

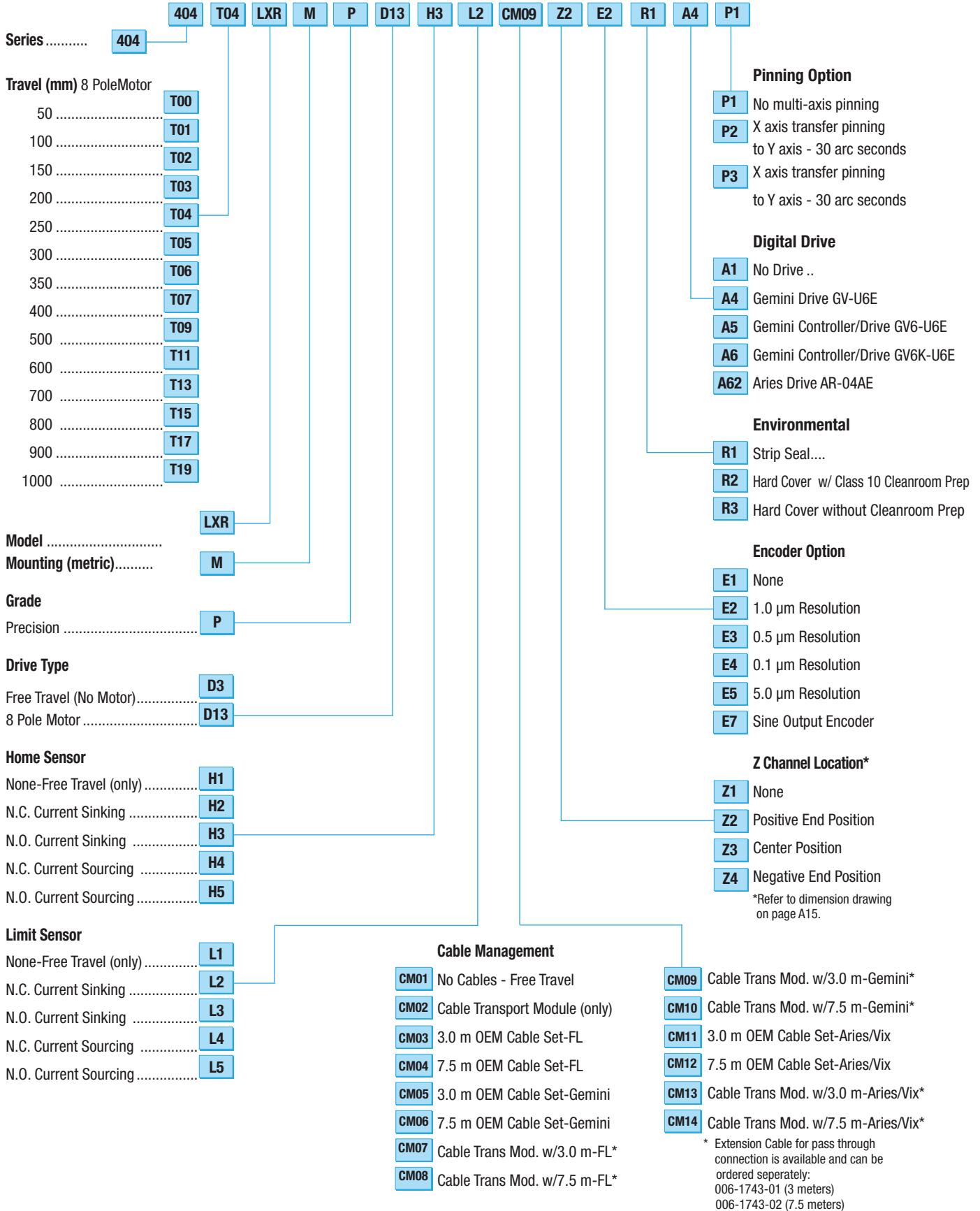


End Views A-A



Model	Travel (mm)	Dim A	B	C	D	E
404T00LXR	50	368.0	1	100.0	12	346.0
404T01LXR	100	418.0	1	100.0	12	396.0
404T02LXR	150	468.0	1	100.0	12	446.0
404T03LXR	200	518.0	1	100.0	12	496.0
404T04LXR	250	568.0	1	100.0	12	546.0
404T05LXR	300	618.0	2	200.0	16	596.0
404T06LXR	350	668.0	2	200.0	16	646.0
404T07LXR	400	718.0	2	200.0	16	696.0
404T09LXR	500	818.0	3	300.0	20	796.0
404T11LXR	600	918.0	3	300.0	20	896.0
404T13LXR	700	1018.0	4	400.0	24	996.0
404T15LXR	800	1118.0	4	400.0	24	1096.0
404T17LXR	900	1218.0	5	500.0	28	1196.0
404T19LXR	1000	1318.0	5	500.0	28	1296.0

