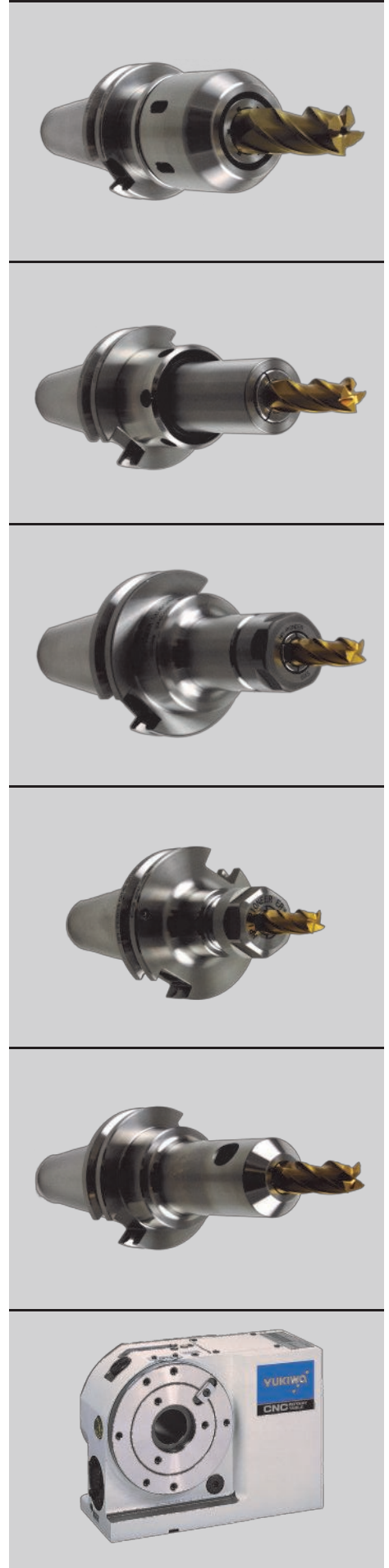




Premium Tool & Work Holding

2012 - Premium Tool Holding Catalog



HIGH PRECISION AIR CHUCK

Over 15,000 sets have been sold in the past 20-years. Based on years of practical experience and technical engineering know-how, we offer Air Chucks of the highest accuracy, performance and reliability in the marketplace today. The demand for accuracy and performance from production people has never been greater. We, as a proven solution-provider, continue to propose unique and innovative ideas that meet, and exceed the demands of those people and their applications.



Rotating Air Chucks

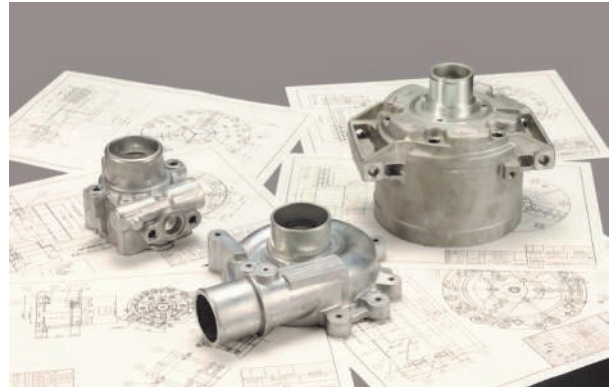
Air chucks are ideal solutions in High Precision turning, cylindrical grinding and similar applications where extremely close tolerances in the concentricity, squareness and parallelism are requirements. Adjustable clamping force enables clamping of thin-walled or similarly fragile parts in such a way as to minimize distortion. All models feature Coolant/Air-through-center air tube design.

Chuck Accuracy

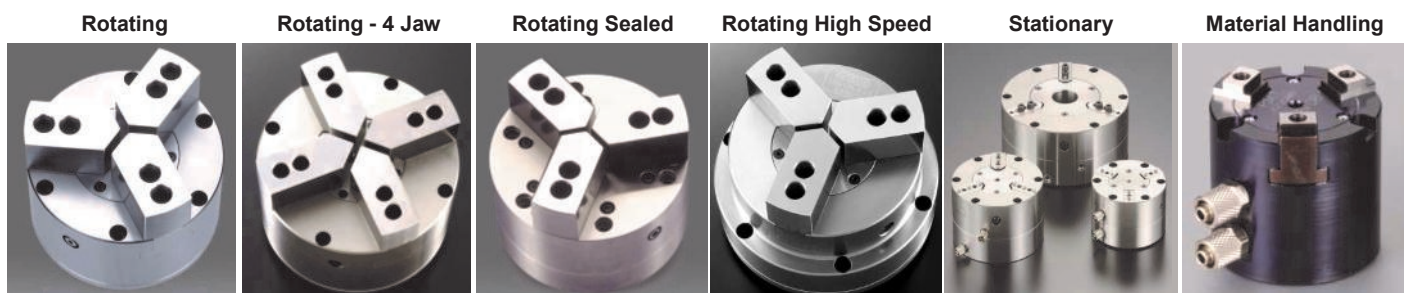
- 1 - 2 Micron - 0.00004 - 0.00008" TIR is standard

Available Options

- Precision located top jaw system
- 3" to 10" chucks available
- 3 & 4 Jaw standard, other configurations available
- Higher accuracy available - See diaphragm chucks for up to 0.2 Microns, 0.0000078"
- Operating pressure as low as 0.1 MPa (14.5 PSI) for thin wall parts
- Coolant / Air Thru the center of air tube



See *PIONEER Chuck Catalog* for additional information

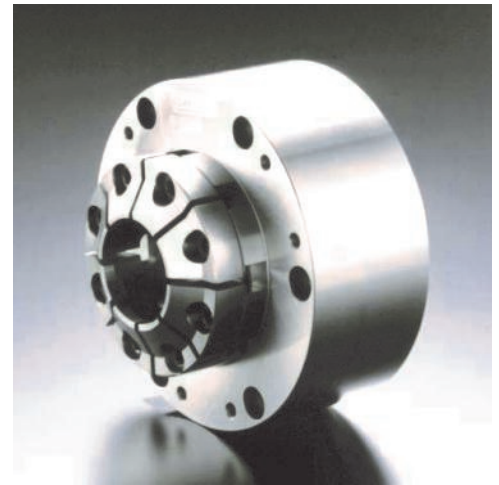


PMT Diaphragm Chucks

SUPER HIGH PRECISION DIAPHRAGM CHUCK

PIONEER's Diaphragm Chuck clamps work pieces 'soft and even' to avoid distortion.

One of the reasons it works so well, is the tensile strength of the unique material used in the Diaphragm's construction. By design, the Diaphragm Chuck is built to be unaffected by the centrifugal force at high-speeds and; it can be used up to 10,000min or over. It ensures 'Super High Precision" and "Stable Performance" in the turning.



Custom Jaw Examples

Diaphragm chucks use a 1 piece jaw system for improved accuracy and easy tool change.

Custom jaws are designed and built to meet your unique work piece for either ID or OD holding.

4 layer AFT and nozzle supplied with air ports are available so the chuck will not close unless the work piece is seated properly on the nozzle.

Repeatability	Within 0.2 Micron , 0.0002mm or 0.0000078"
Maintenance Free	No Lubrication Necessary. Chuck is completely sealed.
Flex. Clamping Power	For both OD & ID clamping, fine adjustment of clamping power is possible.
Excellent High Speed Capability	On any type of chucks, super performance can be obtained at high RPM.
High Durability	Long life of rigidity and accuracy is insured due to unique diaphragm material.
Flex. Application	Both OD & ID clamping is possible with one chuck, and very flexible arrangement of work piece mounting stop is possible.

See PIONEER Chuck Catalog for additional information

AIR FEED TUBE ASSEMBLY

Models Available:

JHP3 For Diaphragm Chuck & Air Chuck up to 8,000 RPM

JHP2 For w/movable AFT Air Chuck up to 8,000 RPM

4L3 For Diaphragm Chuck and For Air Chuck (4 Layer Type)

Not only opening & closing jaws, air blow and/or coolant teed through the center bore of chuck, checking and confirming work piece seated properly or not, is possible.



Value Pack 2.0

Premium Tool Holders & Collets @ Unbeatable Pricing!

Features:

- * All Holders are Dynamically Balanced 20,000 RPM or Better!
- * Traverse Ground Shanks - AT3 or better Taper Tolerance Guaranteed
- * Collet Chucks 3µm (0.0001") TIR Taper to Taper - *Best in the Industry!*
- * End Mill Adapters 3µm (0.0001") TIR Taper to Bore - *Best in the Industry!* with H5 Bore Tolerance
- * Coolant Thru the Center
- * DIN AD+B Flange Entry Coolant **Standard!**

CAT40 Value Pack

Includes:

- ⇒ (2) ER16 Collet Chucks - 2.50 Projection
- ⇒ (2) ER32 Collet Chucks - 2.50 Projection
- ⇒ (1) 1/4 End Mill Adapter - 2.50 Projection
- ⇒ (1) 3/8 End Mill Adapter - 2.50 Projection
- ⇒ (1) 1/2 End Mill Adapter - 2.50 Projection
- ⇒ (1) 3/4 End Mill Adapter - 2.50 Projection
- ⇒ (1) 1" End Mill Adapter - 3.00 Projection
- ⇒ (1) 3/4 Shell Mill Adapter - 1.75 Projection

Your Price \$599.00_{USD}

Add Collets & Wrench's

- ⇒ (1) ER16 Inch Collet Set - 10 Collets & Tray
- ⇒ (1) ER16 Wrench Hex Style
- ⇒ (1) ER32 Inch Collet Set - 18 Collets & Tray
- ⇒ (1) ER32 Wrench "E" Style

VP+Collets+Wrench Your Price \$995.00_{USD}

Add (10) Ground Retention Knobs

- ⇒ Haas, Standard or Coolant Thru
- ⇒ Mori-Seiki
- ⇒ Mazak
- ⇒ Okuma
- ⇒ Fadal
- ⇒ Bridgeport
- ⇒ Doosan
- and many more...

All of the above Your Price \$1095.00_{USD}



BT30 and BT40 Value Packages Available...

Special Package quotes available upon request. Distributor discount code "F" applies. Pricing subject to change.

Cat40 Flex-Pack

For only **\$875.00** you are getting the best of the best.
 This is the finest tooling in the industry with a retail value
 of **\$1,564.00** packaged up the way **YOU** want it.

Here is what you get:

- (5) Collet Chucks
- (5) End Mill Adapters
- (1) Shell Mill Adapters
- (10) ER Collets



Features:

- Dynamically Balanced **20,000 RPM**
- AT3 or better Taper Tolerance Guaranteed
- Collet Chucks **3µm (0.0001") TIR Taper to Taper**
- End Mill Adapters **3µm (0.0001") TIR Taper to Bore with H5 Bore Tolerance**
- **Coolant Thru the Center & DIN AD/B Flange Entry Coolant Standard!**

Size	Proj.	Collet Chucks	
ER11	2.50	CAT40-ER11H-0250	<input type="checkbox"/>
ER16	2.50	CAT40-ER16H-0250	<input type="checkbox"/>
ER20	2.50	CAT40-ER20H-0250	<input type="checkbox"/>
ER25	2.50	CAT40-ER25-0250	<input type="checkbox"/>
ER32	2.50	CAT40-ER32-0250	<input type="checkbox"/>
ER40	2.50	CAT40-ER40-0250	<input type="checkbox"/>
Choose 5			

Size	Proj.	Shell Mill Adapters	
3/4	1.75	CAT40-SM075-0175	<input type="checkbox"/>
1"	2.00	CAT40-SM100-0200	<input type="checkbox"/>
1-1/4	2.25	CAT40-SM125-0225	<input type="checkbox"/>
1-1/2	2.40	CAT40-SM150-0240	<input type="checkbox"/>
Choose 1			

Bore	Proj.	End Mill Adapters	
1/8	2.50	CAT40-EM012-0250	<input type="checkbox"/>
3/16	2.50	CAT40-EM018-0250	<input type="checkbox"/>
1/4	1.75	CAT40-EM025-0175	<input type="checkbox"/>
1/4	2.50	CAT40-EM025-0250	<input type="checkbox"/>
5/16	1.75	CAT40-EM031-0175	<input type="checkbox"/>
5/16	2.50	CAT40-EM031-0250	<input type="checkbox"/>
3/8	1.75	CAT40-EM037-0175	<input type="checkbox"/>
3/8	2.50	CAT40-EM037-0250	<input type="checkbox"/>
1/2	1.75	CAT40-EM050-0175	<input type="checkbox"/>
1/2	2.50	CAT40-EM050-0250	<input type="checkbox"/>
5/8	1.75	CAT40-EM062-0175	<input type="checkbox"/>
5/8	2.50	CAT40-EM062-0250	<input type="checkbox"/>
3/4	1.75	CAT40-EM075-0175	<input type="checkbox"/>
3/4	2.50	CAT40-EM075-0250	<input type="checkbox"/>
7/8	1.75	CAT40-EM087-0175	<input type="checkbox"/>
7/8	3.50	CAT40-EM087-0350	<input type="checkbox"/>
1"	1.75	CAT40-EM100-0175	<input type="checkbox"/>
1"	3.00	CAT40-EM100-0300	<input type="checkbox"/>
1-1/4	2.00	CAT40-EM125-0200	<input type="checkbox"/>
1-1/4	4.00	CAT40-EM125-0400	<input type="checkbox"/>
Choose 5			

ER Collets - Circle 10 Pieces or Multiples of the same size.

