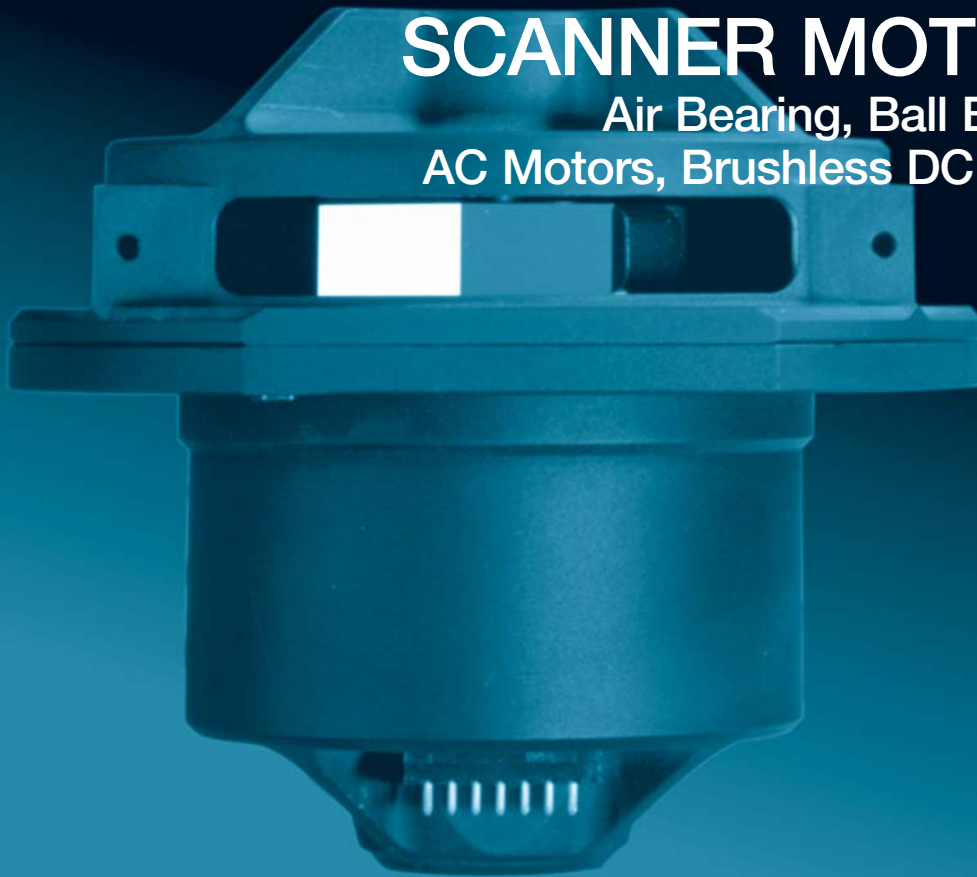


# SCANNER MOTORS

## Air Bearing, Ball Bearing, AC Motors, Brushless DC Motors



**Lincoln Laser manufactures quality motors specially designed to meet specific scanning requirements.**

Scanning system motors must be built to exacting specifications in order to achieve maximum efficiencies and effectiveness. Lincoln Laser manufactures a wide selection of these specialized motors to meet the requirements of your specific application.

### Air Bearing & Ball Bearing Motors

Lincoln Laser offers both Air Bearing and conventional Ball Bearing scanner motor systems. The Air Bearing design is ideally suited for polygonal mirrors weighing less than 120 grams – with speed ranges of 6,000 - 55,000 rpm (required in most high-end laser printers). MTBF exceeds 20,000 hours.

Ball Bearing designs are specified for larger polygonal mirrors (>120 grams) or applications which require wider speed ranges (1000 - 45,000 rpm).

### AC Motors

Lincoln Laser has pioneered the use of AC hysteresis synchronous motors in laser scanning systems. These motors are inherently quite simple and provide dependable rotor integrity at low speeds (300-2000) rpm) – as well as at extremely high speeds (40,000 rpm and higher).

