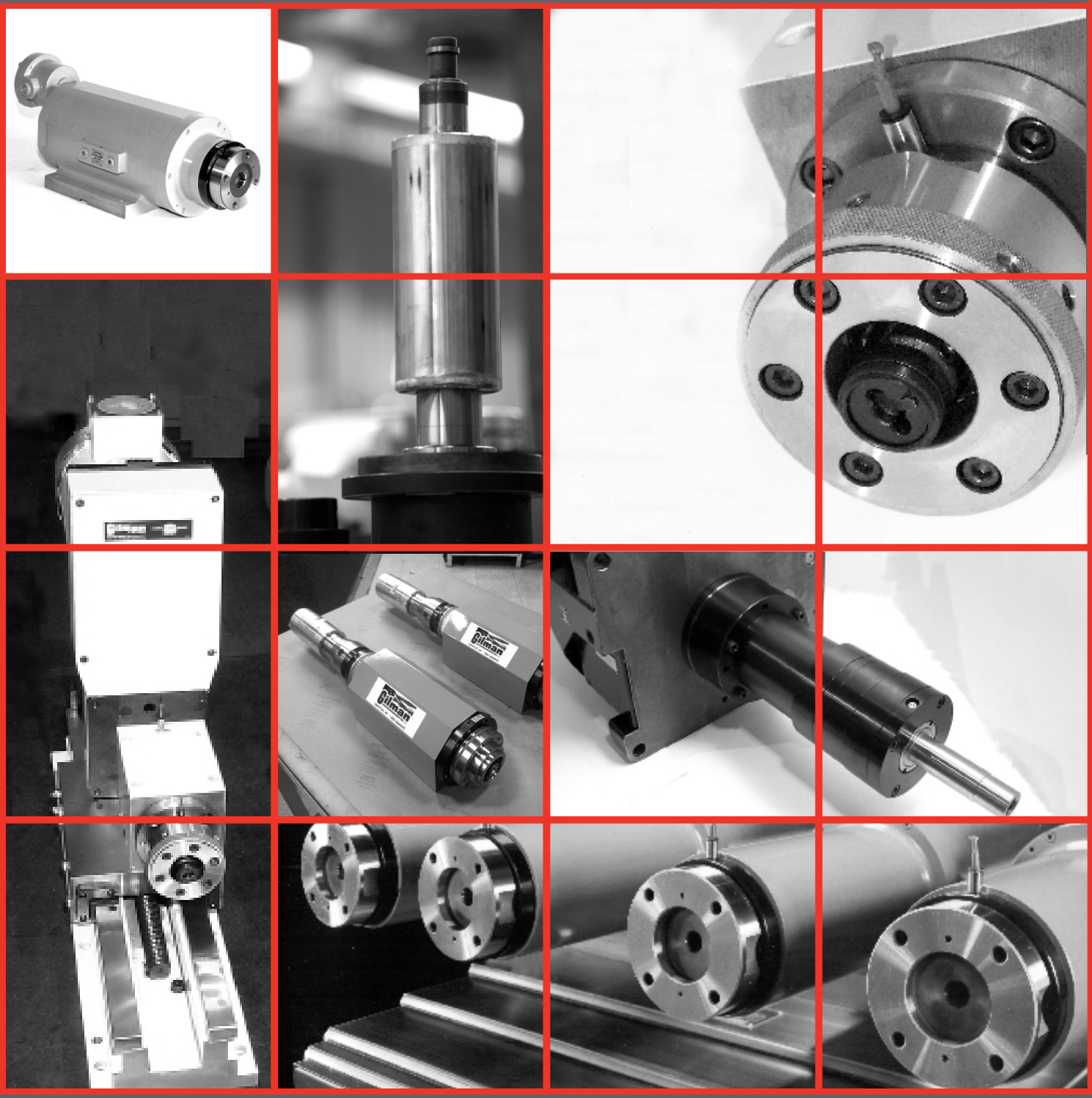
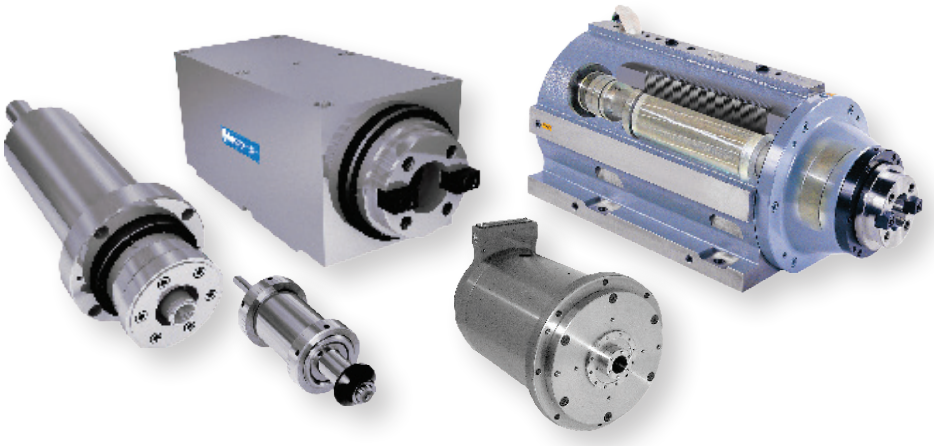
Gilman

SOLUTIONS FOR LINEAR & ROTARY MOTION

spindles





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Complete Spindle Selection

Customized solutions to increase efficiency and productivity.

CARTRIDGE & BLOCK BELT-DRIVEN SPINDLES

- *Six standard tool interface styles*
  - Arbor
  - Boring
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  - HSK
  - NMTB
  - Morse Taper
- *Multiple bearing set-ups*
- *Eight spindle sizes: 1.25 in. to 8 in. cartridge diameter*
- *36 lb. to 4,700 lb. thrust capacity*
- *Up to 27,200 RPM maximum*
- *All components in stock*

MECH-TRONIX INTEGRAL MOTOR SPINDLES

- *Complete spindle systems*
  - Spindle (open loop)
  - Matched drive (open loop)
  - Matched chiller for liquid cooled spindles
- *Standard tool interface*
  - Boring
  - HSK
  - NMTB
- *Four bearing structures for speed and thrust capabilities*
- *100 lb. to 3,790 lb. thrust capacity*
- *Up to 11,800 RPM*
- *Up to 20 horsepower (S1 Duty)*

SPINDLE BASICS

Steel Bearings

Steel angular contact bearings are the common choice for precision spindles. These types of bearings are preloading by adjusting them axially against each other or preloading them by the means of springs. Angular contact bearings support both radial and axial loads. These angular contact bearings have different contact angles. The most common are 15 degrees and 25 degrees. The higher the contact angle the more axial load capacity.

Ceramic Bearings

Ceramic or hybrid angular contact bearings are used to increase speed or lower operating temperature. These hybrid bearings use steel inner and outer rings with ceramic balls. The basic principles of hybrid ceramic angular contact bearings are the same as the steel type.

ABEC Rating

ABEC is the scaled description of bearing tolerances. The Scale was developed by the Annular Bearing Engineering Committee. There are five grades, 1, 3, 5, 7, and 9. The higher the number the greater the precision of the bearing. There are also ISO standards for bearing precision, ISO 492. ISO has five grades also, 6X, 6, 5, 4 and 2. With ISO, the lower the number the higher the precision.

Lubrication

Spindle bearings are lubricated by two forms, fluid lubricants (oils) or thickened fluid lubricants (greases). Fluid lubricants are applied by oil mist, oil+air or oil jet. Greases are packed in the bearings using specific amounts. There are many types of greases available depending on the speed required, load and environment. Gilman uses high performance synthetic greases in their spindles as standard. Fluid lubrication is available as a special design.

Angular Contact Bearings

Angular contact bearings use asymmetric axial races. Angular contact bearings are used to support loading in both the axial and radial directions. For higher axial loads, use triplex bearing constructions.

Labyrinth Seals

Labyrinth seals are non-contact seals which have passages designed to make it difficult for contaminants to make it from the outside of the spindle to the bearings. Labyrinth seals are used in applications where high speeds prevent the use of contact seals. Labyrinth seals are assisted in effectiveness by the use of air flowing out of the seal to the outside or what is called air purge.

Contact Seals

Contact seals are the preferred sealing method for keeping contaminants from reaching the spindle bearings. Because of the friction produced from the contact seal, contact seals are limited as far as speed. Contact seals can also be assisted by using air purge.

Balancing

An unbalanced rotor, when rotating, wants to revolve around its mass center axis. Because the bearings restrict this movement, the centrifugal force, due to the unbalance, causes the rotor to vibrate. This vibration causes wear to the bearings and creates unnecessary noise. It is therefore necessary to reduce the unbalance to an acceptable limit. Typical acceptable limits or balancing grade is ISO G1.0 or G0.4.

Gilman Brand Spindles

Manufacturing customized solutions for linear and rotary motion since 1952.

Built from the highest quality materials and components, our high-speed, belt-driven performance operates at fixed speeds and incorporates a timing belt for power positive transmission. Standard motors are 230/460 volt 3-phrase 60-Hz with other voltage options, gear motors, and inverter rated motors.

Our motorized spindles give processes more power, variable speed, and more tool connection choices. They provide high levels of reliability and allow maintenance work to be carried out quickly and efficiently. Optional capabilities include drives and cooling units.

View our line of standard spindles, ranging in size and speeds, in configuration, as well a variety of spindle accessories. Or, discuss your customized needs with one of Gilman's application engineers for a custom-designed spindle.

FEATURES AND BENEFITS

High Quality Alloy Steel Shaft
Case hardened and precision ground, the shaft combines a hard outer surface with a tough, resilient core.

Precision Grade Ball Bearings
Precision grade ABEC-7 angular contact ball bearings are provided as standard, (1250 and 1875 series spindles feature ABEC-7 shielded deep groove ball bearings). Bearings are lubricated with high performance synthetic grease.

Cast Iron Housings
Close-grain, stress-relieved cast iron housings provide dampening and heat-transfer properties.

Precision Runout Tolerances
Precision runout tolerances down to .0001 TIR are standard, depending on the size of the spindle unit, (refer to Spindle Runout Chart on page 7). Spindles with even higher precision (lower TIR values) can be furnished upon request.

High Performance Sealing
Highly effective standard sealing design includes labyrinth seals with flinging grooves and a gravity drain. Lower speed models feature Nitrile rubber V-ring seals. Air purging can be specified. 1250 and 1875 series spindles feature a shielded bearing sealing method (refer to pages 11-13).

Custom Materials and Sealing Solutions
Special materials and sealing methods can be used with any Gilman spindle, as may be required by unusual environmental situations.

Belt-Driven Motorized Spindles
Motorized spindles incorporate a totally enclosed fan-cooled motor, with timing belt drives as standard, (1875 series spindles are furnished with totally enclosed, non-ventilated motor). Poly-Vee belt, and Flat belt drives are available for application where high speed and minimum vibrations are required.

Here to Help
Refer to the following pages for detailed information on selecting the proper size spindle to match specific applications, or visit our website for product selection resources.

Contact our application engineering department for recommendations and inquiries on standard designs, modifications, or custom engineered spindles to meet specific needs.

Telephone: (800) 445-6267
E-mail: sales@gilmanprecision.com

Sizing Instructions

Proper spindle sizing is important to ensure a long and dependable life of the spindle. To help select the correct spindle, the following factors should be considered.

GENERAL RULES FOR SIZING

1. Always select the largest spindle that will fit your particular space and comply with the speed requirements. This will give you the maximum spindle stiffness and longest life.

2. Keep tool overhang to a minimum, particularly when boring, end milling or non-supported arbor milling, As you move farther from the spindle bearings, bearing loads increase and spindle stiffness decreases. Use the specification charts to find the maximum overhang distance.

3. When boring, the spindle nose bearing ID should be as large or larger than the hole being machined.

4. To minimize any shaft or bearing loading, keep within the maximum torque rating given on the specification charts.

5. Consider the environment in which the spindle is used. If the conditions are dusty, air purging is recommended. If there is heavy coolant or chips, it is advisable to supply a deflector cover to keep coolant or chips from directly attacking the spindle. Contact seals should be used unless speed requirements do not allow.

6. Specify the correct bearing arrangement. For mostly radial loaded applications, use a bearing pair at the nose end. For high axial loads, combination axial and radial loading or heavy or interrupted cuts, use a triplex bearing set at the nose end.

7. Gilman Precision's engineering and sales staff is always available to help select the correct spindles for your applications. When asking for assistance please supply the following information:

   - *Type of operation and stock removal amounts*
   - *Tooling description*
   - *Part material specification*
   - *Spindle Orientation*
   - *Environmental Conditions*
   - *Space Limitations*
   - *Horsepower and RPM Requirements*

   Whenever possible, supply a part print along with any other information that my be useful in spindle selection.

SPINDLE RUNOUT

Nose Style	Runout Location	Cartridge and Block Series								Mech-Tronix Series			
		1250	1875	2750	3500	4000	5500	6500	8000	350	400	550	650
NMTB	Mounting Face	--	--	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0002	0.0002	0.0002	0.0003
	Radial Diameter	--	--	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0002	0.0002	0.0002	0.0003
	Internal Taper	--	--	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001	0.0002
Boring or HSK (Cartridge & Block)	Pilot Bore	--	--	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	--	--	--	--
	Mounting Face	--	--	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	--	--	--	--
Collet and Morse Taper	Internal Taper	--	0.0003	0.0001	0.0001	--	--	--	--	--	--	--	--
Straight Bore	Internal Bore	--	0.0003	0.0002	--	--	--	--	--	--	--	--	--
Arbor	Radial Diameter	0.0003	0.0003	--	--	--	--	--	--	--	--	--	--
Boring (Mech-Tronix)	Pilot Bore	--	--	--	--	--	--	--	--	0.0001	0.0001	0.0001	0.0002
	Mounting Face	--	--	--	--	--	--	--	--	0.0001	0.0001	0.0001	0.0001
HSK (Mech-Tronix)	Mounting Face	--	--	--	--	--	--	--	--	0.0001	0.0001	0.0001	0.0001
	Internal Taper	--	--	--	--	--	--	--	--	0.0001	0.0001	0.0001	0.0001

Cartridge & Block Spindles

Since 1952, Gilman Precision has manufactured customized solutions for linear and rotary motion.

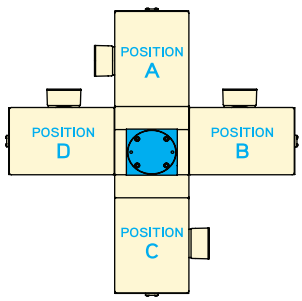
Cartridge and block spindles are identified by the first five code symbols. The first symbol determines the size of the spindle. The second symbol identifies the cartridge mounting or block configuration. The third symbol identifies the internal construction type and the fourth identifies the nose end bearing preload. The fifth symbol identifies the type of spindle nose.

ORDERING INSTRUCTIONS

Specify speed when ordering. Brackets are available for all cartridge spindles, see dimension sheets for model numbers.

Motorized spindles use the first five code symbols of the cartridge or block assembly and the sixth code symbol to describe the type of motor drive.

On most belt-driven units, the motor can be positioned at four locations around the spindle, but motor positions are not field changeable. Position "A" will be furnished unless otherwise specified. Motor dimensions and frame size may vary. If exact dimensions are required, request certified print.



Specify spindle speed when ordering. All motors will be supplied 230/460 volt, 3 phase 60 cycle. Consult factory for other motor specifications and spindle speeds not shown in charts.

You can readily determine the spindle model number as you decide on size, spindle mounting, internal construction, shaft type and if motorized drives are required.

Check to see that each code symbol in the model number is indicated under the size selected and to the left in the column under the assembly selected, These are the spindle assemblies that are available.

We can give prompt accurate service if complete information is provided with the order.

If you have any questions, please telephone our Sales Engineering Department: (800) 445-6267.

Specify air purge if required. Fitting will be supplied upon request on nose end of cartridge spindles and each end of block spindles.

Spindle Size								Description	Code
1250	1875	2750	3500	4000	5500	6500	8000		
								Housing Type	
●	●							Plain housing cartridge	P
●	●							Positioning nut cartridge	N
		●	●	●	●	●	●	Flange housing cartridge	C
		●	●	●	●	●	●	Block housing	B
								Bearing and Seal Construction	
●	●	●	●	●	●	●	●	Duplex ball nose end, contact seal	X1
		●	●	●	●	●	●	Duplex ball nose end, labyrinth seal	X2
		●	●	●	●	●	●	Duplex ceramic ball nose end, labyrinth seal	X2C
		●	●	●	●	●	●	Triplex ball nose end, contact seal	X3
		●	●	●	●	●	●	Triplex ball nose end, labyrinth seal	X4
		●	●	●	●	●	●	Triplex ceramic ball nose end, labyrinth seal	X4C
								Nose end bearing preload	
		●	●	●	●	●	●	Light preload	L
●	●	●	●	●	●	●	●	Medium preload	M‡
		●	●	●	●	●	●	Heavy preload	H
								Shaft nose	
●	●							Arbor	AR*
	●							Morse taper	MT
		●	●	●	●	●	●	Boring nose	BN
	●	●	●					Collet	CE
		●	●	●	●	●	●	HSK manual adapter	HM
		●	●					30 NMTB	30
				●	●			40 NMTB	40
						●	●	50 NMTB	50
								Motor drive	
	●	●	●	●	●			Belt - motor drive end (high HP)	B1
	●	●	●	●	●	●	●	Belt - motor nose end (high HP)	B2
		●	●	●	●	●		Belt - motor drive end (low HP)	B3
		●	●	●	●	●	●	Belt - motor nose end (low HP)	B4

*1250 Arbor nose not available in motorized.
‡Medium preload is offered as standard. Light and heavy preload are available upon request. 1250 and 1875 only available with medium preload.

Mech-Tronix Spindle Systems

Integral motorized spindle system with factory matched drive and chiller options.

The motorized spindles from Gilman Precision can be defined by using a simple model number to define the standard features desired. Mech-Tronix spindles offer a series of pre-engineered choices that have been application tested and utilized industry standards for housing sizes, bearing construction, tooling interface lubrication and motor performance.

ORDERING INSTRUCTIONS

Select Size
This is a function of the bearing diameter. Refer to the data charts for front bearing size.

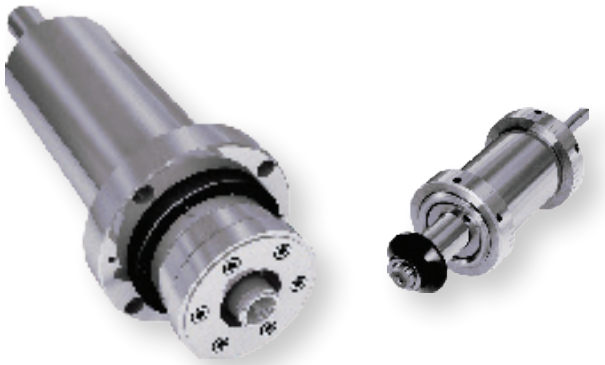
Housing Style
All spindles are foot mounted. The Mech-Tronix spindle is available in a cartridge housing as a special product.

Bearing:
Angular contact ABEC class 7/9 bearings using either steel or hybrid ceramic balls. This is a function of the operating RPM. Synthetic grease lubrication is standard. The duplex configuration is typical. The Mech-Tronix spindle has a triplex design for greater stiffness and thrust capacity at lower RPM ranges.

Tooling
HSK tooling is recommended for high speed machining. The Mech-Tronix spindle can be ordered with traditional milling taper and used a standard draw rod for tool retention.

Motor Performance
Define your operating RPM and HP requirements. Select the liquid cooled options for higher performance in HP. Drives, chiller and accessories are sold separately.

Size				Description	Code
350	400	550	650		
				Bearing arrangement - nose end	
●	●	●	●	Duplex set, light preload, ceramic balls	2LC
●	●	●	●	Duplex set, medium preload, steel balls	2M
●	●	●	●	Triplex set, medium preload, steel balls	3M
●	●	●	●	Triplex set, heavy preload, steel balls	3H
				Tooling connection	
●				30 NMTB taper	30
	●	●		40 NMTB taper	40
			●	50 NMTB taper	50
●	●	●	●	Boring nose	BN
●	●	●	●	HSK hollow shank: manual clamp	HM
				Motor enclosure	
●	●	●	●	Totally Enclosed Non-Ventilated (TENV)	
●	●	●	●	Totally Enclosed Liquid-Cooled (TELC)	



Cartridge & Block Spindles

A wide selection for milling, drilling, boring
and other rotational processes.

CARTRIDGE, BLOCK & MOTORIZED SPINDLES

Gilman
SOLUTIONS FOR LINEAR & ROTARY MOTION

1250P CARTRIDGE SPINDLE

1250N CARTRIDGE SPINDLE

1250 Cartridge Spindles are available in plain and positioning nut types. Positioning nut models feature two 0.001 inch graduated nuts at each end of the cartridge for axial adjustment of the spindle. They are availabe in one standard nose type and one standard internal construction.

Nose Types

- 0.375 inch diameter arbor

Internal Construction

- X1M Duplex Shielded Ball Bearing at Nose End

Specifications

- Maximum Torque: 5 in-lbs
- WK^2: 0.023 lb-in^2
- Approximate Weight: 1 lb

Notes

Refer to the 1250P/1250N specification chart, as well as the sizing instructions on page 6, to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

Two types of cartridge spindle brackets are available: clamp type for plain cartridges and positioning nut type. Both types are manufactured from close grain, stress relieved cast iron.

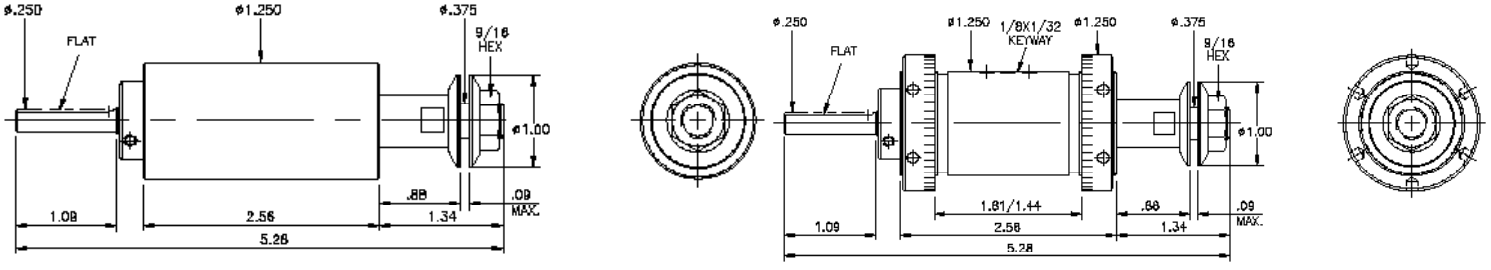
1250P/1250N

Bearing/Seal Number	Maximum Thrust (lbs.)	Maximum RPM	Radial Stiffness At Nose (lbs./in.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1M	36	14,000	5,060	8mm ID Duplex Ball	Shielded Bearing	8mm ID Single Row Ball	Shielded Bearing

1250P & 1250N SPINDLE

Arbor

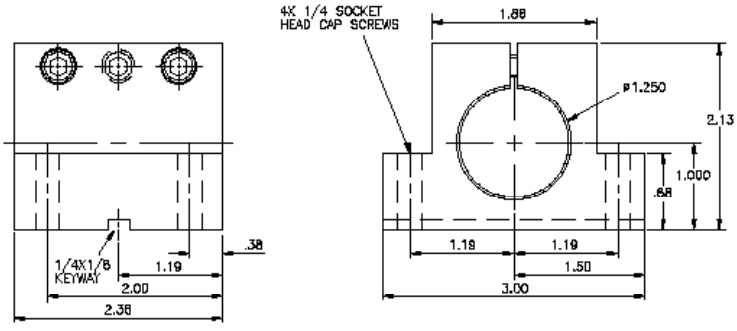
All Dimensions = Inches



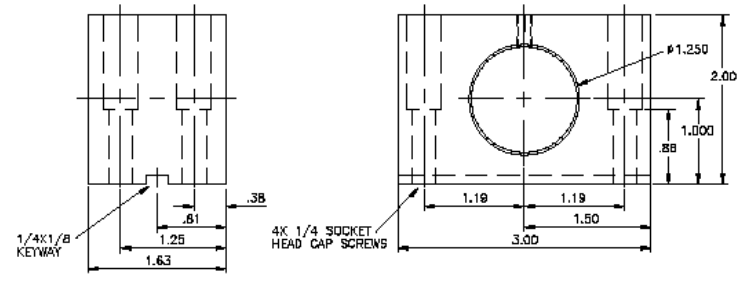
1250P & 1250N BRACKETS

Mounting Bracket

Clamp Type B20307-2



Positioning Nut Type B20308-2



1875 Plain Cartridge Spindles are available in three standard nose types and one standard internal construction.

Nose Types

- 0.500 inch diameter Arbor
- 1/16" to 3/8" ER16 Collet Shaft
- #1 Morse Taper shaft

Internal Construction

- X1M Duplex Shielded Ball Bearing at nose end

Specifications

- Maximum Torque: 35 in-lbs
- Maximum Tool Overhang: 2 1/2"
- WK²: 0.205 lb-in²
- 1875P/N Spindle Approximate Weight: 4 lbs
- 1875N Belt-Driven Motorized Spindle Approximate Weight: 35 lbs

Notes

Refer to the 1875 specification chart, as well as the sizing instructions on page 6, to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs. Tool overhang pertains to boring, end milling and nonsupported arbor milling.