ER11	1/16, 3/32, 1/8, 5/32, 3/16, 7/32, 1/4 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0
ER16	1/16, 3/32, 1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 13/32 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0
ER20	3/32, 1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 13/32, 7/16, 15/32, 1/2 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0
ER25	3/32, 1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 13/32, 7/16, 15/32, 1/2, 17/32, 9/16, 19/32, 5/8 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0, 16.0
ER32	3/32, 1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 13/32, 7/16, 15/32, 1/2, 17/32, 9/16, 19/32, 5/8, 21/32, 11/16, 23/32, 3/4 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0
ER40	1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 13/32, 7/16, 15/32, 1/2, 17/32, 9/16, 19/32, 5/8, 21/32, 11/16, 23/32, 3/4, 25/32, 13/16, 27/32, 7/8, 29/32, 15/16, 31/32, 1" 3.0, 3.5, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0, 21.0, 22.0, 23.0, 24.0, 25.0, 26.0

CAT50, HSK63A, BT30 and BT40 Value Packages Available...

Special Package quotes available upon request. Distributor discount code "F" applies. Pricing subject to change.

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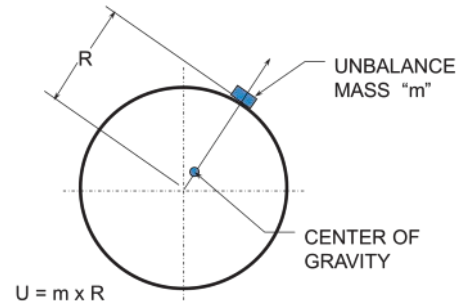
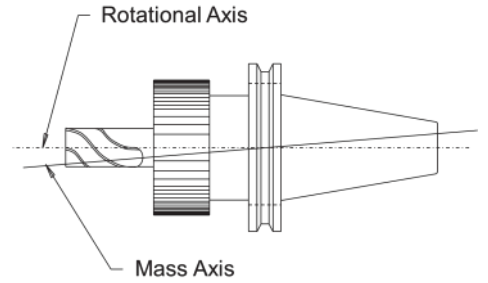
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Balanced Tool Holders

Unbalance is a condition that exists when the Mass Axis of a rotor does not coincide with the Rotational Axis.

What Causes Unbalance?

- Flaws in the base material
 - Voids, seams, and porosity
All result in unbalance and structural weakness
- Poor tolerances during fabrication
 - Un-machined portions of the forging
 - Out of roundness
 - Improper placement of through holes
 - Any machining performed on the tool holder that diminishes the absolute concentricity about the rotational axis contributes to unbalance
- Asymmetrical tool holder design
- Improper balance practice (Mass Symmetry / Par Symmetry)
- Cutting Tool Weight
- Unbalanced Cutting Tools
- Axial movement of preset screws and cutting tools
- Unbalanced Components of the Tool Holder



Unbalance Effect

The result of the conditions listed above create a new center of gravity in the tool holder. This center of gravity can be corrected by adding or removing material from the assembly. To make this correction you need to know the following:

- W = Weight of the Assembly
- G = Required "G" rating (see chart to the right)
- RPM = The operating speed for this assembly

Balance Quality Grade	Product of the relationship (G _{max} x W) ^{1), 2)} mm/s	
G4 000	4 000	Crankshafts/drives 1) of rigidly mounted slow marine diesel engines with uneven number of cylinders 4)
G1 600	1 600	Crankshafts/drives of rigidly mounted large two-cycle engines
G630	630	Crankshafts/drives of rigidly mounted large four-cycle engines
G250	250	Crankshafts/drives of elastically mounted marine diesel engines
G100	100	Crankshafts/drives of rigidly mounted fast four-cylinder diesel engines 4)
G40	40	Complete engines (gasoline or diesel) for cars, trucks and locomotives 4)
G16	16	Crankshafts/drives of elastically mounted fast four-cycle engines (gasoline or diesel) with six or more cylinders 4)
		Crankshafts/drives of engines of cars, trucks and locomotives
		Drive shafts (propeller shafts, cardan shafts) with special requirements
		Parts of crushing machines
		Parts of agricultural machinery
		Individual components of engines (gasoline or diesel) for cars, trucks and locomotives
		Crankshafts/drives of engines with six or more cylinders under special requirements
G6.3	6.3	Parts of process plant machines
		Marine main turbine gears (merchant service)
		Centrifuge drums
		Paper machinery rolls; print rolls
		Fans
		Assembled aircraft gas turbine rotors
		Flywheels
		Pump impellers
		Machine-tool and general machinery parts
		Medium and large electric armatures (of electric motors having at least 80 mm shaft height) without special requirements
		Small electric armatures, often mass produced, in vibration insensitive applications and/or with vibration-isolating mountings
G2.5	2.5	Individual components of engines under special requirements
		Gas and steam turbines, including marine main turbines (merchant service)
		Rigid turbo-generator rotors
		Computer memory drums and discs
		Turbo-compressors
		Machine-tool drives
		Medium and large electric armatures with special requirements
		Small electric armatures not qualifying for one or both of the conditions specified for small electric armatures of balance quality grade G6.3
G1	1	Lubrication pumps
		Tape recorder and phonograph (gramophone) drives
		Grinding-machine drives
		Small electric armatures of precision grinders
G0.4	0.4	Spindles, discs, and armatures with special requirements
		Gyroscopes

Applied with a 9549 constant you use the following formula to calculate your allowable unbalance.

$$U = \frac{G \times 9549 \times W}{\text{RPM}}$$

Calculation of "G" 2.5 for a #40 Taper Tool Holder Assembly at 8,000 and 20,000 rpm a general expression for G 2.5 works out to the following:

$$U = \frac{2.5 \times 9549 \times 2.75}{\text{RPM}}$$

Solving these expressions for 8,000 rpm and 20,000 rpm range shows:

- Unbalance for G 2.5 at 8,000 rpm gives an allowable unbalance of 8.2 g.mm
- Unbalance for G 2.5 at 20,000 rpm gives an allowable unbalance of 3.3 g.mm

This shows that as spindle speeds increase the tolerance for allowable unbalance decreases.

Some manufacturer's believe a symmetrical design will provide sufficient balance correction. In today's market with spindle speeds averaging 15,000 RPM's and higher, Dynamic Balance is required on all tool holders and components to reduce machine tool wear and improve cutting tool performance.

All PIONEER tool holders are symmetrically designed and Dynamically Balanced for optimal performance. Some components like ER Collet Nuts are individually Dynamically Balanced to help eliminate any unbalance effect. This balance will exceed required balance for most machining applications. For high speed applications, it is recommended to balance the assembly with the retention knob locked in place and re-balance after every tool change. Ultimately this is the only way to guarantee the required balance.

Coolant Thru Options

Coolant or Air thru the tool comes in 2 configurations.

1. Coolant Thru the Center
2. Coolant Thru the Flange

Coolant Thru the Knob or Center

This configuration is when the coolant is supplied down the center of the machine spindle. A hole in the retention knob allows coolant to pass thru the holder to the cutting tool.

Coolant Thru the Flange

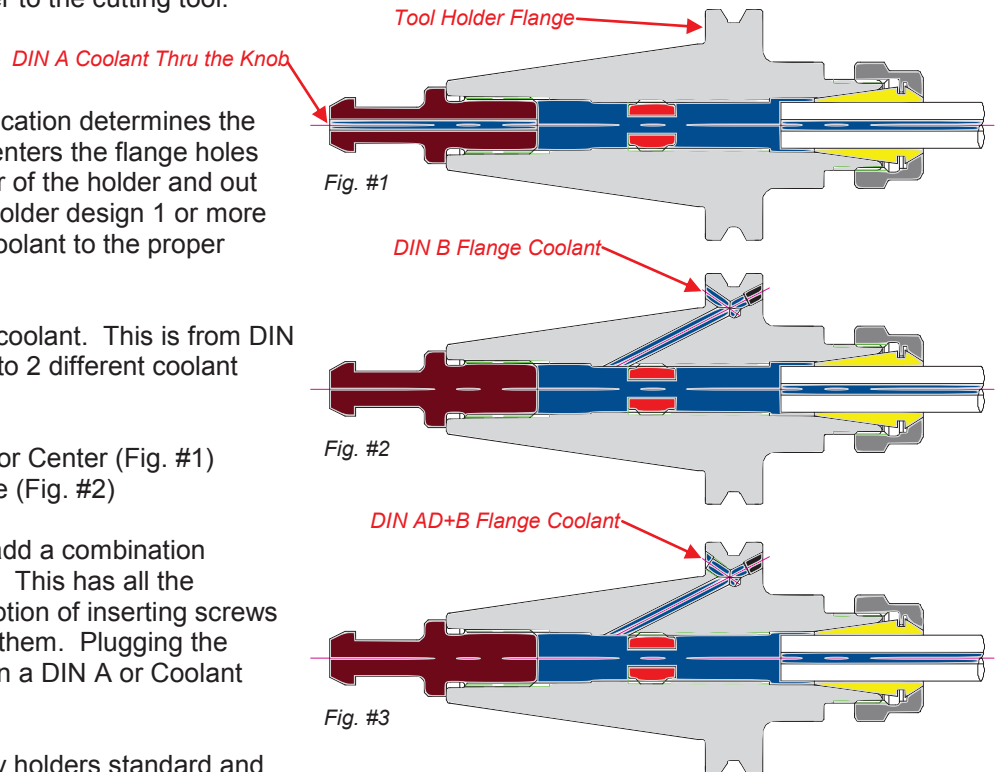
In a Flange Coolant system a specification determines the hole location and size. The coolant enters the flange holes which direct the coolant to the center of the holder and out the cutting tool. Depending on the holder design 1 or more holes may be needed to direct the coolant to the proper location.

Flange coolant is also known as DIN coolant. This is from DIN standard #69871. DIN69871 refers to 2 different coolant styles:

1. DIN A = Coolant Thru the Knob or Center (Fig. #1)
2. DIN B = Coolant Thru the Flange (Fig. #2)

The standard was later modified to add a combination feature DIN AD+B or AD/B (Fig. #3). This has all the features of flange coolant with the option of inserting screws into the flange coolant holes to plug them. Plugging the holes allows the holder to be used on a DIN A or Coolant Thru the Center machine.

PIONEER offers DIN AD+B on many holders standard and the option to alter DIN A holders to DIN B upon request. DIN AD+B holders are shipped with the plugs installed and must be removed for Coolant Thru the Flange applications.



MC - Mill Chuck

Powerful, Rigid with Unbeatable T.I.R.

Roughing and Finishing Milling & Drilling



Ultimate Precision 0.0002"

- Runout at end of tool 4" from chuck face is within 0.0002" TIR, that is 8" from the spindle face or more!