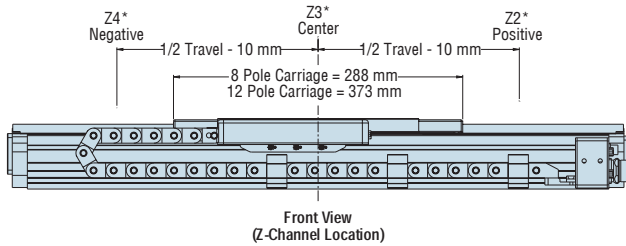
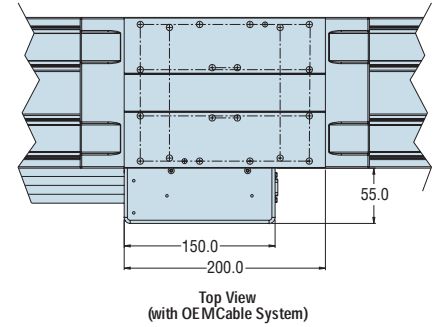
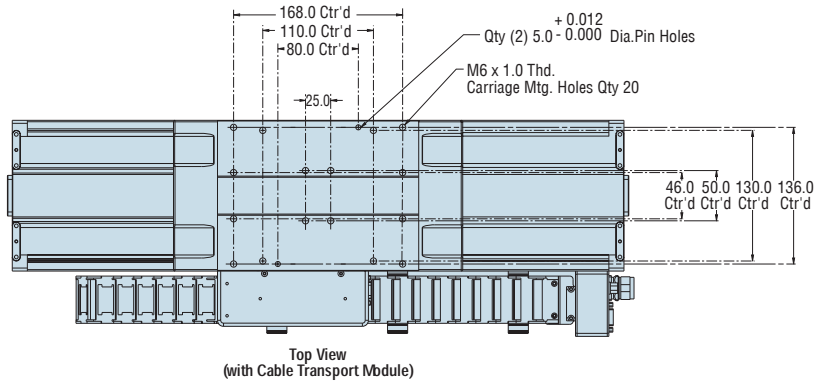
Order Example



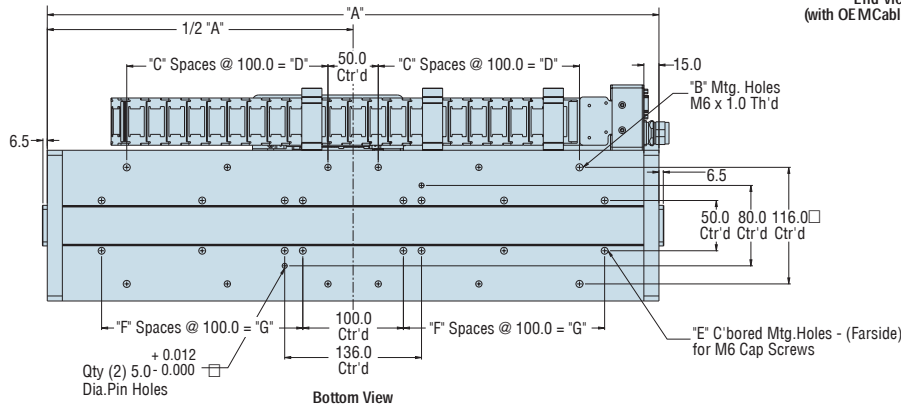
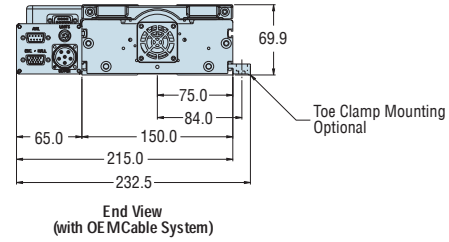


406LXR Series Dimensions (mm)