Two types of cartridge spindle brackets are available: clamp type for plain cartridges and positioning nut type. Both types are manufactured from close grain, stress relieved cast iron. See Spindle Accessories on page 44.

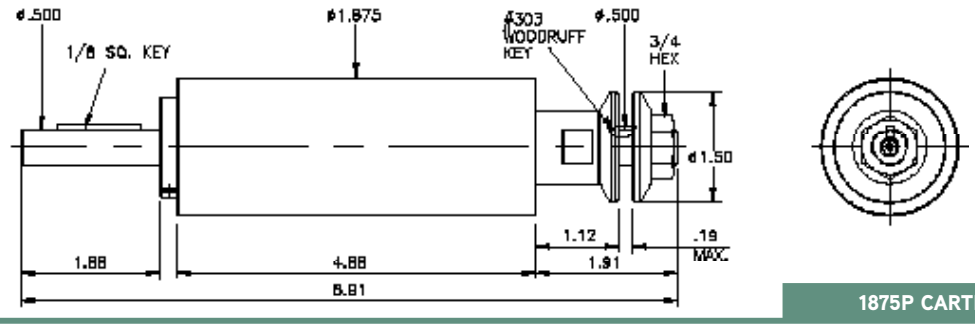
1875P

Bearing/Seal Number	Maximum Thrust (lbs.)	Maximum RPM	Radial Stiffness At Nose (lbs./in.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1M	45	15,800	33,444	17mm ID Duplex Ball	Shielded Bearing	17mm ID Single Row Ball	Shielded Bearing

Arbor

1875P CARTRIDGE SPINDLE

All Dimensions = Inches

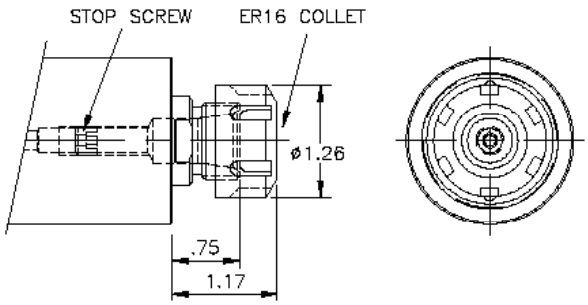


ER16 Collet

1875P CARTRIDGE SPINDLE

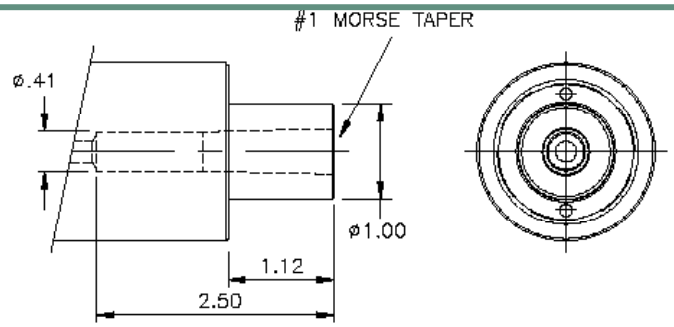
ER16 Collet Capacity

Tool Diameter	Max Tool Depth
1/16 to 1/4" shaft max tool depth	2"
1/4 to 3/8" shaft max tool depth	1-3/16"



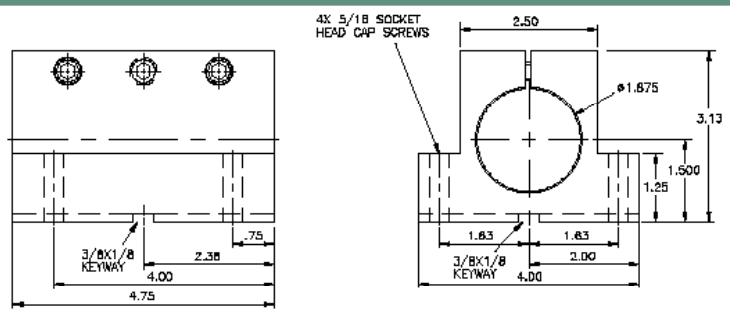
Morse Taper

1875P CARTRIDGE SPINDLE



Mounting Bracket

1875P CARTRIDGE SPINDLE



1875N

POITIONING NUT

1875 Positioning Nut Cartridge Spindles feature two 0.001 inch graduated nuts at each end of the cartridge for axial adjustment of the spindle. Also available are three standard nose types and one standard internal construction.

Nose Types

- 0.500 inch diameter Arbor
- 1/16" to 3/8" ER16 Collet Shaft
- #1 Morse Taper shaft

Internal Construction

- X1M Duplex Shielded Ball Bearing at nose end

1875N

Bearing/Seal Number	Maximum Thrust (lbs.)	Maximum RPM	Radial Stiffness At Nose (lbs./in.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1M	45	15,800	33,444	17mm ID Duplex Ball	Shielded Bearing	17mm ID Single Row Ball	Shielded Bearing

Specifications

- Maximum Torque: 35 in-lbs
- Maximum Tool Overhang: 2 1/2"
- WK²: 0.205 lb-in²
- 1875P/N Spindle Approximate Weight: 4 lbs
- 1875N Belt-Driven Motorized Spindle Approximate Weight: 35 lbs

Notes

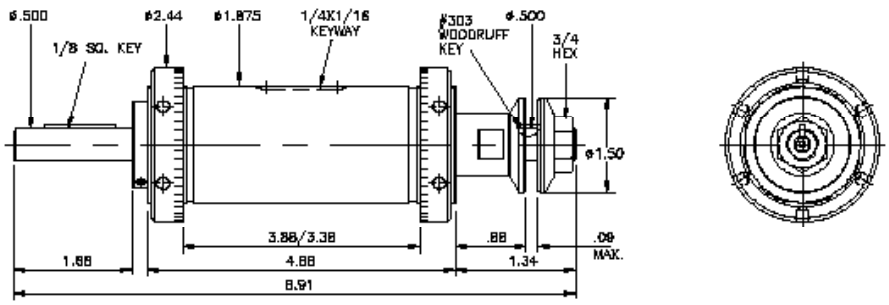
Refer to the 1875 specification chart, as well as the sizing instructions on page 6, to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

Tool overhang pertains to boring, end milling and nonsupported arbor milling.

Two types of cartridge spindle brackets are available: clamp type for plain cartridges and positioning nut type. Both types are manufactured from close grain, stress relieved cast iron. See Spindle Accessories on page 44.

1875N CARTRIDGE SPINDLE — **Arbor**

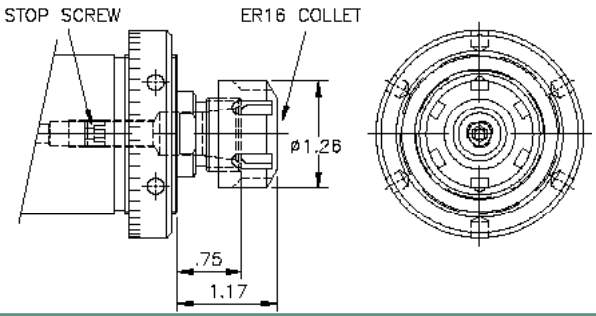
All Dimensions = Inches



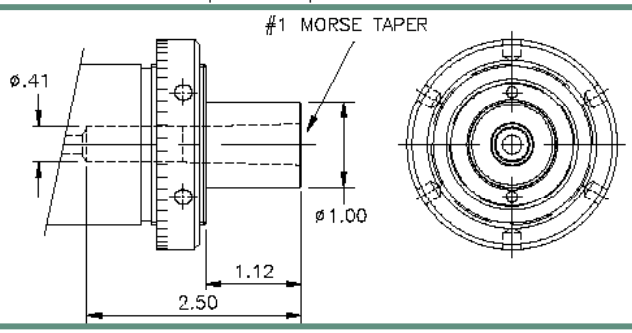
1875N CARTRIDGE SPINDLE — **ER16 Collet**

ER16 Collet Capacity

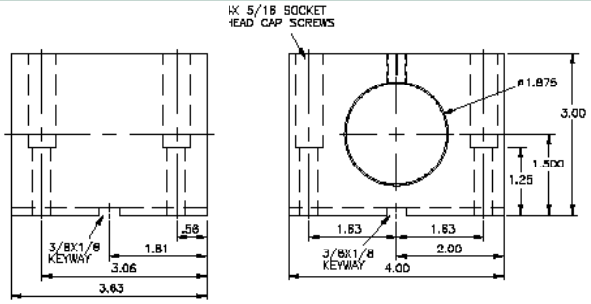
Tool Diameter	Max Tool Depth
1/16 to 1/4" shaft max tool depth	2"
1/4 to 3/8" shaft max tool depth	1-3/16"



1875N CARTRIDGE SPINDLE — **Morse Taper**



1875N CARTRIDGE SPINDLE — **Mounting Bracket**



1875N Belt-Driven Motorized Spindles are fixed-speed units incorporating a timing belt drive for positive power transmition. Poly-Vee belt and Flat-Belt drives are available where high speed and minimum vibration are required.

Belt Drives

- Poly-Vee belt
- Flat-Belt
- Timing Belt

1875N B1 & B2

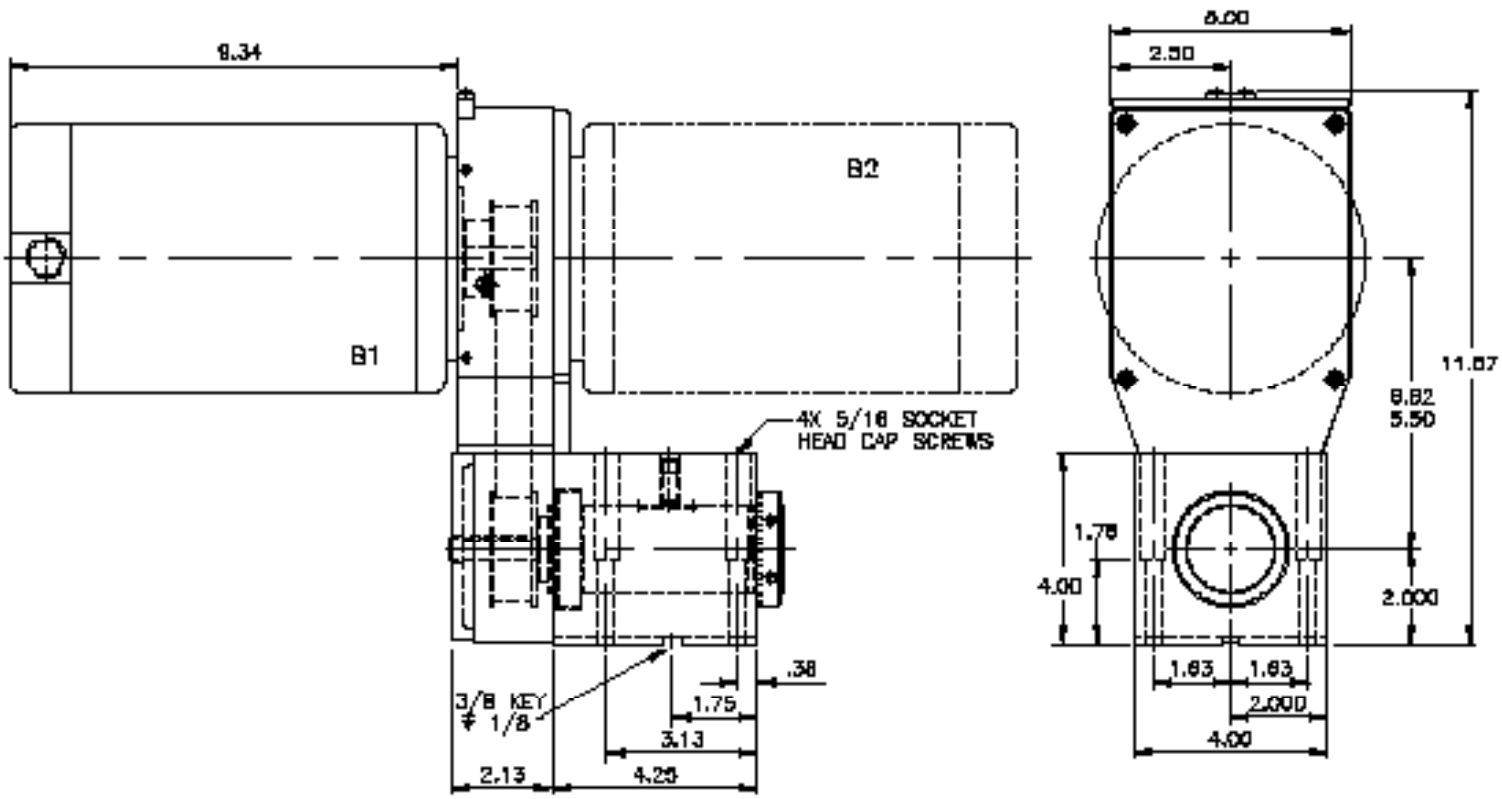
Spindle RPM		Motor		
Minimum	Maximum	RPM	HP	Frame
800	2,350	1,160	0.33	48C
1,150	3,500	1,750	0.25 or 0.5	48C
2,300	10,500	3,500	0.33 or 0.5	48C

Notes

Refer to the 1875P/1875N specification chart, as well as the sizing instructions on page 6, to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific need

B1 & B2 BELT-DRIVEN MOTORIZED

All Dimensions = Inches



2750C
CARTRIDGE SPINDLE

2750C Cartridge Spindles and 2750B Block Spindles are available with four standard nose types and six standard internal construction types.

Nose Types

- #30 NMTB Taper Shaft
- Boring Nose
- ER32 Collet Shaft
- HSKC40 Manual Clamp

Internal Construction

- X1 Duplex Ball Bearing at nose end with contact seal
- X2 Duplex Ball Bearing at nose end with labyrinth seal
- X2C Duplex Ceramic Ball Bearing at nose end with labyrinth seal
- X3 Triplex Ball Bearing at nose end with contact seal
- X4 Triplex Ball Bearing at nose end with labyrinth seal
- X4C Triplex Ceramic Ball Bearing at nose end with labyrinth seal

Specifications

- Maximum Torque: 133 in-lbs
- Maximum Tool Overhang: 3" from the dot in the drawing below.
- WK^2: 2.8 lb-in²
- 2750C Spindle Approximate Weight: 15 lbs
- 2750B Spindle Approximate Weight: 25 lbs

Notes

Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available.

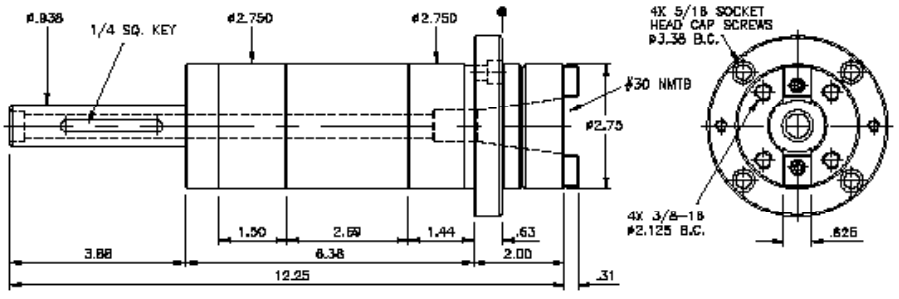
Tool overhang pertains to boring, end milling and nonsupported arbor milling.

Refer to the 2750C/2750B specification chart, as well as the sizing instructions on page 6, to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

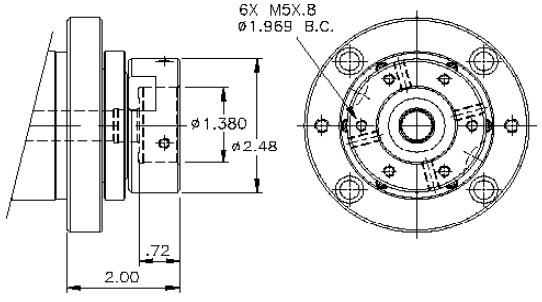
Cartridge spindle brackets are available. See Spindle Accessories on page 44.

2750C CARTRIDGE SPINDLE — **30 NMTB Taper**

All Dimensions = Inches



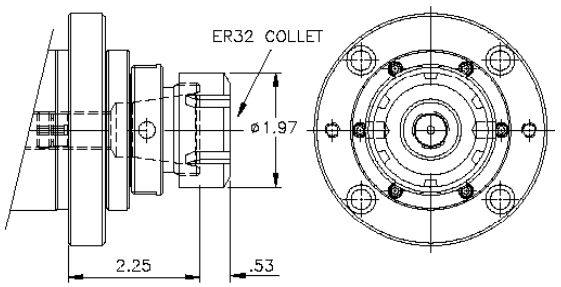
2750C CARTRIDGE SPINDLE — **Boring Nose**



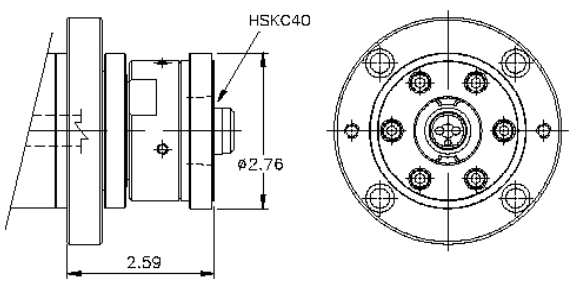
2750C CARTRIDGE SPINDLE — **ER32 Collet**

ER32 Collet Capacity

Tool Diameter	Max Tool Depth
1/16 to 9/16" shaft max tool depth	4"
Over 9/16 to 3/4"	2"



2750C CARTRIDGE SPINDLE — **HSKC40 Manual Clamp**

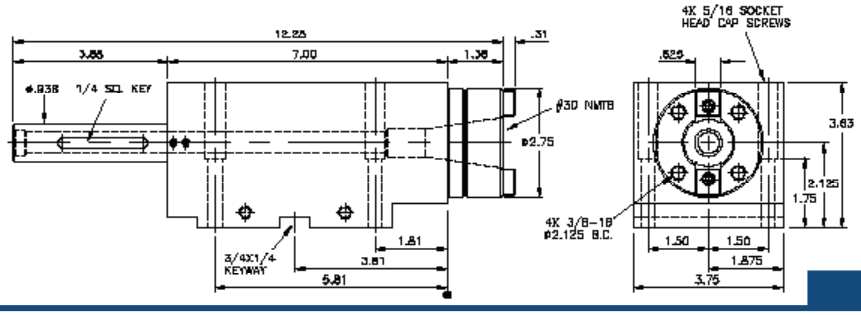


2750C/2750B

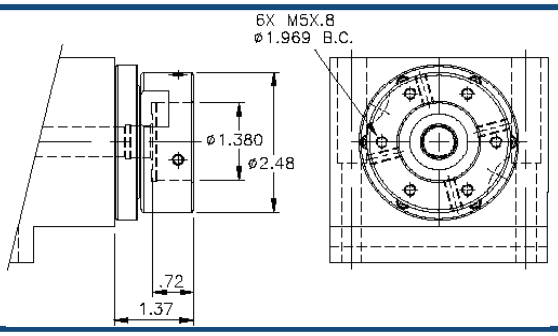
Bearing/Seal Number	Maximum Thrust (lbs.)	Maximum RPM	Radial Stiffness At Nose (lbs./in.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	46	5,300	180,000	30mm ID Duplex Ball	Contact	25mm ID Duplex Ball	Labyrinth
X1M	139	5,300	200,000				
X1H	289	5,300	210,000				
X2L	46	17,500	180,000	30mm ID Duplex Ball	Labyrinth	25mm ID Duplex Ball	Labyrinth
X2M	139	15,600	200,000				
X2H	289	10,400	210,000				
X2CL	34	27,200	180,000	30mm ID Duplex Ceramic Ball	Labyrinth	25mm ID Duplex Ceramic Ball	Labyrinth
X2CM	70	23,800	200,000				
X3L	92	5,300	260,000	30mm ID Triplex Ball	Contact	25mm ID Triplex Ball	Labyrinth
X3M	290	5,300	290,000				
X3H	655	5,300	300,000				
X4L	92	15,600	260,000	30mm ID Triplex Ball	Labyrinth	25mm ID Triplex Ball	Labyrinth
X4M	290	10,400	290,000				
X4H	655	8,300	300,000				
X4CL	67	23,800	260,000	30mm ID Triplex Ceramic Ball	Labyrinth	25mm ID Triplex Ceramic Ball	Labyrinth
X4CM	138	18,700	290,000				

30 NMTB Taper

All Dimensions = Inches



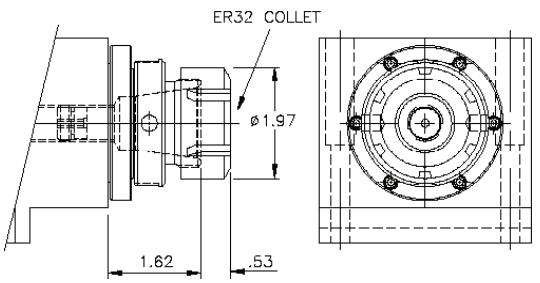
Boring Nose



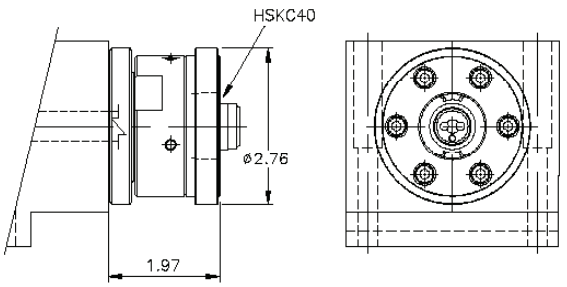
ER32 Collet

ER32 Collet Capacity

Tool Diameter	Max Tool Depth
1/16 to 9/16" shaft max tool depth	4"
Over 9/16 to 3/4"	2"



HSKC40 Manual Clamp



2750C and 2750B Belt-Driven Motorized Spindles are fixed-speed units incorporating a timing-belt drive for positive power transmission. Poly-Vee belt, V-belt and flat-belt drives are available at additional cost where high-speed and minimum vibration are required. The 2750C and 2750B Belt-Driven Motorized Spindles are available in two sizes: B1 and B2 units are high-horsepower and B3 and B4 units are low-horsepower.

