Linear Motor Driven
high-speed, high-precision tables

Positioning systems needed for many of today's high-technology applications must satisfy an ever-increasing demand for high throughput and the need for extreme precision. Semiconductor, fiber optics, computer peripherals, metrology, solar scribing, digital printing, and other high-end industries require positioning systems which demonstrate quick response, high acceleration, high velocity, and fast settling time, in conjunction with micron and submicron level positioning. Parker's linear motor product group is designed to satisfy this attribute combination of performance and precision. Products and systems in this section feature advanced direct-drive technology, which enables payloads to be directly driven by highly efficient brushless servo motors.

Contents

400LXR Series Linear Motor Tables

Linear motors cannot function on their own. Before motion can occur, a platform must be engineered to provide support, direction, and feedback for the linear motor. Bearings, cables, connectors, encoder, travel stops, homing sensor and other components must be performance matched and integrated to achieve desired motion and control.

- Pre-engineered package
- Performance matched components
- Protection from environment
- Laser certified precision

Parker linear motor tables provide all this and more in a pre-engineered, easily mounted, ready to run package. The linear motor magnet rail is mounted to a stationary base and the forcer is mounted to the moveable carriage. The only contact between the moving carriage and the stationary base is through the linear support bearings. High-precision square rail bearings provide load support, low-friction translation, and a precise linear path. A high resolution linear encoder provides the required velocity and positional information to the motor controller, and a unique cable management system enables high performance motion with a life of 30 million cycles and beyond.

Parker tables, with the slotless linear motor, are offered in three sizes: 404LXR, 406LXR, and 412LXR.

Performance Matched Components

The 400LXR Series linear servo motor tables achieve optimum performance by combining slotless 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, digital printing, solar panel, and general automation.

"Designer Friendly" Features and Options

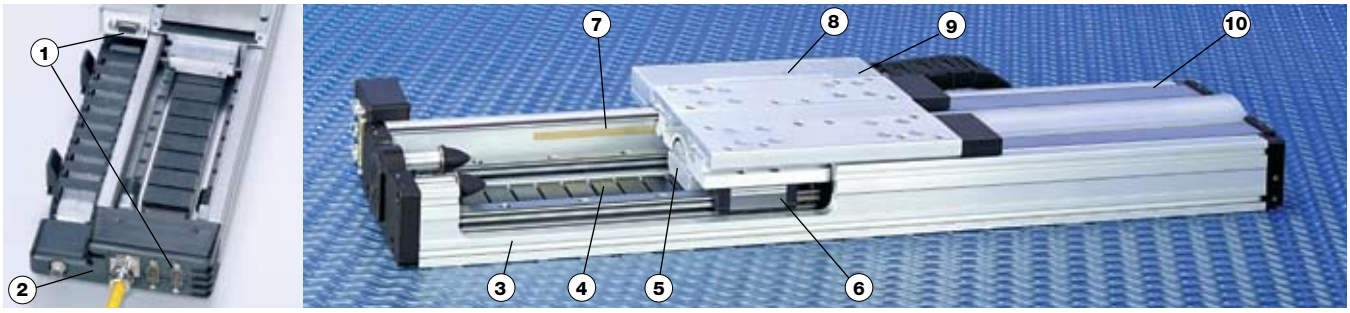
A vast assortment of "designer friendly" features and options simplify the engineering challenges often confronted with "base model" positioning devices. Features like the IP30 protective strip seal and long life cable management system exemplify the built-in value found in the 400LXR units. Other selectable 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.



1 "Pass-Through" Cabling

Pre-wired, plug-in connection of the moving payload for easy hookup of user instruments or end effectors.

2 Connector Panel

Electrically shielded panel provides "plug-in" connectivity and quick disconnect for all signal and power requirements.

3 High Strength Aluminum Body

Extruded aluminum housing is precision machined to provide outstanding straightness and flatness.

4 Magnet Rail

Single rail of high energy rare earth magnets offers lower weight and lower cost than double magnet type.

5 Slotless Linear Motor

Provides a highly responsive, zero backlash drive system. Slotless motors offer excellent heat management, durability, and have built-in thermal sensor and hall sensors.

6 Linear Guidance System

The highly engineered carriage and bearing system effectively counters the combined problematic effects of heat, high-speed and high acceleration.

7 Integral Linear Encoder

Protected non-contact feedback with selectable resolutions to 0.1 micron. Z channel is factory aligned to home sensor for precise homing.

8 Limit/Home Sensors

Proximity sensors establish end of travel and "home" location and are easily adjustable over entire length to restrict the travel envelope.

9 "Quick Change" Cabling

Innovative cable transport module offers extended life (30 million cycles) and a simple cable changing system for preventative maintenance.

10 Protective Seals

Hard shell aluminum cover combined with stainless steel strip seals provide IP30 protection to interior components as well as enhances overall appearance.