Radial Grooves for Improve Gripping Power and TIR Consistency

- Allows the bore to compress more evenly for additional shank engagement
- Creates driving points for higher radial torque up to 650 ft/lbs
 - 5X higher than a ER collet chuck
 - 2X higher than hydraulic chucks
 - 20% greater than competitive MC Chucks

High Pressure Coolant Capable

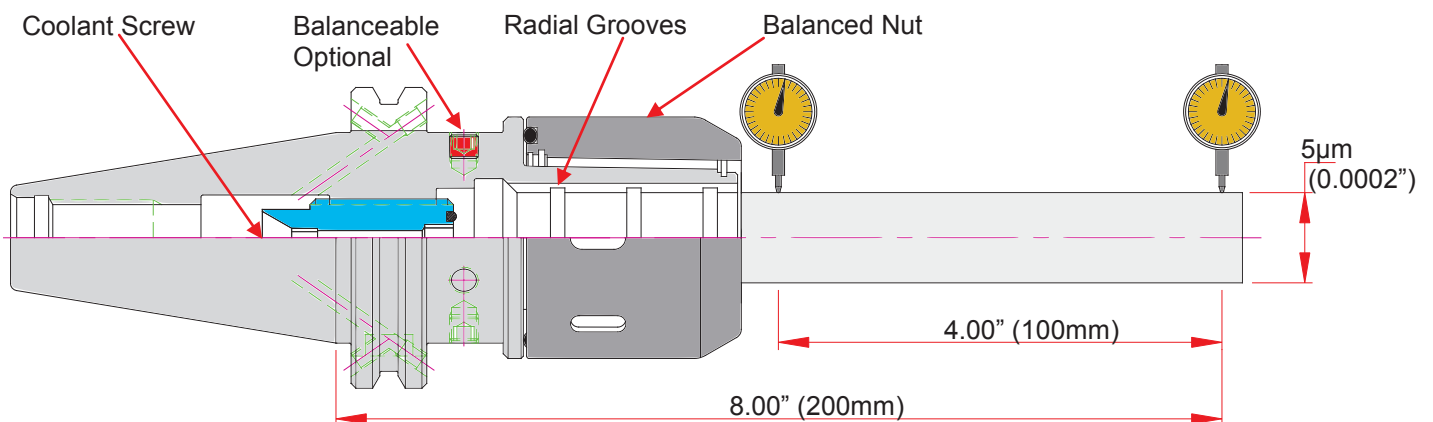
- 2 Sided Nylon Preset Screw Included
- Optional Coolant Cap System available for use with standard MC Collets

Dynamically Balanced

- 30, 40 & HSK63A @ 20,000 RPM
- 50 & HSK100A @ 15,000 RPM

ISO AT3 Taper Tolerance

- Tapers are ground better than AT3 for optimal T.I.R.

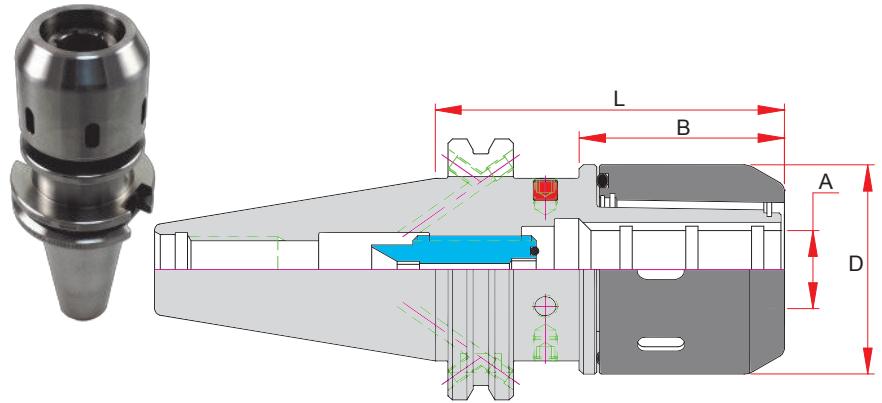


MC - Mill Chuck

CAT40 & CAT50

Features

- 5 µm - 0.0002" Runout @ 4" out
- Coolant Thru w/ Nylon Screw Seal
- Dynamically Balanced
 - CAT40 G6.3 @ 20,000 RPM
 - CAT50 G6.3 @ 15,000 RPM
- Radial Slip Torque 4X ER Chucks
- -S = DIN AD+B & Balanceable
Available in some models (See Chart)
- Order Collets & Wrench Separately



Capacity	Part Number	A - Bore	L Projection	B	D	Preset Screw	Collet	Wrench	DIN AD+B Flange Coolant	Balanceable
3/4	CAT40-MC075-0335	0.7500	3.35	2.76	2.09	ASC-16-40	MC075	MCW20	N	N
3/4	CAT40-MC075-0335-S	0.7500	3.35	2.76	2.09	ASC-16-40	MC075	MCW20	Y	Y
3/4	CAT40-MC075-0472	0.7500	4.72	2.76	2.09	ASC-16-40	MC075	MCW20	N	N
3/4	CAT40-MC075-0591-S	0.7500	5.91	2.76	2.09	ASC-16-40	MC075	MCW20	Y	Y
1"	CAT40-MC100-0335	1.0000	3.35	2.91	2.44	ASC-16-40	MC100	MCW25	N	N
1"	CAT40-MC100-0374-S	1.0000	3.74	2.91	2.44	ASC-16-40	MC100	MCW25	Y	Y
1"	CAT40-MC100-0413	1.0000	4.13	2.91	2.44	ASC-16-40	MC100	MCW25	N	N
1"	CAT40-MC100-0591-S	1.0000	5.91	2.91	2.44	ASC-16-40	MC100	MCW25	Y	Y
1-1/4	CAT40-MC125-0354*	1.2500	3.54	3.07	2.76	ASC-16-40	MC125	MCW32	N	N
1-1/4	CAT40-MC125-0413	1.2500	4.13	3.07	2.76	ASC-16-40	MC125	MCW32	N	N
1-1/4	CAT40-MC125-0472	1.2500	4.72	3.07	2.76	ASC-16-40	MC125	MCW32	N	N
1-1/4	CAT40-MC125-0472-S	1.2500	4.72	3.07	2.76	ASC-16-40	MC125	MCW32	Y	Y
1-1/4	CAT40-MC125-0591-S	1.2500	5.91	3.07	2.76	ASC-16-40	MC125	MCW32	Y	Y
32MM	CAT40-MC32-105	32.0000	4.13	3.07	2.76	ASC-16-40	MC32	MCW32	N	N
3/4	CAT50-MC075-0354-S	0.7500	3.54	2.76	2.09	ASC-16-40	MC075	MCW20	Y	Y
3/4	CAT50-MC075-0413	0.7500	4.13	2.76	2.09	ASC-16-40	MC075	MCW20	N	N
3/4	CAT50-MC075-0531	0.7500	5.31	2.76	2.09	ASC-16-40	MC075	MCW20	N	N
3/4	CAT50-MC075-0650	0.7500	6.50	2.76	2.09	ASC-16-40	MC075	MCW20	N	N
3/4	CAT50-MC075-0650-S	0.7500	6.50	2.76	2.09	ASC-16-40	MC075	MCW20	Y	Y
1"	CAT50-MC100-0315	1.0000	3.15	2.95	2.44	ASC-16-40	MC100	MCW25	N	N
1"	CAT50-MC100-0354-S	1.0000	3.54	2.95	2.44	ASC-16-40	MC100	MCW25	Y	Y
1"	CAT50-MC100-0413	1.0000	4.13	2.95	2.44	ASC-16-40	MC100	MCW25	N	N
1"	CAT50-MC100-0531	1.0000	5.31	2.95	2.44	ASC-16-40	MC100	MCW25	N	N
1"	CAT50-MC100-0531-S	1.0000	5.31	2.95	2.44	ASC-16-40	MC100	MCW25	Y	Y
1"	CAT50-MC100-0650-S	1.0000	6.50	2.95	2.44	ASC-16-40	MC100	MCW25	Y	Y
1-1/4	CAT50-MC125-0354	1.2500	3.54	3.23	2.76	ASC-16-40	MC125	MCW32	N	N
1-1/4	CAT50-MC125-0354-S	1.2500	3.54	3.23	2.76	ASC-16-40	MC125	MCW32	Y	Y
1-1/4	CAT50-MC125-0413	1.2500	4.13	3.23	2.76	ASC-16-40	MC125	MCW32	N	N
1-1/4	CAT50-MC125-0531	1.2500	5.31	3.23	2.76	ASC-16-40	MC125	MCW32	N	N
1-1/4	CAT50-MC125-0531-S	1.2500	5.31	3.23	2.76	ASC-16-40	MC125	MCW32	Y	Y
1-1/4	CAT50-MC125-0650	1.2500	6.50	3.23	2.76	ASC-16-40	MC125	MCW32	N	N
1-1/4	CAT50-MC125-0650-S	1.2500	6.50	3.23	2.76	ASC-16-40	MC125	MCW32	Y	Y
20MM	CAT50-MC20-105	20.0000	4.13	3.54	2.09	ASC-16-40	MC20	MCW20	N	N
20MM	CAT50-MC20-135	20.0000	5.31	3.54	2.09	ASC-16-40	MC20	MCW20	N	N
20MM	CAT50-MC20-165	20.0000	6.50	3.54	2.09	ASC-16-40	MC20	MCW20	N	N
32MM	CAT50-MC32-105	32.0000	4.13	3.54	2.76	ASC-16-40	MC32	MCW32	N	N
32MM	CAT50-MC32-135	32.0000	5.31	3.54	2.76	ASC-16-40	MC32	MCW32	N	N
32MM	CAT50-MC32-165	32.0000	6.50	3.54	2.76	ASC-16-40	MC32	MCW32	N	N

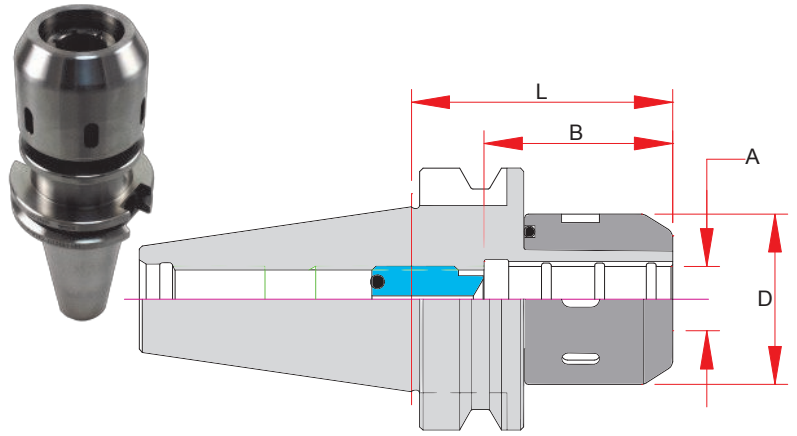
* No ANSI Safety Area - will not function in umbrella style tool changers

MC - Mill Chuck

BT30, BT40 & BT50

Features

- 5 μ m - 0.0002" Runout @ 4" out
- Coolant Thru w/ Nylon Screw Seal
- Dynamically Balanced
 - BT30 & BT40 G6.3 @ 20,000 RPM
 - BT50 G6.3 @ 15,000 RPM
- Radial Slip Torque 4X ER Chucks
- -S = DIN AD+B & Balanceable
Available in some models (See Chart)
- Order Collets & Wrench Separately