Drives

- Timing Belt
- Poly-Vee Belt
- V-Belt
- Flat-Belt

Motors

- B1 & B2 High-Horsepower: 1.5HP, 2HP and 3HP
- B3 & B4 Low-Horsepower: 0.33HP, 0.75HP and 1HP

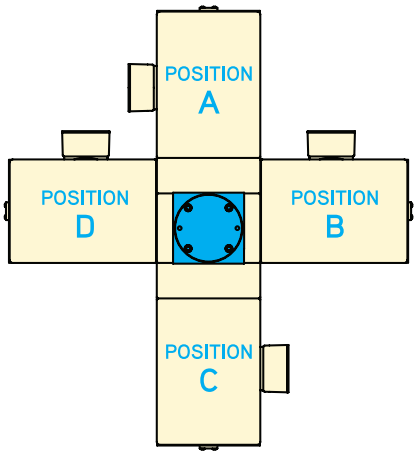
Specifications

- 2750C Belt-Driven Motorized Spindle Approximate Weight: 95 lbs
- 2750B Belt-Driven Motorized Approximate Weight: 85 lbs

Notes

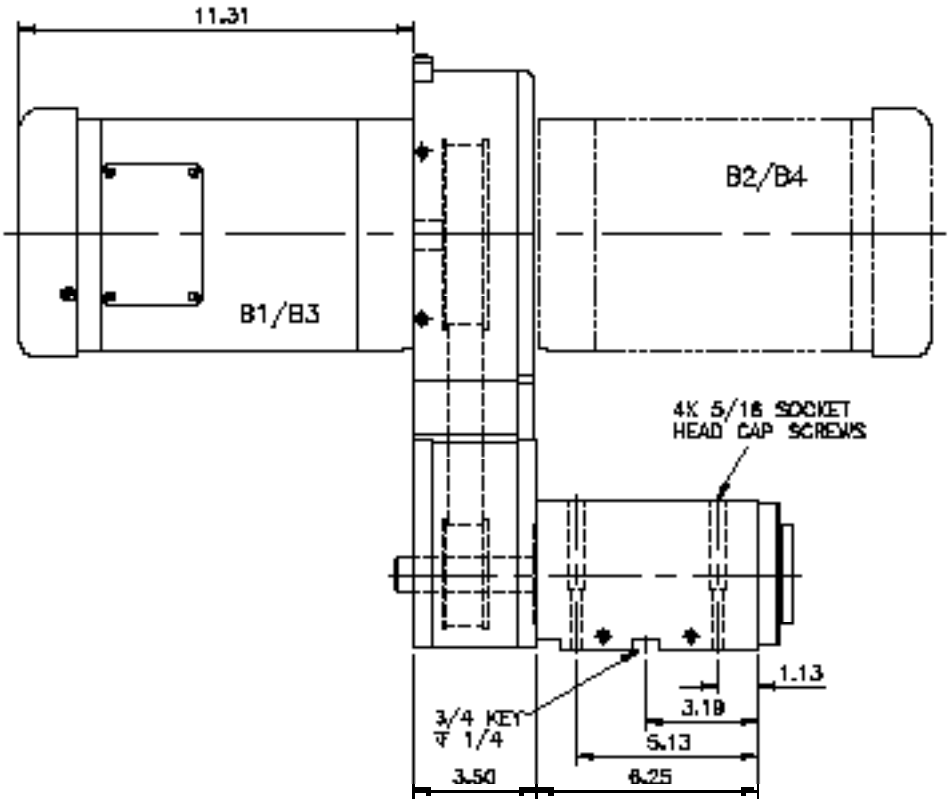
Spindles refer to the 2750C/2750B specification chart, as well as the sizing instructions on page 7, for specific spindle specifications and to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

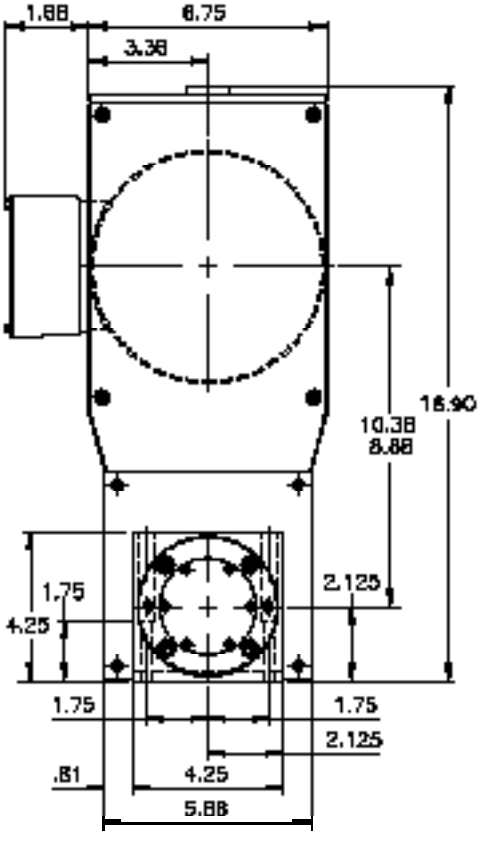
See Spindle Accessories on page 44.



2750C BELT-DRIVEN MOTORIZED

All Dimensions = Inches





2750C/2750B B1 & B2

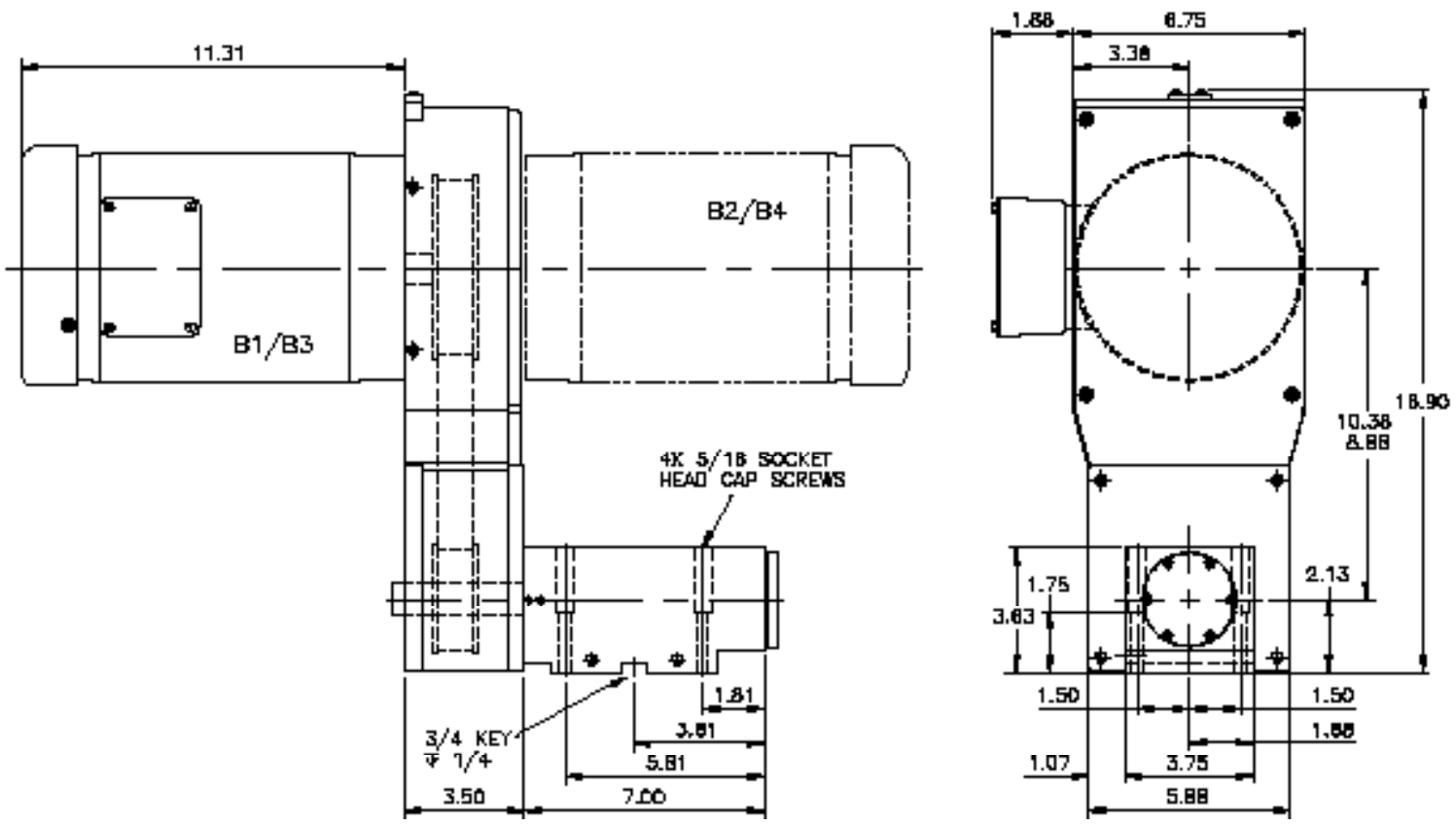
Spindle RPM			Motor		
Position	Minimum	Maximum	RPM	HP	Frame
A & C	900	2,350	1,160	1.5	145TC
B & D	900	1,900			
A & C	1,450	3,500	1,750	1.5 or 2	145TC
B & D	1,450	2,050			
A & C	3,300	7,700	3,500	2 or 3	145TC
B & D	3,300	6,250			

2750C/2750B B3 & B4

Spindle RPM			Motor		
Position	Minimum	Maximum	RPM	HP	Frame
A & C	800	2,350	1,160	0.33 or 0.5	56C
B & D	800	2,350			
A & C	1,200	3,500	1,750	0.5 or 0.75	56C
B & D	1,200	3,500			
A & C	2,400	7,700	3,500	0.75 or 1	56C
B & D	2,400	6,250			

2750B BELT-DRIVEN MOTORIZED

All Dimensions = Inches



3500C Cartridge Spindles and 3500B Block Spindles are available with four standard nose types and six standard internal construction types.

Nose Types

- #30 NMTB Taper Shaft
- Boring Nose
- 1/16" to 3/4" ER32 Collet
- HSKC50 Manual Clamp

Internal Construction

- X1 Duplex Ball Bearing at Nose End with Contact Seal
- X2 Duplex Ball Bearing at Nose End with Labyrinth Seal
- X2C Duplex Ceramic Ball Bearing at Nose End with Labyrinth Seal
- X3 Triplex Ball Bearing at Nose End with Contact Seal
- X4 Triplex Ball Bearing at Nose End with Labyrinth Seal
- X4C Triplex Ceramic Ball Bearing at Nose End with Labyrinth Seal

Specifications

- Maximum Torque: 527 in-lbs
- Maximum Tool Overhang: 3-7/8" from the dot in the drawing below.
- WK^2: 6.2 lb-in²
- 3500C Spindle Approximate Weight: 30 lbs
- 3500B Spindle Approximate Weight: 45 lbs

Notes

Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available.

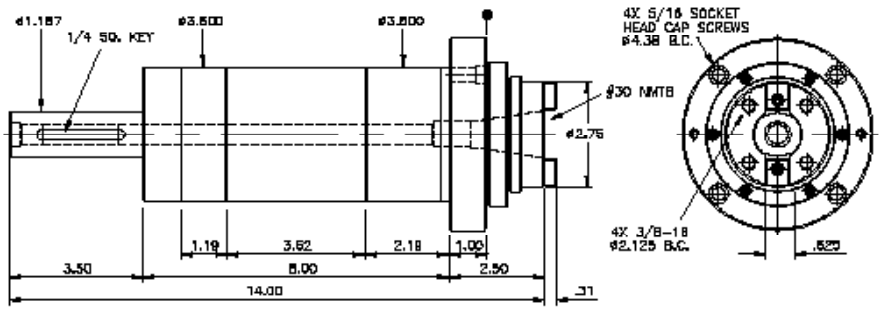
Tool overhang pertains to boring, end milling and nonsupported arbor milling.

Refer to the 3500C/3500B specification chart, as well as the sizing instructions on page 6, to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

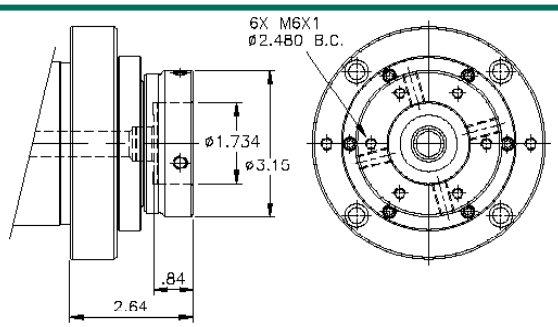
Cartridge spindle brackets are available. See Spindle Accessories on page 44.

3500C CARTRIDGE SPINDLE — **#30 NMTB Taper**

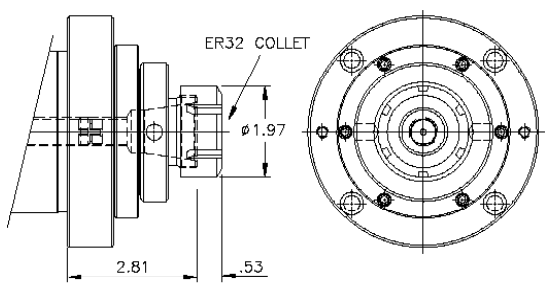
All Dimensions = Inches



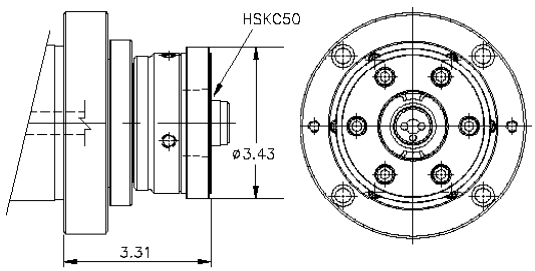
3500C CARTRIDGE SPINDLE — **Boring Nose**



3500C CARTRIDGE SPINDLE — **ER32 Collet**



3500C CARTRIDGE SPINDLE — **HSKC50 Manual Clamp**



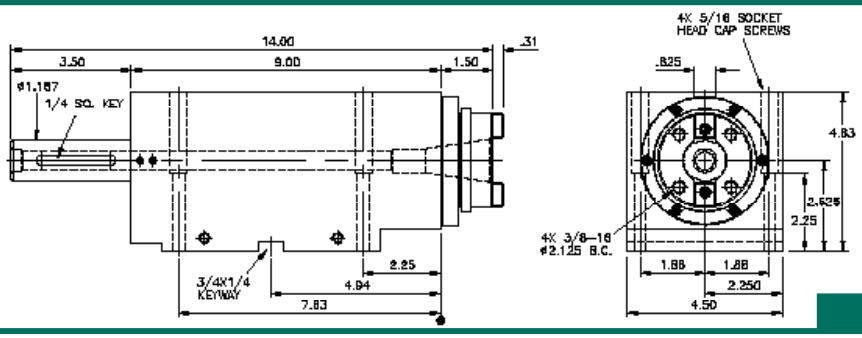
3500C/3500B

Bearing/Seal Number	Maximum Thrust (lbs.)	Maximum RPM	Radial Stiffness At Nose (lbs./in.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	100	3,750	430,000	45mm ID Duplex Ball	Contact	35mm ID Duplex Ball	Labyrinth
X1M	265	3,750	490,000				
X1H	560	3,750	530,000				
X2L	100	13,900	430,000	45mm ID Duplex Ball	Labyrinth	35mm ID Duplex Ball	Labyrinth
X2M	265	10,800	490,000				
X2H	560	7,200	530,000				
X2CL	77	17,600	430,000	45mm ID Duplex Ceramic Ball	Labyrinth	35mm ID Duplex Ceramic Ball	Labyrinth
X2CM	162	15,400	490,000				
X3L	207	3,750	670,000	45mm ID Triplex Ball	Contact	35mm ID Duplex Ball	Labyrinth
X3M	527	3,750	750,000				
X3H	1191	3,750	820,000				
X4L	207	10,800	670,000	45mm ID Triplex Ball	Labyrinth	35mm ID Duplex Ball	Labyrinth
X4M	527	7,200	750,000				
X4H	1191	5,700	820,000				
X4CL	153	15,400	670,000	45mm ID Triplex Ceramic Ball	Labyrinth	35mm ID Duplex Ceramic Ball	Labyrinth
X4CM	319	12,100	750,000				

#30 NMTB Taper

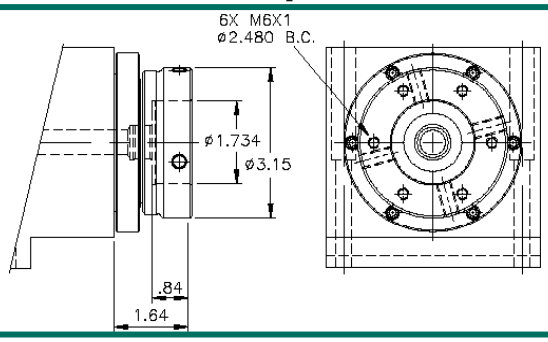
3500B BLOCK SPINDLE

All Dimensions = Inches



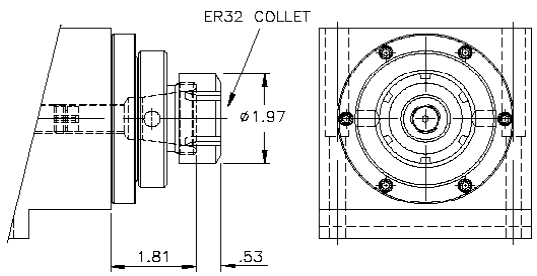
Boring Nose

3500B BLOCK SPINDLE



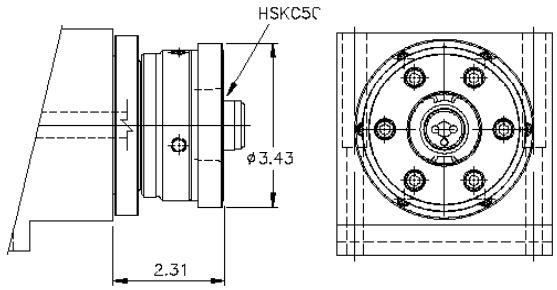
ER32 Collet

3500B BLOCK SPINDLE



HSKC50 Manual Clamp

3500B BLOCK SPINDLE



3500C
MOTORIZED SPINDLE

3500C and 3500B Motorized Spindles are fixed-speed units incorporating a timing-belt drive for positive power transmission. Poly-Vee belt, V-belt and flat-belt drives are available at additional cost where high-speed and minimum vibration are required. The 3500C and 3500B Motorized Spindles are available in two sizes: B1 and B2 units are high-horsepower and B3 and B4 units are low-horsepower.

Drives

- Poly-Vee Belt
- V-Belt
- Flat-Belt
- Timing Belt

Motors

- B1 & B2 High-Horsepower: 1.5HP, 2HP and 3HP
- B3 & B4 Low-Horsepower: .33HP, .5HP, .75HP and 1HP

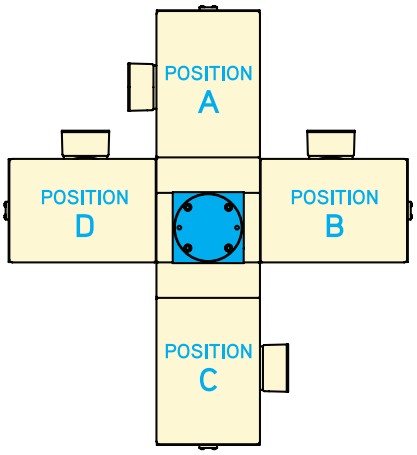
Specifications

- 3500C Motorized Spindle Approximate Weight: 125 lbs
- 3500B Motorized Approximate Weight: 105 lbs

Notes

Spindles refer to the 3500C/3500B specification chart, as well as the sizing instructions on page 6, for specific spindle specifications and to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

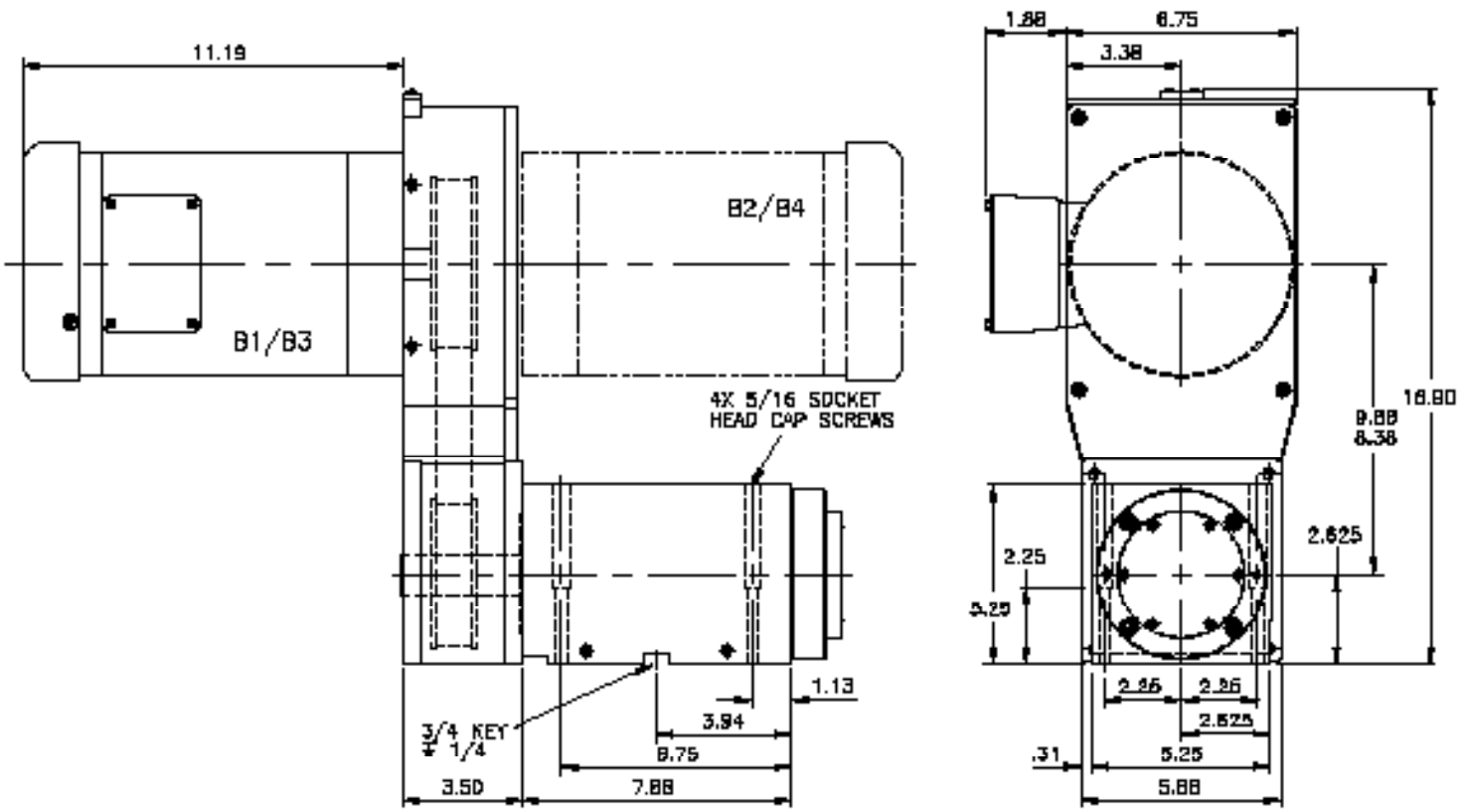
See Spindle Accessories on page 44.