400LXR Series Specifications

Model		404LXR	406LXR		412LXR
Motor		8 Pole	8 Pole	12 Pole	12 Pole
Rated Load	kg (lb)	45 (99)	180 (396)	180 (396)	950 (2090)
Maximum Acceleration			5 Gs		
Maximum Velocity	(m/sec)				
Encoder Resolution:					
0.1 µm		0.3	0.3	0.3	0.3
0.5 µm		1.5	1.5	1.5	1.5
1.0 µm		3.0	3.0	3.0	3.0
5.0 µm		3.0	3.0	3.0	3.0
Sine Output		3.0	3.0	3.0	3.0
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)
Continuous Force	N (lb)	50 (11)	75 (17)	110 (25)	355 (80)
Carriage Mass	(kg)	1.4	3.2	4.1	12.3

Travel Dependent Specifications

Travel (mm)	Accuracy* (µm) Positional Resolution 0.1 0.5 1.0	5.0	Straightness & Flatness	Unit Weight (Kg) 404LXR 8-Pole	406LXR 8-Pole	406LXR 12-Pole	412LXR 12-Pole
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	–	–	–
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	–	–	–
550	23	33	21	–	16.4	18.7	–
600	25	35	22	8.9	–	–	–
650	26	36	24	–	17.9	20.2	61
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	–
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	–	–	–	–
1200	39	49	41	–	26.3	–	83
1350	42	52	45	–	–	30.9	–
1450	43	53	48	–	30.1	–	–
1500	44	54	50	–	–	–	95
1600	45	55	53	–	–	34.7	–
1700	46	56	56	–	33.9	–	–
1750	46	56	57	–	–	–	105
1850	47	57	60	–	–	38.6	–
1950	48	58	63	–	37.7	–	–
2000	48	58	65	–	–	–	113
2350	49	59	76	–	–	–	–
2500	50	60	80	–	–	–	133
2850	50	60	84	–	–	–	–
3000	50	60	84	–	–	–	153

* Accuracy stated is at 20° 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 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 max 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

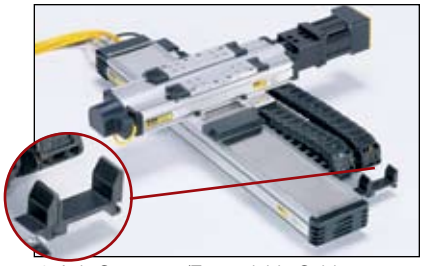
Cable Transport Module

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.

"Quick Change" Cartridge

Cable Extensions – Flying Leads Terminations

404LXR Cable Transport Module



2-Axis System w/Expandable Cable Management

Connection Ends

404LXR

406LXR/412LXR

Cable Transport Module Order Code

Order Code	Extension Cable	
	Length (m)	Termination
CM02	No Extension Cables	
CM07	3.0	Flying Leads
CM08	7.5	Flying Leads
CM09	3.0	Gemini Conn.
CM10	7.5	Gemini Conn.
CM13	3.0	Aries/ViX Conn.
CM14	7.5	Aries/ViX Conn.

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, as well as Gemini or Aries connectors.

406LXR with OEM cables and flying leads

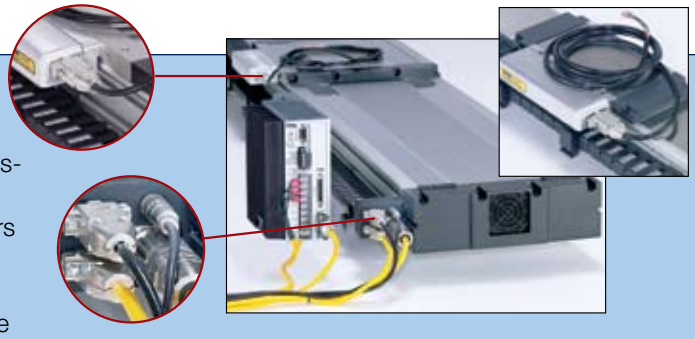
OEM Cable System Order Code

Order Code	Extension Cable	
	Length (m)	Termination
CM03	3.0	Flying Leads
CM04	7.5	Flying Leads
CM05	3.0	Gemini Conn.
CM06	7.5	Gemini Conn.
CM11	3.0	Aries/ViX Conn.
CM12	7.5	Aries/ViX Conn.

User "Pass-Through" Cabling

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).



- 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

Simple Configuration Digital Drive Options

All digital drives ordered in the LXR part number configuration come set up with a motor file including electrical parameters to set continuous and peak currents, current loop compensation values, and default gain settings. Users will have the ability to override these parameters for special application requirements. Tuning is easy to use and intuitive for users and is available via a variety of methods. The motor and loading information must be known by the drive to determine the baseline tuning gains. These are simple parameter entries the user can complete with the help of standard Parker supplied front-end software tools.

Aries Series

Aries Digital Drive

The Aries option allows the user to select the fully digital compact servo drive from Parker. Look for upcoming additions to the LXR configured with the Aries ETHERNET Powerlink version as well as the Aries Drive/Controller versions.

Order Codes: A62 A63

Gemini Series

GV Digital Servo Drive

The Gemini Series offers a fully digital servo drive configured directly in the LXR part numbering system.

Order Codes: A4 A7 A40

GV Digital Controller/Servo Drive

The Gemini Series servo drive/controller option allows the user to order a preconfigured digital drive/controller for a single-axis easy to use solution.