Capacity	Part Number	A - Bore	B	D	L Projection	Preset Screw	Collet	Wrench	DIN AD+B Flange Coolant	Balanceable
3/4	BT30-MC075-0315	0.7500	2.76	2.09	3.15	ASC-12-30	MC075	MCW20	N	N
3/4	BT30-MC075-0335-S	0.7500	2.76	2.09	3.35	ASC-12-30	MC075	MCW20	Y	N
20mm	BT30-MC20-080	20mm	2.76	2.09	3.15	ASC-12-30	MC20	MCW20	N	N
3/4	BT40-MC075-0295	0.7500	2.76	2.09	2.95	ASC-16-40	MC075	MCW20	N	N
3/4	BT40-MC075-0295-S	0.7500	2.76	2.09	2.95	ASC-16-40	MC075	MCW20	Y	Y
3/4	BT40-MC075-0354	0.7500	2.76	2.09	3.54	ASC-16-40	MC075	MCW20	N	N
3/4	BT40-MC075-0472	0.7500	2.76	2.09	4.72	ASC-16-40	MC075	MCW20	N	N
3/4	BT40-MC075-0472-S	0.7500	2.76	2.09	4.72	ASC-16-40	MC075	MCW20	Y	Y
1"	BT40-MC100-0315	1.0000	2.91	2.44	3.15	ASC-16-40	MC100	MCW25	N	N
1"	BT40-MC100-0335-S	1.0000	2.91	2.44	3.35	ASC-16-40	MC100	MCW25	Y	Y
1"	BT40-MC100-0413	1.0000	2.91	2.44	4.13	ASC-16-40	MC100	MCW25	N	N
1"	BT40-MC100-0472-S	1.0000	2.91	2.44	4.72	ASC-16-40	MC100	MCW25	Y	Y
1-1/4	BT40-MC125-0335	1.2500	3.07	2.76	3.35	ASC-16-40	MC125	MCW32	N	N
1-1/4	BT40-MC125-0354-S	1.2500	3.07	2.76	3.54	ASC-16-40	MC125	MCW32	Y	Y
1-1/4	BT40-MC125-0472	1.2500	3.07	2.76	4.72	ASC-16-40	MC125	MCW32	N	N
1-1/4	BT40-MC125-0472-S	1.2500	3.07	2.76	4.72	ASC-16-40	MC125	MCW32	Y	Y
3/4	BT50-MC075-0413-S	0.7500	2.76	2.09	4.13	ASC-16-40	MC075	MCW20	Y	Y
1"	BT50-MC100-0413-S	1.0000	2.91	2.44	4.13	ASC-16-40	MC100	MCW25	Y	Y
1-1/4	BT50-MC125-0413-S	1.2500	3.74	2.91	4.13	ASC-16-40	MC127	MCW34	Y	Y

Mill Chuck Kits

Includes: (1) Mill Chuck, Set of Collets, (1) Wrench & Wooden Case

Part Number	Collets Included
CAT40-MC075-0335-KIT	(8) Collets - 5/8, 1/2, 7/16, 3/8, 5/16, 1/4, 3/16, 1/8
CAT40-MC100-0335-KIT	(9) Collets - 7/8, 3/4, 5/8, 1/2, 3/8, 5/16, 1/4, 3/16, 1/8
CAT40-MC125-0354-KIT	(10) Collets - 1", 7/8, 3/4, 5/8, 1/2, 3/8, 5/16, 1/4, 3/16, 1/8

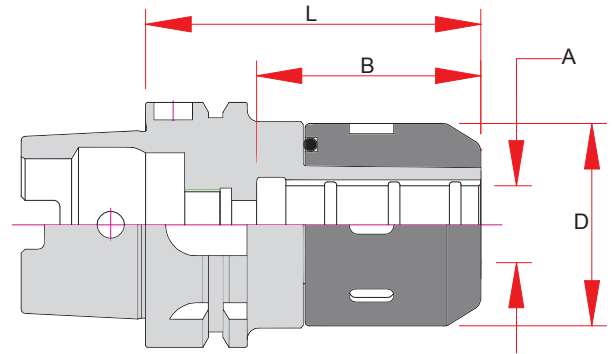


MC - Mill Chuck

HSK63A & HSK100A

Features

- 5 μm - 0.0002" Runout @ 4" out
- Coolant Thru w/ Nylon Screw Seal
- Dynamically Balanced
 - HSK 63A G6.3 @ 20,000 RPM
 - HSK100A G6.3 @ 15,000 RPM
- Radial Slip Torque 4X ER Chucks
- DIN AD+B & Balanceable Available in some models (See Chart)
- Order Collets & Wrench Separately



Capacity	Part Number	A - Bore	B	D	L Projection	Preset Screw	Collet	Wrench	Balanceable
3/4	HSK63A-MC075-0374	0.7500	2.36	2.09	3.74	-	MC075	MCW20	N
3/4	HSK63A-MC075-0433-S	0.7500	2.36	2.09	4.33	ASC-16-18	MC075	MCW20	Y
1"	HSK63A-MC100-0394	1.0000	2.40	2.44	3.94	-	MC100	MCW25	N
1"	HSK63A-MC100-0472-S	1.0000	2.40	2.44	4.72	ASC-16-18	MC100	MCW25	Y
1-1/4	HSK63A-MC125-0394	1.2500	2.99	2.76	3.94	-	MC125	MCW32	N
1-1/4	HSK63A-MC125-0472-S	1.2500	2.99	2.76	4.72	ASC-16-18	MC125	MCW32	Y
20mm	HSK63A-MC20-110-S	20.000	2.36	2.09	4.33	ASC-16-18	MC20	MCW20	Y
32mm	HSK63A-MC32-120-S	32.000	2.99	2.76	4.72	ASC-16-18	MC32	MCW32	Y
3/4	HSK100A-MC075-0453-S	0.7500	2.52	2.09	4.53	ASC-16-18	MC075	MCW20	Y
1"	HSK100A-MC100-0512-S	1.0000	2.40	2.44	5.12	ASC-16-18	MC100	MCW25	Y
1-1/4	HSK100A-MC125-0531-S	1.2500	3.07	2.76	5.31	ASC-16-18	MC125	MCW32	Y
20mm	HSK100A-MC20-115-S	20.000	2.52	2.09	4.53	ASC-16-18	MC20	MCW20	Y
32mm	HSK100A-MC32-135-S	32.000	3.07	2.76	5.31	ASC-16-18	MC32	MCW32	Y

Preset Screws

- Nylon Coolant Screw w/ O-Ring Standard

2 Sided Coolant Preset Screw



Screw Part Number	Description	Coolant Hole	O-Ring	Thread	Length	Wrench
ASC-16-40	MC20, 25, 32, 075, 100 & 125 Nylon Coolant	2.50	11mm OD x 2.0mm	M16 x 2.00	40	2.5mm & 5.0mm Hex
ASC-12-30	BT30 - MC20 & MC075 Nylon Coolant	2.50	10mm OD x 1.5mm	M12 x 1.75	30	2.5mm & 5.0mm Hex
ASC-16-18	HSK - MC20, 25, 32, 075, 100 & 125 Nylon Coolant	2.50	11mm OD x 2.0mm	M16 x 2.00	18	2.5mm & 5.0mm Hex

MC - Mill Chuck Collets

MC - Milling Chuck Collets

MC Collets are Straight Sleeves that allow you to expand the capabilities of your Mill Chuck.

- **3µm - 0.0001" Runout**
- Interchangeable with most competitive models
- Designed for h6 tolerance cutting tool shanks



Cutter Shank Size		MC100
1/8	0.1250	MC100-0125
3/16	0.1875	MC100-0187
1/4	0.2500	MC100-0250
5/16	0.3125	MC100-0312
3/8	0.3750	MC100-0375
7/16	0.4375	MC100-0437
1/2	0.5000	MC100-0500
9/16	0.5625	MC100-0562
5/8	0.6250	MC100-0625
3/4	0.7500	MC100-0750
7/8	0.8750	MC100-0875
6mm	0.2362	MC100-M060
8mm	0.3150	MC100-M080
10mm	0.3937	MC100-M100
12mm	0.4724	MC100-M120
14mm	0.5512	MC100-M140
16mm	0.6299	MC100-M160
18mm	0.7087	MC100-M180
20mm	0.7874	MC100-M200

Cutter Shank Size		MC20
1/8	0.1250	MC20-0125
3/16	0.1875	MC20-0187
1/4	0.2500	MC20-0250
5/16	0.3125	MC20-0312
3/8	0.3750	MC20-0375
7/16	0.4375	MC20-0437
1/2	0.5000	MC20-0500
9/16	0.5625	MC20-0562
5/8	0.6250	MC20-0625
2mm	0.0787	MC20-M020
4mm	0.1575	MC20-M040
5mm	0.1969	MC20-M050
6mm	0.2362	MC20-M060
8mm	0.3150	MC20-M080
10mm	0.3937	MC20-M100
12mm	0.4724	MC20-M120
14mm	0.5512	MC20-M140
16mm	0.6299	MC20-M160
18mm	0.7087	MC20-M180

Cutter Shank Size		MC075
1/8	0.1250	MC075-0125
3/16	0.1875	MC075-0187
1/4	0.2500	MC075-0250
5/16	0.3125	MC075-0312
3/8	0.3750	MC075-0375
7/16	0.4375	MC075-0437
1/2	0.5000	MC075-0500
9/16	0.5625	MC075-0562
5/8	0.6250	MC075-0625
6mm	0.2362	MC075-M060
8mm	0.3150	MC075-M080
10mm	0.3937	MC075-M100
12mm	0.4724	MC075-M120
14mm	0.5512	MC075-M140
16mm	0.6299	MC075-M160

Cutter Shank Size		MC125
1/8	0.1250	MC125-0125
3/16	0.1875	MC125-0187
1/4	0.2500	MC125-0250
5/16	0.3125	MC125-0312
3/8	0.3750	MC125-0375
7/16	0.4375	MC125-0437
1/2	0.5000	MC125-0500
9/16	0.5625	MC125-0562
5/8	0.6250	MC125-0625
11/16	0.6875	MC125-0687
3/4	0.7500	MC125-0750
13/16	0.8125	MC125-0812
7/8	0.8750	MC125-0875
15/16	0.9375	MC125-0937
1	1.0000	MC125-1000
3mm	0.1181	MC125-M030
4mm	0.1575	MC125-M040
5mm	0.1969	MC125-M050
6mm	0.2362	MC125-M060
8mm	0.3150	MC125-M080
10mm	0.3937	MC125-M100
12mm	0.4724	MC125-M120
14mm	0.5512	MC125-M140
16mm	0.6299	MC125-M160
18mm	0.7087	MC125-M180
20mm	0.7874	MC125-M200
22mm	0.8661	MC125-M220
25mm	0.9843	MC125-M250

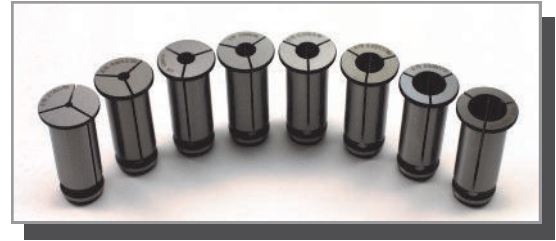
Cutter Shank Size		MC32
1/8	0.1250	MC32-0125
3/16	0.1875	MC32-0187
7/32	0.2188	MC32-0219
1/4	0.2500	MC32-0250
9/32	0.2813	MC32-0281
5/16	0.3125	MC32-0312
11/32	0.3438	MC32-0343
3/8	0.3750	MC32-0375
13/32	0.4063	MC32-0406
7/16	0.4375	MC32-0437
1/2	0.5000	MC32-0500
9/16	0.5625	MC32-0562
5/8	0.6250	MC32-0625
11/16	0.6875	MC32-0687
3/4	0.7500	MC32-0750
13/16	0.8125	MC32-0812
7/8	0.8750	MC32-0875
15/16	0.9375	MC32-0937
1"	1.0000	MC32-1000
4mm	0.1575	MC32-M040
6mm	0.2362	MC32-M060
7mm	0.2756	MC32-M070
8mm	0.3150	MC32-M080
10mm	0.3937	MC32-M100
11mm	0.4331	MC32-M110
12mm	0.4724	MC32-M120
14mm	0.5512	MC32-M140
16mm	0.6299	MC32-M160
18mm	0.7087	MC32-M180
19mm	0.7480	MC32-M190
20mm	0.7874	MC32-M200
21mm	0.8268	MC32-M210
22mm	0.8661	MC32-M220
24mm	0.9449	MC32-M240
25mm	0.9843	MC32-M250

MC - Mill Chuck Accessories

Collet Sets

MC Collets are Straight Sleeves that allow you to expand the capabilities of your Mill Chuck.

