# Specifications

## Typical Applications

- Heavy Duty Pick and Place
- Heavy Work Piece Positioning
- Machining
- Contouring
- High Moment Loads
- Multi-Axis Systems (base)



## General Specifications

| | |
|---|---|
| Materials | Top and base — black anodized aluminum alloy (6061 and cast tool plate);<br>Ballscrew and guideways — DIN 1.6523 and 1.3505 steel |
| Cross Section | 203.2mm x 88.9mm (8 inches x 3.5 inches) |
| Travel Lengths | **Standard** — 152.4mm (6 inches), 304.8mm (12 inches), 457.2mm (18 inches),<br>609.6mm (24 inches) and 762.0mm (30 inches) |
| (including limits and covers) | **Extended** — 914.4mm (36 inches), 1066.8mm (42 inches), 1219.2mm (48 inches),<br>1371.6mm (54 inches) and 1524.0mm (60 inches)<br>(please refer to Travel Dependent Specifications) |
| Drive Screw | Preloaded precision ground ballscrew — JIS C3 and JIS C5 (zero backlash)<br>Nominal diameter 25mm (0.9843 inches) |
| Ballscrew Lead Options | 5.08mm (0.2 inches), 10mm (0.3937 inches) or 25.4mm (1.0 inches)<br>(please refer to Travel Dependent Specifications or maximum speeds) |
| Bearings | Matched precision grade recirculating linear guideways<br>Nominal coefficient of friction 0.008<br>Special high precision assembly option available for standard travels only |
| Couplings | Bellows, Oldham or Stainless Steel Beam (please refer to Coupling Section) |
| Motors | Stepper (N, T or V options) or Servo; Nominal NEMA 34 frame size<br>(please refer to Stepper Section G-1, Servo Section H-1 and Motor Section) |
| Limit Switches | Internal Hall Effect switches — non-adjustable<br>3 position or 2 position — normally closed<br>(please refer to Limit Switch Section) |
| Linear Encoder Resolution | 1 micron (0.000039 inches) or 2 microns (0.000079 inches)<br>(please refer to Linear Encoder Section) |
| Covers | Neoprene Bellows (Nominal IP 53) |
| Environment | General industrial, clean room or vacuum (please refer to Environmental Section) |
| Normal Ambient Temperature | 20°C ± 15°C (68°F ± 27°F) — special high or low temperature preparation also available |
| Normal Ambient Pressure | 760 torr — $10^{-3}$ torr (standard preparation) — up to $10^{-7}$ torr (special preparation) |
| Normal Cleanliness | Class 1000 (standard preparation) — up to Class 100 (special preparation) |
| Audible Noise (max.) | 70 dB at top speed (1m away from positioning system) |
| Maximum Input Torque | 600 oz-in |