Order Codes: A5 A6 A8 A9 A41 A42

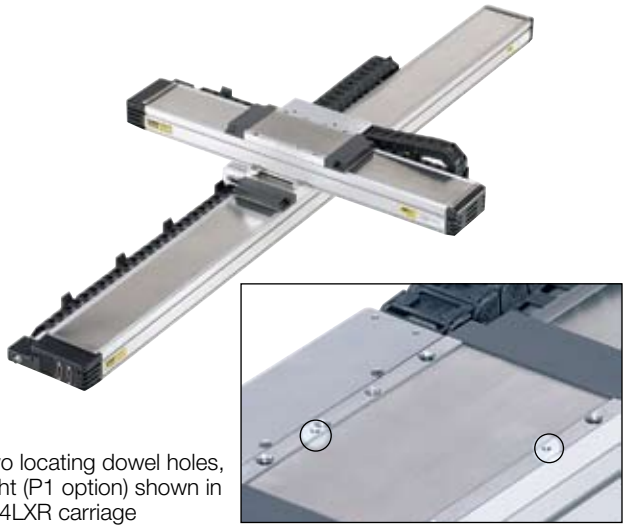
For complete details on drive product features and specifications, please refer to the "Drives & Controllers" section of this catalog.

Dowel Pinning Options

Order Codes: P1 P2 P3

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 and 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. In some instances a 404LXR pinning adapter may be required part number 100-9584-01.



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

Cleanroom Preparation Option

Order Codes: R2

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.

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.

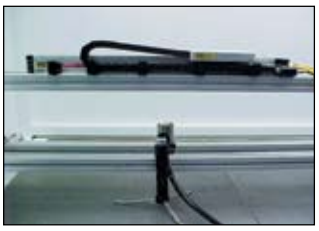
The chart below describes the conditions that must be maintained for the cleanroom to have a specific "class" rating.

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

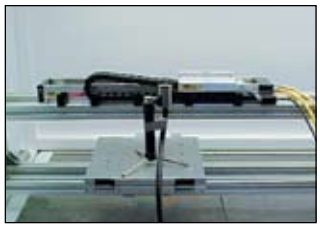
404LXR with cleanroom Class 10 modification

Standard Cleanroom Preparation

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



Testing at 4.5 inches below table



Testing at carriage mounting surface

400LXR Cleanroom Compatibility

	Class	
Table Velocity	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

Toe Clamp Accessories

Part Number: **100-8376-01 (404LXR)**
002-3624-01 (406LXR)
002-2160-01 (412LXR)

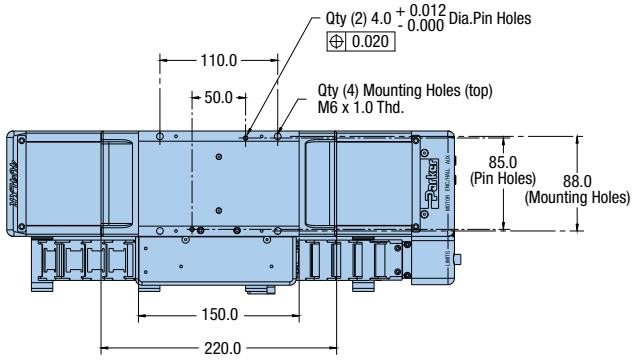
Toe clamps for mounting 400LXR tables are ordered separately.

Note that 400LXR Series toe clamps are not interchangeable with toe clamps for 400XR Series tables.

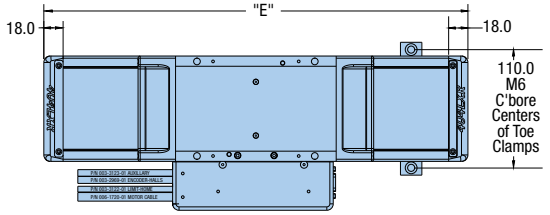
404LXR Dimensions

2D & 3D CAD files — Download from parkermotion.com

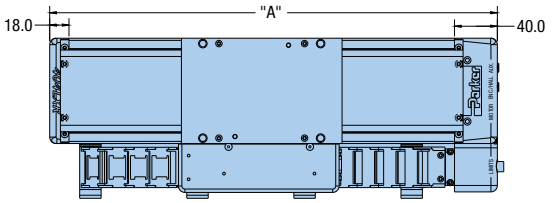
Dimensions (mm)



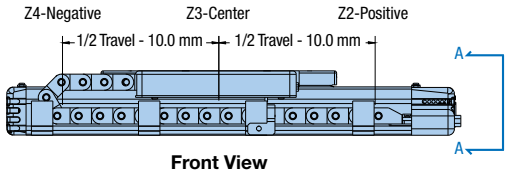
Top View
(With Cable Transport Module)



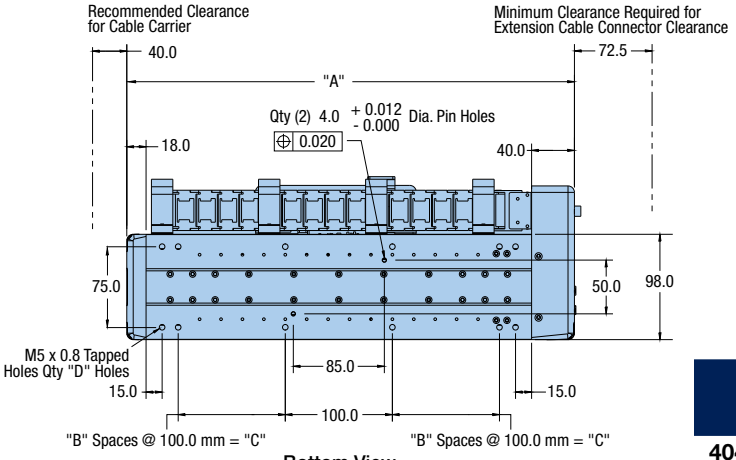
OEM Cables (Strip Seal/Hardcover)