- **3 μ m - 0.0001" Runout**
- Interchangeable with most competitive models
- Designed for h6 tolerance cutting tool shanks



Part #	Collet Size	Pieces	Includes
MC075-ISET	MC075	9	1/8, 3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8
MC100-ISET	MC100	11	1/8, 3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 3/4, 7/8
MC125-ISET	MC125	12	1/8, 3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 3/4, 7/8, 1"
MC075-MSET	MC075	6	6, 8, 10, 12, 14, 16
MC100-MSET	MC100	8	6, 8, 10, 12, 14, 16, 18, 20
MC125-MSET	MC125	10	6, 8, 10, 12, 14, 16, 18, 20, 22, 25

MC Coolant Cap

- Works with all MC Collets
- Requires (1) MCN Nut and (1) MCC Cap
- Order Cap to match MC Collet ID Size
 - Example: MCC075-0250 for Collet MC075-0250

Nut Part #	Collet Size	Cap Part #	Available Sizes
MCN075	MC075	MCC075-	1/8, 3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8
MCN100	MC100	MCC100-	1/8, 3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 3/4, 7/8
MCN125	MC125	MCC125-	1/8, 3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 3/4, 7/8, 1"
MCN075	MC075	MCC075-	6, 8, 10, 12, 14, 16
MCN100	MC100	MCC100-	6, 8, 10, 12, 14, 16, 18, 20
MCN125	MC125	MCC125-	6, 8, 10, 12, 14, 16, 18, 20, 22, 25



Wrenches

Part Number	Chuck Sizes
MCW20	3/4" & 20MM
MCW25	1" & 25MM
MCW32	1-1/4" & 32MM



HSK Coolant Tubes

- Fits HSK Form A Shanks
- Double Seal Design

Part Number	Description
TUBE-063A	HSK 63A Coolant Tube
TUBE-100A	HSK 100A Coolant Tube



Ultimate Performance in Finishing

Semi-Finishing and Finishing for Milling, Drilling & Thread Milling



Ultimate Precision 3µm (0.0001") Standard

- Runout at end of tool (4xD) is within 0.0001" TIR

Front Locking System for Easy Function & Improved Holding Power

- Dual collar front locking system pulls straight back with no twisting of the collet for consistent T.I.R. from every tool change.
- Higher Radial Torque due to spanner wrench locking system.
- 4X the holding power of MX Collet Chucks

Coolant Thru the Center

- Sealed for pressures up to 1,500 psi

Dynamically Balanced

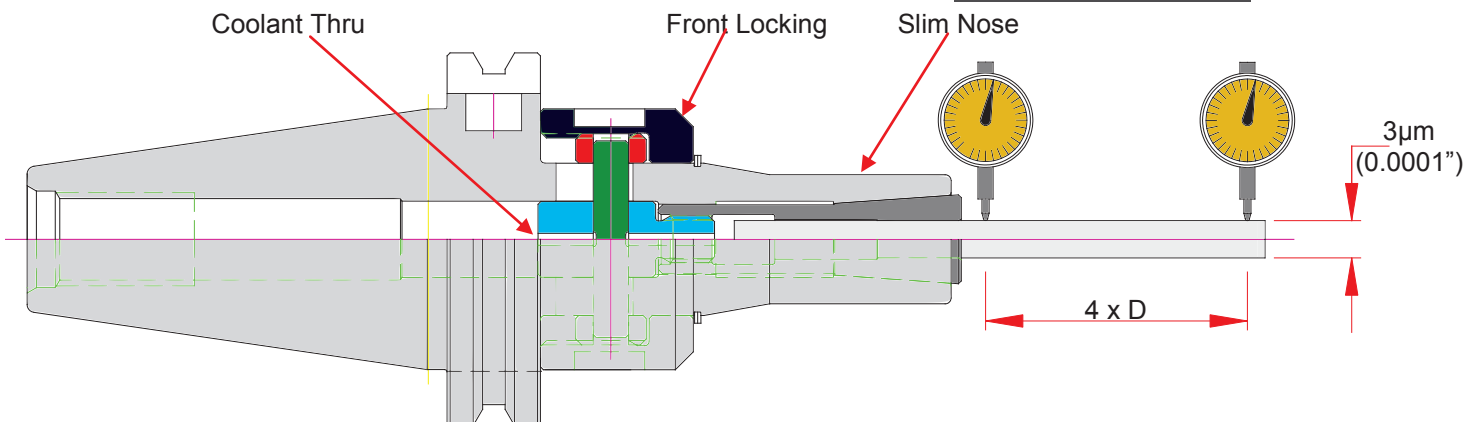
- 30, 40 & 63A - G2.5 @ 20,000 RPM
- 50 & 100A - G2.5 @ 15,000 RPM

Designed with Small Tools in Mind

- Collet sizes from 1/2" down to 2mm
- Small nose design for maximum clearance

ISO AT3 Taper Tolerance

- Tapers are ground better than AT3 for optimal T.I.R.



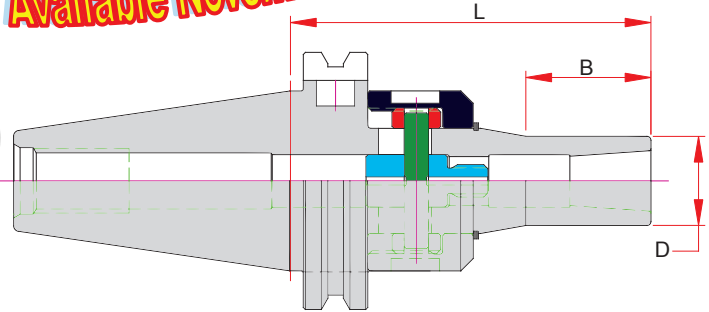
VX - Mini Chuck +

Features

- 3 μ m - 0.0001" Runout @ 4X Diameter
- Front Locking System
- Sealed up to 1,500 PSI Coolant
- Dynamically Balanced
 - 30, 40 & 63A - G2.5 @ 20,000 RPM
 - CAT50 - G2.5 @ 15,000 RPM
- DIN-B Flange Coolant upon request
- Balanceable upon request
- Order Collets & Wrench Separately



Available November 2011



Capacity	Part Number	Collet Range	L - Projection	D	B	Collet	Wrench
1/4	CAT40-VX06-0394	0.031 - 0.250	3.94	0.62	1.48	MX06	VXW12
1/4	CAT40-VX06-0591	0.031 - 0.250	5.91	0.62	1.48	MX06	VXW12
3/8	CAT40-VX08-0350	0.125 - 0.394	3.50	0.87	1.21	MX08	VXW12
3/8	CAT40-VX08-0591	0.125 - 0.394	5.91	0.87	1.21	MX08	VXW12
1/2	CAT40-VX12-0394	0.157 - 0.500	3.94	1.18	2.03	MX12	VXW12
1/2	CAT40-VX12-0591	0.157 - 0.500	5.91	1.18	4.00	MX12	VXW12
3/8	CAT50-VX08-0350	0.125 - 0.394	3.50	0.87	1.21	MX08	VXW12
3/8	CAT50-VX08-0591	0.125 - 0.394	5.91	0.87	1.21	MX08	VXW12
1/2	CAT50-VX12-0394	0.157 - 0.500	3.94	1.18	2.03	MX12	VXW12
1/2	CAT50-VX12-0591	0.157 - 0.500	5.91	1.18	4.00	MX12	VXW12
1/4	BT30-VX06-090	0.031 - 0.250	3.54	1.42	1.37	MX06	VXW12
3/8	BT30-VX08-092	0.125 - 0.394	3.62	1.42	1.21	MX08	VXW12
1/4	BT40-VX06-100	0.031 - 0.250	3.94	0.62	1.48	MX06	VXW12
1/4	BT40-VX06-150	0.031 - 0.250	5.91	0.62	1.48	MX06	VXW12
3/8	BT40-VX08-100	0.125 - 0.394	3.94	0.87	1.21	MX08	VXW12
3/8	BT40-VX08-150	0.125 - 0.394	5.91	0.87	1.21	MX08	VXW12
1/2	BT40-VX12-110	0.157 - 0.500	4.33	1.18	2.03	MX12	VXW12
1/2	BT40-VX12-150	0.157 - 0.500	5.91	1.18	4.00	MX12	VXW12
3/8	HSK 63A-VX08-105	0.125 - 0.394	4.13	0.87	1.21	MX08	VXW12
3/8	HSK 63A-VX08-150	0.125 - 0.394	5.91	0.87	1.21	MX08	VXW12
1/2	HSK 63A-VX12-115	0.157 - 0.500	4.53	1.18	2.03	MX12	VXW12
1/2	HSK 63A-VX12-150	0.157 - 0.500	5.91	1.18	4.00	MX12	VXW12

Assembly Instructions

The instructions below are a basic procedure. Always use proper safety equipment when working with any machine tool component. Contact your safety officer for your facilities recommended safety equipment and procedures.



Turn locking collar counter-clockwise until it stops.



Insert collet and turn clockwise. Use Flat Screw Driver if required.



Turn collet until it stops or reaches 1/8" from the face of the chuck. Assemble loose, **Do not tighten!** Thread gap is required for proper function.



Insert cutter, do not allow the cutter to rest on the bottom, while holding the cutter hand tighten the locking collet clockwise until the collet holds the tool.



Tighten locking collar to 80 ft/lbs Maximum. Do not over tighten!

MX - Mini Chuck

Ultimate Performance in Finishing

Finishing for Milling, Drilling & Thread Milling



Ultimate Precision 3 μ m (0.0001") Standard

- Runout at end of tool (4xD) is within 0.0001" TIR

Rear Locking System for Easy Function & Cost Competitive

- Rear draw bar locking system
- Lowest Cost of Ownership in its class
- Simple maintenance free system

Coolant Thru the Center

- Sealed for pressures up to 1,500 psi

Dynamically Balanced

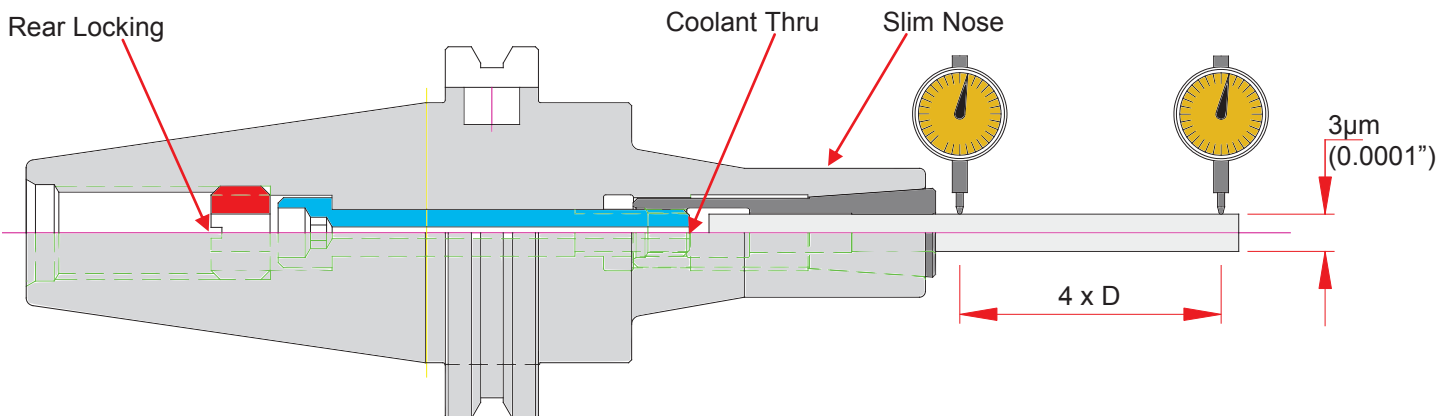
- 30, 40 & 63A - G2.5 @ 20,000 RPM
- 50 & 100A - G2.5 @ 15,000 RPM

Designed with Small Tools in Mind

- Collet sizes from 1/2" down to 2mm
- Small nose design for maximum clearance

ISO AT3 Taper Tolerance

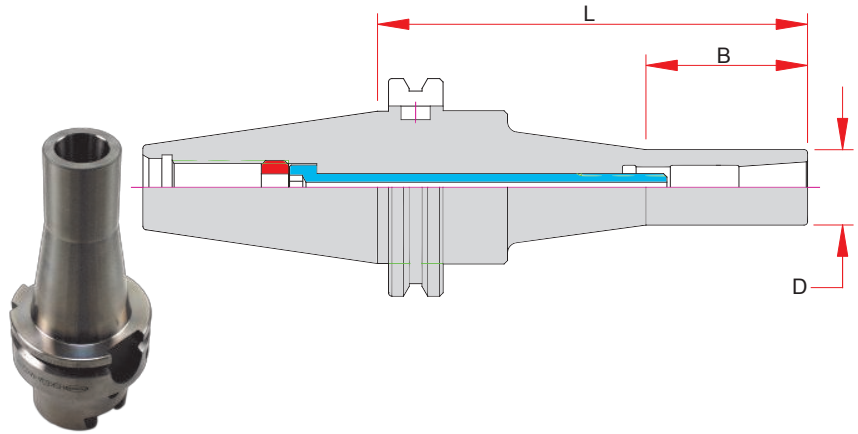
- Tapers are ground better than AT3 for optimal T.I.R.