3500C B1 & B2 MOTORIZED

B1/B2: High-Horsepower

All Dimensions = Inches



3500C/3500B B1 & B2

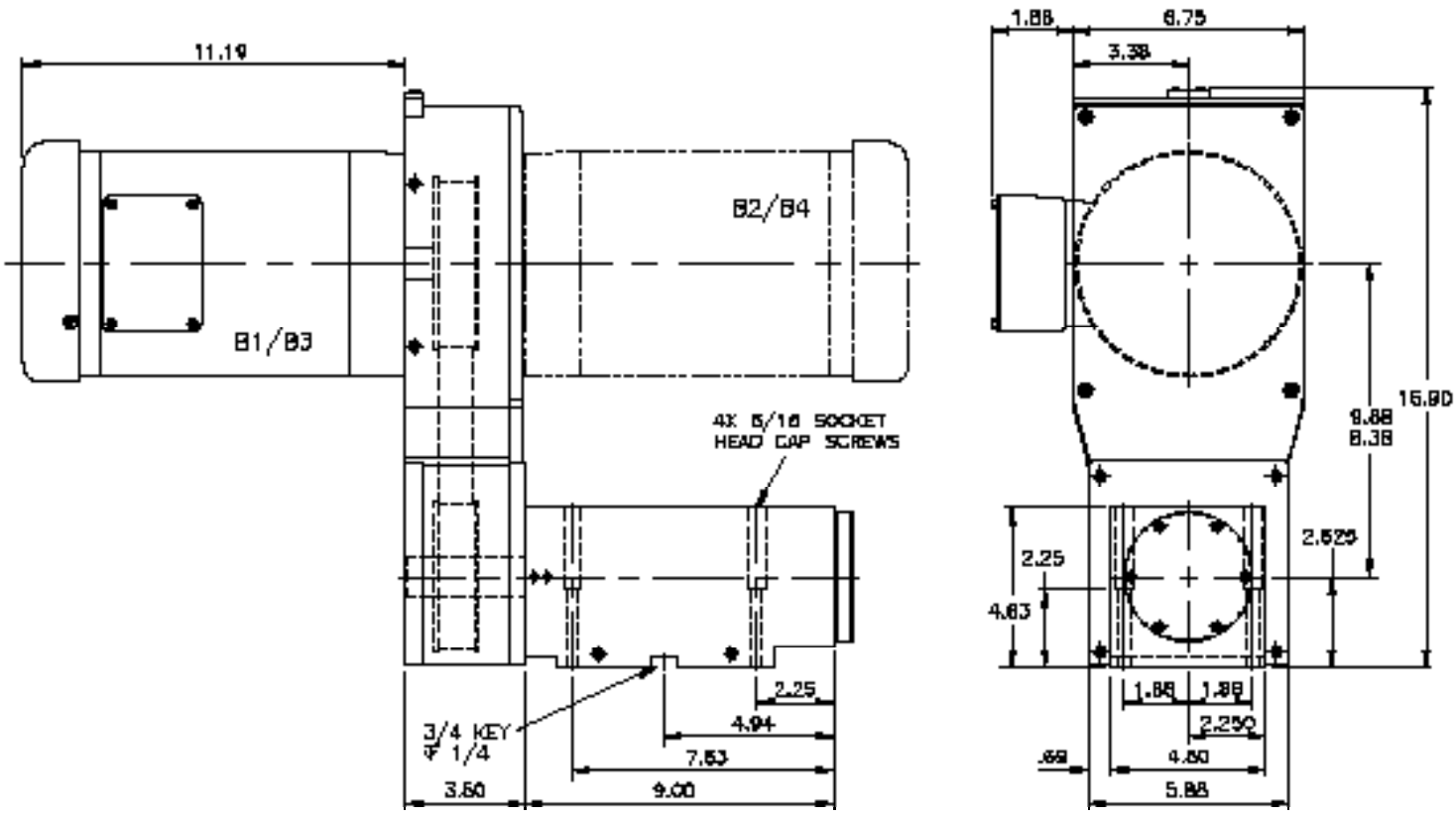
Spindle RPM			Motor		
Position	Minimum	Maximum	RPM	HP	Frame
A & C	650	2,150	1,160	1.5	145TC
B & D	650	2,150			
A & C	1,150	3,250	1,750	1.5 or 2	145TC
B & D	1,150	3,250			
A & C	2,600	6,450	3,500	2 or 3	145TC
B & D	2,600	5,250			

3500C/3500B B3 & B4

Spindle RPM			Motor		
Position	Minimum	Maximum	RPM	HP	Frame
A & C	650	2,350	1,160	0.33 or 0.5	56C
B & D	650	2,350			
A & C	950	3,500	1,750	0.5 or 0.75	56C
B & D	950	3,500			
A & C	1,950	6,450	3,500	0.75 or 1	56C
B & D	1,950	6,450			

3500B B1 & B2 MOTORIZED

All Dimensions = Inches



4000C Cartridge Spindles and 4000B Block Spindles are available with three standard nose types and six standard internal construction types.

Nose Types

- #40 NMTB Taper Shaft
- Boring Nose
- HSKC63 Manual Clamp

Internal Construction

- X1 Duplex Ball Bearing at Nose End with Contact Seal
- X2 Duplex Ball Bearing at Nose End with Labyrinth Seal
- X2C Duplex Ceramic Ball Bearing at Nose End with Labyrinth Seal
- X3 Triplex Ball Bearing at Nose End with Contact Seal
- X4 Triplex Ball Bearing at Nose End with Labyrinth Seal
- X4C Triplex Ceramic Ball Bearing at Nose End with Labyrinth Seal

Specifications

- Maximum Torque: 1000 in-lbs
- Maximum Tool Overhang: 5 1/8" from the dot in the drawing below.
- WK^2: 17.0 lb-in²
- 4000C Spindle Approximate Weight: 38 lbs
- 4000B Spindle Approximate Weight: 78 lbs

Notes

Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available.

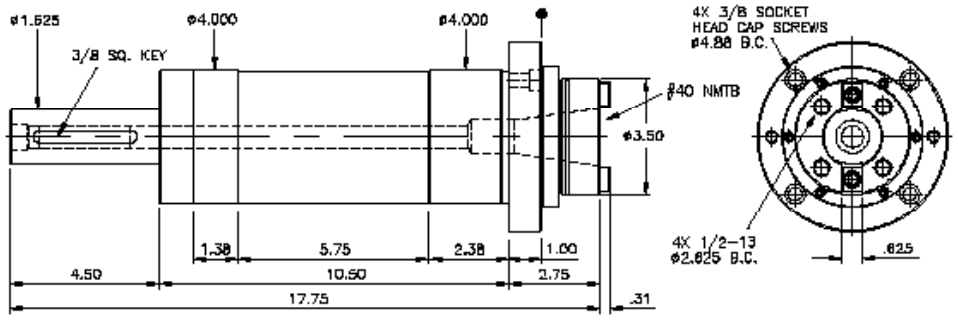
Tool overhang pertains to boring, end milling and nonsupported arbor milling.

Refer to the 4000C/4000B specification chart, as well as the sizing instructions on page 6, to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

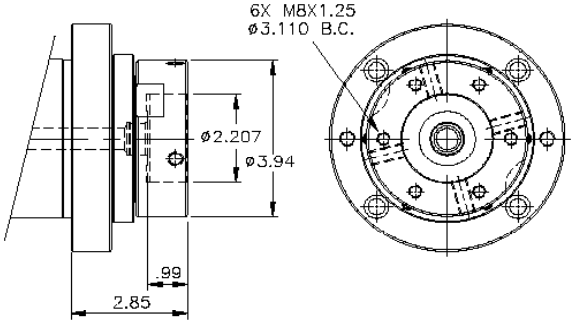
Cartridge spindle brackets are available. See Spindle Accessories on page 44.

4000C CARTRIDGE SPINDLE — **#40 NMTB Taper**

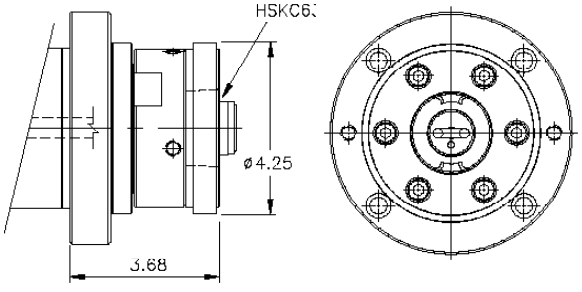
All Dimensions = Inches



4000C CARTRIDGE SPINDLE — **Boring Nose**



4000C CARTRIDGE SPINDLE — **HSKC63 Manual Clamp**

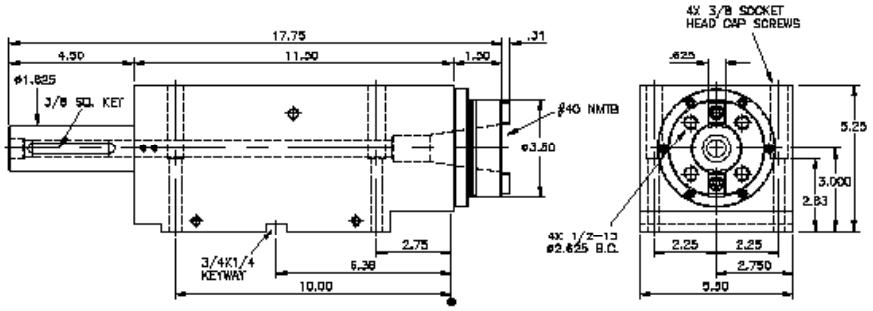


4000C/4000B

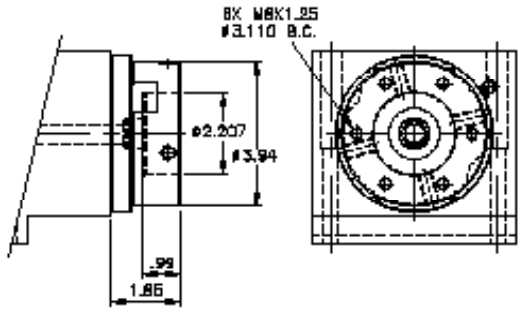
Bearing/Seal Number	Maximum Thrust (lbs.)	Maximum RPM	Radial Stiffness At Nose (lbs./in.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	161	3,150	460,000	55mm ID Duplex Ball	Contact	45mm ID Duplex Ball	Labyrinth
X1M	394	3,150	510,000				
X1H	855	3,150	540,000				
X2L	161	10,800	460,000	55mm ID Duplex Ball	Labyrinth	45mm ID Duplex Ball	Labyrinth
X2M	394	9,200	510,000				
X2H	855	6,100	540,000				
X2CL	105	14,400	460,000	55mm ID Duplex Ceramic Ball	Labyrinth	45mm ID Duplex Ceramic Ball	Labyrinth
X2CM	220	12,600	510,000				
X3L	322	3,150	800,000	55mm ID Triplex Ball	Contact	45mm ID Duplex Ball	Labyrinth
X3M	847	3,150	890,000				
X3H	1,693	3,150	950,000				
X4L	322	9,200	800,000	55mm ID Triplex Ball	Labyrinth	45mm ID Duplex Ball	Labyrinth
X4M	847	6,100	890,000				
X4H	1,693	4,900	950,000				
X4CL	207	12,600	800,000	55mm ID Triplex Ceramic Ball	Labyrinth	45mm ID Duplex Ceramic Ball	Labyrinth
X4CM	433	9,900	890,000				

#40 NMTB Taper

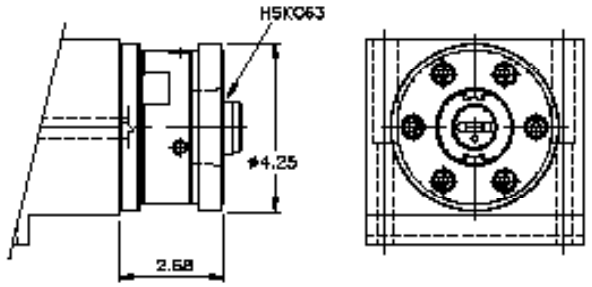
All Dimensions = Inches



Boring Nose



HSKC63 Manual Clamp



4000C
MOTORIZED SPINDLE

4000C and 4000B Motorized Spindles are fixed-speed units incorporating a timing-belt drive for positive power transmission. Poly-Vee belt, V-belt and flat-belt drives are available at additional cost where high-speed and minimum vibration are required. The 4000C and 4000B Motorized Spindles are available in two sizes: B1 and B2 units are high-horsepower and B3 and B4 units are low-horsepower.

Belt Types

- Poly-Vee Belt
- V-Belt
- Flat-Belt
- Timing Belt

Motors

- B1 & B2 High-Horsepower: 5HP and 7.5HP
- B3 & B4 Low-Horsepower: 1.5HP, 2HP and 3HP

Specifications

- 4000C Motorized Spindle Approximate Weight: 300 lbs
- 4000B Motorized Approximate Weight: 290 lbs

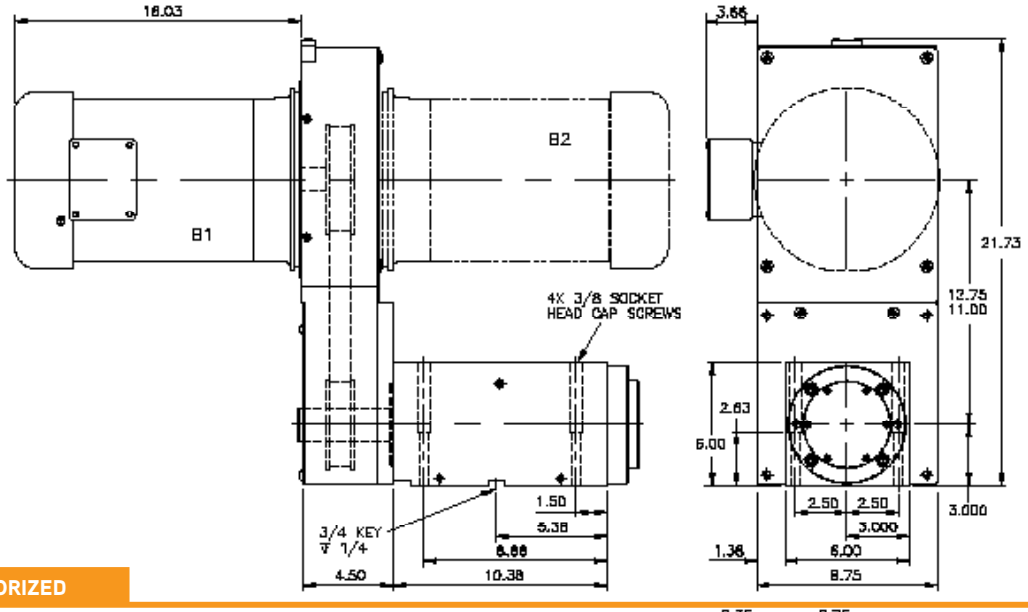
Notes

Spindles refer to the 4000C/4000B specification chart, as well as the sizing instructions on page 6, for specific spindle specifications and to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

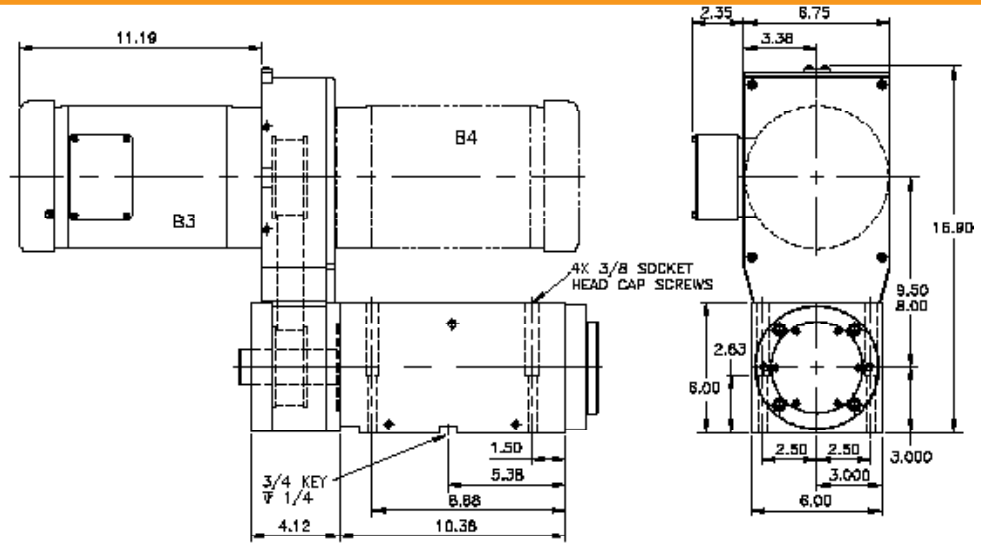
See Spindle Accessories on page 44.

4000C B1 & B2 MOTORIZED

All Dimensions = Inches

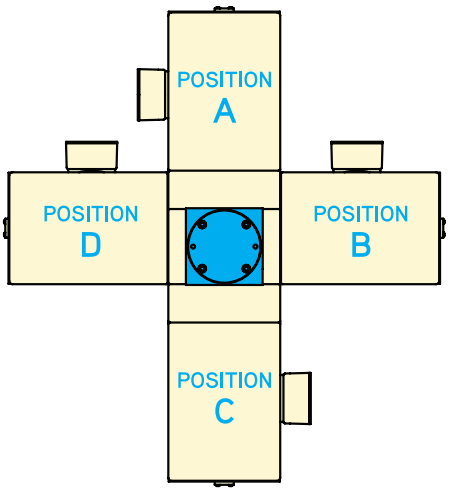


4000C B3 & B4 MOTORIZED



4000C/4000B B1 & B2

Spindle RPM			Motor						
Position	Minimum	Maximum	RPM	HP	Frame	A	B	C	D
A & C	800	2,350	1,160	5	215TC	10.19	5.81	3.00	16.31
B & D	800	2,350							
A & C	1,250	3,500	1,750	5 or 7.5	184TC	8.5	4.98	1.5	15.44
B & D	1,250	3,500			213TC	10.19	5.81	3.00	16.31
A & C	2,500	6,400	3,500	5 or 7.5	184TC	8.50	4.94	1.50	15.44
B & D	2,500	4,700							

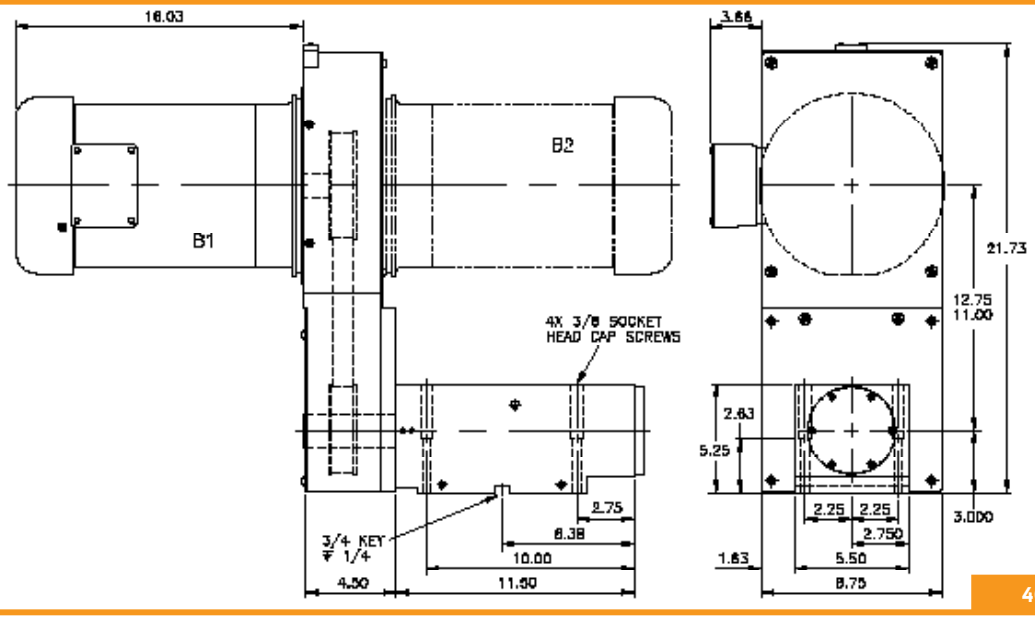


4000C/4000B B3 & B4

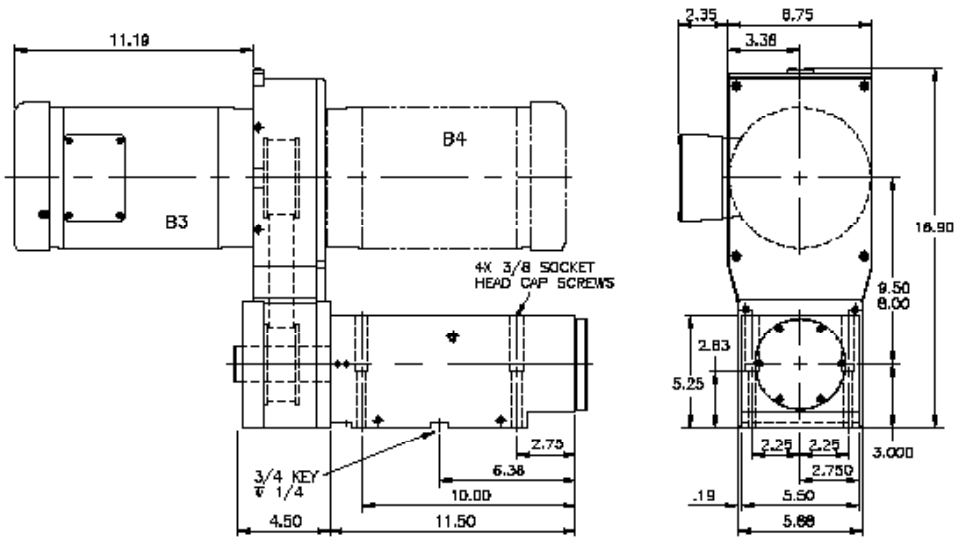
Spindle RPM			Motor		
Position	Minimum	Maximum	RPM	HP	Frame
A & C	550	2,150	1,160	1.5	145TC
B & D	550	2,150			
A & C	1,000	3,000	1,750	1.5 or 2	145TC
B & D	1,000	3,000			
A & C	2,250	5,850	3,500	2 or 3	145TC
B & D	2,250	5,850			

4000B B1 & B2 MOTORIZED

All Dimensions = Inches



4000B B3 & B4 MOTORIZED



5500C
CARTRIDGE SPINDLE

5500C Cartridge Spindles and 5500B Block Spindles are available with three standard nose types and six standard internal construction types.

Nose Types

- #40 NMTB Taper Shaft
- Boring Nose
- HSKC63 Manual Clamp

Internal Construction

- X1 Duplex Ball Bearing at Nose End with Contact Seal
- X2 Duplex Ball Bearing at Nose End with Labyrinth Seal
- X2C Duplex Ceramic Ball Bearing at Nose End with Labyrinth Seal
- X3 Triplex Ball Bearing at Nose End with Contact Seal
- X4 Triplex Ball Bearing at Nose End with Labyrinth Seal
- X4C Triplex Ceramic Ball Bearing at Nose End with Labyrinth Seal

Specifications

- Maximum Torque: 2,164 in-lbs
- Maximum Tool Overhang: 6 1/8" from the dot in the drawing below.
- WK²: 47.2 lb-in²
- 5500C Spindle Approximate Weight: 82 lbs
- 5500B Spindle Approximate Weight: 138 lbs

Notes

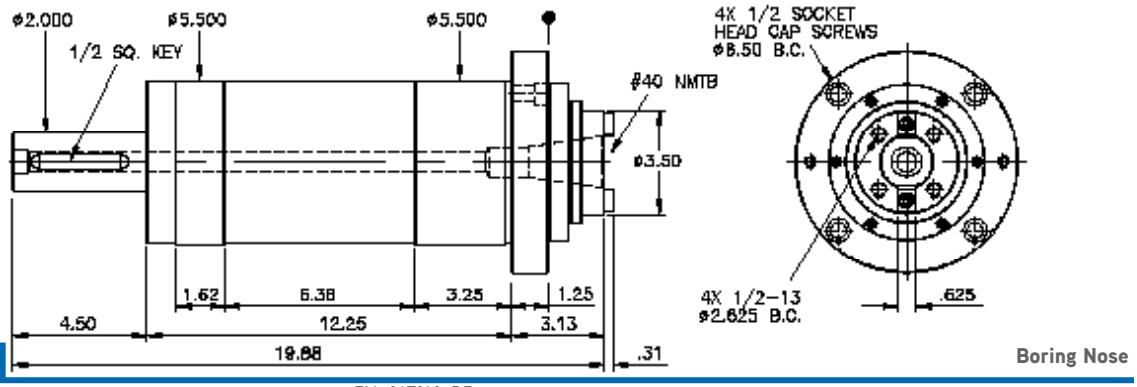
Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available.

Tool overhang pertains to boring, end milling and nonsupported arbor milling.

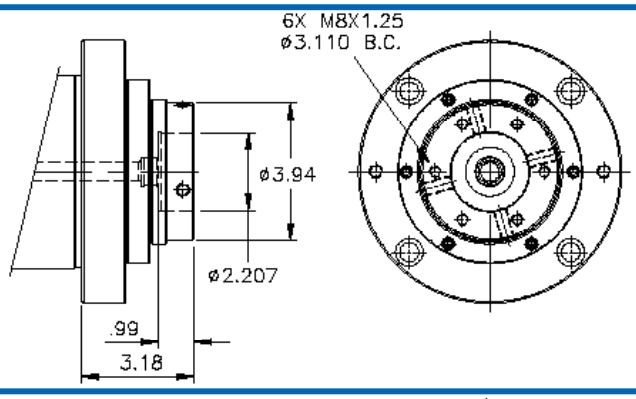
Refer to the 5500C/5500B specification chart, as well as the sizing instructions on page 6, to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

Cartridge spindle brackets are available. See Spindle Accessories on page 44.