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# Specifications

## Global Specifications

| | |
|---|---|
| Ballscrew Accuracy Tolerances[1,2] (maximum lead error tolerance) | **Travel of 762.0mm (30 inches) or less — JIS C3**<br>8 microns per 300mm - 6 microns per revolution<br>0.00032 inches per foot - 0.00024 inches per revolution<br>**Travel of 762.0mm (30 inches) or less — JIS C1**<br>5 microns per 300mm — 4 microns per revolution<br>0.00020 inch per foot — 0.00016 inch per revolution<br>**Travel greater then 762.0mm (30 inches) — JIS C5**<br>18 microns per 300mm — 8 microns per revolution<br>0.00072 inches per foot — 0.00032 inches per revolution |
| Unidirectional Repeatability (max.)[1,2] (without linear encoder) | **Travel 762.0mm (30 inches) or less**<br>3 microns (0.00012 inches)<br>**Travel greater then 762.0mm (30 inches)**<br>4 microns (0.00016 inches) |
| Bi-directional Repeatability (max.)[1,2] (without linear encoder) | **Travel 762.0mm (30 inches) or less**<br>6 microns (0.00024 inches)<br>**Travel greater then 762.0mm (30 inches)**<br>8 microns (0.00032 inches) |
| Limit Switch Repeatability[2] | 50 microns (0.002 inches)<br>(please refer to Limit Switch Section) |
| Breakaway Torque (max.)[2] | 0.247 Nm (35 oz-in) |
| Running Torque (max.)[2] | 0.212 Nm (30 oz-in) |
| Nominal Acceleration (max.)[2] | 2.0 g |
| Duty Cycle | 100% |
| Normal Load Capacity (max.)[2,3] | ±567 kg(f) (1,250 lbs.) (please refer to stiffness specifications) |
| Side Load Capacity (max.)[2,3] | ±340 kg(f) (750 lbs.) (please refer to stiffness specifications) |
| Axial Load Capacity (max.)[2,3] | ±82 kg(f) (180 lbs.) (please refer to stiffness specifications) |
| Roll Moment Capacity (max.)[2,3] | ±534 Nm (394 ft-lb.) (please refer to compliance specifications) |
| Pitch Moment Capacity (max.)[2,3] | ±446 Nm (329 ft-lb.) (please refer to compliance specifications) |
| Yaw Moment Capacity (max.)[2,3] | ±149 Nm (110 ft-lb.) (please refer to compliance specifications) |
| Nominal Straightness[2,3] (horizontal straightness)<br>Precision Option — (standard travels only) | 2 microns per 25mm (0.00008 inches per inch)<br>Not to exceed travel dependent specifications<br>1 micron per 25mm (0.00004 inches per inch)<br>Not to exceed travel dependent specifications |
| Nominal Flatness[2,3] (vertical straightness)<br>Precision Option — (standard travels only) | 2 microns per 25mm (0.00008 inches per inch)<br>Not to exceed travel dependent specifications<br>1 micron per 25mm (0.00004 inches per inch)<br>Not to exceed travel dependent specifications |
| Normal Load Stiffness[2,3] | 8.0 kg(f) per micron (450,000 lbs. per inch) |
| Side Load Stiffness[2,3] | 7.3 kg(f) per micron (410,000 lbs. per inch) |
| Axial Load Stiffness[2,3] | 0.9 kg(f) per micron (52,000 lbs. per inch) |
| Roll Moment Compliance[2,3] | 0.22 arc-sec per Nm (0.3 arc-sec per ft-lb.) |
| Pitch Moment Compliance[2,3] | 0.15 arc-sec per Nm (0.2 arc-sec per ft-lb.) |
| Yaw Moment Compliance[2,3] | 0.85 arc-sec per Nm (2.5 arc-sec per ft-lb.) |
| Precision X-Y Mounting Orthogonality (XYP)[2,3] | 15 arc-sec |
| Moving Mass (carriage and bearings) | 4.1 kg(f) (9 lbs.) |

1 For applications requiring higher specification, interferometer testing, a higher accuracy ballscrew or a linear encoder may be necessary. Please refer to the Performance Verification Section and the Linear Encoder Section.
2 Please consult IDC if your application requirements exceed catalog specifications.
3 Based on the centerline of the table top.
All specifications are based on ISO 230-2 measurements of an unloaded, bolted down Precision Table with optimized motor tuning. These specifications were generated by measuring the peformance of a complete motion system that utilized IDC motors, drives and controls.
Note: IDC accuracy measurements are based on a stable 20°C environment. Thermal variations can affect application results significantly.