12 Pole Slotless Motor

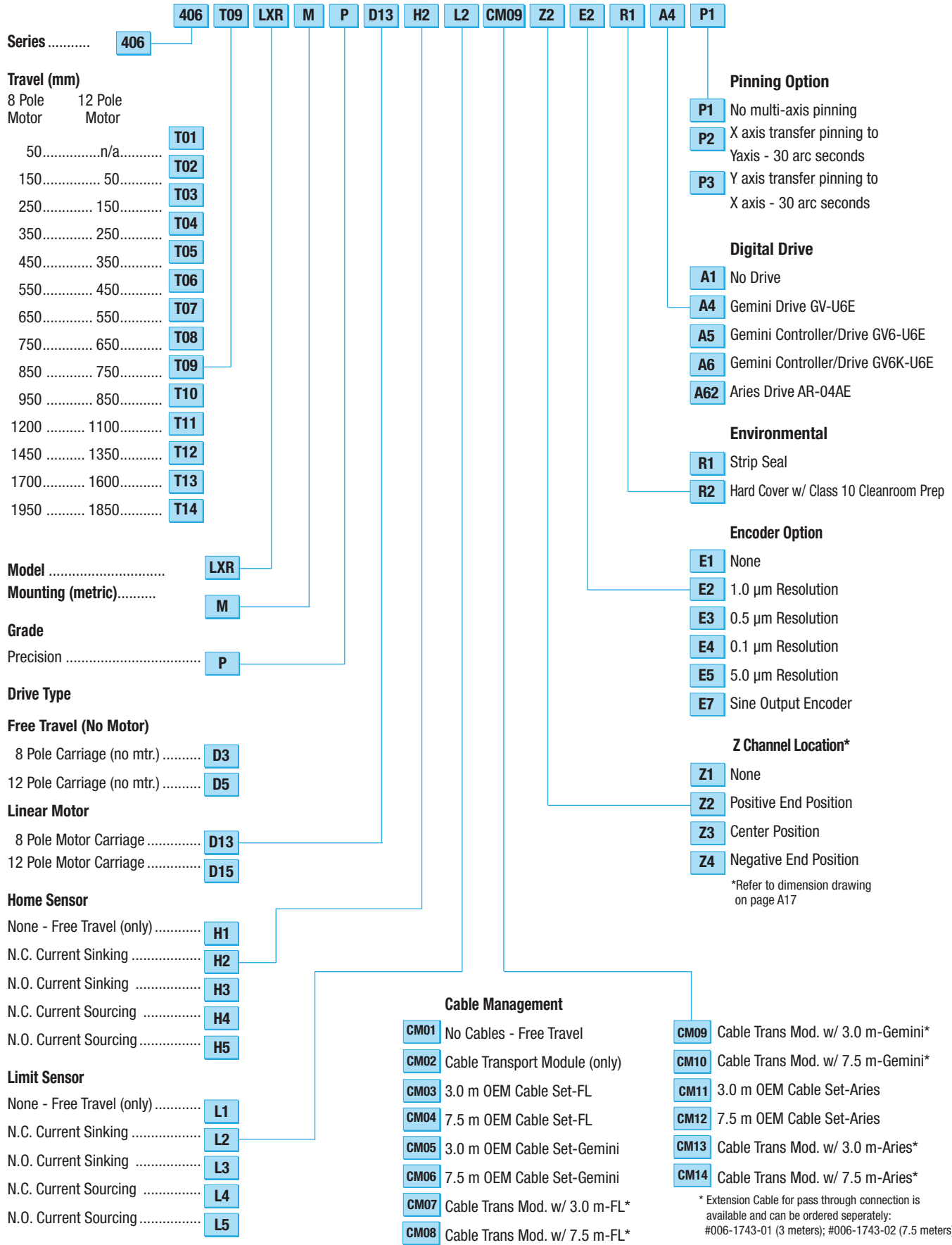


*Z2, Z3, Z4 shows Carriage Center-line Location for Selected Z-Channel Position



Model	Travel (mm) 8 Pole	Travel (mm) 12 Pole	A	B	C	D	E	F	G
406T01LXR	50	N/A	408	8	1	100.0	12	1	100.0
406T02LXR	150	50	508	8	1	100.0	12	1	100.0
406T03LXR	250	150	608	12	2	200.0	16	2	200.0
406T04LXR	350	250	708	12	2	200.0	16	2	200.0
406T05LXR	450	350	808	16	3	300.0	20	3	300.0
406T06LXR	550	450	908	16	3	300.0	20	3	300.0
406T07LXR	650	550	1008	20	4	400.0	24	4	400.0