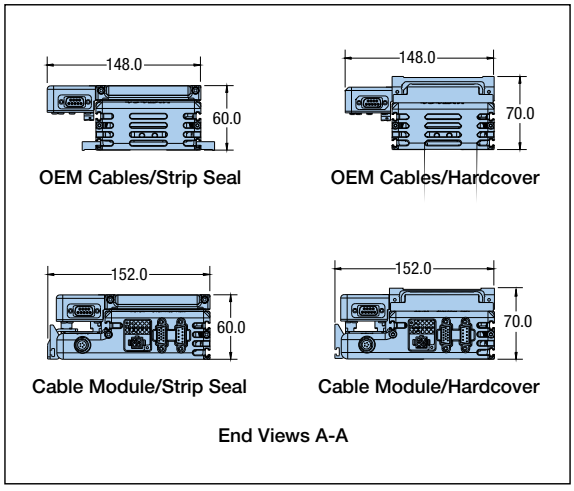
Cable Module (Strip Seal/Hardcover)



Front View
Z-Channel Location



Bottom View



OEM Cables/Strip Seal — OEM Cables/Hardcover

Cable Module/Strip Seal — Cable Module/Hardcover

End Views A-A

Model	Travel (mm)	Dimensions (mm) 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

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
Order Example:	404	T04	LXR	M	P	D13	H3	L2	CM09	Z2	E2	R1	A4	P1

① Series
404

② Travel – mm

	8 Pole Motor
T00	50
T01	100
T02	150
T03	200
T04	250
T05	300
T06	350
T07	400
T09	500
T11	600
T13	700
T15	800
T17	900
T19	1000

③ Model
LXR Linear Motor

④ Mounting
M Metric

⑤ Grade
P Precision

⑥ Drive Type
D3 Free Travel (No Motor)
D13 8 Pole Motor

⑦ Home Sensor
H1 None-Free Travel (only)
H2 N.C. Current Sinking
H3 N.O. Current Sinking
H4 N.C. Current Sourcing
H5 N.O. Current Sourcing

⑧ Limit Sensor
L1 None-Free Travel (only)
L2 N.C. Current Sinking
L3 N.O. Current Sinking
L4 N.C. Current Sourcing
L5 N.O. Current Sourcing

⑨ Cable Management
CM01 No Cables – Free Travel
CM02 Cable Transport Module (only)
CM03 3.0 m OEM Cable Set-FL
CM04 7.5 m OEM Cable Set-FL
CM05 3.0 m OEM Cable Set-Gemini
CM06 7.5 m OEM Cable Set-Gemini
CM07 Cable Trans Mod. w/3.0 m-FL*
CM08 Cable Trans Mod. w/7.5 m-FL*
CM09 Cable Trans Mod. w/3.0 m-Gemini*
CM10 Cable Trans Mod. w/7.5 m-Gemini*
CM11 3.0 m OEM Cable Set-Aries/ViX
CM12 7.5 m OEM Cable Set-Aries/ViX
CM13 Cable Trans Mod. w/3.0 m-Aries/ViX*
CM14 Cable Trans Mod. w/7.5 m-Aries/ViX*

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

⑩ Z Channel Location*
Z1 None
Z2 Positive End Position
Z3 Center Position
Z4 Negative End Position

* Refer to dimensions on previous page

⑪ Encoder Option
E1 None
E2 1.0 µm Resolution
E3 0.5 µm Resolution
E4 0.1 µm Resolution
E5 5.0 µm Resolution
E7 Sine Output Encoder

⑫ Environmental
R1 Strip Seal
R2 Hard Cover w/Class 10 Cleanroom Prep
R3 Hard Cover without Cleanroom Prep

⑬ Digital Drive
A1 No Drive
A4 Gemini Drive GV-U6E
A5 Gemini Controller/Drive GV6-U6E
A6 Gemini Controller/Drive GV6K-U6E
A62 Aries Drive AR-04AE

⑭ Pinning Option
P1 No multi-axis pinning
P2 * X axis transfer pinning to Y or Z axis - 30 arc-sec
P3 * Y axis transfer pinning to X axis - 30 arc-sec

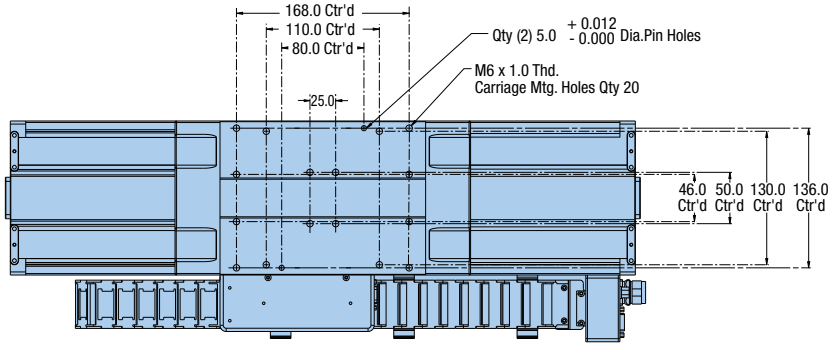
* Transfer pinning to XR from LXR requires additional bracket and an EPS request. Call 1-800-245-6903 for details.