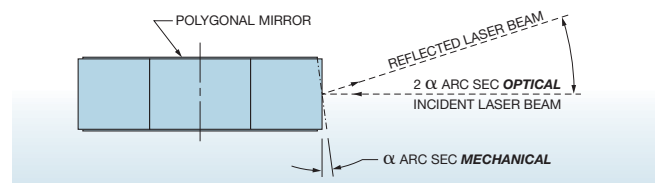
### Brushless DC Motors

The newer Lincoln Laser Brushless DC motors, however, have demonstrably superior operating characteristics in the most frequently specified speed ranges. These advanced BDC motors provide high efficiency, high torque output, and excellent position accuracy. These are features that are proving essential in most new, state-of-the-art scanning system designs using 24 or 48 volt motors.

### Features

- Bi-directional
- Operates in any attitude
- Brushless DC motor
- Tight tracking accuracy
- High and low speed mirror rotation
- Long life

**Dynamic Track** – This is a measure of the repeatable errors in the reflection angle perpendicular to scan. The two components of this error are the facet pyramid errors and hub parallelism errors. These errors are expressed in terms of arc seconds – and are measured mechanically.



**Non-Repeatable Runout** – A measure of the reflection errors perpendicular to the scan which are not repetitive. These errors are caused by the bearings and bearing mountings. Application note\* number 218 provides more in-depth discussion of track and runout errors.

**Jitter** – A measure of the short term (<10 revolutions) error in the time of flight from one point in the scan to another. The components that contribute to this error are surface figure errors, motor cogging, facet radius variations and dynamic stress.

**Velocity Stability** – A measure of the long term (>10 revolutions) variation in motor speed. The motor control determines the magnitude of this error. Application note\* number 214 provides more in-depth discussion of velocity stability and jitter.

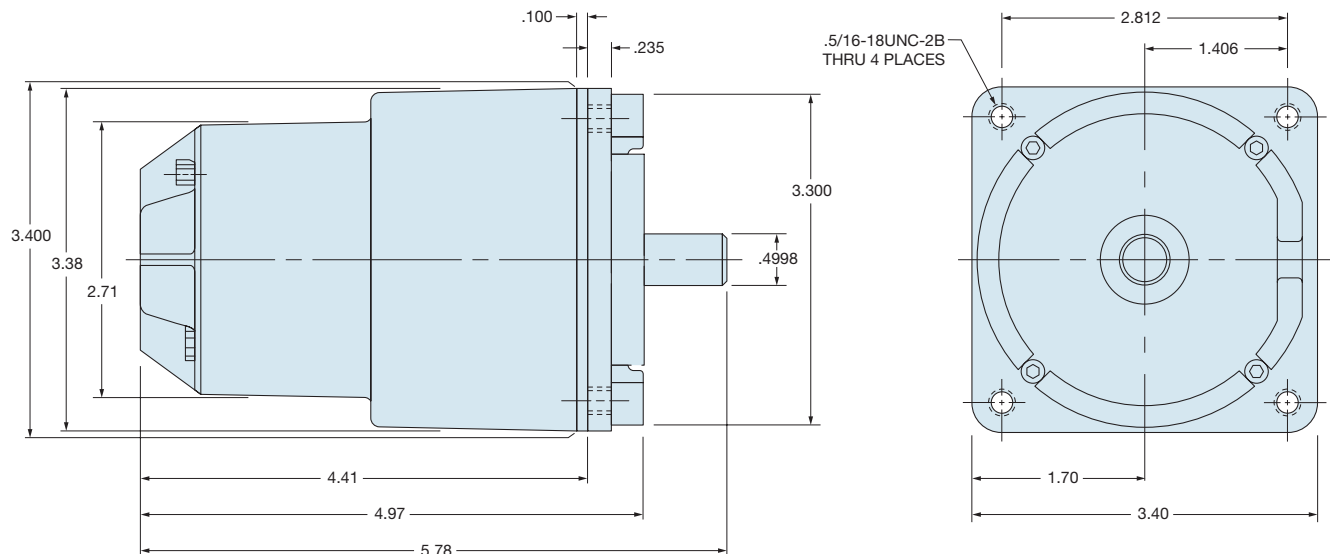
\* For Application notes go to “app notes” at [www.lincolnlaser.com](http://www.lincolnlaser.com)