MX - Mini Chuck

Features

- **3 μ m - 0.0001" Runout @ 4X Diameter**
- Rear Draw Bolt System
- Sealed up to 1,500 PSI Coolant
- Dynamically Balanced
 - 30, 40 & 63A - G2.5 @ 20,000 RPM
 - CAT50 - G2.5 @ 15,000 RPM
- DIN-B Flange Coolant upon request
- Balanceable upon request
- Order Collets & Wrench Separately



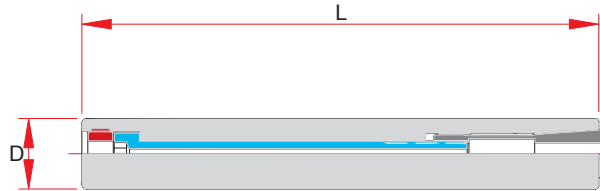
Capacity	Part Number	Collet Range	L - Projection	D	B	Collet	Coolant Thru Standard	Wrench
1/4	CAT40-MX06-085	0.031 - 0.250	3.35	0.50	1.42	MX06	N	MXW05
1/4	CAT40-MX06-150	0.031 - 0.250	5.91	0.50	1.42	MX06	N	MXW05
3/8	CAT40-MX08-085	0.125 - 0.394	3.35	0.87	1.42	MX08	Y	MXW05
3/8	CAT40-MX08-120	0.125 - 0.394	4.72	0.87	1.42	MX08	Y	MXW05
3/8	CAT40-MX08-150	0.125 - 0.394	5.91	0.87	1.42	MX08	Y	MXW05
1/2	CAT40-MX12-090	0.157 - 0.500	3.54	1.18	1.38	MX12	Y	MXW05
1/2	CAT40-MX12-120	0.157 - 0.500	4.72	1.18	1.38	MX12	Y	MXW05
3/8	CAT50-MX08-110	0.125 - 0.394	4.33	0.87	1.42	MX08	Y	MXW05
3/8	CAT50-MX08-165	0.125 - 0.394	6.50	0.87	1.42	MX08	Y	MXW05
1/2	CAT50-MX12-105	0.157 - 0.500	4.13	1.18	1.38	MX12	Y	MXW05
1/2	CAT50-MX12-165	0.157 - 0.500	6.50	1.18	1.38	MX12	Y	MXW05
1/4	BT30-MX06-090	0.031 - 0.250	3.54	0.50	1.42	MX06	N	MXW05
3/8	BT30-MX08-090	0.125 - 0.394	3.54	0.87	1.42	MX08	Y	MXW05
1/2	BT30-MX12-105	0.157 - 0.500	4.13	1.18	1.38	MX12	Y	MXW05
1/4	BT40-MX06-085	0.031 - 0.250	3.35	0.50	1.42	MX06	N	MXW05
1/4	BT40-MX06-150	0.031 - 0.250	5.91	0.50	1.42	MX06	N	MXW05
3/8	BT40-MX08-085	0.125 - 0.394	3.35	0.87	1.42	MX08	Y	MXW05
3/8	BT40-MX08-120	0.125 - 0.394	4.72	0.87	1.42	MX08	Y	MXW05
1/2	BT40-MX12-090	0.157 - 0.500	3.54	1.18	1.38	MX12	Y	MXW05
1/4	HSK 63A-MX06-100	0.031 - 0.250	3.94	0.50	1.42	MX06	N	MXW05
3/8	HSK 63A-MX08-100	0.125 - 0.394	3.94	0.87	1.42	MX08	Y	MXW05
1/2	HSK 63A-MX12-110	0.157 - 0.500	4.33	1.18	1.54	MX12	Y	MXW05

MX - Mini Chuck Collets

Straight Shank

Features

- 3µm - 0.0001" Runout @ 4X Diameter
- Sealed up to 1,500 PSI Coolant



Part Number	Collet Range	D	L	Collet	Wrench
S050-MX06-0400	0.031 - 0.250	0.5000	4.00	MX06	MXW05
S050-MX06-0600			6.00		
S075-MX08-0600	0.125 - 0.394	0.7500	6.00	MX08	
S075-MX08-0800			8.00		
S100-MX12-0600	0.157 - 0.500	1.0000	6.00	MX12	
S100-MX12-0800			8.00		

Collets

Features

- 2.5µm - 0.0001" Runout @ 4X Diameter
- Seals up to 1,500 PSI Coolant
- Fits MX & VX Collet Chucks
- Designed for h6 tolerance cutting tools



MX06 Collets

Tool Shank	Tool Max.	MX06
3/32	0.0938	MX06-M025
1/8	0.1250	MX06-0125
5/32	0.1563	MX06-0156
3/16	0.1875	MX06-0187
7/32	0.2188	MX06-0218
1/4	0.2500	MX06-0250
2.0	0.0787	MX06-M020
2.5	0.0984	MX06-M025
3.0	0.1181	MX06-M030
3.5	0.1378	MX06-M035
4.0	0.1575	MX06-M040
4.5	0.1772	MX06-M045
5.0	0.1969	MX06-M050
5.5	0.2165	MX06-M055
6.0	0.2362	MX06-M060

MX08 Collets

Tool Shank	Tool Max.	MX08
1/8	0.1250	MX08-0125
5/32	0.1563	MX08-0156
3/16	0.1875	MX08-0187
1/4	0.2500	MX08-0250
5/16	0.3125	MX08-0312
3/8	0.3750	MX08-0375
3.0	0.1181	MX08-M030
4.0	0.1575	MX08-M040
5.0	0.1969	MX08-M050
6.0	0.2362	MX08-M060
7.0	0.2756	MX08-M070
8.0	0.3150	MX08-M080
9.0	0.3543	MX08-M090
10.0	0.3937	MX08-M100

MX12 Collets

Tool Shank	Tool Max.	MX12
3/16	0.1875	MX12-0187
1/4	0.2500	MX12-0250
5/16	0.3125	MX12-0312
3/8	0.3750	MX12-0375
7/16	0.4375	MX12-0437
1/2	0.5000	MX12-0500
4.0	0.1575	MX12-M040
5.0	0.1969	MX12-M050
6.0	0.2362	MX12-M060
8.0	0.3150	MX12-M080
10.0	0.3937	MX12-M100
12.0	0.4724	MX12-M120

Collet Sets

Part Number	Collet Size	Pieces	Includes
MX06-MSET	MX06	9	2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0
MX06-ISET	MX06	6	3/32, 1/8, 5/32, 3/16, 7/32, 1/4
MX08-MSET	MX08	6	3.0, 4.0, 5.0, 6.0, 8.0, 10.0
MX08-ISET	MX08	6	1/8, 5/32, 3/16, 1/4, 5/16, 3/8
MX12-MSET	MX12	6	4.0, 5.0, 6.0, 8.0, 10.0, 12.0
MX12-ISET	MX12	6	3/16, 1/4, 5/16, 3/8, 7/16, 1/2

MX - Mini Chuck Accessories

Wrenches

Notes:

- Verify holder number prior to ordering.



Spanner

Wrench Part Number	Description	Wrench Type	Max. Torque
VXW12	VX	Spanner	80 ft/lbs
MXW05	MX	T Handle	30 ft/lbs
HSKW063A	HSK 63A Coolant Tube Wrench	T Handle	
HSKW100A	HSK 100A Coolant Tube Wrench	T Handle	



T Handle

HSK Coolant Tubes

- Fits HSK Form A Shanks
- Double Seal Design

Part Number	Description
TUBE-063A	HSK 63A Coolant Tube
TUBE-100A	HSK 100A Coolant Tube



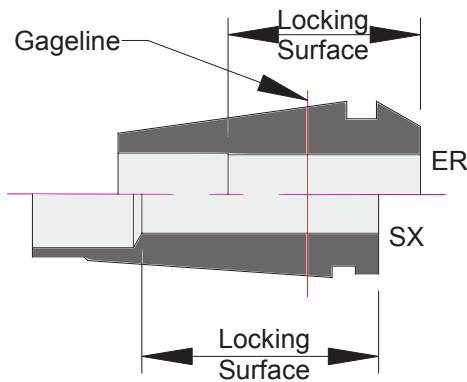
SX - Super Chuck

Powerful and Rigid

Semi-Roughing and Finishing for Drilling, Reaming & Milling



Comparison Shown: SX10 vs ER16



Why SX?

- More Locking Surface for Consistency in T.I.R.
- 2/3rd's of the Locking Surface engaged in the chuck bore. ER, less than 1/2. More engagement = higher driving torques
- SX = 8°, ER = 16°
Tightening Torque is double on SX than ER
- SX has a Flat Ground Locking Shoulder, locking nut does not effect T.I.R.
ER collet nose has a taper. If the taper of the nut is not on the same exact center line of the holder, T.I.R. increases.
- Smaller nose diameters for close center work
- Effective Balance design

Premium Precision 0.0002"

Ultimate Precision 0.0001" Available

- Runout at end of tool (4D) is within 0.0002" TIR or optional Ultimate Precision @ 0.0001" TIR

8° Taper

Strong Gripping Power and High Rigidity

- Smaller collet taper angle creates higher gripping torque and is more consistent on each tool change.
- Longer taper provides more surface contact for stability and rigidity.

Flat Ground Shoulder

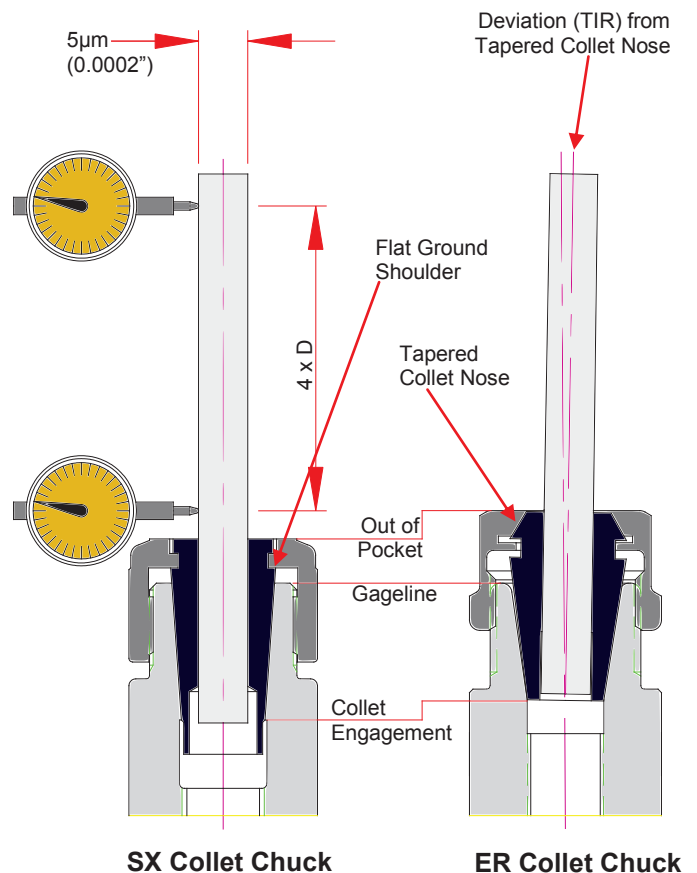
- The Flat Ground shoulder of the SX collet eliminates any influence from the locking nut.
- Locking forces are directed into the Collet Taper.

Dynamically Balanced

- Dynamically Balanced for G2.5 @ 20,000 RPM

ISO AT3 Taper Tolerance

- Tapers are ground better than AT3 for optimal T.I.R.