# Specifications

## Table Diameter Dependent Specifications

### Standard Travels — Precision Assembly Option Available

(Travel includes space for limit switches and bellows)

| | RB8-6 | RB8-12 | RB8-18 | RB8-24 | RB8-30 |
|---|---|---|---|---|---|
| Travel — mm (inches) | 152.4 (6) | 304.8 (12) | 457.2 (18) | 609.6 (24) | 762.0 (30) |
| Accuracy (error max.) — microns (inches) | 12 (0.00048) | 14 (0.00056) | 16 (0.00064) | 18 (0.00072) | 20 (0.00080) |
| Inertia — $kgm^2x10^{-6}$ ($oz\text{-}in\text{-}s^2x10^{-3}$) | 223.2 (31.6) | 275.7 (39.1) | 328.3 (46.5) | 380.8 (53.9) | 433.3 (61.4) |
| Total Table Weight (without motors) — kg(f) (lbs.) | 13.6 (30) | 15.9 (35) | 18.1 (40) | 20.4 (45) | 22.7 (50) |
| Top Speed — 5G screw — mm/s (inches/s) | 261 (10.3) | 261 (10.3) | 244 (9.6) | 178 (7.0) | 135 (5.3) |
| Top Speed — 10MG screw — mm/s (inches/s) | 513 (20.2) | 513 (20.2) | 481 (18.9) | 349 (13.8) | 265 (10.4) |
| Top Speed — 1G screw- mm/s (inches/s) | 1303 (51.3) | 1303 (51.3) | 1222 (48.1) | 887 (34.9) | 674 (26.5) |
| Roll Deviation (max.)[2,3] — arc-sec (precision) | 35 (22) | 40 (24) | 45 (26) | 50 (28) | 55 (30) |
| Yaw Deviation (max.)[2,3] — arc-sec (precision) | 20 (10) | 24 (12) | 28 (14) | 32 (16) | 36 (18) |
| Pitch Deviation (max.)[2,3] — arc-sec (precision) | 40 (22) | 45 (24) | 50 (26) | 55 (28) | 60 (30) |
| Nominal Straightness (max.)[2,3] — microns (inches) | 12 (0.00048) | 16 (0.00064) | 20 (0.00080) | 24 (0.00096) | 28 (0.00112) |
| Precision Assembly Option | 6 (0.00024) | 8 (0.00032) | 10 (0.00040) | 12 (0.00048) | 14 (0.00056) |
| Nominal Flatness (max.)[2,3] — microns (inches) | 12 (0.00048) | 16 (0.00064) | 20 (0.00080) | 24 (0.00096) | 28 (0.00112) |
| Precision Assembly Option | 6 (0.00024) | 8 (0.00032) | 10 (0.00040) | 12 (0.00048) | 14 (0.00056) |

### Extended Travels — Precision Assembly Option Not Available

(Travel includes space for limit switches and bellows)

| | RB8-36 | RB8-42 | RB8-48 | RB8-54 | RB8-60 |
|---|---|---|---|---|---|
| Travel — mm (inches) | 914.4 (36) | 1066.8 (42) | 1219.2 (48) | 1371.6 (54) | 1524.0 (60) |
| Accuracy (error max.) — microns (inches) | 28 (0.00112) | 32 (0.00128) | 36 (0.00144) | 40 (0.00160) | 44 (0.00176) |
| Inertia — $kgm^2x10^{-6}$ ($oz\text{-}in\text{-}s^2x10^{-3}$) | 485.8 (68.8) | 538.4 (76.2) | 590.9 (83.7) | 617.2 (87.4) | 643.4 (91.1) |
| Total Table Weight (without motors) — kg(f) (lbs.) | 24.9 (55) | 27.2 (60) | 29.5 (65) | 31.8 (70) | 34.0 (75) |
| Top Speed — 5G screw — mm/s (inches/s) | 106 (4.2) | 85 (3.4) | 70 (2.8) | 64 (2.5) | 59 (2.3) |
| Top Speed — 10MG screw — mm/s (inches/s) | 208 (8.2) | 168 (6.6) | 138 (5.4) | 126 (5.0) | 116 (4.6) |
| Top Speed — 1G screw- mm/s (inches/s) | 529 (20.8) | 426 (16.8) | 350 (13.8) | 320 (12.6) | 293 (11.6) |
| Roll Deviation (max.)[2,3] — arc-sec | 60 | 65 | 70 | 75 | 80 |
| Yaw Deviation (max.)[2,3] — arc-sec | 40 | 45 | 50 | 55 | 60 |
| Pitch Deviation (max.)[2,3] — arc-sec | 65 | 70 | 70 | 75 | 80 |
| Nominal Straightness (max.)[2,3] — microns (inches) | 32 (0.00128) | 36 (0.00144) | 40 (0.00160) | 44 (0.00176) | 48 (0.00192) |
| Nominal Flatness (max.)[2,3] — microns (inches) | 32 (0.00128) | 36 (0.00144) | 40 (0.00160) | 44 (0.00176) | 48 (0.00192) |