## SCANNER MOTORS – SPECIFICATIONS

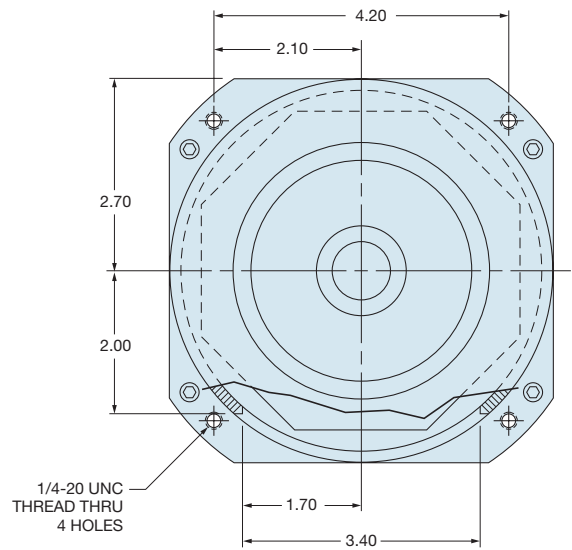
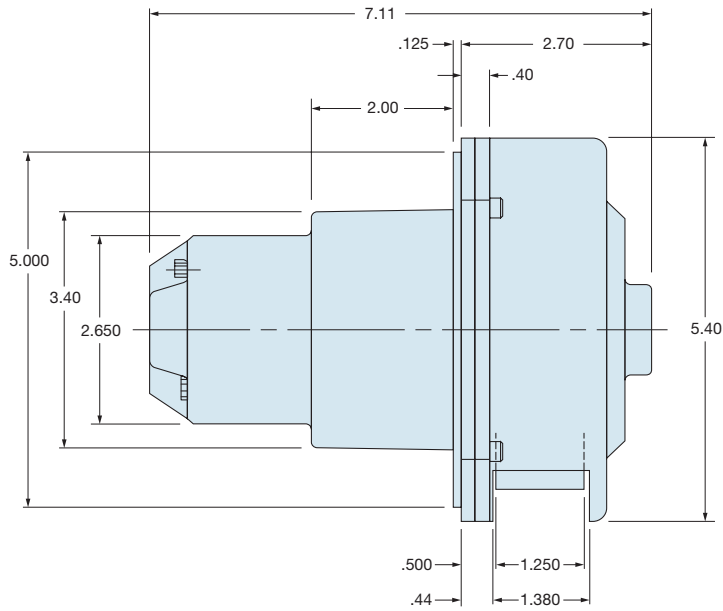
Model	Speed (RPM)	Mirror Size (Max.) Thick x Dia.	Bearing Type	Dynamic Track (Arc Sec.)	Housing Design	Velocity Stability* (%)	Encoder Option
<b>LB5C</b>	1-5k	1.25" x 3.27"	Ball	+/- 30	Cantilever	0.05	Yes
<b>LB5-5</b>	1-5k	1.25" x 5.00"	Ball	+/- 10	Captured	0.05	Yes
<b>LB5-6</b>	1-5k	1.25" x 6.00"	Ball	+/- 10	Captured	0.05	Yes
<b>LB5-6.5</b>	1-5k	1.25" x 6.50"	Ball	+/- 10	Captured	0.05	Yes
<b>LB12C</b>	5-12k	1.25" x 3.27"	Ball	+/- 30	Cantilever	0.02	Yes
<b>LB12-5</b>	5-12k	1.25" x 5.00"	Ball	+/- 10	Captured	0.02	Yes
<b>LB12-6</b>	5-12k	1.25" x 6.00"	Ball	+/- 10	Captured	0.02	Yes
<b>LB12-6.5</b>	5-12k	1.25" x 6.50"	Ball	+/- 10	Captured	0.02	Yes
<b>LB34</b>	20-34k	0.75" x 2.84"	Ball	+/- 10	Captured	0.01	Yes
<b>P1AB</b>	8-50k	0.40" x 2.50"	Air	+/- 30	Cantilever	0.02	No
<b>P1BB</b>	1-10k	1.00" x 3.00"	Ball	+/- 30	Cantilever	0.01	Yes
<b>SA24</b>	5-55k	0.40" x 3.00"	Air	+/- 30	Captured	0.01	No
<b>SA24C</b>	4-30k	0.40" x 3.00"	Air	+/- 10	Cantilever	0.01	No
<b>SB12</b>	2-12k	0.40" x 3.00"	Ball	+/- 10	Captured	0.02	Yes
<b>SB12C</b>	2-12k	1.00" x 3.00"	Ball	+/- 10	Cantilever	0.02	Yes