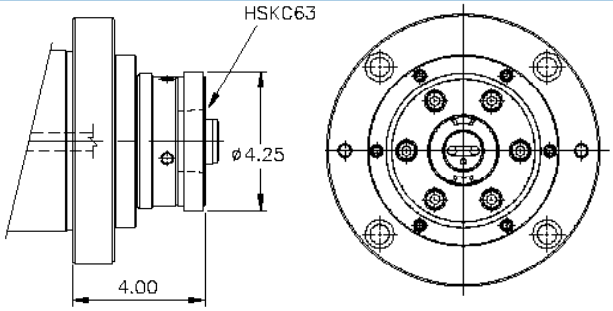
5500C CARTRIDGE SPINDLE — **#40 NMTB Taper**



5500C CARTRIDGE SPINDLE — **Boring Nose**



5500C CARTRIDGE SPINDLE — **HSKC63 Manual Clamp**

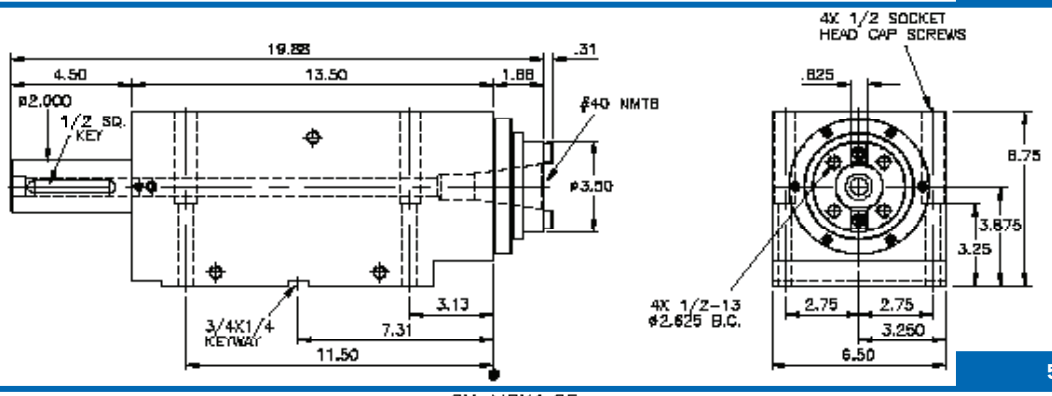


5500C/5500B

Bearing/Seal Number	Maximum Thrust (lbs.)	Maximum RPM	Radial Stiffness At Nose (lbs./in.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	200	2,500	750,000	70mm ID Duplex Ball	Contact	55mm ID Duplex Ball	Labyrinth
X1M	560	2,500	850,000				
X1H	1,160	2,500	930,000				
X2L	200	9,200	750,000	70mm ID Duplex Ball	Labyrinth	55mm ID Duplex Ball	Labyrinth
X2M	560	7,100	850,000				
X2H	1,160	4,750	930,000				
X2CL	140	12,000	750,000	70mm ID Duplex Ceramic Ball	Labyrinth	55mm ID Duplex Ceramic Ball	Labyrinth
X2CM	192	10,500	850,000				
X3L	425	2,500	1,150,000	70mm ID Triplex Ball	Contact	55mm ID Duplex Ball	Labyrinth
X3M	1,175	2,500	1,290,000				
X3H	2,625	2,500	1,380,000				
X4L	425	7,100	1,150,000	70mm ID Triplex Ball	Labyrinth	55mm ID Duplex Ball	Labyrinth
X4M	1,175	4,750	1,290,000				
X4H	2,625	3,800	1,380,000				
X4CL	276	10,500	1,150,000	70mm ID Triplex Ceramic Ball	Labyrinth	55mm ID Duplex Ceramic Ball	Labyrinth
X4CM	576	8,250	1,290,000				

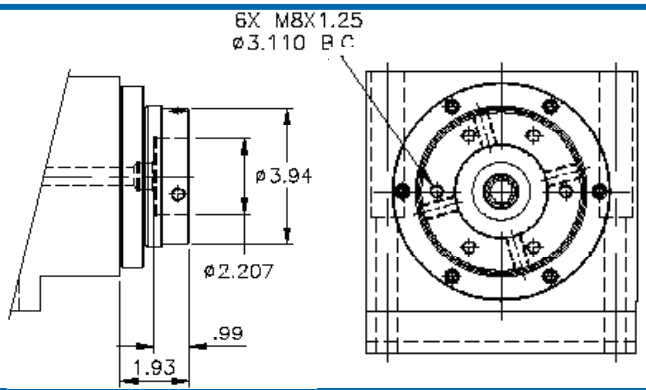
#40 NMTB Taper

5500B BLOCK SPINDLE



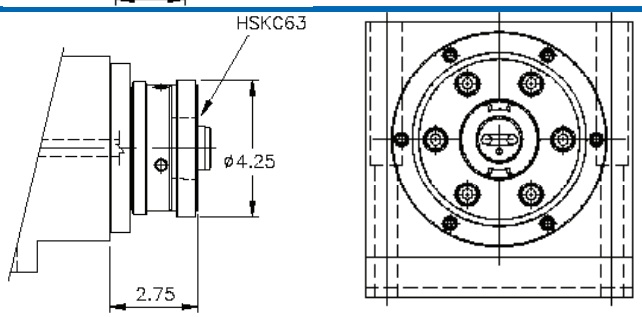
Boring Nose

5500B BLOCK SPINDLE



HSKC63 Manual Clamp

5500B BLOCK SPINDLE



5500C
MOTORIZED SPINDLE

5500C and 5500B Motorized Spindles are fixed-speed units incorporating a timing-belt drive for positive power transmission. Poly-Vee belt, V-belt and flat-belt drives are available at additional cost where high-speed and minimum vibration are required. The 5500C and 5500B Motorized Spindles are available in two sizes: B1 and B2 units are high-horsepower and B3 and B4 units are low-horsepower.

Drives

- Poly-Vee Belt
- V-Belt
- Flat-Belt
- Timing Belt

Motors

- B1 & B2 High-Horsepower: 5HP and 7.5HP
- B3 & B4 Low-Horsepower: 2HP and 3HP

Specifications

- 5500C Motorized Spindle Approximate Weight: 395 lbs
- 5500B Motorized Approximate Weight: 310 lbs

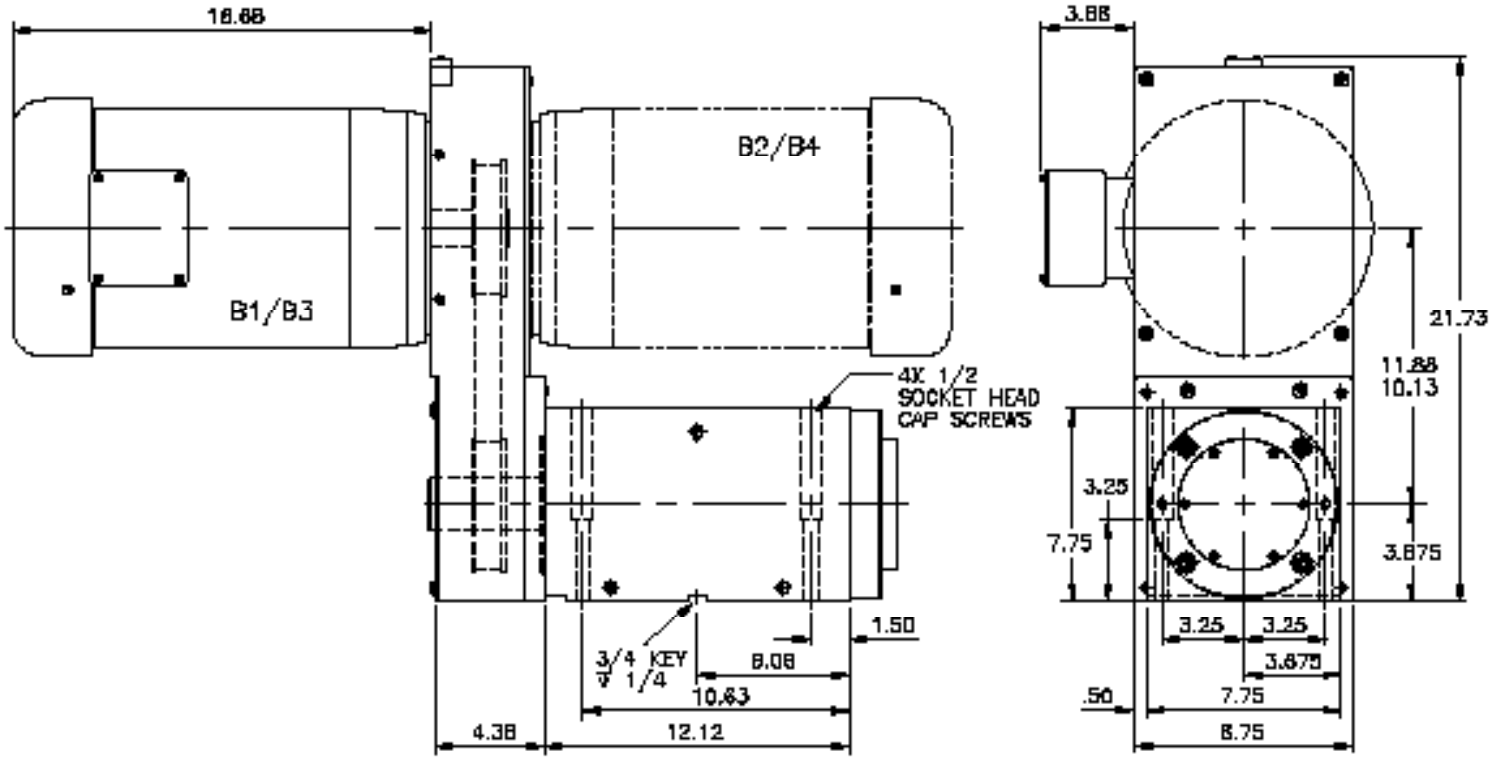
Notes

Spindles refer to the 5500C/5500B specification chart, as well as the sizing instructions on page 6, for specific spindle specifications and to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

See Spindle Accessories on page 44.

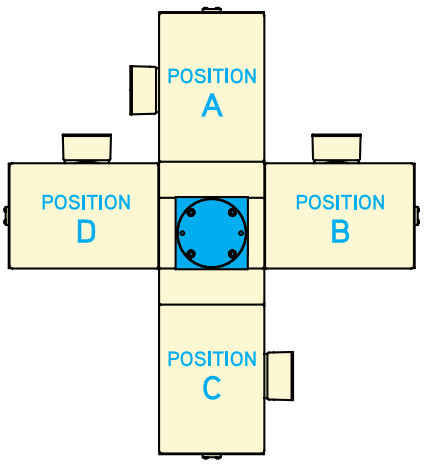
5500C B1 & B2 MOTORIZED

All Dimensions = Inches



5500C/5500B B1 & B2

Spindle RPM			Motor						
Position	Minimum	Maximum	RPM	HP	Frame	A	B	C	D
A & C	600	2,150	1160	5	215TC	10.19	5.81	3.00	16.31
B & D	600	2,150							
A & C	950	3,250	1750	5 or 7.5	184TC	8.5	4.98	1.5	15.44
B & D	950	3,250			213TC	10.19	5.81	3.00	16.31
A & C	1,900	6,450	3500	5 or 7.5	184TC	8.50	4.94	1.50	15.44
B & D	1,900	6,450							

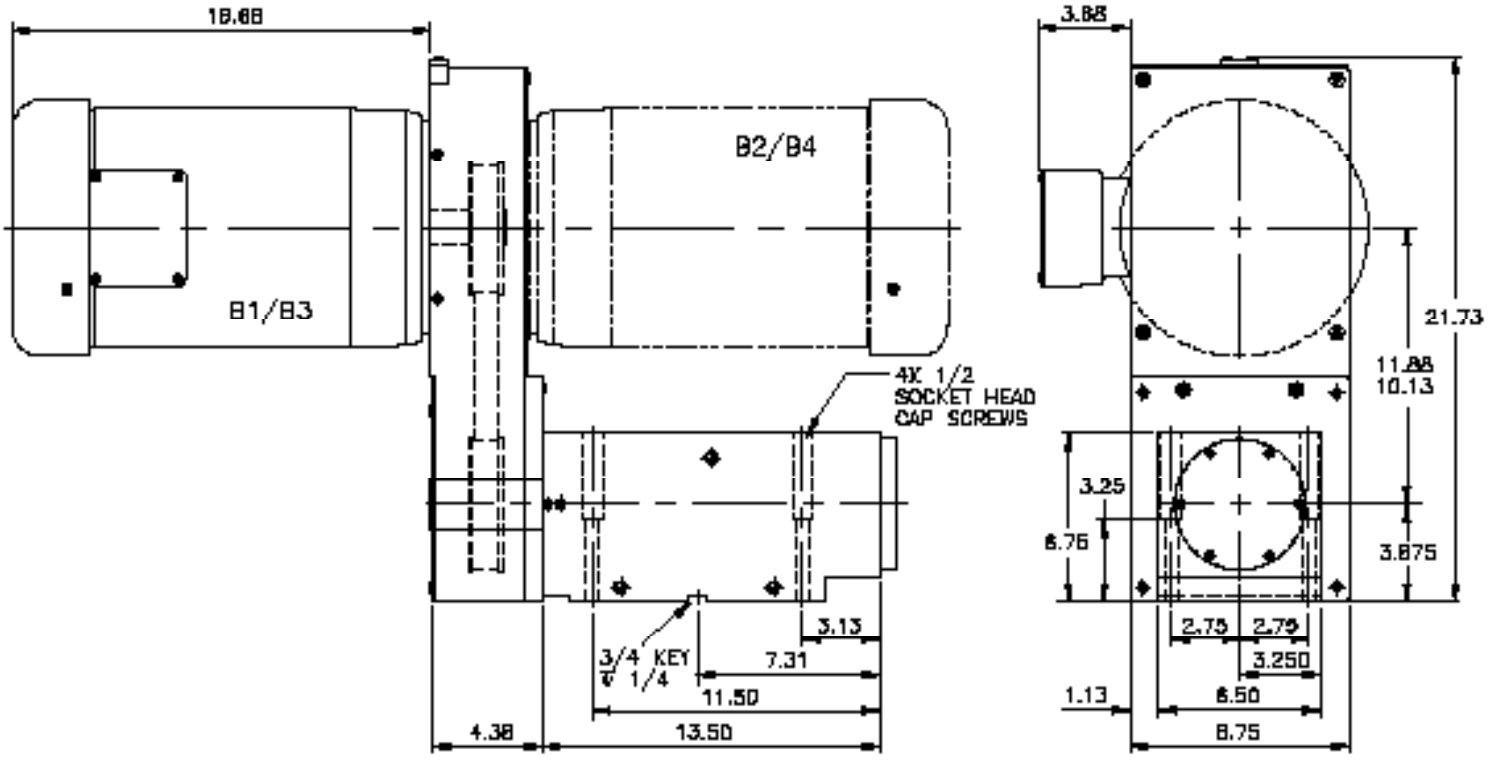


5500C/5500B B3 & B4

Spindle RPM			Motor		
Position	Minimum	Maximum	RPM	HP	Frame
A & C	500	2,150	1,160	2	184TC
B & D	500	2,150			
A & C	850	3,250	1,750	3	182TC
B & D	850	3,250			
A & C	1,750	6,450	3,500	3	182TC
B & D	1,750	6,450			

All Dimensions = Inches

B1/B2: High-Horsepower



6500C Cartridge Spindles and 6500B Block Spindles are available with three standard nose types and six standard internal construction types.

Nose Types

- #50 NMTB Taper Shaft
- Boring Nose
- HSKC100 Manual Clamp

Internal Construction

- X1 Duplex Ball Bearing at Nose End with Contact Seal
- X2 Duplex Ball Bearing at Nose End with Labyrinth Seal
- X2C Duplex Ceramic Ball Bearing at Nose End with Labyrinth Seal
- X3 Triplex Ball Bearing at Nose End with Contact Seal
- X4 Triplex Ball Bearing at Nose End with Labyrinth Seal
- X4C Triplex Ceramic Ball Bearing at Nose End with Labyrinth Seal

Specifications

- Maximum Torque: 4,100 in-lbs
- Maximum Tool Overhang: 8" from the dot in the drawing below.
- WK^2: 104.2 lb-in²
- 6500C Spindle Approximate Weight: 195 lbs
- 6500B Spindle Approximate Weight: 225 lbs

Notes

Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available.

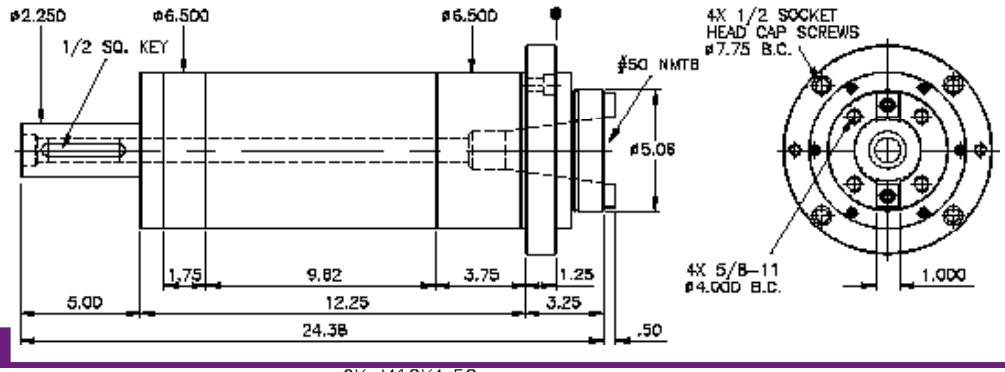
Tool overhang pertains to boring, end milling and nonsupported arbor milling.

Refer to the 6500C/6500B specification chart, as well as the sizing instructions on page 6, to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

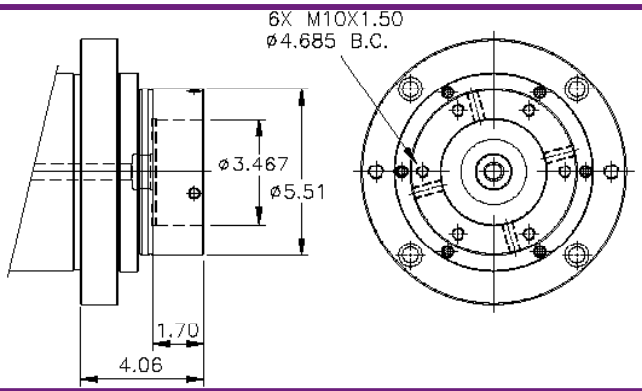
Cartridge spindle brackets are available. See Spindle Accessories on page 44.

6500C CARTRIDGE SPINDLE — **#50 NMTB Taper**

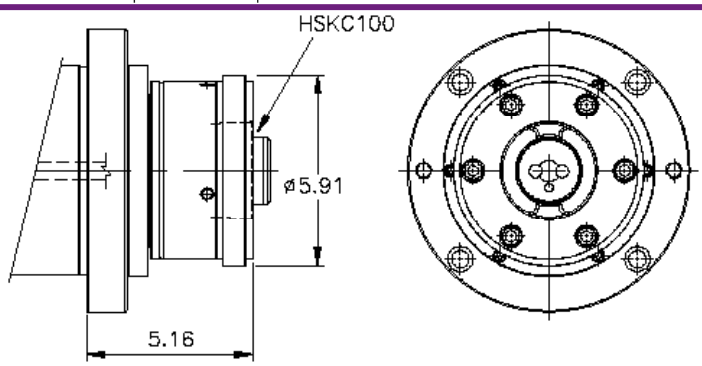
All Dimensions = Inches



6500C CARTRIDGE SPINDLE — **Boring Nose**



6500C CARTRIDGE SPINDLE — **HSKC100 Manual Clamp**



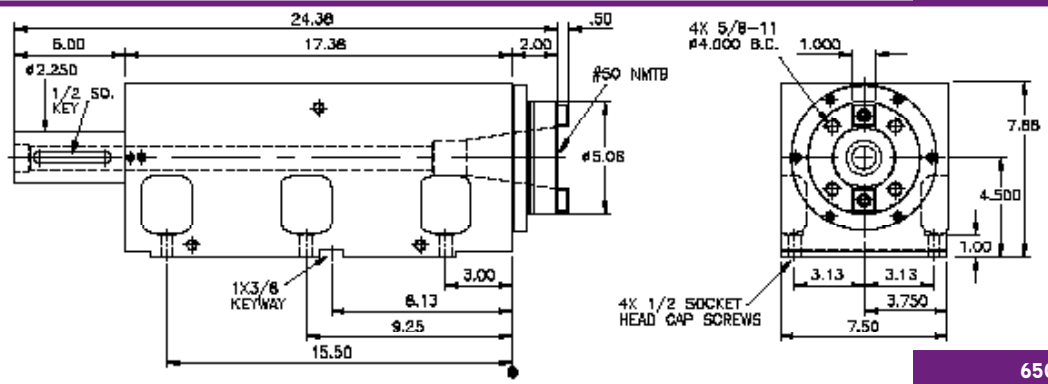
6500C/6500B

Bearing/Seal Number	Maximum Thrust (lbs.)	Maximum RPM	Radial Stiffness At Nose (lbs./in.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	280	2,125	960,000	85mm ID Duplex Ball	Contact	70mm ID Duplex Ball	Labyrinth
X1M	765	2,125	1,080,000				
X1H	1,380	2,125	1,160,000				
X2L	280	7,600	960,000	85mm ID Duplex Ball	Labyrinth	70mm ID Duplex Ball	Labyrinth
X2M	765	5,700	1,080,000				
X2H	1,380	3,800	1,160,000				
X2CL	174	10,400	960,000	85mm ID Duplex Ceramic Ball	Labyrinth	70mm ID Duplex Ceramic Ball	Labyrinth
X2CM	363	9,100	1,080,000				
X3L	570	2,125	1,450,000	85mm ID Triplex Ball	Contact	70mm ID Duplex Ball	Labyrinth
X3M	1,695	2,125	1,620,000				
X3H	3,790	2,125	1,700,000				
X4L	570	5,700	1,450,000	85mm ID Triplex Ball	Labyrinth	70mm ID Duplex Ball	Labyrinth
X4M	1,695	3,800	1,620,000				
X4H	3,790	3,000	1,700,000				
X4CL	343	9,100	1,450,000	85mm ID Triplex Ceramic Ball	Labyrinth	70mm ID Duplex Ceramic Ball	Labyrinth
X4CM	714	7,150	1,620,000				

#50 NMTB Taper

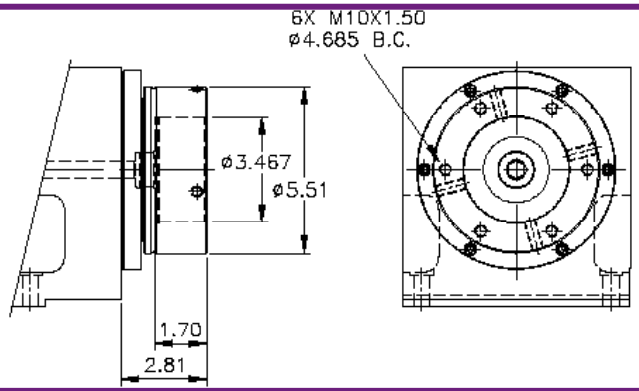
6500B BLOCK SPINDLE

All Dimensions = Inches



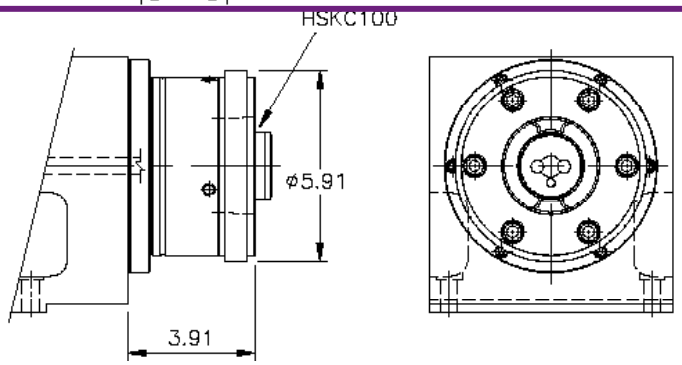
Boring Nose

6500B BLOCK SPINDLE



HSKC100 Manual Clamp

6500B BLOCK SPINDLE



6500C
MOTORIZED SPINDLE

6500C and 6500B Motorized Spindles are fixed-speed units incorporating a timing-belt drive for positive power transmission. Poly-Vee belt, V-belt and flat-belt drives are available at additional cost where high-speed and minimum vibration are required. The 6500C and 6500B Motorized Spindles are available in two sizes: the B2 unit is high-horsepower and B3 and B4 units are low-horsepower.