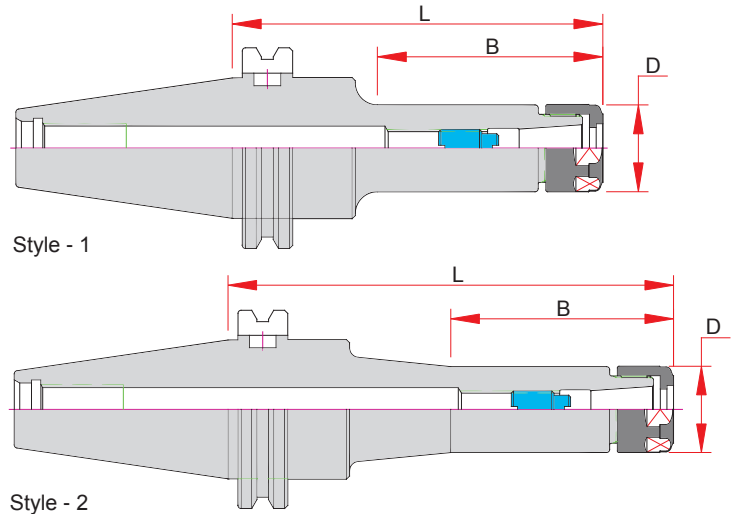


SX - Super Chuck

CAT40/50 SX Collet Chucks

Features

- **3 μm - 0.0001" Runout Taper to Taper**
- Optional Coolant Thru
Order Coolant Thru Preset Screw Separately
- DIN B Flange Coolant Optional
- Dynamically Balanced
 - CAT40 - G2.5 @ 20,000 RPM
 - CAT50 - G2.5 @ 15,000 RPM
- Order Collets & Wrench Separately



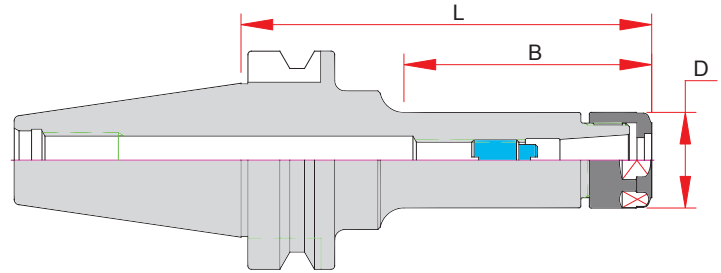
Capacity	Part Number	Range	L - Projection	B	D	Collet	Nut	Wrench	Stop Screw	Style
1/4	CAT40-SX06-090	.030 - .250	3.54	1.97	0.77	SX06	SXN-06	SXW-06	AS-SX06	1
1/4	CAT40-SX06-120	.030 - .250	4.72	2.36	0.77	SX06	SXN-06	SXW-06	AS-SX06	2
1/4	CAT40-SX06-150	.030 - .250	5.91	2.36	0.77	SX06	SXN-06	SXW-06	AS-SX06	2
3/8	CAT40-SX10-090	.069 - .394	3.54	1.97	1.08	SX10	SXN-10	SXW-10	AS-SX10	1
3/8	CAT40-SX10-120	.069 - .394	4.72	2.76	1.08	SX10	SXN-10	SXW-10	AS-SX10	2
3/8	CAT40-SX10-150	.069 - .394	5.91	2.76	1.08	SX10	SXN-10	SXW-10	AS-SX10	2
5/8	CAT40-SX16-090	.108 - .630	3.54	2.12	1.58	SX16	SXN-16	SXW-16	AS-SX16	1
5/8	CAT40-SX16-120	.108 - .630	4.72	3.30	1.58	SX16	SXN-16	SXW-16	AS-SX16	1
5/8	CAT40-SX16-150	.108 - .630	5.91	4.48	1.58	SX16	SXN-16	SXW-16	AS-SX16	1
1"	CAT40-SX25-090	.630 - 1.000	3.54	2.79	2.17	SX25	SXN-25	SXW-25	AS-SX25	1
1"	CAT40-SX25-120	.630 - 1.000	4.72	3.97	2.17	SX25	SXN-25	SXW-25	AS-SX25	1
1/4	CAT50-SX06-105	.030 - .250	4.13	2.36	0.77	SX06	SXN-06	SXW-06	AS-SX06	2
1/4	CAT50-SX06-135	.030 - .250	5.31	2.36	0.77	SX06	SXN-06	SXW-06	AS-SX06	2
1/4	CAT50-SX06-165	.030 - .250	6.50	2.36	0.77	SX06	SXN-06	SXW-06	AS-SX06	2
3/8	CAT50-SX10-105	.069 - .394	4.13	2.36	1.08	SX10	SXN-10	SXW-10	AS-SX10	1
3/8	CAT50-SX10-135	.069 - .394	5.31	2.95	1.08	SX10	SXN-10	SXW-10	AS-SX10	2
3/8	CAT50-SX10-165	.069 - .394	6.50	2.95	1.08	SX10	SXN-10	SXW-10	AS-SX10	2
5/8	CAT50-SX16-105	.108 - .630	4.13	2.55	1.58	SX16	SXN-16	SXW-16	AS-SX16	1
5/8	CAT50-SX16-135	.108 - .630	5.31	3.54	1.58	SX16	SXN-16	SXW-16	AS-SX16	1
5/8	CAT50-SX16-165	.108 - .630	6.50	3.54	1.58	SX16	SXN-16	SXW-16	AS-SX16	2
1"	CAT50-SX25-105	.630 - 1.000	4.13	2.55	2.17	SX25	SXN-25	SXW-25	AS-SX25	1
1"	CAT50-SX25-135	.630 - 1.000	5.31	3.74	2.17	SX25	SXN-25	SXW-25	AS-SX25	1
1"	CAT50-SX25-165	.630 - 1.000	6.50	4.92	2.17	SX25	SXN-25	SXW-25	AS-SX25	1

SX - Super Chuck

BT & HSK SX Collet Chucks

Features

- 3 μm - 0.0001" Runout Taper to Taper
- Optional Coolant Thru
- DIN B Flange Coolant Optional
- Balanced G2.5 @ 20,000 RPM
- Order Collets & Wrench Separately



Capacity	Part Number	Range	L - Projection	B	D	Collet	Nut	Wrench	Stop Screw
1/4	BT30-SX06-060	0.030 - 0.236	2.36	1.30	0.77	SX6	SXN-06	SXW-06	AS-SX06
1/4	BT30-SX06-090	0.030 - 0.236	3.54	2.20	0.77	SX6	SXN-06	SXW-06	AS-SX06
3/8	BT30-SX10-045	0.069 - 0.394	1.77	0.87	1.08	SX10	SXN-10	SXW-10	AS-SX10
3/8	BT30-SX10-060	0.069 - 0.394	2.36	1.38	1.08	SX10	SXN-10	SXW-10	AS-SX10
3/8	BT30-SX10-090	0.069 - 0.394	3.54	2.56	1.08	SX10	SXN-10	SXW-10	AS-SX10
5/8	BT30-SX16-060	0.108 - 0.630	2.36	1.46	1.58	SX16	SXN-16	SXW-16	AS-SX16
5/8	BT30-SX16-090	0.108 - 0.630	3.54	2.64	1.58	SX16	SXN-16	SXW-16	AS-SX16
1"	BT30-SX25-090	0.630 - 1.000	3.54	2.68	2.17	SX25	SXN-25	SXW-25	AS-SX25
1/4	BT40-SX06-090	0.030 - 0.236	3.54	2.36	0.77	SX06	SXN-06	SXW-06	AS-SX06
1/4	BT40-SX06-120	0.030 - 0.236	4.72	2.36	0.77	SX06	SXN-06	SXW-06	AS-SX06
3/8	BT40-SX10-090	0.069 - 0.394	3.54	2.36	1.08	SX10	SXN-10	SXW-10	AS-SX10
3/8	BT40-SX10-120	0.069 - 0.394	4.72	2.76	1.08	SX10	SXN-10	SXW-10	AS-SX10
3/8	BT40-SX10-150	0.069 - 0.394	5.91	2.87	1.08	SX10	SXN-10	SXW-10	AS-SX10
5/8	BT40-SX16-090	0.108 - 0.630	3.54	2.28	1.58	SX16	SXN-16	SXW-16	AS-SX16
5/8	BT40-SX16-120	0.108 - 0.630	4.72	3.46	1.58	SX16	SXN-16	SXW-16	AS-SX16
5/8	BT40-SX16-150	0.108 - 0.630	5.91	4.65	1.58	SX16	SXN-16	SXW-16	AS-SX16
1"	BT40-SX25-090	0.630 - 1.000	3.54	2.40	2.17	SX25	SXN-25	SXW-25	AS-SX25
1/4	HSK 63A-SX06C-100	0.030 - 0.236	3.94	2.64	0.77	SX06	SXN-06	SXW-06	ASC-SX06
1/4	HSK 63A-SX06C-150	0.030 - 0.236	5.91	4.21	0.77	SX06	SXN-06	SXW-06	ASC-SX06
3/8	HSK63A-SX10C-105	0.069 - 0.394	4.13	2.83	1.08	SX10	SXN-10	SXW-10	ASC-SX10
3/8	HSK 63A-SX10C-150	0.069 - 0.394	5.91	4.50	1.08	SX10	SXN-10	SXW-10	ASC-SX10
5/8	HSK63A-SX16C-120	0.108 - 0.630	4.72	3.54	1.58	SX16	SXN-16	SXW-16	ASC-SX16
5/8	HSK 63A-SX16C-150	0.108 - 0.630	5.91	4.68	1.58	SX16	SXN-16	SXW-16	ASC-SX16
1"	HSK 63A-SX25C-135	0.630 - 1.000	5.31	4.29	2.17	SX25	SXN-25	SXW-25	ASC-SX25

SX - Super Chuck Collets

SX Collets

Features

- Premium 5µm - 0.0002" T.I.R. @ 4X tool diameter
- Reduced OD for Close Center Applications
- Flat ground shoulder guarantees the collet to be seated correctly for optimal repeatability.
- 3µm - 0.0001" T.I.R. Ultimate Precision collets available upon request. Please add "P" after the part number.
- A Type Collets
 - On Size Collets—h6 Tool Shank Required
- Standard Collets (following page)
 - Up to 0.020" (0.5mm) Collapse Range

Note:

For Ultimate Precision place "P" at the end of the part number.