\* Speed and load dependent

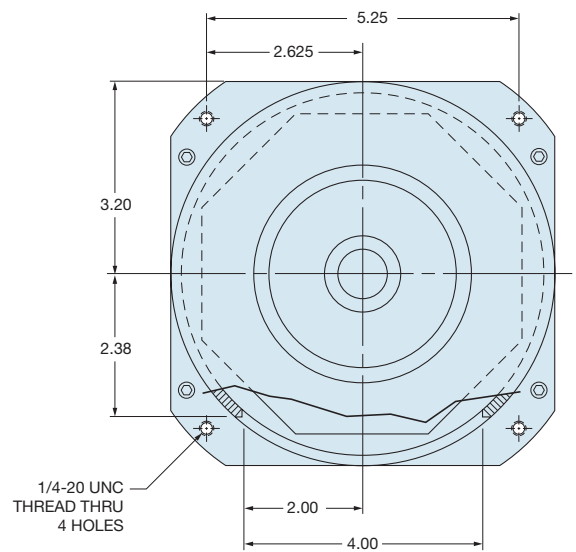
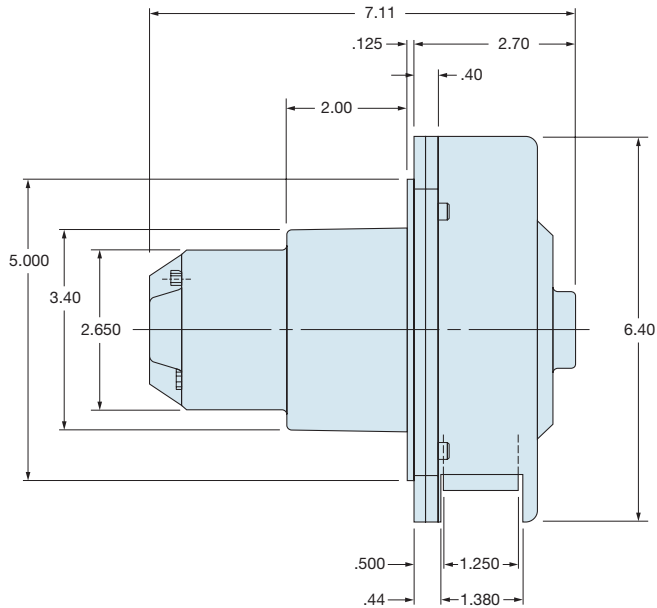
### Model # LB5C and LB12C