### Drive Screw Data

| | Diameter mm (inches) | Efficiency | Direction | Duty Cycle | Contouring Thrust Load (max.) kg(f) (lbs.) |
|---|---|---|---|---|---|
| 5G | 25 (0.9843) | 87% | Right Hand | 100% | 16.0 (35.3) |
| 10MG | 25 (0.9843) | 90% | Right Hand | 100% | 11.0 (24.3) |
| 1G | 25 (0.9843) | 93% | Right Hand | 100% | 7.0 (15.4) |

### Life Calculation Constants (Dynamic Load Capacity)

(please refer to Bearing and Drivescrew Section)

| | |
|---|---|
| Bearings | 1550 kg(f) |
| 5G Ballscrew | 467 kg(f) |
| 10MG Ballscrew | 373 kg(f) |
| 1G Ballscrew | 283 kg(f) |

2 Please consult IDC if your application requirements exceed catalog specifications.

3 Based on the centerline of the table top.

Note: IDC accuracy measurements are based on a stable 20°C environment. Thermal variations can affect application results significantly.





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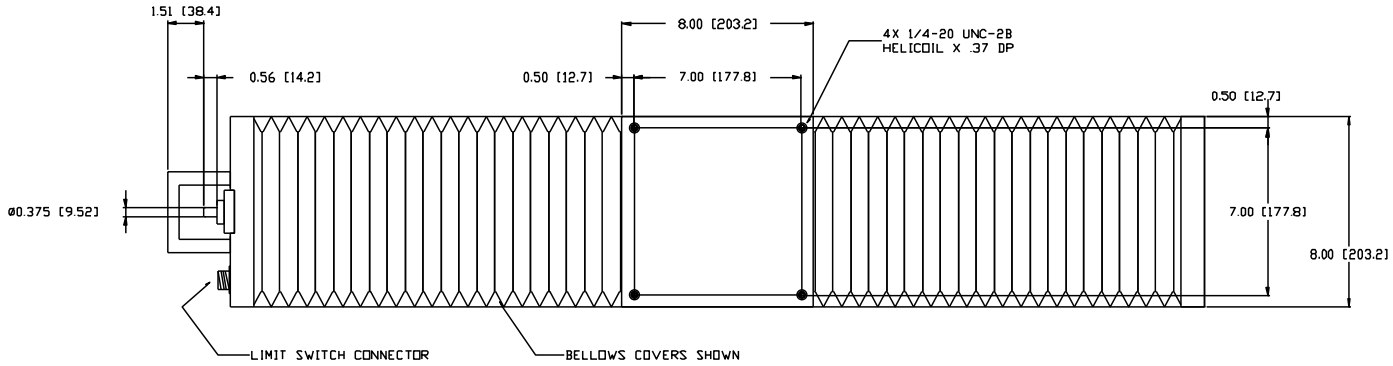
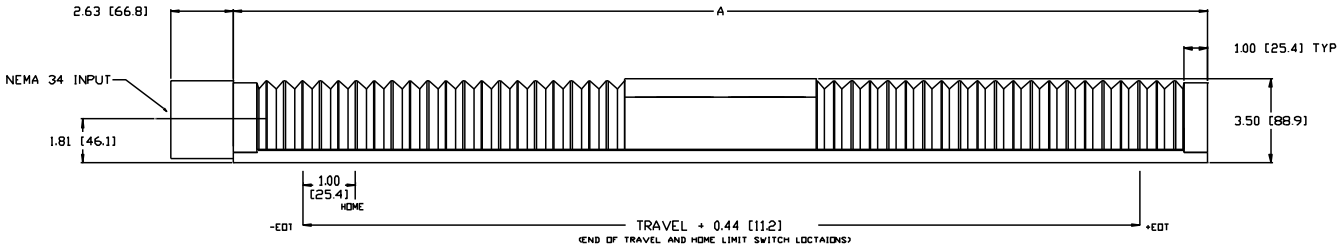