406LXR Dimensions

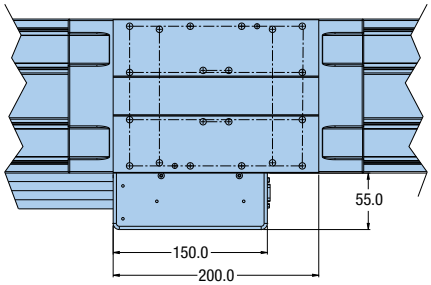
2D & 3D CAD files — Download from parkermotion.com

8 or 12 Pole Slotless Motor

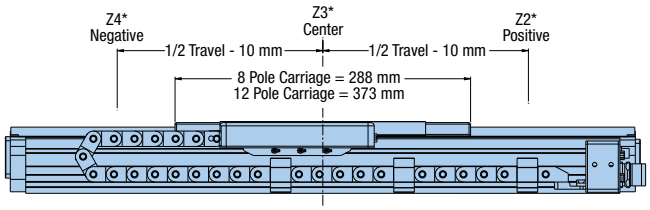
Dimensions (mm)



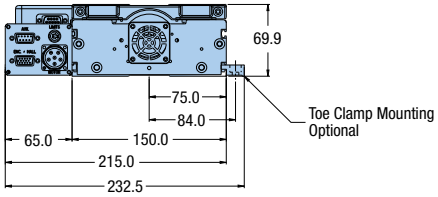
Top View
(with Cable Transport Module)



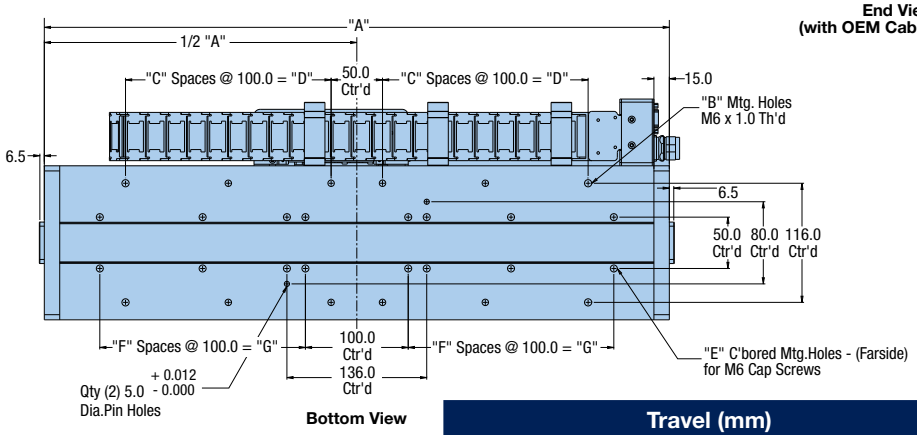
Top View
(with OEM Cable System)



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



End View
(with OEM Cable System)



Bottom View

Model	Travel (mm) 8 Pole	Travel (mm) 12 Pole	Dimensions (mm) A	B	C	D	E	F	G
406T01LXR	50	—	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

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
Order Example:	406	T08	LXR	M	P	D13	H2	L2	CM09	Z2	E2	R1	A4	P1

① Series
406

② Travel – mm

	8 Pole Motor	12 Pole Motor
T01	50	—
T02	150	50
T03	250	150
T04	350	250
T05	450	350
T06	550	450
T07	650	550
T08	750	650
T09	850	750
T10	950	850
T11	1200	1100
T12	1450	1350
T13	1700	1650
T14	1950	1850

③ Model
LXR Linear Motor

④ Mounting
M Metric

⑤ Grade
P Precision

⑥ Drive Type
Free Travel (No Motor)
D3 8 Pole Motor (No Motor)
D5 12 Pole Motor (No Motor)
Linear Motor
D13 8 Pole Motor Carriage
D15 12 Pole Motor Carriage

⑦ Home Sensor
H1 None-Free Travel (only)
H2 N.C. Current Sinking
H3 N.O. Current Sinking
H4 N.C. Current Sourcing
H5 N.O. Current Sourcing

⑧ Limit Sensor
L1 None-Free Travel (only)
L2 N.C. Current Sinking
L3 N.O. Current Sinking
L4 N.C. Current Sourcing
L5 N.O. Current Sourcing

⑨ Cable Management
CM01 No Cables – Free Travel
CM02 Cable Transport Module (only)
CM03 3.0 m OEM Cable Set-FL
CM04 7.5 m OEM Cable Set-FL
CM05 3.0 m OEM Cable Set-Gemini
CM06 7.5 m OEM Cable Set-Gemini
CM07 Cable Trans Mod. w/3.0 m-FL*
CM08 Cable Trans Mod. w/7.5 m-FL*
CM09 Cable Trans Mod. w/3.0 m-Gemini*
CM10 Cable Trans Mod. w/7.5 m-Gemini*
CM11 3.0 m OEM Cable Set-Aries/ViX
CM12 7.5 m OEM Cable Set-Aries/ViX
CM13 Cable Trans Mod. w/3.0 m-Aries/ViX*
CM14 Cable Trans Mod. w/7.5 m-Aries/ViX*

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

⑩ Z Channel Location*
Z1 None
Z2 Positive End Position
Z3 Center Position
Z4 Negative End Position

* Refer to dimensions on previous page

⑪ Encoder Option
E1 None
E2 1.0 µm Resolution
E3 0.5 µm Resolution
E4 0.1 µm Resolution
E5 5.0 µm Resolution
E7 Sine Output Encoder