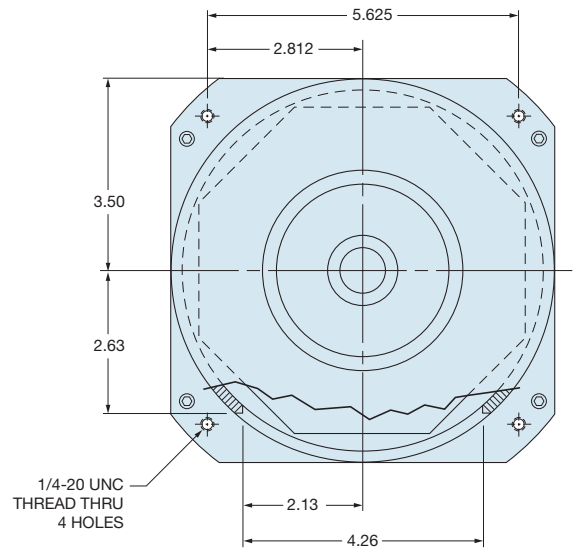
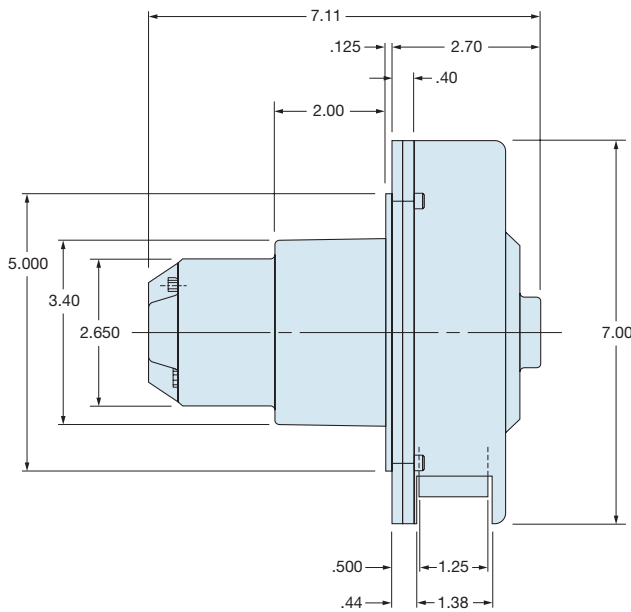
**Model # LB5-5 AND LB12-5**