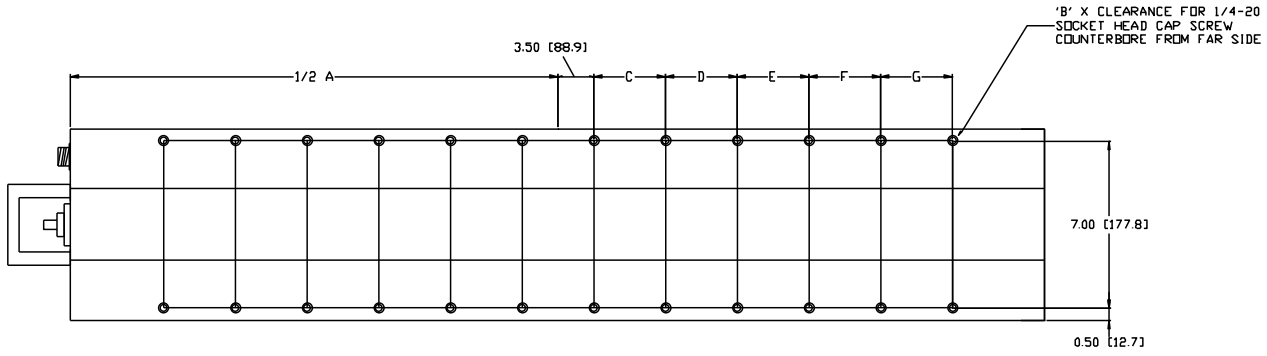
# Specifications




| Travel | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 6.00 (152.4) | 20.66 (524.8) | 4.00 | — | — | — | — | — |
| 12.00 (304.8) | 27.36 (694.9) | 8.00 | 7.00 (177.8) | — | — | — | — |
| 18.00 (457.2) | 34.07 (865.4) | 8.00 | 7.00 (177.8) | — | — | — | — |
| 24.00 (609.6) | 40.77 (1035.6) | 12.00 | 7.00 (177.8) | 7.00 (177.8) | — | — | — |
| 30.00 (762.0) | 47.48 (1206.0) | 12.00 | 7.00 (177.8) | 7.00 (177.8) | — | — | — |
| 36.00 (914.4) | 54.35 (1380.5) | 16.00 | 7.00 (177.8) | 7.00 (177.8) | 7.00 (177.8) | — | |
| 42.00 (1066.8) | 61.15 (1553.2) | 16.00 | 7.00 (177.8) | 7.00 (177.8) | 7.00 (177.8) | — | — |
| 48.00 (1219.2) | 67.93 (1725.4) | 20.00 | 7.00 (177.8) | 7.00 (177.8) | 7.00 (177.8) | 7.00 (177.8) | — |
| 54.00 (1371.6) | 74.65 (1896.1) | 20.00 | 7.00 (177.8) | 7.00 (177.8) | 7.00 (177.8) | 7.00 (177.8) | — |
| 60.00 (1524.0) | 81.39 (2067.3) | 24.00 | 7.00 (177.8) | 7.00 (177.8) | 7.00 (177.8) | 7.00 (177.8) | 7.00 (177.8) |