⑫ Environmental
R1 Strip Seal
R2 Hard Cover w/Class 10 Cleanroom Prep

⑬ Digital Drive
A1 No Drive
A4 Gemini Drive GV-U6E
A5 Gemini Controller/Drive GV6-U6E
A6 Gemini Controller/Drive GV6K-U6E
A62 Aries Drive AR-04AE

⑭ Pinning Option
P1 No multi-axis pinning
P2 * X axis transfer pinning to Y or Z axis - 30 arc-sec
P3 * Y axis transfer pinning to X axis - 30 arc-sec

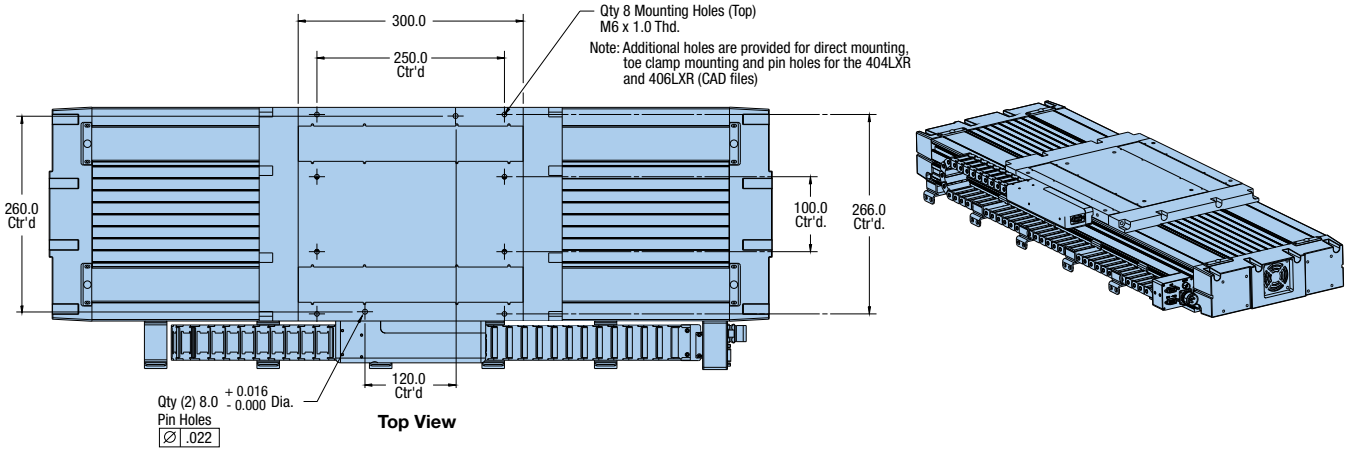
* Transfer pinning to XR from LXR requires additional bracket and an EPS request. Call 1-800-245-6903 for details.

412LXR Dimensions

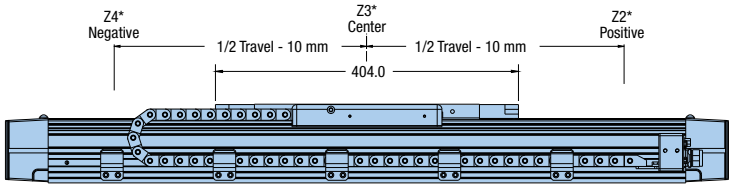
2D & 3D CAD files — Download from parkermotion.com

12 Pole Slotless Motor

Dimensions (mm)

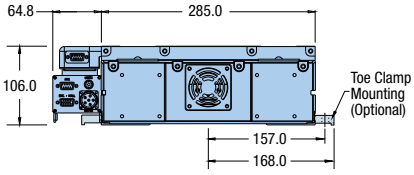


Top View

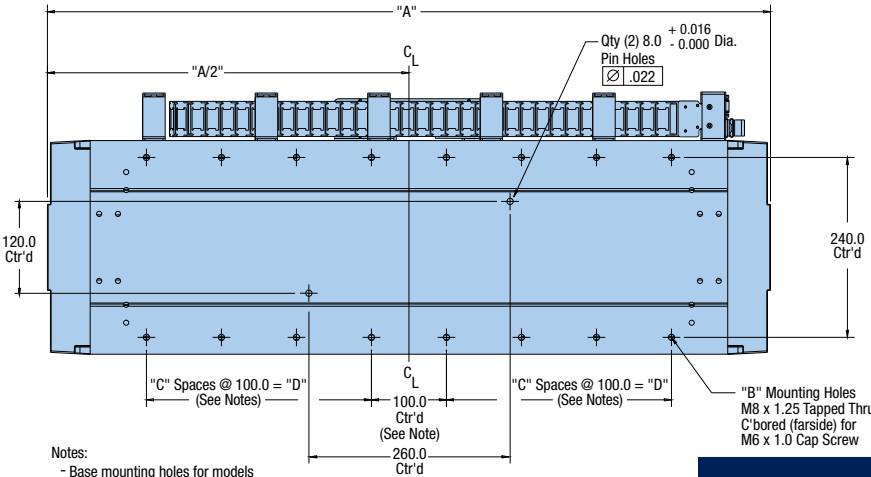


Front View

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



End View



Bottom View

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

Model	Travel (mm)	Dimensions (mm) A	B	C	D
412T01LXR	150	764	12	2	200
412T02LXR	250	864	16	3	300
412T03LXR	350	964	16	3	300
412T04LXR	650	1264	24	5	500
412T05LXR	800	1414	24	5	500
412T06LXR	1000	1614	28	6	600
412T07LXR	1200	1814	32	7	700
412T08LXR	1500	2114	40	9	900
412T09LXR	1750	2364	44	10	1000
412T10LXR	2000	2614	50	12	1200
412T11LXR	2500	3114	60	14	1400
412T12LXR	3000	3614	70	17	1700