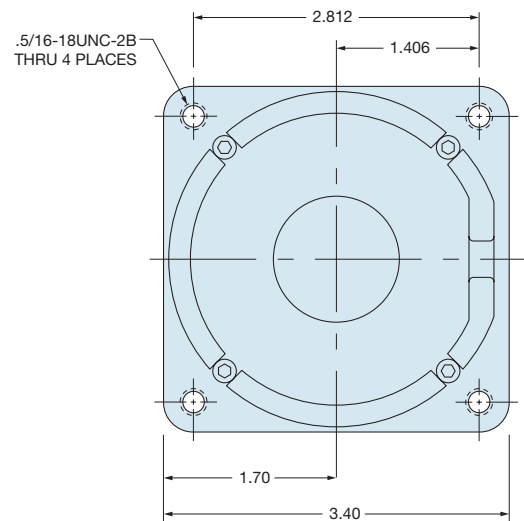
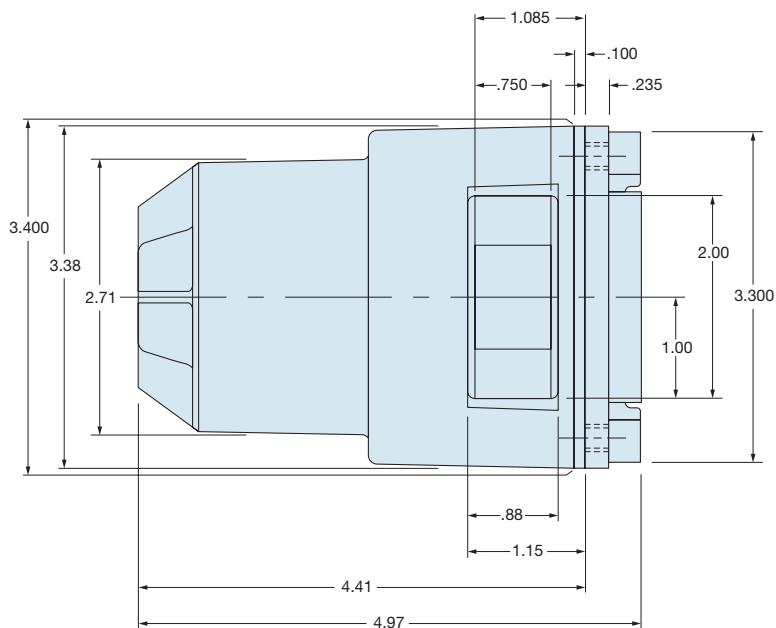
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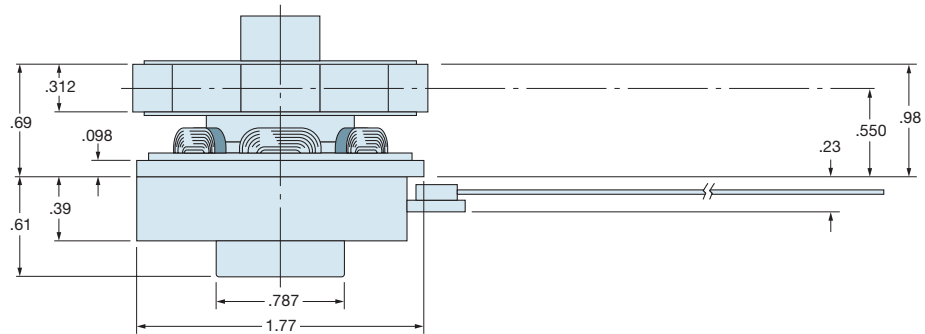
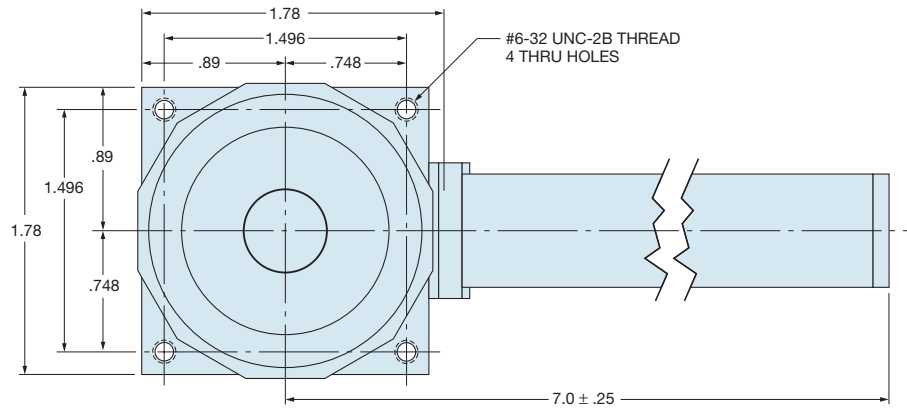
**Model # LB5-6.5 and LB12-6.5**