# Specifications

## Basic Stepper Configuration

**RB8-___-5G-OE8-P32V-LI3-E0-CV1**

| | |
|---|---|
| Standard Precision Assembly | High Performance Step Motor (P32V) |
| Precision Ground Ballscrew (5G) | 3 Position Internal Limit Switches (LI3) |
| Travel (inches) 6, 12, 18, 24, and 30 | No Linear Encoder (E0) |
| 0.5 inch Oldham Coupling (OE8) | Neoprene Bellows Covers (CV1) |

(please refer to How to Order page for additional standard options)

## Basic Servo Configuration

**RB8-___-5G-BE6-BN32-LI3-E0-CV1**

| | |
|---|---|
| Standard Precision Assembly | High Performance Servo Motor (BN32) |
| Precision Ground Ballscrew (5G) | 3 Position Internal Limit Switches (LI3) |
| Travel (inches) 6, 12, 18, 24, and 30 | No Linear Encoder (E0) |
| 0.375 inch Bellows Coupling (BE6) | Neoprene Bellows Covers (CV1) |

(please refer to How to Order page for additional standard options)

## Make it an IDeal System

Include an IDC drive or control that is preconfigured for and tested with each Precision Table axis.
Stepper Choices: NextStep, SmartStep, S6961 or S6962
Servo Choices: B8001, B8961 or B8962
(order as a separate line item)

| | | |
|---|---|---|
| Example: | RB8-18-5G-OE8-P32T-LI3-E0-CV1 | 2 |
| | RB8 XYP | 1 |
| | SMART STEP | 2 |
| | IDEAL SYSTEM | 2 |

(please refer to the IDeal System Section for further details)


## Standard Multi-Axis Configuration

**Standard Precision X-Y Mounting (XYP) — 15 arc-sec Orthogonality — (dowel pinned assembly)**
(ordered as a separate line item to assemble 2 separate tables)

| | | |
|---|---|---|
| Example: | RB8-24-5G-BE6-BN32-LI3-E0-CV1 | 2 |
| | RB8 XYP | 1 |

(for applications requiring more complicated assemblies than XYP, please refer to the Multi-Axis Section)

## Standard Environmental Preparations

All standard IDC precision tables are designed to operate in general industrial environments.
Standard environmental preparation for Class 100 Clean Room or $10^{-7}$ Vacuum environments is also available.
(ordered as a separate line item per axis)

| | | | | | |
|---|---|---|---|---|---|
| Example: | RB8-18-5G-OE8-P32V-LI3-E0-CV0 | 2 | Example: | RB8-12-5G-BE6-BN32-LI3-E0-CV0 | 2 |
| | CLEAN 100 | 2 | | VACUUM | 2 |
| | RB8 XYP | 1 | | RB8 XYP | 1 |

(for applications requiring other non-standard environments, please refer to the Environmental Section)

## Performance Verification and Testing

(ordered as separate line item per axis)

| | | |
|---|---|---|
| Example: | RB8-30-5G-OE8-P32V-LI3-E0-CV1 | 1 |
| | TEST 1-1 | 1 |

(for applications requiring testing, please refer to the Performance Verification Section)

## More Info?

More information, including a copy of the Owner's Manual is available by visiting IDC's web site or by contacting IDC.