Drives

- Poly-Vee Belt
- V-Belt
- Flat-Belt
- Timing Belt

Motors

- B2 High-Horsepower: 10HP, 15HP and 20HP
- B3 & B4 Low-Horsepower: 3HP, 5HP and 7.5HP

Specifications

- 6500C Motorized Spindle Approximate Weight: 930 lbs
- 6500B Motorized Approximate Weight: 755 lbs

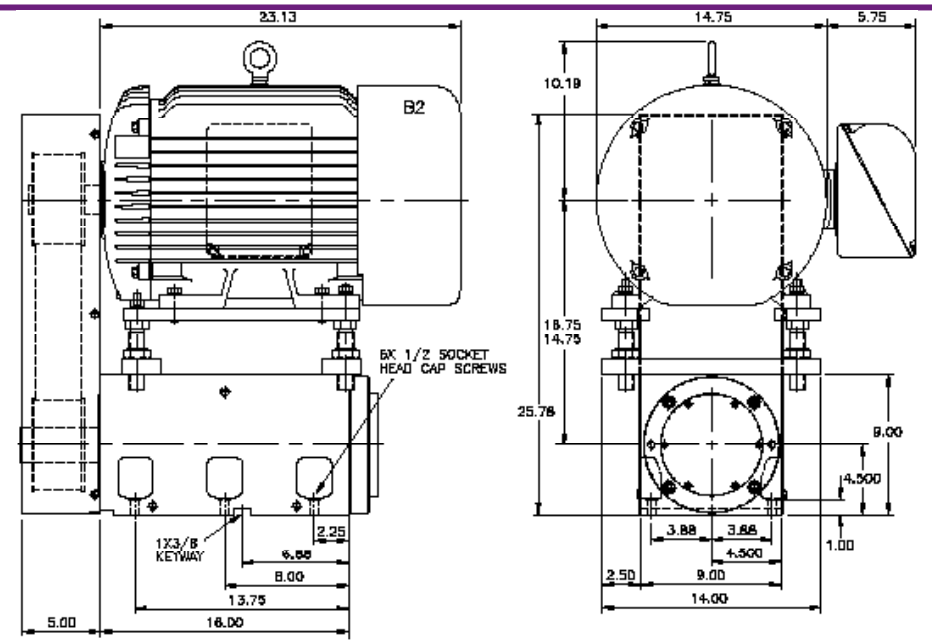
Notes

Spindles refer to the 6500C/6500B specification chart, as well as the sizing instructions on page 6, for specific spindle specifications and to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

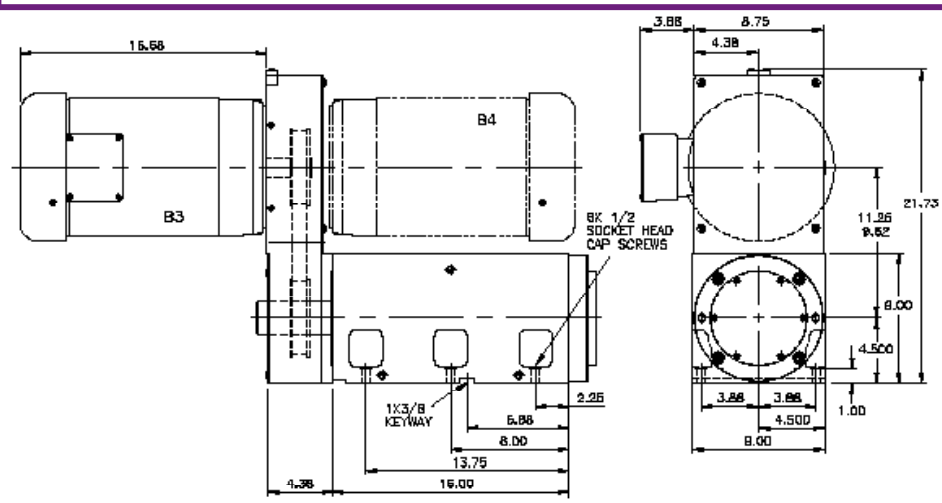
See Spindle Accessories on page 44.

6500C B2 MOTORIZED

All Dimensions = Inches

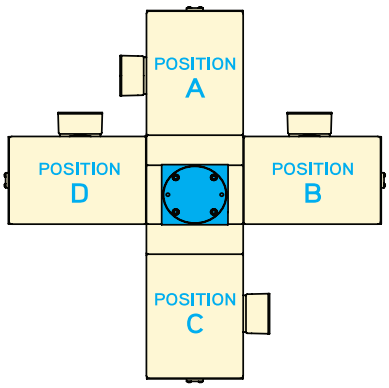


6500C B3 & B4 MOTORIZED



6500C/6500B B2

Spindle RPM		Motor						D	
Minimum	Maximum	RPM	HP	Frame	A	B	C	Min	Max
550	1,750	1,160	10 or 15	256T 284T	12.94 14.62	3.19 7.19	4.94 8.38	14.00 14.75	16.00 16.75
850	2,650	1,750	15 or 20	254T 256T	12.94	1.12 3.19	4.94	14.00	16.00
1,750	4,300	3,500	15 or 20	254T 256T	12.94	1.12 2.88	4.94	14.00	16.00

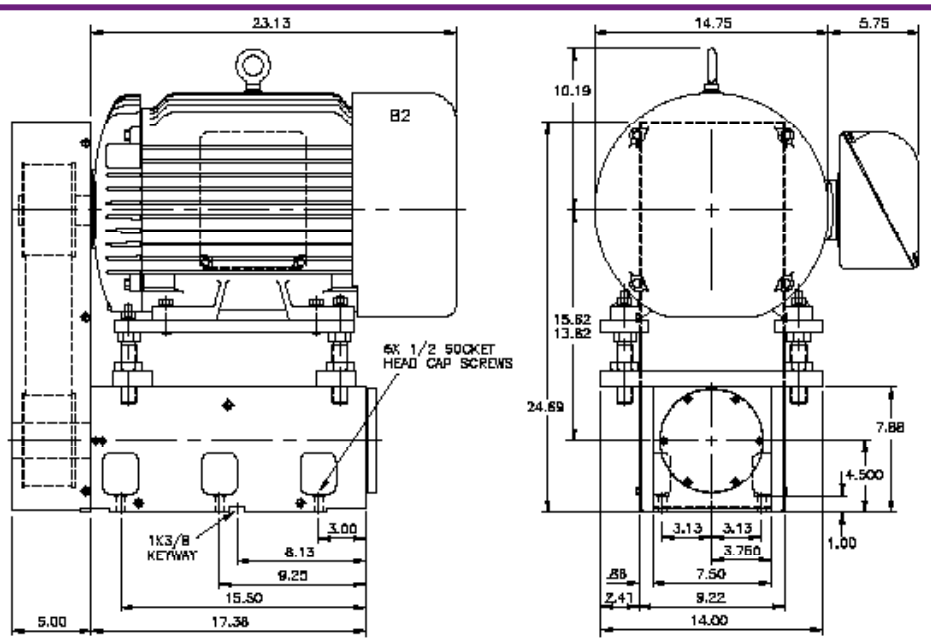


6500C/6500B B3 & B4

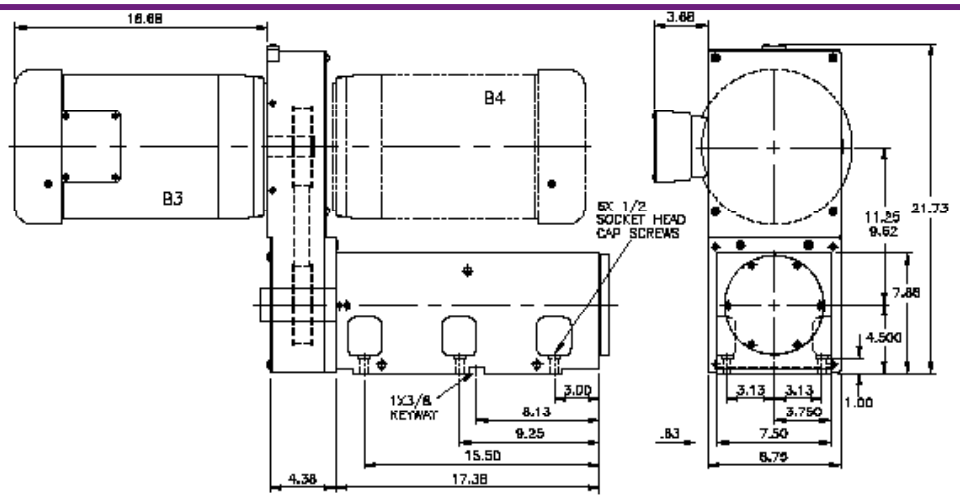
Spindle RPM		Motor						
Minimum	Maximum	RPM	HP	Frame	A	B	C	D
550	1,650	1,160	3 or 5	213TC 215TC	9.56	-0.44 0.69	3.00	15.56 16.69
850	2,450	1,750	5 or 7.5	184TC 213TC	8.88 9.56	-2.00 -0.44	1.5 3.00	13.94 15.56
1,750	4,850	3,500	5 or 7.5	184TC	8.88	-2.00 -0.59	1.50	13.94 15.44

6500B B2 MOTORIZED

All Dimensions = Inches



6500B B3 & B4 MOTORIZED



8000C
CARTRIDGE SPINDLE

8000C Cartridge Spindles and 8000B Block Spindles are available with three standard nose types and six standard internal construction types.

Nose Types

- #50 NMTB Taper Shaft
- Boring Nose
- HSKC100 Manual Clamp

Internal Construction

- X1 Duplex Ball Bearing at Nose End with Contact Seal
- X2 Duplex Ball Bearing at Nose End with Labyrinth Seal
- X2C Duplex Ceramic Ball Bearing at Nose End with Labyrinth Seal
- X3 Triplex Ball Bearing at Nose End with Contact Seal
- X4 Triplex Ball Bearing at Nose End with Labyrinth Seal
- X4C Triplex Ceramic Ball Bearing at Nose End with Labyrinth Seal

Specifications

- Maximum Torque: 7,460 in-lbs
- Maximum Tool Overhang: 9-3/8" from the dot in the drawing below.
- WK^2: 210.1 lb-in²
- 8000C Spindle Approximate Weight: 260 lbs
- 8000B Spindle Approximate Weight: 475 lbs

Notes

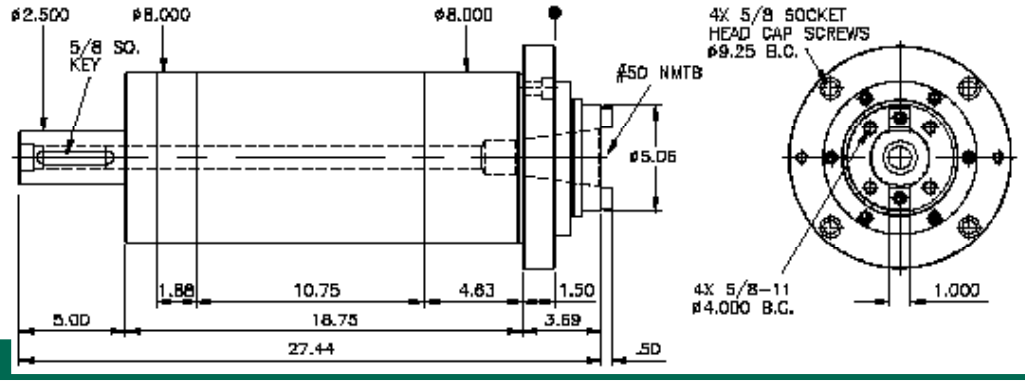
Spindles are supplied with medium bearing preloads as standard. Light and heavy bearing preloads are available.

Tool overhang pertains to boring, end milling and nonsupported arbor milling.

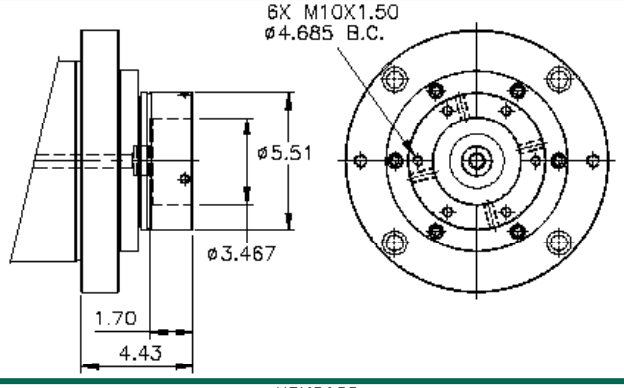
Refer to the 8000C/8000B specification chart, as well as the sizing instructions on page 6, to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

Cartridge spindle brackets are available. See Spindle Accessories on page 44.

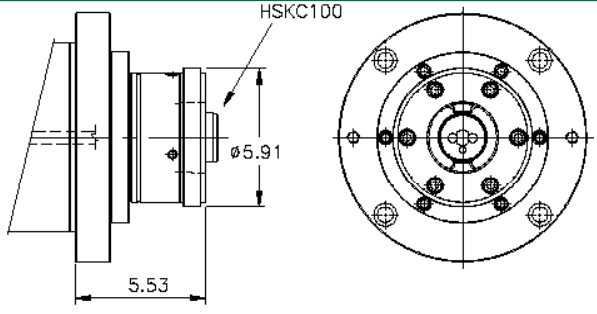
8000C CARTRIDGE SPINDLE — **#50 NMTB Taper**



8000C CARTRIDGE SPINDLE — **Boring Nose**



8000C CARTRIDGE SPINDLE — **HSKC100 Manual Clamp**

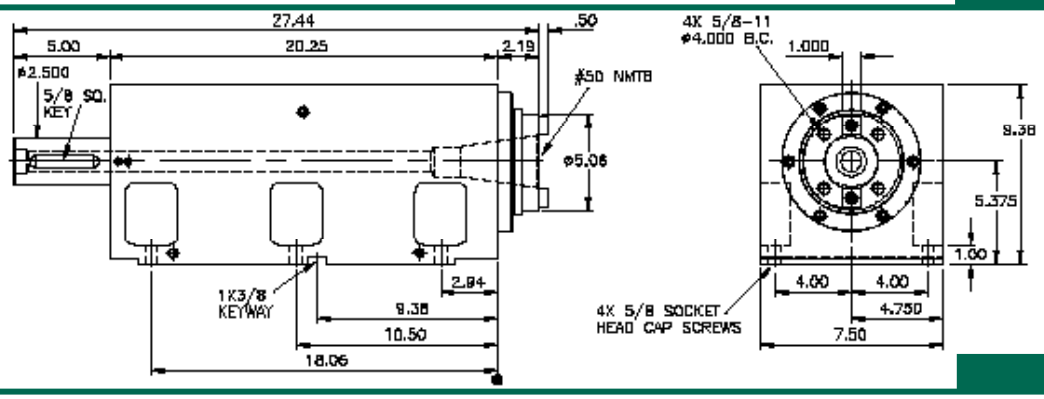


8000C/8000B

Bearing/Seal Number	Maximum Thrust (lbs.)	Maximum RPM	Radial Stiffness At Nose (lbs./in.)	Nose End		Drive End	
				Bearing	Seal	Bearing	Seal
X1L	370	1,800	1,430,000	100mm ID Duplex Ball	Contact	85mm ID Duplex Ball	Labyrinth
X1M	950	1,800	1,630,000				
X1H	2,045	1,800	1,780,000				
X2L	370	5,700	1,430,000	100mm ID Duplex Ball	Labyrinth	85mm ID Duplex Ball	Labyrinth
X2M	950	4,600	1,630,000				
X2H	2,045	3,100	1,780,000				
X2CL	215	8,000	1,430,000	100mm ID Duplex Ceramic Ball	Labyrinth	85mm ID Duplex Ceramic Ball	Labyrinth
X2CM	448	7,000	1,630,000				
X3L	750	1,800	2,150,000	100mm ID Triplex Ball	Contact	85mm ID Duplex Ball	Labyrinth
X3M	2,100	1,800	2,450,000				
X3H	4,700	1,800	2,630,000				
X4L	750	4,600	2,150,000	100mm ID Triplex Ball	Labyrinth	85mm ID Duplex Ball	Labyrinth
X4M	2,100	3,100	2,450,000				
X4H	4,700	1,800	2,630,000				
X4CL	425	7,000	2,150,000	100mm ID Triplex Ceramic Ball	Labyrinth	85mm ID Duplex Ceramic Ball	Labyrinth
X4CM	884	5,500	2,450,000				

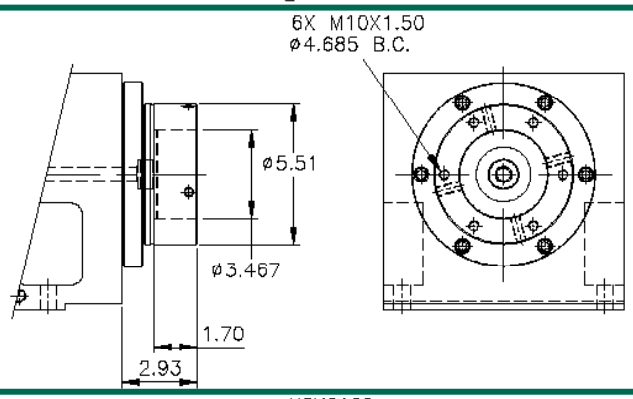
#50 NMTB Taper

8000B BLOCK SPINDLE



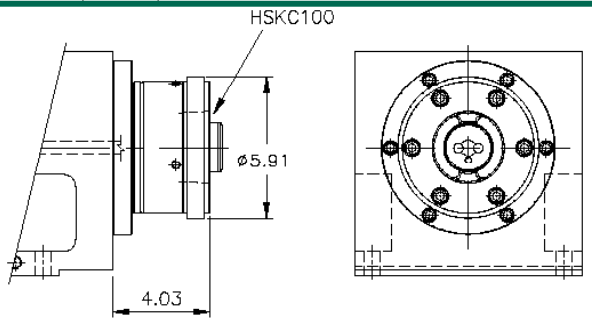
Boring Nose

8000B BLOCK SPINDLE



HSKC100 Manual Clamp

8000B BLOCK SPINDLE



8000C
MOTORIZED SPINDLE

8000C and 8000B Motorized Spindles are fixed-speed units incorporating a timing-belt drive for positive power transmission. Poly-Vee belt, V-belt and flat-belt drives are available at additional cost where high-speed and minimum vibation are required. The 8000C and 8000B Motorized Spindles are available in two sizes: B2 units are high-horsepower and B4 units are low-horsepower.

Drives

- Poly-Vee Belt
- V-Belt
- Flat-Belt
- Timing-Belt

Motors

- B2 High-Horsepower: 10HP, 15HP, 20H, 25HP and 30HP
- B4 Low-Horsepower: 5HP and 7.5HP

Specifications

- 8000C Motorized Spindle Approximate Weight: 1,210 lbs
- 8000B Motorized Approximate Weight1,100 lbs

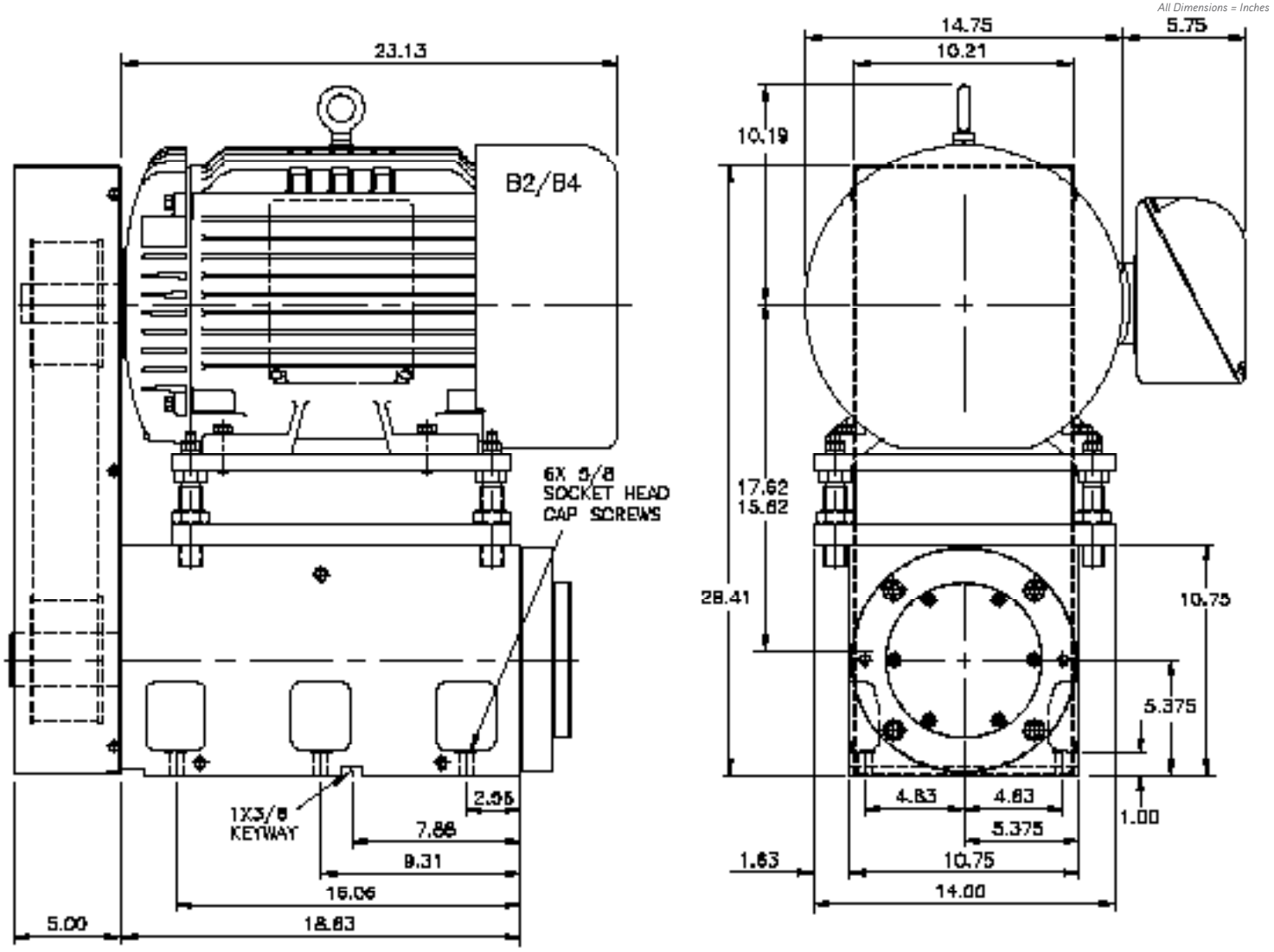
Notes

Spindles refer to the 8000C/8000B specification chart, as well as the sizing instructions on page 6 for specific spindle specifications and to select the proper spindle for your rotational requirements. Special designs are also available to meet your specific needs.

See Spindle Accessories on page 44.