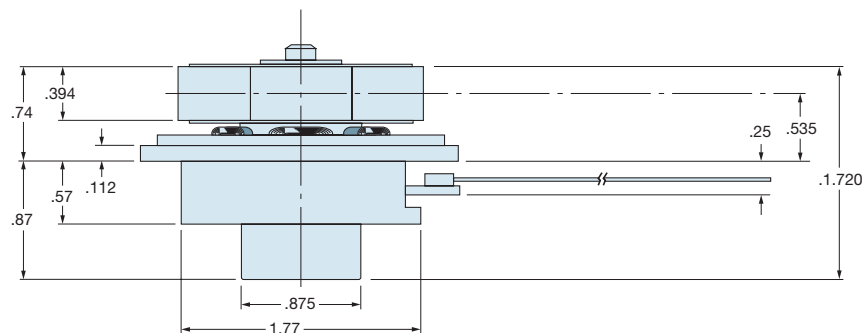
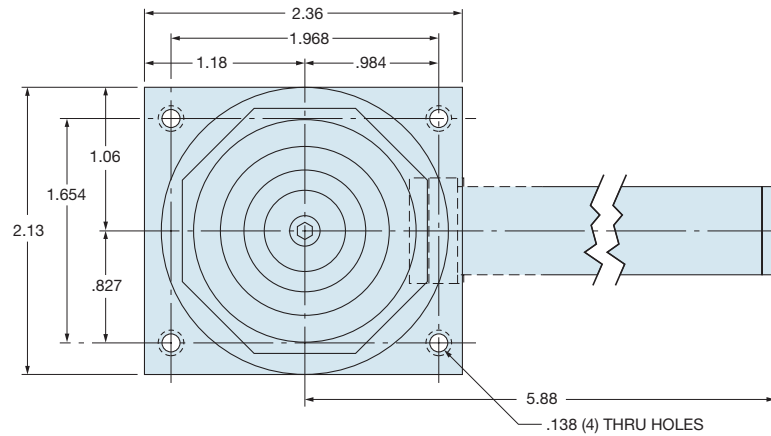
**Model # LB34**



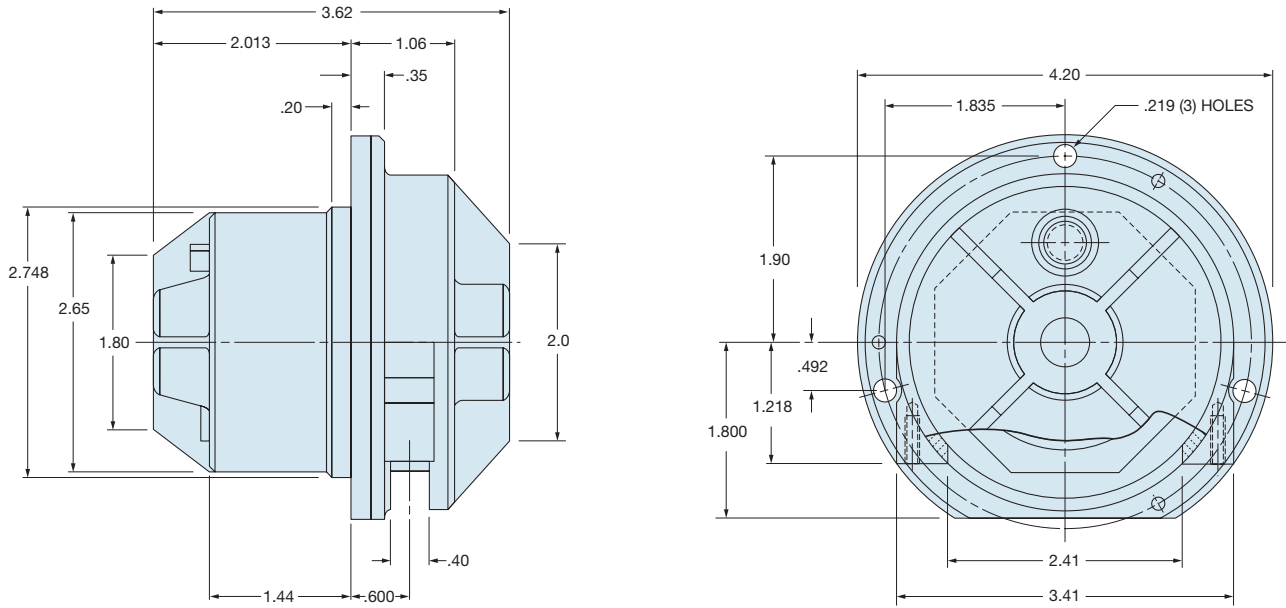
### Model # P1AB



### Model # P1BB



**Model # SB12, SA24, SB12C**



**Model # SA24C**