406T08LXR	750	650	1108	20	4	400.0	24	4	400.0
406T09LXR	850	750	1208	24	5	500.0	28	5	500.0
406T10LXR	950	850	1308	24	5	500.0	28	5	500.0
406T11LXR	1200	1100	1558	32	7	700.0	32	6	600.0
406T12LXR	1450	1350	1808	36	8	800.0	40	8	800.0
406T13LXR	1700	1600	2058	40	9	900.0	44	9	900.0
406T14LXR	1950	1850	2308	44	10	1000.0	48	10	1000.0

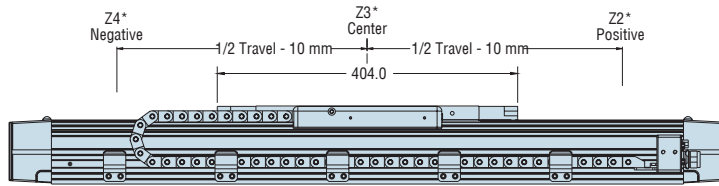
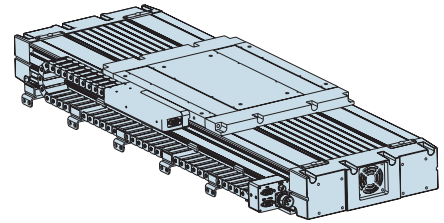
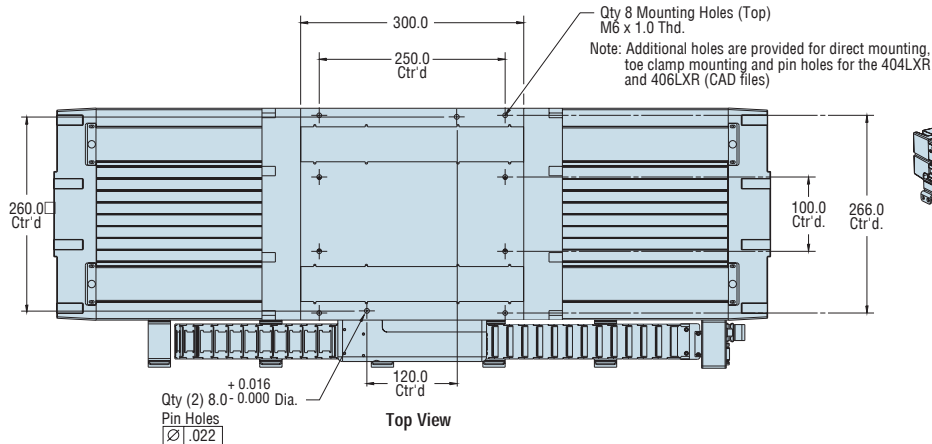
Order Example



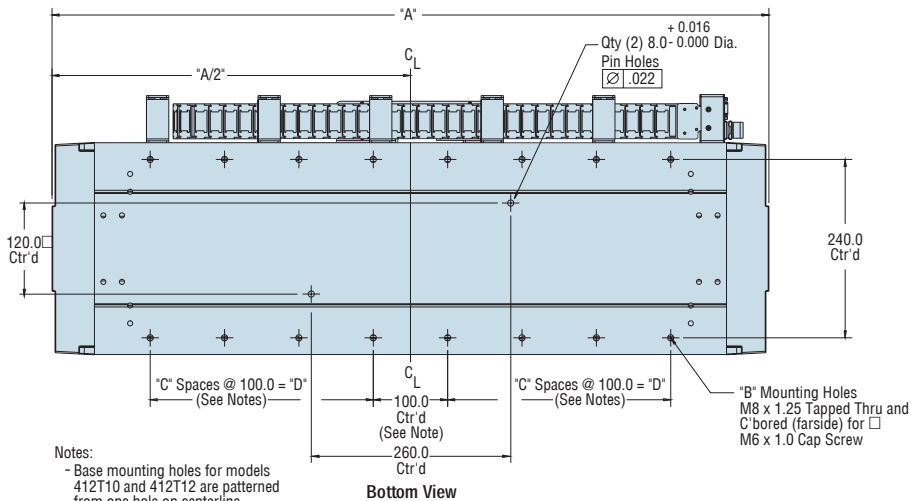
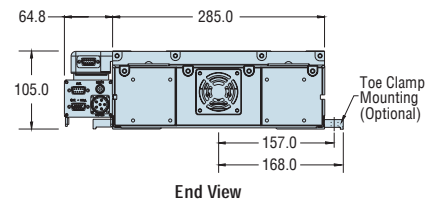