8000C B2 & B4 MOTORIZED

All Dimensions = Inches



8000C/8000B B2

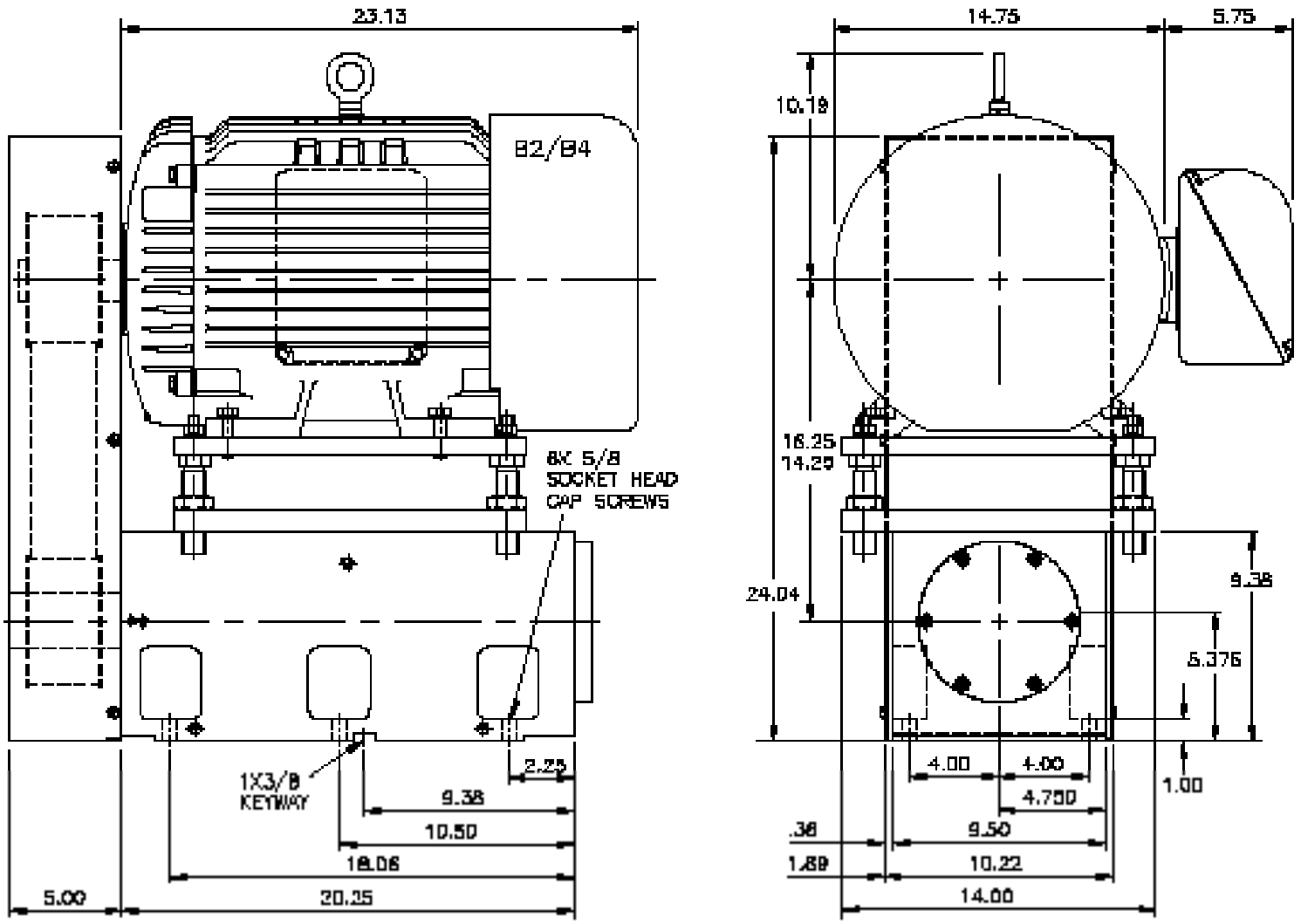
Spindle RPM		Motor					8000C			8000B		
Minimum	Maximum	RPM	HP	Frame	A	C	B	D: Min	D: Max	B	D: Min	D: Max
550	1,950	1,160	10 or 15	256T 284TC	12.94 14.62	4.38 7.88	0.56 4.50	14.88 15.62	16.88 17.62	-1.06 2.88	13.50 14.25	15.50 16.25
850	2,850	1,750	20	256T	12.94	4.38	0.56	14.88	16.88	-1.06	13.50	15.50
1,750	4,400	3,500	25 or 30	284TS 286TS	14.62	7.88	2.75	15.62	17.62	1.12	14.25	16.25

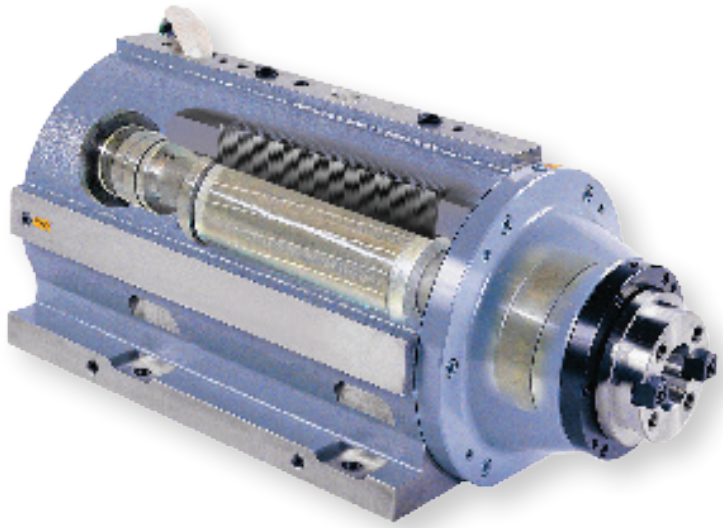
8000C/8000B B4

Spindle RPM		Motor					8000C			8000B		
Minimum	Maximum	RPM	HP	Frame	A	C	B	D: Min	D: Max	B	D: Min	D: Max
550	1,950	1,160	5	215T	9.56	0.62	350	13.88	15.88	5.12	13.88	15.88
850	2,950	1,750	5 or 7.5	184T 213T	7.88 9.56	2.12 0.62	6.12 3.50	13.12 13.88	15.12 15.88	7.75 5.12	13.12 13.88	15.12 15.88
1,750	3,950	3,500	5 or 7.5	184T 213T	7.88 9.56	2.12 0.62	6.12 3.50	13.12 13.88	15.12 15.88	7.75 5.12	13.12 13.88	15.12 15.88

8000B B2 & B4 MOTORIZED

All Dimensions = Inches





Mech-Tronix

Integral Motorized Spindle System

MECH-TRONIX SPINDLE SYSTEM

Gilman
SOLUTIONS FOR LINEAR & ROTARY MOTION

Gilman Precision's industry standard spindle line, Mech-Tronix, will give your process more power, variable speed and more tool connection choices than any other spindle.

Select either Totally Enclosed Non-Ventilated (TENV) or Totally Enclosed Liquid-Cooled (TELC). The liquid-cooled TELC motor generates over three times as much power as the TENV. Mech-Tronix is available with preprogrammed/tuned AC drive and a properly sized motor chiller.

Motor Rotor/Stator

- Matched up with drive for optimum performance
- Embedded KTY84-130 PTC Thermistor
- Class H insulation
- Max torque from 10-60 Hz.
- Balanced to ISO G1.0 specifications
- 36" long motor lead wires exit at the 12 o'clock position. 3/4-14 NPTF

Nose Designs

- NMTB Taper
- Boring Nose
- HSK Manual Nose
- Specials

Specials Available

- Custom Spindle Noses
  - Grinding Taper
  - ABS
  - Lathe
  - Gun Drill
  - Quick Change
  - Others
- Alternate horsepower motor configurations
- Cartridge housing
- Special duty cycles
- Air purge fittings (for 5/32 OD plastic tubing)
- Shaft balancing available

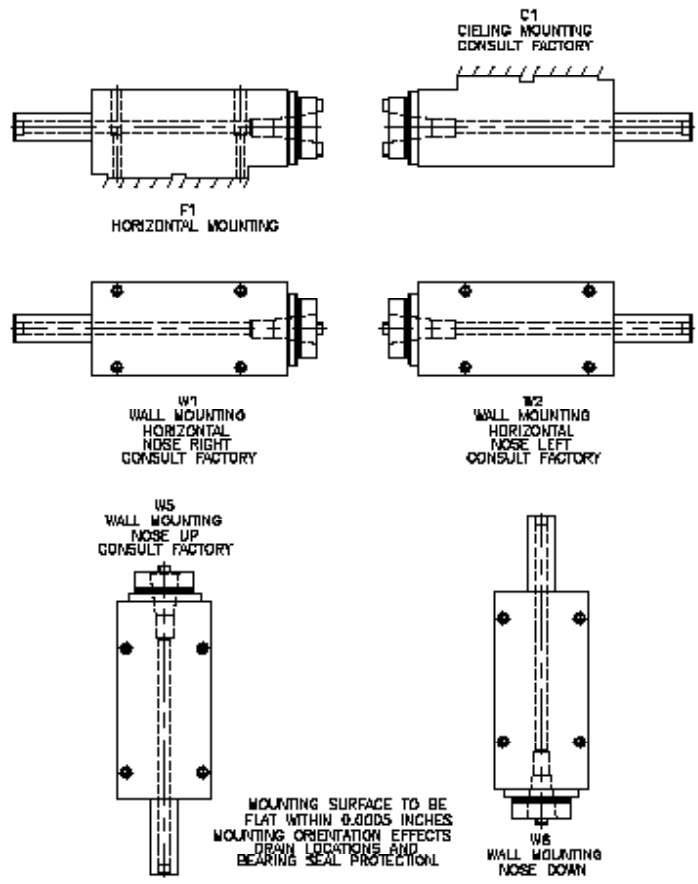
Selectable Bearing Structure: RPM/Thrust Variable

- Duplex or Triplex
- Greased for life
- Steel or ceramic balls (ABEC 7)
- Labyrinth seals front and rear with standard air purge

Easy Mounting

- Foot-mounted housing
- Four industry standard sizes
- Standard jack screw holes for alignment

Mounting Data



Mech-Tronix 350

INTEGRAL MOTORIZED SPINDLE SYSTEM

Mech-Tronix 350 Series Motorized Spindles are available with three standard nose types and four bearing arrangements.

Nose Types

- #30 NMTB Taper Nose
- Boring Nose
- HSKC50 Nose

Bearing Arrangements

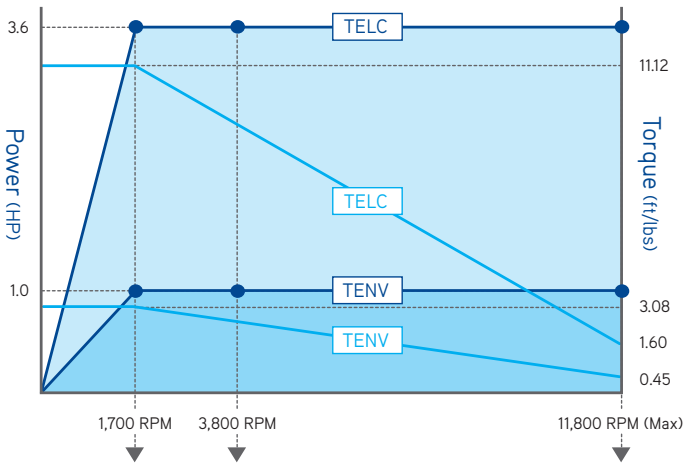
- 2LC Duplex Ceramic Ball Bearing at Nose End with Labyrinth Seal
- 2M Duplex Steel Ball Bearing at Nose End with Labyrinth Seal
- 3M Triplex Steel Ball Bearing at Nose End with Labyrinth Seal
- 3H Triplex Steel Ball Bearing at Nose End with Labyrinth Seal

Specifications

- Front Bearing: 45mm; Rear Bearing: 30mm
- Includes Air Purge
- Cooling: TENV or TELC
- Approximate Weight: 110 lbs

Bearing Code	Bearing Arrangement	Preload	Maximum Thrust (lbs.)	Maximum RPM
2LC	Duplex Ceramic	Light	77	11,800
2M	Duplex Steel	Medium	265	9,300
3M	Triplex Steel	Medium	527	6,200
3H	Triplex Steel	Heavy	1,191	4,900

S1 – 100% Duty Cycle Rating

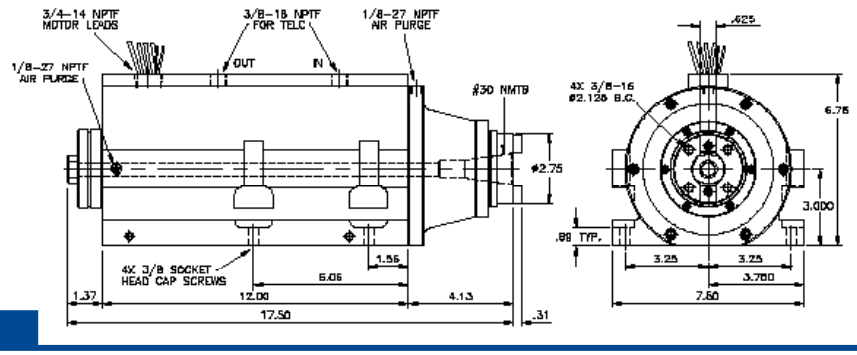


Volts	215	460	460
Hertz	60	128	400
Full Load Amps:TENV	3.3	2.4	1.4
Full Load Amps: TELC	12.5	8.5	4.7

MECH-TRONIX 350

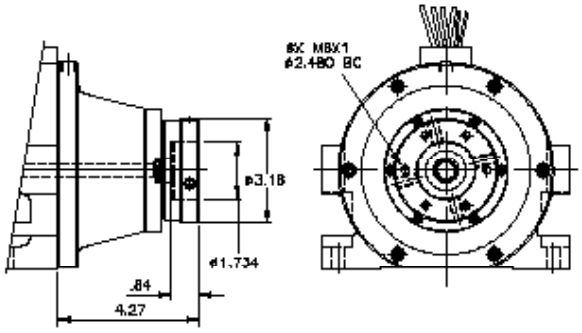
#30 NMTB Taper Nose

All Dimensions = Inches



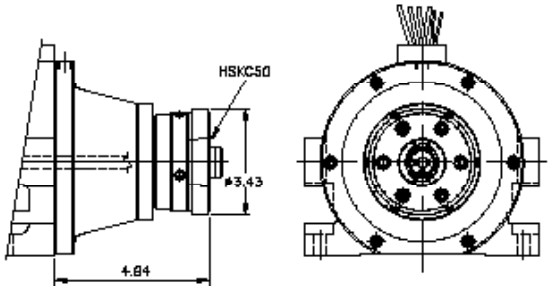
MECH-TRONIX 350

Boring Nose

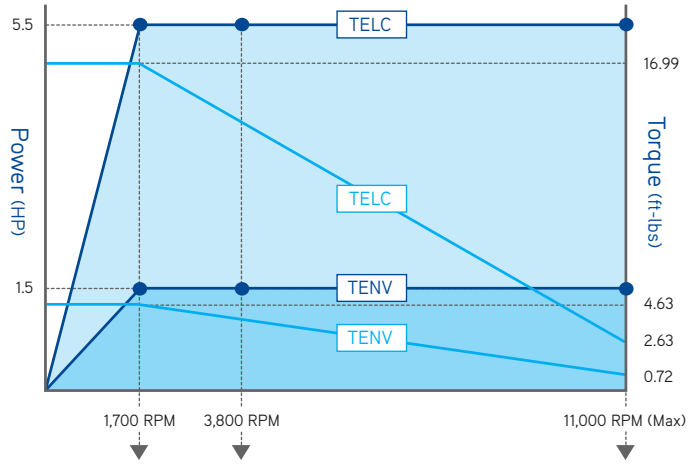


MECH-TRONIX 350

HSK Nose



S1 – 100% Duty Cycle Rating



Volts	215	460	460
Hertz	60	128	371
Full Load Amps:TENV	4.6	3.9	1.9
Full Load Amps: TELC	17.4	11.4	6.7

Mech-Tronix 400 Series Motorized Spindles are available with three standard nose types and four bearing arrangements.

Nose Types

- #40 NMTB Taper Nose
- Boring Nose
- HSKC63 Nose

Bearing Arrangements

- 2LC Duplex Ceramic Ball Bearing at Nose End with Labyrinth Seal
- 2M Duplex Steel Ball Bearing at Nose End with Labyrinth Seal
- 3M Triplex Steel Ball Bearing at Nose End with Labyrinth Seal
- 3H Triplex Steel Ball Bearing at Nose End with Labyrinth Seal

Specifications

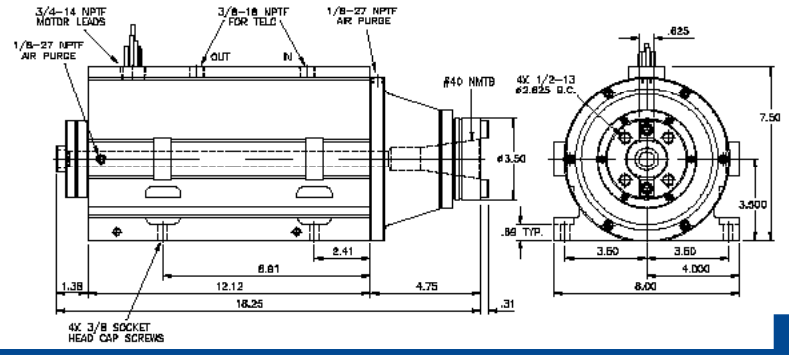
- Front Bearing: 55mm; Rear Bearing: 35mm
- Includes Air Purge
- Cooling: TENV or TELC
- Approximate Weight: 135 lbs

Bearing Code	Bearing Arrangement	Preload	Maximum Thrust (lbs.)	Maximum RPM
2LC	Duplex Ceramic	Light	105	11,000
2M	Duplex Steel	Medium	394	7,800
3M	Triplex Steel	Medium	847	5,200
3H	Triplex Steel	Heavy	1,693	4,100

#40 NMTB Taper Nose

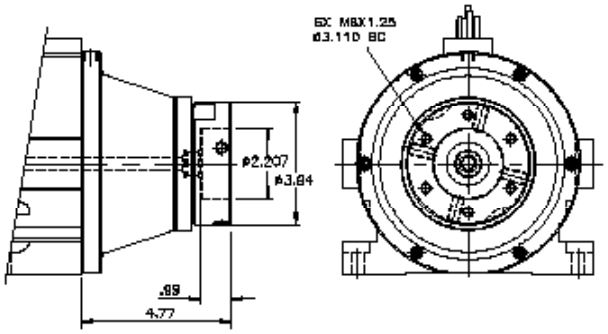
MECH-TRONIX 400

All Dimensions = Inches



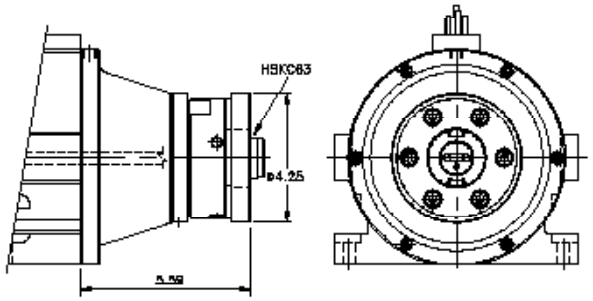
Boring Nose

MECH-TRONIX 400



HSK Nose

MECH-TRONIX 400



Mech-Tronix 550

INTEGRAL MOTORIZED SPINDLE SYSTEM

Mech-Tronix 550 Series Motorized Spindles are available with three standard nose types and four bearing arrangements.

Nose Types

- #40 NMTB Taper Nose
- Boring Nose
- HSKC63 Nose

Bearing Arrangements

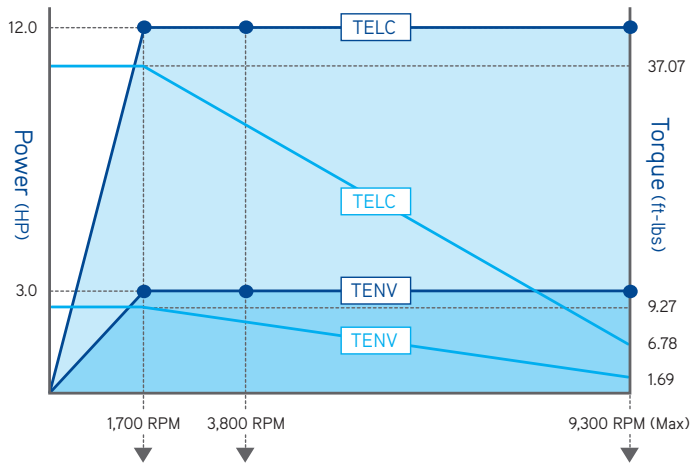
- 2LC Duplex Ceramic Ball Bearing at Nose End with Labyrinth Seal
- 2M Duplex Steel Ball Bearing at Nose End with Labyrinth Seal
- 3M Triplex Steel Ball Bearing at Nose End with Labyrinth Seal
- 3H Triplex Steel Ball Bearing at Nose End with Labyrinth Seal

Specifications

- Front Bearing: 70mm; Rear Bearing: 45mm
- Includes Air Purge
- Cooling: TENV or TELC
- Approximate Weight: 210 lbs

Bearing Code	Bearing Arrangement	Preload	Maximum Thrust (lbs.)	Maximum RPM
2LC	Duplex Ceramic	Light	140	9,300
2M	Duplex Steel	Medium	560	6,200
3M	Triplex Steel	Medium	1,175	4,100
3H	Triplex Steel	Heavy	2,625	3,200

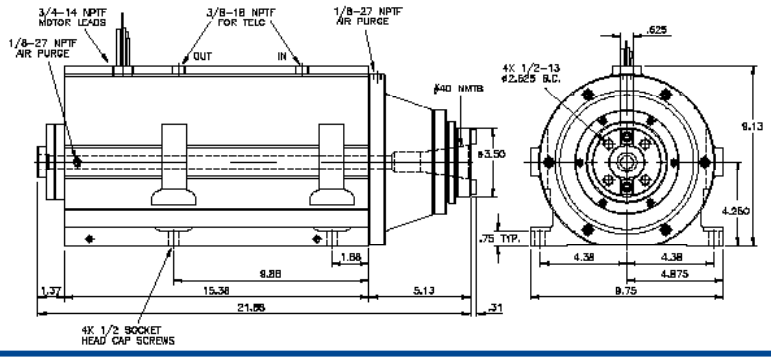
S1 – 100% Duty Cycle Rating



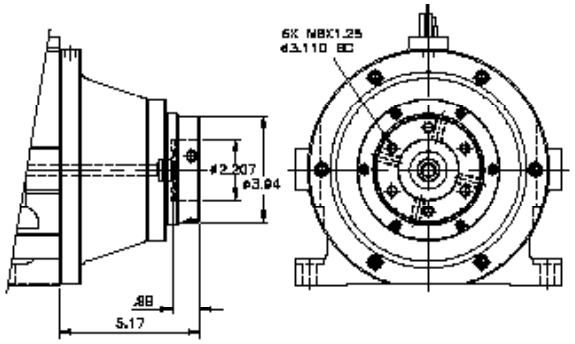
Volts	215	460	460
Hertz	60	128	313
Full Load Amps:TENV	8.3	4.9	3.7
Full Load Amps: TELC	35.1	21.0	14.1

MECH-TRONIX 550 — **#40 NMTB Taper Nose**

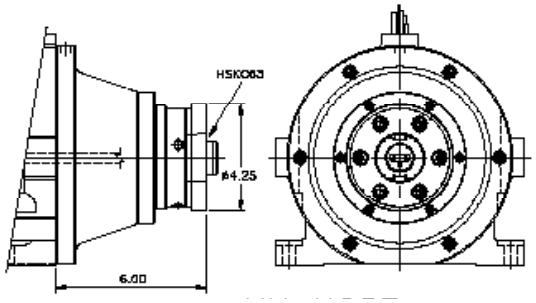
All Dimensions = Inches



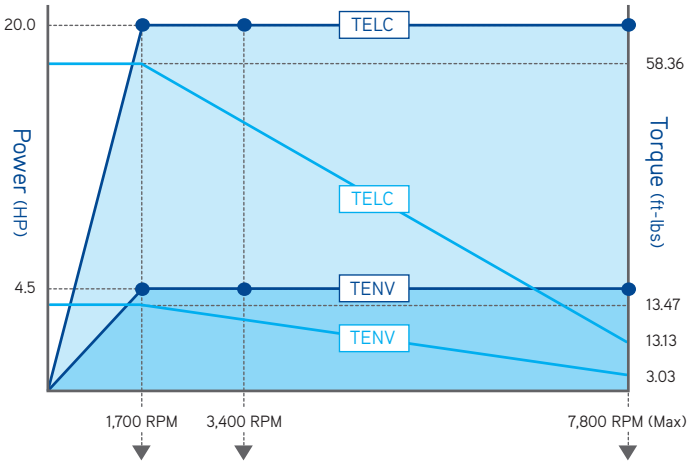
MECH-TRONIX 550 — **Boring Nose**



MECH-TRONIX 550 — **HSK Nose**



S1 – 100% Duty Cycle Rating



Volts	240	460	460
Hertz	60	115	263
Full Load Amps:TENV	10.8	6.7	5.4
Full Load Amps: TELC	50.9	32.3	23.1

Mech-Tronix 650 Series Motorized Spindles are available with three standard nose types and four bearing arrangements.