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# How To Order

## Ordering Example

| RB8 | – | 24 | – | 5G | – | OE8 | – | P32V | – | LI3 | – | E0 | – | CV1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | | Travel | | Drive Screw | | Coupling | | Motor | | Limit Switches | | Linear Encoder | | Covers |

## Product Model

| | |
|---|---|
| RB8 | Standard Assembly |
| RB8P | Precision Assembly (lower angular errors) (Standard travels only) |

## Travel (inches)

6, 12, 18, 24, 30, 36, 42, 48, 54, 60

## Drive Screws *(see Drive Screw Section)*

| | |
|---|---|
| 5G | 5.08mm (0.2 inch) JIS C3 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 30 inches) |
| 10MG | 10mm (0.3937 inch) JIS C3 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 30 inches) |
| 1G | 25.4mm (1.0 inch) JIS C3 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 30 inches) |
| 5GP | 5.08mm (0.2 inch) JIS C1 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 30 inches) |
| 10MGP | 10mm (0.3937 inch) JIS C1 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 30 inches) |
| 1GP | 25.4mm (1.0 inch) JIS C1 Precision Ground Ballscrew Preloaded — Zero Backlash (JIS C5 for travel over 30 inches) |

## Coupling — Type and Input Shaft *(see Coupling Section)*

| | |
|---|---|
| BE6 | Stainless Steel Bellows 0.375 inch shaft diameter |
| BE8 | Stainless Steel Bellows 0.5 inch shaft diameter |
| BE10 | Stainless Steel Bellows 0.625 inch shaft diameter |
| OE6 | Oldham 0.375 inch shaft diameter |
| OE8 | Oldham 0.5 inch shaft diameter |
| OE10 | Oldham 0.625 inch shaft diameter |
| SE6 | Stainless Steel Beam 0.375 inch shaft diameter |
| SE8 | Stainless Steel Beam 0.5 inch shaft diameter |
| SE10 | Stainless Steel Beam 0.625 inch shaft diameter |

## Motors - Stepper *(see Stepper Section on page G-1 and Motor Section)*

| | |
|---|---|
| P31n | Performance NEMA 34 (0.5 inch coupling) |
| P32n | Performance NEMA 34 (0.5 inch coupling) |
| P33n | Performance NEMA 34 (0.625 inch coupling) |
| S32n | Standard NEMA 34 (0.375 inch coupling) |
| S33n | Standard NEMA 34 (0.375 inch coupling) |
| | n = T (Series), V (Parallel), N (Flying leads) |

## Motors - Servo *(see Servo Section on page H-1 and Motor Section)*

| | |
|---|---|
| BN31 | Performance NEMA 34 (0.375 inch coupling) |
| BN32 | Performance NEMA 34 (0.375 inch coupling) |
| B31 | Standard NEMA 34 (0.5 inch coupling) |
| B32 | Standard NEMA 34 (0.5 inch coupling) |
| B33 | Standard NEMA 34 (0.5 inch coupling) |

## Motors - Customer Supplied *(see Motor Section)*

| | |
|---|---|
| X34n | Standard NEMA 34 Motor Mount<br>n = X Customer Supplied and Mounted<br>n = C Customer Supplied and IDC Mounted |

## Limit Switches *(see Limit Switch Section)*

| | |
|---|---|
| L0 | No Limit Switches |
| LI2 | 2 Position Internal Hall Effect Limit Switch (2 over travel limit switches) |
| LI3 | 3 Position Internal Hall Effect Limit Switch (2 over travel limits & 1 home limit switch) |

## Encoders *(see Linear Encoder Section)*

| | |
|---|---|
| E0 | No Linear Encoder |
| EM1 | 1 Micron Resolution |
| EM2 | 2 Micron Resolution |
| EMR | Standard Motor Mounted Rotary Encoder |
| EMKR | 1000 Line Encoder (where available) |

## Covers *(see Cover Section)*

| | |
|---|---|
| CV0 | No Covers |
| CV1 | Neoprene Bellows Cover |

## Special Features *(see preceding page)*

(ordered as a separate line item)

Please contact IDC for non-standard applications or components.

Lead-times for complete positioning systems are determined by the lead-times of the individual components (precision tables, motors, gearmotors, drives and controls, etc.). Standard precision table lead-times apply to basic configurations and standard catalog options. Extended travels, environmental preparations, special components, special testing, special modifications and custom systems may require additional lead-time. Please contact IDC for further details.