412LXR-D15 Series Dimensions (mm)

12 Pole Slotless Motor



*Z2, Z3, Z4 shows Carriage Center-line Location for Selected Z-Channel Position



Notes:
- Base mounting holes for models 412T10 and 412T12 are patterned from one hole on centerline



Model	Travel (mm)	A	B	C	D
412T01LXRD-15	150	764	12	2	200
412T02LXRD-15	250	864	16	3	300
412T03LXRD-15	350	964	16	3	300
412T04LXRD-15	650	1264	24	5	500
412T05LXRD-15	800	1414	24	5	500
412T06LXRD-15	1000	1614	28	6	600
412T07LXRD-15	1200	1814	32	7	700
412T08LXRD-15	1500	2114	40	9	900
412T09LXRD-15	1750	2364	44	10	1000
412T10LXRD-15	2000	2614	50	12	1200
412T11LXRD-15	2500	3114	60	14	1400
412T12LXRD-15	3000	3614	70	17	1700

12 Pole Slotless Linear Motor

Order Example

412 T09 LXR M P D15 H3 L3 CM09 Z2 E2 R1 A7 P1

- Series** 412
- Travel (mm) 12 Pole Motor**
- 150... T01 1200... T07
 - 250... T02 1500... T08
 - 350... T03 1750... T09
 - 650... T04 2000... T10
 - 800... T05 2500... T11
 - 1000... T06 3000... T12

Model LXR

Mounting (metric) M

Grade

Precision P

Drive Type

Free Travel (No Motor)..... D5

12 Pole Motor D15

Refer to page A22 for 24 pole iron core motor drive.

Home Sensor

None-Free Travel (only)..... H1

N.C. Current Sinking H2

N.O. Current Sinking H3

N.C. Current Sourcing H4

N.O. Current Sourcing H5

Limit Sensor

None-Free Travel (only)..... L1

N.C. Current Sinking L2

N.O. Current Sinking L3

N.C. Current Sourcing L4

N.O. Current Sourcing L5

Cable Management

No Cables - Free Travel..... CM01

Cable Transport Module (only)..... CM02

3.0 m OEM Cable Set-FL..... CM03 Cable Trans Mod. w/ 3.0 m-Gemini*..... CM09

7.5 m OEM Cable Set-FL..... CM04 Cable Trans Mod. w/ 7.5 m-Gemini*..... CM10

3.0 m OEM Cable Set-Gemini..... CM05 3.0 m OEM Cable Set-Aries..... CM11

7.5 m OEM Cable Set-Gemini..... CM06 7.5 m OEM Cable Set-Aries..... CM12

Cable Trans Mod. w/ 3.0 m-FL* CM07 Cable Trans Mod. w/ 3.0 m-Aries*..... CM13

Cable Trans Mod. w/ 7.5 m-FL* CM08 Cable Trans Mod. w/ 7.5 m-Aries*..... CM14

Pinning Option

P1 No multi-axis pinning

P2 X axis transfer pinning to Y axis- 30 arc seconds

P3 Y axis transfer pinning to X axis - 30 arc seconds*

*P3 Option includes a required 15 mm thick adapter.

Digital Drive

A1 No Drive

A7 Gemini Drive GV-U12E

A8 Gemini Controller/Drive GV6-U12E

A9 Gemini Controller/Drive GV6K-U12E

A63 Aries Drive AR-08AE

Environmental

R1 Class 1000, Strip Seals

R2 Class 10 Cleanroom Prep

Encoder

E1 None

E2 1.0 µm Resolution Linear

E3 0.5 µm Resolution Linear

E4 0.1 µm Resolution Linear

E5 5.0 µm Resolution Linear

E7 Sine Output Encoder

Z Channel Location*

Z1 None

Z2 Positive End Position

Z3 Center Position

Z4 Negative End Position

*Refer to dimension drawing on page A19.



* Extension Cable for pass through connection is available and can be ordered separately:
#006-1743-01 (3 meters); #006-1743-02 (7.5 meters).