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

① Series

412

② Travel – mm

	8 Pole Motor
T01	150
T02	250
T03	350
T04	650
T05	800
T06	1000
T07	1200
T08	1500
T09	1750
T10	2000
T11	2500
T12	3000

③ Model

LXR	Linear Motor

④ Mounting

M	Metric

⑤ Grade

P	Precision

⑥ Drive Type

D5	Free Travel (No Motor)
D15	12 Pole Motor

⑦ Home Sensor

H1	None-Free Travel (only)
H2	N.C. Current Sinking
H3	N.O. Current Sinking
H4	N.C. Current Sourcing
H5	N.O. Current Sourcing

⑧ Limit Sensor

L1	None-Free Travel (only)
L2	N.C. Current Sinking
L3	N.O. Current Sinking
L4	N.C. Current Sourcing
L5	N.O. Current Sourcing

⑨ Cable Management

CM01	No Cables – Free Travel
CM02	Cable Transport Module (only)
CM03	3.0 m OEM Cable Set-FL
CM04	7.5 m OEM Cable Set-FL
CM05	3.0 m OEM Cable Set-Gemini
CM06	7.5 m OEM Cable Set-Gemini
CM07	Cable Trans Mod. w/3.0 m-FL*
CM08	Cable Trans Mod. w/7.5 m-FL*
CM09	Cable Trans Mod. w/3.0 m-Gemini*
CM10	Cable Trans Mod. w/7.5 m-Gemini*
CM11	3.0 m OEM Cable Set-Aries/ViX
CM12	7.5 m OEM Cable Set-Aries/ViX
CM13	Cable Trans Mod. w/3.0 m-Aries/ViX*
CM14	Cable Trans Mod. w/7.5 m-Aries/ViX*

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

⑩ Z Channel Location*

Z1	None
Z2	Positive End Position
Z3	Center Position
Z4	Negative End Position

* Refer to dimensions on previous page

⑪ Encoder Option

E1	None
E2	1.0 µm Resolution
E3	0.5 µm Resolution
E4	0.1 µm Resolution
E5	5.0 µm Resolution
E7	Sine Output Encoder

⑫ Environmental

R1	Strip Seal
R2	Hard Cover w/Class 10 Cleanroom Prep

⑬ Digital Drive

A1	No Drive
A7	Gemini Drive GV-U6E
A8	Gemini Controller/Drive GV6-U6E
A9	Gemini Controller/Drive GV6K-U6E
A63	Aries Drive AR-04AE

⑭ Pinning Option

P1	No multi-axis pinning
P2 *	X axis transfer pinning to Y or Z axis - 30 arc-sec
P3 *	Y axis transfer pinning to X axis - 30 arc-sec

* Transfer pinning to XR from LXR requires additional bracket and an EPS request. Call 1-800-245-6903 for details.

Trilogy I-Force Ironless Linear Motors

www.parker.com/em/ironless

Parker Trilogy's I-Force ironless motors offer high force and rapid accelerations in a compact package. Parker Trilogy's patented I-beam shape, with its overlapping windings, allows for a higher power density in a smaller motor, improved heat removal, and added structural stiffness. A forgiving air gap and no attractive forces allow for easy installation and zero cogging during motion.

- 5 different cross sections (110, 210, 310, 410, and ML50) up to 8 poles
- Compact size with high force density and superior heat removal
- Air and water cooling
- Vacuum rated to 10^{-6} torr
- Ultra high-flex cable standard

Trilogy RIPPED Ironcore Linear Motors

www.parker.com/em/ironcore

Parker Trilogy's RIPPED ironcore linear motors, with their patent-pending anti-cog technology, can produce the large forces needed for many industrial applications – without the roughness associated with traditional ironcore linear motors. The RIPPED family is well suited for a broad range of extremely demanding applications.

- Patent-pending anti-cog technology for extremely smooth motion
- 5 different cross sections
- Single magnet row for high performance at an economical price
- Connector module allows for quick installation and easy cable management
- Ultra high-flex cable standard

Trilogy ML50 Ironless Linear Motors

www.parker.com/em/ML50

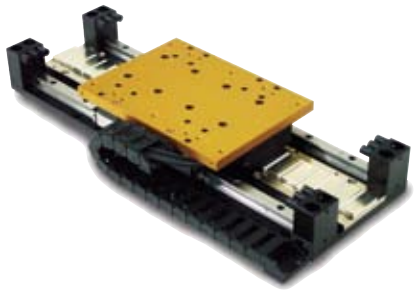
Parker Trilogy's ML50 ironless linear motors are optimized to provide high forces with minimum moving mass, making them the ideal choice for applications requiring very high, continuous accelerations of relatively light payloads. Demanding applications such as high-speed pick and place, die sorting, injection mold loading/unloading, and textile weaving can all benefit from unique characteristics of the ML50 motors.