Nose Types

- #50 NMTB Taper Nose
- Boring Nose
- HSKC100 Nose

Bearing Arrangements

- 2LC Duplex Ceramic Ball Bearing at Nose End with Labyrinth Seal
- 2M Duplex Steel Ball Bearing at Nose End with Labyrinth Seal
- 3M Triplex Steel Ball Bearing at Nose End with Labyrinth Seal
- 3H Triplex Steel Ball Bearing at Nose End with Labyrinth Seal

Specifications

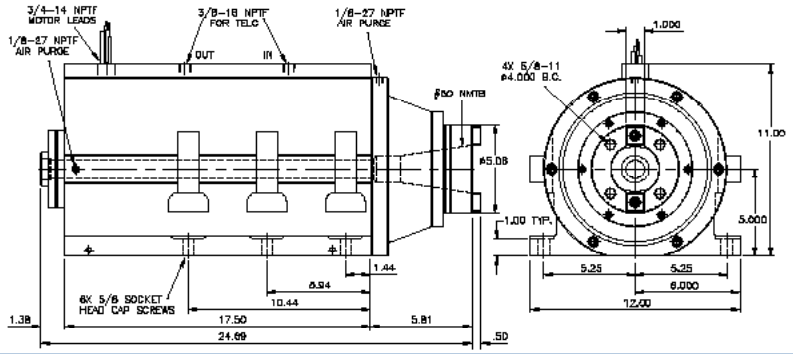
- Front Bearing: 85mm; Rear Bearing: 55mm
- Includes Air Purge
- Cooling: TENV or TELC
- Approximate Weight: 330 lbs

Bearing Code	Bearing Arrangement	Preload	Maximum Thrust (lbs.)	Maximum RPM
2LC	Duplex Ceramic	Light	174	7,800
2M	Duplex Steel	Medium	765	4,900
3M	Triplex Steel	Medium	1,695	3,200
3H	Triplex Steel	Heavy	3,790	2,500

#50 NMTB Taper Nose

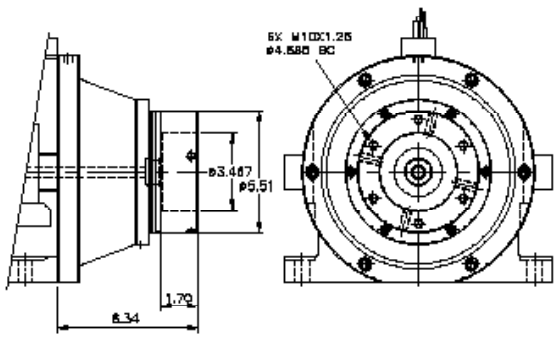
MECH-TRONIX 650

All Dimensions = Inches



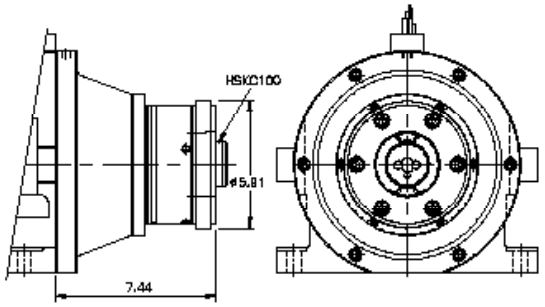
Boring Nose

MECH-TRONIX 650



HSK Nose

MECH-TRONIX 650



Accessories

Cartridge and Block Spindles
Mech-Tronix Integral Motorized Spindle Systems

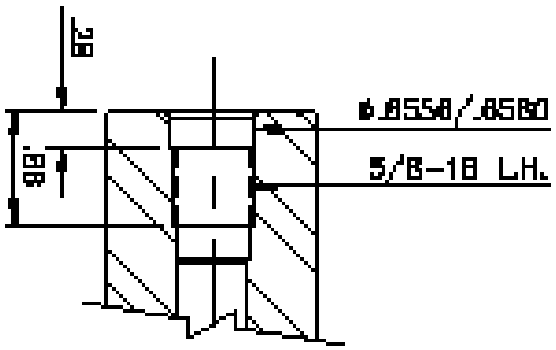
Gilman
SOLUTIONS FOR LINEAR & ROTARY MOTION

1. Coolant Union Connection

When needed, coolant can be fed through the spindle via a rotary union, by adding a coolant union connection to all spindles (except for 30, 40 and 50 NMTB) with through-hole shafts.

Available on belt-driven spindle sizes 2750 and above.

Standard on Mechtronix spindles.



2. High Speed Coolant Union

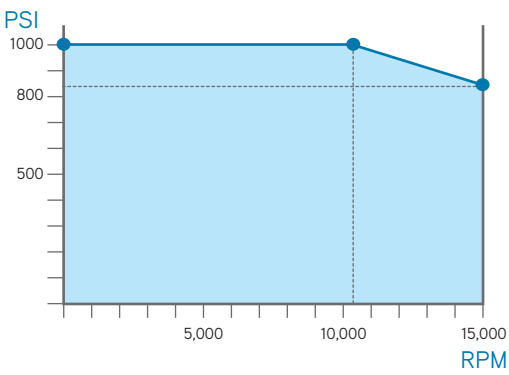
All Dimensions = Inches

Alternate coolant union for spindle RPM over 10,000.

Coolant Union Notes
- 15,000 RPM Maximum
- Filtration 10 Microns
- 71°C (160°F) Maximum Temperature
- Maximum Flow Rate: 13 GPM
- Do Not Run Dry
- Coolant Connection Must Not Produce Radial or Axial Loads on the Coolant Union.

Spindle Type	Straight Item Number	90° Item Number
3500/350	1108-002-102	1108-001-002
4000/400	1108-002-102	1108-001-002
2750	1108-002-102	1108-001-002

For use with boring and HSK spindle nose connections only.

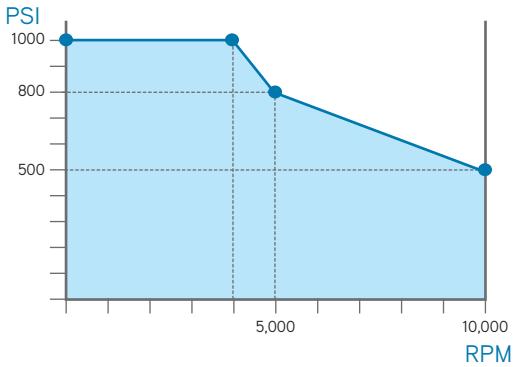


3. Low Speed Coolant Union

Coolant Union Notes
- 10,000 RPM Maximum
- Filtration 10 Microns
- 71°C (160°F) Maximum Temperature
- Maximum Flow Rate: 13 GPM
- Do Not Run Dry
- Coolant Connection Must Not Produce Radial or Axial Loads on the Coolant Union

Spindle Type	Straight Item Number	90° Item Number
3500/350	1116-048-059	1116-090-059
4000/400	1116-048-059	1116-090-059
5000/550	1116-048-059	1116-090-059
6500/650	1116-048-059	1116-090-059
2750	1116-048-059	1116-090-059
8000	1116-048-059	1116-090-059

For use with boring and HSK spindle nose connections only.



4. Wrenches

Wrenches for spindle collet locknuts must be ordered separately from the spindle. Refer to chart for correct wrench number corresponding with spindle model.

Model	Pin	Collet Nut
1875	--	A11293
2750	A10016-2	A11599
3500	A10278-2	A11599

5. HSK T-Wrench

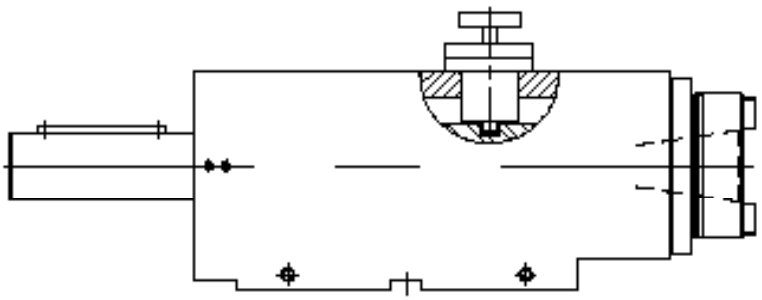
Spindle Type	Size	Item Number
3500/350	HSK50C	A11226
4000/400	HSK63C	A11227
5500/550	HSK63C	A11227
6500/650	HSK100C	A11228
2750	HSKC40	A11336

6. Manual Spindle Lock

A spindle lock is used to prevent the spindle shaft from rotating while tooling is being changed. Available on block spindles only.

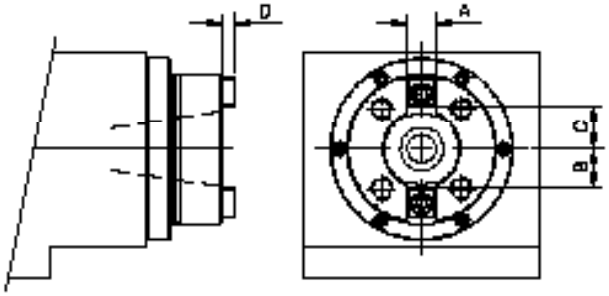
Hold-to-lock or twist-to-lock styles are available.

When using the twist-lock version, a motor interlocking switch is supplied to prevent spindle start-up while the lock is in position.



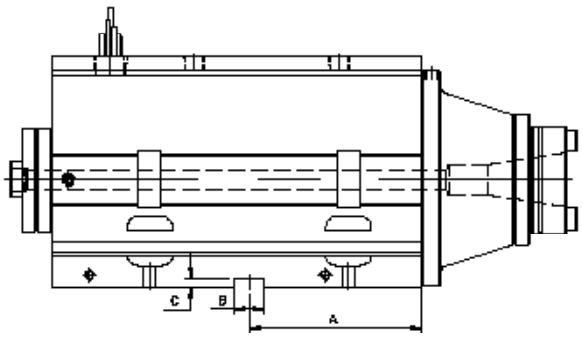
7. V-Flange Nose Kit

All Dimensions = Inches



Spindle Type	Size	A	B	C	D	Item Number
3500/350	#30 Taper	0.625	0.660/0.654	0.755/0.749	0.31	A11223
4000/400	#40 Taper	0.625	0.910/0.904	1.005/0.999	0.31	A11224
5500/550	#40 Taper	0.625	0.910/0.904	1.005/0.999	0.31	A11224
6500/650	#50 Taper	1.000	1.160/1.154	1.255/1.249	0.50	A11225

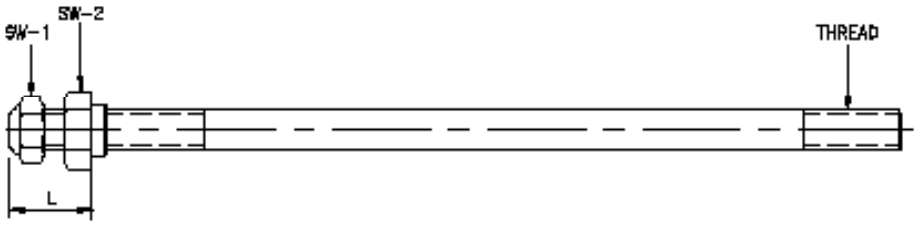
8. Thrust Keyway Alteration



Mech-Tronix Spindle	A	B	C	Item Number
350	3.812	0.750/0.751	0.13/0.14	B21879
400	5.656	1.000/1.001	0.25/0.26	B21880
550	5.875	1.000/1.001	025/0.26	B21881
650	8.188	1.000/1.001	0.25/0.26	B21882

9. Manual Draw Bar

Precision manual draw bars for spindles with #30, #40, and #50 NMTB tapers are made to operate at high speeds with minimal vibration.

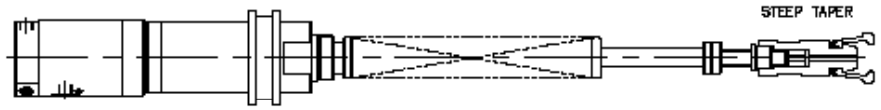


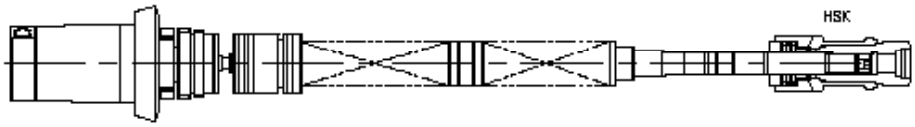
Spindle Type	Thread A	SW-1	SW-2	Z (NMTB)	Z (V-Flange)	Item Number
3500/350	0.5 - 13	0.875	0.75	1.88	1.06	B21871
4000/400	0.625 - 11	0.9375	1.125	2.19	2.19	B21873
5500/550	0.625 - 11	0.9375	1.125	2.19	2.19	B21875
6500/650	1 - 8	1.5	1.5	2.62	2.62	B21877

NMTB per ANSI B5.18, V-Flange per ANSI B5.50.

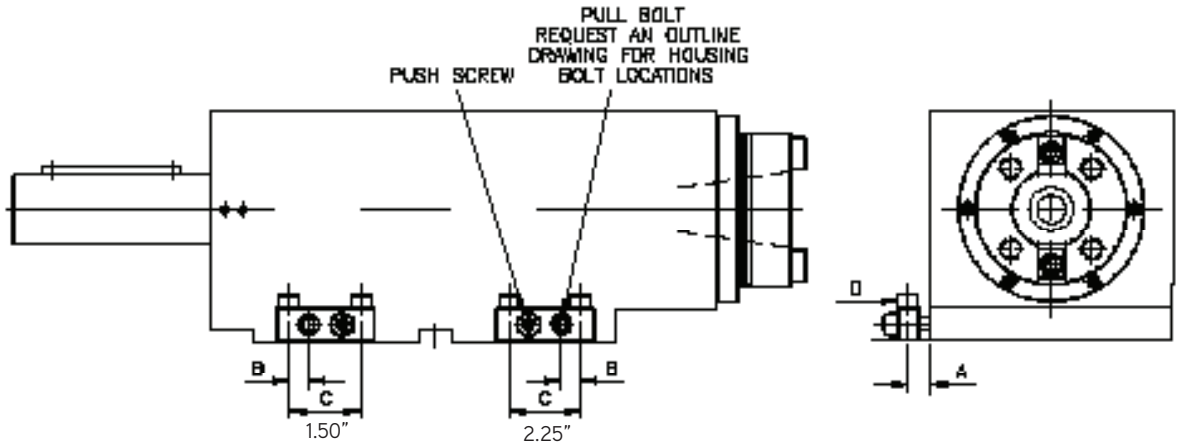
10. Power Draw Bar Systems

Offering high speed operation and strong clamping power, these draw bars provide short tool change cycles for automatic tool change applications. Available in #30, #40 and #50 steep tapers and HSK Can be supplied with MQL or coolant through designs





11. Jack Block Kit



12. MT Series Spindle Drives

MT Series drives are fully tuned for the spindle. Spindle control is performed using the key pad. Each drive comes with a dynamic braking resistor for two-second braking.

See www.gilmanprecision.com for drive planning guide. This will give components and sizes along with wiring requirements.

MT Series Spindle Drives are general purpose, microprocessor based, software-controlled units representing significant advances in AC drive technology.

Design features include comprehensive operator controls and a programming panel for digital setup, troubleshooting and self-diagnostics. Optional capabilities include remote interrogation, digital speed input and multiple communication options for direct control by programmable logic controllers and computers. The drive uses sensorless vector control for improved torque control over the rated speed range.

The MT Series Spindle Drive provides a wide range of adjustable speed control with conventional AC induction motors in applications exhibiting a variety of load characteristics. The unit converts the fixed frequency and voltage source of the AC line power source to a sine coded Pulse Width Modulated (PWM) adjustable voltage and frequency output that will control induction motors over a side speed range.

Drives are designed and manufactured to comply with applicable standards established by the National Electric Code, IEC and NEMA, for industrial motor and control equipment. They are UL listed and CE compliant.

Features

- Touch Pad Adjustable Speed
- AC Motor Controllers
- Vector Drive
- 460-volt 3-phase
- Panel Mounted
- Multiple communication options available
- CE Marked
- Output Fault Protected
  - Line To Line
  - Line To Ground
- Resistor Braking
- Overheating protection using the motor's Thermistor

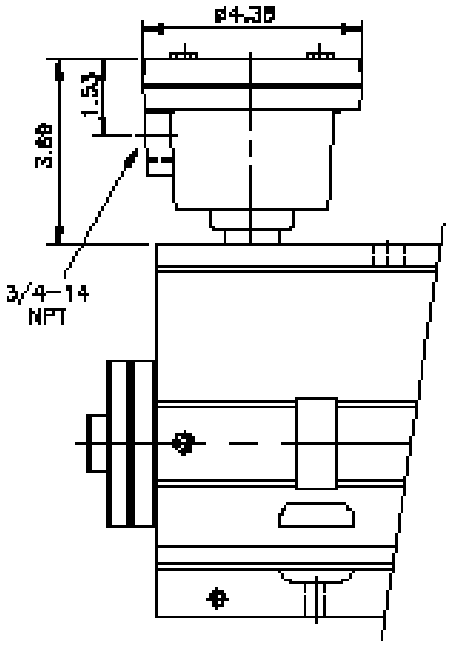
**No cables are furnished.*

Mech-Tronix Spindle	Motor	Spindle Power Rating (HP)	Drive
350	TENV	1.0	B21860
350	TELC	3.6	B21861
400	TENV	1.5	B21862
400	TELC	5.5	B21863
550	TENV	3.0	B21864
550	TELC	12.0	B21865
650	TENV	4.5	B21866
650	TELC	20.0	B21867

Table describes the AC drives applicable to the standard Mech-Tronix integral motor spindles.

13. Conduit Box Kit

Satisfies the requirement for liquid-tight seal. Allows for ease of making electrical connections. If conduit box is not purchased, customer is responsible for providing a "liquid-tight seal."



Mech-Tronix Spindle	Item Number
350	B21884
400	B21884
550	B21884
650	B21884

14. Spindle Coolant Chiller

Mech-Tronix Spindle Chillers are designed to provide a continuous supply of clean, water-based coolant to liquid-cooled spindles. The unit is completely self-contained and consists of a reservoir, adjustable thermostat, recirculating pump and air-cooled refrigeration system. After the unit is filled and the proper electrical and plumbing connections are made, the unit will operate virtually maintenance free, supplying cooling fluid at a constant temperature and pressure.

Chiller units are designed for indoor use in a clean industrial environment. Ambient temperature should not fall below 13°C (55°F), or rise above 43°C (110°F).

Features
- 230/60/1 Operation

Cooling System Requirements
- Not to Exceed 60 PSI
- Input Temperature is 27°C (80°F)
- Maximum Temperature Rise is 11°C (20°F) from Spindle Inlet to Outlet
- Have a 100 Micron Filter or Better

Heat Transfer Requirements
- Calculations are Based on 50% Dowtherm SR-1 (or Equivalant) and 50% water
- Must Not Attack Viton
- Specific Heat of a 50% Mixture at 49°C (120°F) is 0.81 BTU/lbmF
- Density of a 50% Mixture at 49°C (120°F) is 66.2 lbm/ft3
- Do Not Use Automotive Anti-Freeze as Coolant

**No cables are furnished.*

Mech-Tronix Spindle	Minimum Spindle Flow (GPM)	Spindle BTU/HR	Chiller
350	0.2	1800	A11219
400	0.3	2800	A11220
550	0.7	6000	A11221
650	1.2	10200	A11222

Table designates the model number for Gilman Precision's chillers for use with liquid-cooled (TELC) spindles. Flow rates at 60 PSI (Max) line pressure. For multiple spindles cooled by and individual chiller, contact Gilman Precision engineering.

See www.gilmanprecision.com for chiller manuals.

Gilman Quality

Gilman prides itself on ingenuity and the ability of finding an answer to your engineering challenge. No matter how simple or complex, Gilman can design a spindle to meet your exact needs.

Gilman Precision values ingenuity in achieving even the most complex solutions. Mastering the art of engineering since 1952, Gilman specializes in dependable motion control and increased machine efficiency through designing customized slides and spindles.

With a highly skilled, dedicated, and knowledgeable team, containing years of experience, we offer high precision linear and rotary motion to the millionths of an inch. Gilman can rebuild and refurbish a slide or spindle for virtually any manufacturer's machine. To guarantee quality and ensure customer needs are met, Gilman tests the performance and accuracy of each product before leaving the facility in our temperature controlled Class 10,000-level clean room.

Gilman Precision's facility, headquartered in Grafton, WI USA, is ISO 9001 certified. Serving a wide variety of industries, Gilman provides real world solutions for value-minded engineers, at the highest quality. Visit our website for contact information and a full listing of products and services.

WE DELIVER QUALITY PRODUCTS & SERVICES

Gilman's flexible workforce, strength in engineering, and clean workplace provide an advantage in quality customer care. Value added work is done in house to ensure quality control and help our customer's ultimately improving system efficiency, while guaranteeing on-time delivery.

Take advantage of advanced precision technologies and craftsmanship.

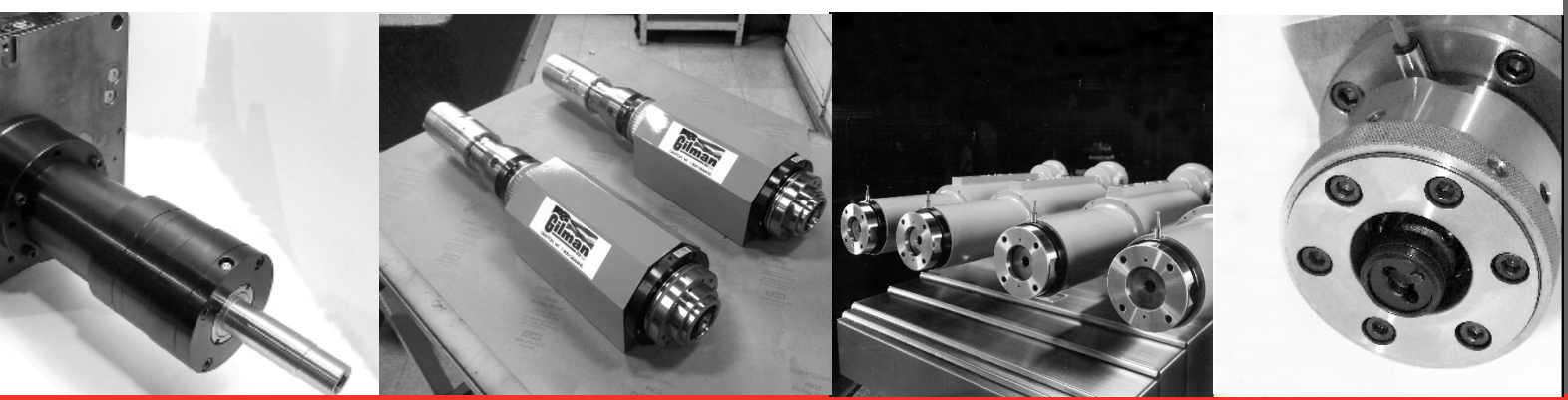
Gilman can assure responsive engineering, precision manufacturing, and prompt, efficient after-sale service, whether the end application is an exclusive machine or an OEM product line.

By keeping sufficient amounts of inventory at our facility, Gilman provides quick delivery and up-front lead times. When committing to a promised date, we keep it.

Gilman Precision's equipment creates accuracy and efficiency.

Along with drilling, milling, grinding, and turning, Gilman specializes in various types of machining operations. Our state-of-the-industry boring and grinding equipment, with millionths-of-an-inch tolerances, allows us to manufacture customized spindles.

Gilman Precision is ISO 9001 certified.



Customized Rotary Motion Solutions...Since 1952.

Gilman prides itself on ingenuity and the ability of finding an answer to your engineering challenge. No matter how simple or complex, Gilman can design a spindle to meet your exact needs. Call us today to discuss your challenge.

Gilman
SOLUTIONS FOR LINEAR & ROTARY MOTION

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