- Optimized for ultra high acceleration of light payloads
- Compact size with high force density and superior heat removal
- Connector module for quick installation and easy cable management
- Ultra high-flex cable standard

Series	I-Force Ironless	ML50 Ironless	Ripped Ironcore
Continuous force	5.5 to 197.5 lbf (24.5 to 878.6 N)	43 to 192 lbf (189 to 852 N)	13 to 501 lbf (56 to 2230 N)
Peak force	45.5 to 883 lbf (202.5 to 3928 N)	190 to 857 lbf (847 to 3811 N)	43 to 1671 lbf (190 to 7433 N)
Cogging force	Zero	Zero	Low
Attractive force	Zero	Zero	High
Magnet tracks	Dual	Dual	Single
Heat dissipation	Good	Good	Better
Applications	Rapid accelerations, extremely smooth motion	Ultra high accelerations of relatively light payloads	High force, lower cost for long travels

Trilogy Ironless and Ironcore Linear Motor Positioning Tables

www.parker.com/em/Impositioners



Parker linear positioners utilize our high-performance Trilogy ironless and ironcore linear motors in a pre-engineered, easily integrated, ready-to-run package. The principal design goal for these positioners is to achieve high performance at an economical cost while preserving the design flexibility to accommodate customization. Options include multi-axis configurations, bellows, and a variety of cable management systems.

- Single- or dual-bearing rail positioners to better match the performance and cost requirements for each application
- Magnetic encoders for industrial environments or optical encoders with resolutions down to 0.1 micron
- Multiple carriage options
- Open frame, bellows or two covers available
- Zero cogging (ironless) or extremely smooth (ironcore)
- Counterbalance options for vertical applications
- Velocities to 7 m/s

For more information on these Trilogy products, refer to our complete Linear Motor Catalog #96-028778-01.

Series	T1S / T1D	T2S / T2D	T3S / T3D	T4S / T4D	TR7	TR9	TR16
Motor	110 ironless	210 ironless	310 ironless	410 ironless	R7 ironcore	R9 ironcore	R16 ironcore
Travel lengths (mm)	100 to 900	60 to 3840	60 to 4390	78 to 3835	105 to 2745	108 to 3708	94 to 3694
Load (kg)	11.3*/13.5**	27.2*/45.3**	72*/108**	90*/181**	200**	300**	450**
Acceleration (G's) * **	5	5	5	5	5	5	5
Velocity (m/s) †	up to 3	up to 5	up to 5	up to 5	up to 5	up to 5	up to 5
Peak force (N)	202.5	494.2	1170.0	3928.1	1761.0	4097.0	7433.0
Continuous force (N)	45.4	110.3	262.0	878.6	462.0	1121.0	2230.0
Resolution (micron)	0.1 to 5.0	0.1 to 5.0	0.1 to 5.0	0.1 to 5.0	0.1 to 5.0	0.1 to 5.0	0.1 to 5.0
Repeatability (micron) ‡	±1	±1	±1	±1	±1	±1	±1

* Single rail load specifications
** Dual rail load specifications
*** Consult factory for higher accelerations
† Peak velocity is encoder dependent
‡ Repeatability is resolution dependent

Recommended loads based on motor size and typical performance.
Bearing specifications exceeded listed specifications. Consult factory for higher loads.

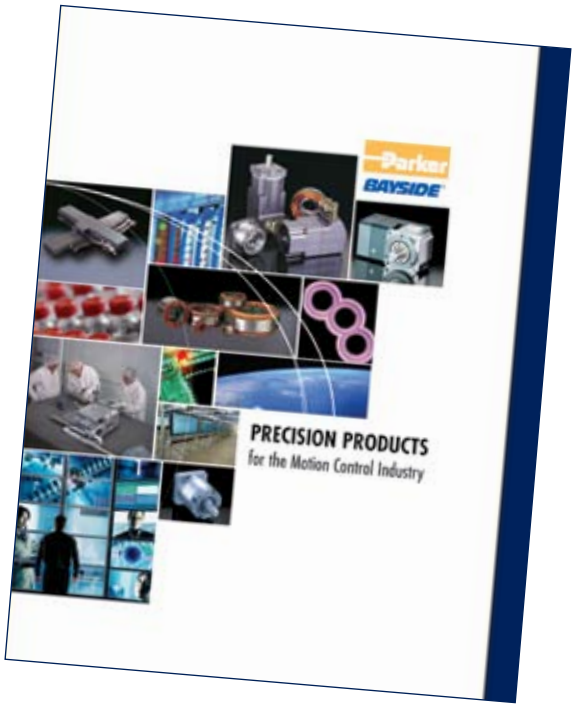
RD Direct Drive Rotary Stages

www.parkermotion.com/products

Parker Direct Drive Rotary Stages feature a robust construction and high performance in a compact package, providing smooth, near frictionless motion with zero backlash.

Featuring an integral brushless DC servo motor, these rotary stages offer several distinct advantages over traditional worm gear-driven stages. The elimination of the worm gearing offers the ability to reduce wear with zero backlash while exhibiting near frictionless motion.

Its high positioning accuracy, solely based on the stage's encoder, provides repeatability within 2 encoder counts, with resolutions ranging to 1.4 arc-seconds. The RD Direct Drive features speeds up to 700 RPM with significant torque capability.



For more information on Parker's direct drive rotary products, please refer to catalog 8100.

Applications

- Electronic assembly
- Fiber Optics
- Medical
- Packaging
- Pharmaceutical

Recommended Uses

- Precision rotary motion
- ZERO backlash
- Compact
- Rugged