Example: SX16-M010P



A - Type Collets

- On Size Collets
- h6 Shank Size

SX06 Inch Collets

Cutter Size	Tool Size"	SX06
1/8	0.1250	SX06-0125A
3/16	0.1875	SX06-0187A

SX10 Inch Collets

Cutter Size	Tool Size"	SX10
1/8	0.1250	SX10-0125A
3/16	0.1875	SX10-0187A
1/4	0.2500	SX10-0250A
5/16	0.3125	SX10-0312A
3/8	0.3750	SX10-0375A

SX16 Inch Collets

Cutter Size	Tool Size"	SX16
1/8	0.1250	SX16-0125A
3/16	0.1875	SX16-0187A
1/4	0.2500	SX16-0250A
5/16	0.3125	SX16-0312A
3/8	0.3750	SX16-0375A
7/16	0.4375	SX16-0437A
1/2	0.5000	SX16-0500A
9/16	0.5625	SX16-0562A
5/8	0.6250	SX16-0625A

SX25 Inch Collets

Cutter Size	Tool Size"	SX25
3/16	0.1875	SX25-0187A
1/4	0.2500	SX25-0250A
5/16	0.3125	SX25-0312A
3/8	0.3750	SX25-0375A
7/16	0.4375	SX25-0437A
1/2	0.5000	SX25-0500A
9/16	0.5625	SX25-0562A
5/8	0.6250	SX25-0625A
3/4	0.7500	SX25-0750A
7/8	0.8750	SX25-0875A
1	1.0000	SX25-M254



Collet Sets

Part Number	Collet Size	Pieces	Range	Increments
SX06-SET09	SX06	9	2.0mm - 6.0mm	0.5mm
SX10-SET17	SX10	17	2.0mm - 10.0mm	0.5mm
SX16-SET27	SX16	27	3.0mm - 16.0mm	0.5mm
SX25-SET20	SX25	20	16.0mm - 25.4mm	0.5mm
SX10-SETA	SX10	5	1/8 - 3/8"	H6 Shanks
SX16-SETA	SX16	9	1/8 - 5/8"	H6 Shanks
SX25-SETA	SX25	11	3/16 - 1"	H6 Shanks

SX - Super Chuck Collets

SX Collets

Features

- Premium 5µm - 0.0002" T.I.R. @ 4X tool diameter
- Flat ground shoulder guarantees the collet to be seated correctly for optimal repeatability.
- 3µm - 0.0001" T.I.R. Ultimate Precision collets available upon request. Please add "P" after the part number.
- Up to 0.020" (0.5mm) Collapse Range

Note:

For Ultimate Precision place "P" at the end of the part number. Example: SX16-M010P



SX06 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	SX06
0.80	0.70	0.0315	0.0276	SX06-M008
1.00	0.90	0.0394	0.0354	SX06-M010
1.25	1.15	0.0492	0.0453	SX06-M0125
1.50	1.30	0.0591	0.0512	SX06-M015
1.75	1.55	0.0689	0.0610	SX06-M0175
2.00	1.80	0.0787	0.0709	SX06-M020
2.25	2.05	0.0886	0.0807	SX06-M0225
2.50	2.30	0.0984	0.0906	SX06-M025
2.75	2.55	0.1083	0.1004	SX06-M0275
3.00	2.80	0.1181	0.1102	SX06-M030
3.50	3.00	0.1378	0.1181	SX06-M035
4.00	3.50	0.1575	0.1378	SX06-M040
4.50	4.00	0.1772	0.1575	SX06-M045
5.00	4.50	0.1969	0.1772	SX06-M050
5.50	5.00	0.2165	0.1969	SX06-M055
6.00	5.50	0.2362	0.2165	SX06-M060

SX10 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	SX10
2.00	1.75	0.0787	0.0689	SX10-M020
2.25	2.00	0.0886	0.0787	SX10-M0225
2.50	2.25	0.0984	0.0886	SX10-M025
2.75	2.50	0.1083	0.0984	SX10-M0275
3.00	2.75	0.1181	0.1083	SX10-M030
3.50	3.00	0.1378	0.1181	SX10-M035
4.00	3.50	0.1575	0.1378	SX10-M040
4.50	4.00	0.1772	0.1575	SX10-M045
5.00	4.50	0.1969	0.1772	SX10-M050
5.50	5.00	0.2165	0.1969	SX10-M055
6.00	5.50	0.2362	0.2165	SX10-M060
6.50	6.00	0.2559	0.2362	SX10-M065
7.00	6.50	0.2756	0.2559	SX10-M070
7.50	7.00	0.2953	0.2756	SX10-M075
8.00	7.50	0.3150	0.2953	SX10-M080
8.50	8.00	0.3346	0.3150	SX10-M085
9.00	8.50	0.3543	0.3346	SX10-M090
9.50	9.00	0.3740	0.3543	SX10-M095
10.00	9.50	0.3937	0.3740	SX10-M100

SX16 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	SX16
3.00	2.75	0.1181	0.1083	SX16-M030
3.50	3.00	0.1378	0.1181	SX16-M035
4.00	3.50	0.1575	0.1378	SX16-M040
4.50	4.00	0.1772	0.1575	SX16-M045
5.00	4.50	0.1969	0.1772	SX16-M050
5.50	5.00	0.2165	0.1969	SX16-M055
6.00	5.50	0.2362	0.2165	SX16-M060
6.50	6.00	0.2559	0.2362	SX16-M065
7.00	6.50	0.2756	0.2559	SX16-M070
7.50	7.00	0.2953	0.2756	SX16-M075
8.00	7.50	0.3150	0.2953	SX16-M080
8.50	8.00	0.3346	0.3150	SX16-M085
9.00	8.50	0.3543	0.3346	SX16-M090
9.50	9.00	0.3740	0.3543	SX16-M095
10.00	9.50	0.3937	0.3740	SX16-M100
10.50	10.00	0.4134	0.3937	SX16-M105
11.00	10.50	0.4331	0.4134	SX16-M110
11.50	11.00	0.4528	0.4331	SX16-M115
12.00	11.50	0.4724	0.4528	SX16-M120
12.50	12.00	0.4921	0.4724	SX16-M125
13.00	12.50	0.5118	0.4921	SX16-M130
13.50	13.00	0.5315	0.5118	SX16-M135
14.00	13.50	0.5512	0.5315	SX16-M140
14.50	14.00	0.5709	0.5512	SX16-M145
15.00	14.50	0.5906	0.5709	SX16-M150
15.50	15.00	0.6102	0.5906	SX16-M155
16.00	15.50	0.6299	0.6102	SX16-M160

SX25 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	SX25
16.00	15.50	0.6299	0.6102	SX25-M160
16.50	16.00	0.6496	0.6299	SX25-M165
17.00	16.50	0.6693	0.6496	SX25-M170
17.50	17.00	0.6890	0.6693	SX25-M175
18.00	17.50	0.7087	0.6890	SX25-M180
18.50	18.00	0.7283	0.7087	SX25-M185
19.00	18.50	0.7480	0.7283	SX25-M190
19.50	19.00	0.7677	0.7480	SX25-M195
20.00	19.50	0.7874	0.7677	SX25-M200
20.50	20.00	0.8071	0.7874	SX25-M205
21.00	20.50	0.8268	0.8071	SX25-M210
21.50	21.00	0.8465	0.8268	SX25-M215
22.00	21.50	0.8661	0.8465	SX25-M220
22.50	22.00	0.8858	0.8661	SX25-M225
23.00	22.50	0.9055	0.8858	SX25-M230
23.50	23.00	0.9252	0.9055	SX25-M235
24.00	23.50	0.9449	0.9252	SX25-M240
24.50	24.00	0.9646	0.9449	SX25-M245
25.00	24.50	0.9843	0.9646	SX25-M250
25.40	25.00	1.0000	0.9843	SX25-M254

SX - Super Chuck Accessories

SX Collet Assembly Instructions



Insert Collet into Assembly Tool until collet collapse's enough to clears the nut ID.

Assemble Collet into the nut, move off center and pull back on the assembly tool.

The collet should lock into the counter bore in the nut and the collet spins freely.

SX Collet Assembly Tool

- Tool is required for assembly and removal of the SX collets from the nut.

SERIES	PART NUMBER
SX06	SXR-06
SX10	SXR-10
SX16	SXR-16
SX25	SXR-25



Preset Screws

- Solid Standard Screw
- Nylon Coolant Screw w/ O-Ring Optional

2 Sided Coolant Preset Screw



Screw Part Number	Description	Coolant Hole	O-Ring	Thread	Length	Wrench
AS-8-24	SX06 Solid Preset Screw	-	-	M8 x 1.25	24	Slotted
AS-12-25	SX10 Solid Preset Screw	-	-	M12 x 1.75	25	Slotted
AS-18-33	SX16 Solid Preset Screw	-	-	M18 x 1.50	33	Slotted
AS-25-30	SX25 Solid Preset Screw	-	-	M25 x 2.00	30	Slotted
ASC-8-24	SX06 Nylon Coolant Preset Screw	1.50	6mm OD x 1.0mm	M8 x 1.25	24	2.0mm Hex
ASC-12-30	SX10 Nylon Coolant Preset Screw	2.50	10mm OD x 1.5mm	M12 x 1.75	30	2.5mm & 5.0mm Hex
ASC-18-33	SX16 Nylon Coolant Preset Screw	3.00	14mm OD x 2.0mm	M18 x 1.5	33	5.0mm Hex
ASC-25-30	SX25 Nylon Coolant Preset Screw	4.00	17mm OD x 2.0mm	M25 x 2.0	30	4.0mm & 8.0mm Hex

SX Collet Nuts

Nut Part Number	Description	Wrench Part Number	Thread	Max. Torque
SXN-06	SX06 Hex Nut	SXW-06	M15.5 x 1.0	22-28 ft/lbs
SXN-10	SX10 Hex Nut	SXW-10	M21.5 x 1.0	33-43 ft/lbs
SXN-16	SX16 Spanner Nut	SXW-16	M32 x 1.5	73-83 ft/lbs
SXN-25	SX25 Spanner Nut	SXW-25	M45 x 1.5	88-97 ft/lbs



Wrenches

Wrench Part Number	Description	Wrench Type	Max. Torque
SXW-06H	SX06 Hex Nut	Hex	22-28 ft/lbs
SXW-10H	SX10 Hex Nut	Hex	33-43 ft/lbs
SXW-16S	SX16 Spanner Nut	Spanner	73-83 ft/lbs
SXW-25S	SX25 Spanner Nut	Spanner	88-97 ft/lbs
SXW-CC	SX Coolant Cap Spanner	Face Spanner	10 ft/lbs



Hex



Hook Spanner

SX - Super Chuck Coolant Caps

SX Coolant Cap Nuts



Coolant Nut Part Number	Description	Type	Nut Wrench Part Number	Thread	Coolant Cap Wrench	Tightening Torque
SXCN-06	SX06 Coolant Cap Nut	Hex	SXW-06	M15.5 X 1.0	SXCCW-06	22-28 ft/lbs
SXCN-10	SX10 Coolant Cap Nut	Hex	SXW-10	M21.5 X 1.0	SXCCW-10	33-43 ft/lbs
SXCN-16	SX16 Coolant Cap Nut	Spanner	SXW-16	M32 X 1.5	SXCCW-16	73-83 ft/lbs
SXCN-25	SX25 Coolant Cap Nut	Spanner	SXW-25	M45 X 1.5	SXCCW-25	88-100 ft/lbs



Thread Coolant Cap into SX nut, snug with wrench after the collet has been assembled.



Insert cutting tool with the seal engaged on the round part of the shank

Torque Wrenches

The proper torque is a necessity in machining:

- Quality: Proper torque assures maximum cutting accuracy.
- Cost Savings: Proper torque extends the life of collets, tools, and holders.
- Safety: Proper torque reduces the possibility of tools loosening up and coming out of the holder.



Part Number	Description	Torque Range	Length	Weight	Spigot
TW-200	Torque Wrench	30-150 ft/lbs	16.5"	1.75 lbs.	16mm round
TW-300	Torque Wrench	45-228 ft/lbs	21.5"	2.5 lbs.	16mm round

Torque Wrench Heads

- Fits Wrenches above.
- Specials available upon request.

Wrench Head Part Number	Description	Wrench Type	Max. Torque
TWH-SX06	SX06 Hex Nut Adapter	Hex	22-28 ft/lbs
TWH-SX10	SX10 Hex Nut Adapter	Hex	33-43 ft/lbs
TWH-SX16	SX16 Spanner Nut Adapter	Spanner	73-83 ft/lbs
TWH-SX25	SX25 Spanner Nut Adapter	Spanner	88-100 ft/lbs

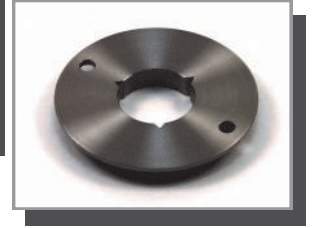


SX - Super Chuck Coolant Caps

SX Coolant Caps

Features

- O-ring seal for pressures up to 1500 PSI
- Prevents chips, dust & swarf from entering the holder
- Seal range +0 / -.50mm (+0 / -.020")
- Requires Coolant Cap Nut (See Below)
- Jet Blast for Non-Coolant Cutting Tools Available
 - Order by adding a "C" to the end of the part number
- Blanks available for custom applications



Jet Blast Version

Range	Inch Shank	SX06	SX10	SX16	SX25
1.0 - 0.7mm	1/32	SXC06-M010	SXC10-M010		
1.5 - 1.2mm	3/64	SXC06-M015	SXC10-M015		
2.0 - 1.5mm	1/16	SXC06-M020	SXC10-M020		
2.5 - 2.0mm	3/32	SXC06-M025	SXC10-M025		
3.0 - 2.5mm	7/64	SXC06-M030	SXC10-M030	SXC16-M030	SXC25-M030
3.5 - 3.0mm	1/8"	SXC06-M035	SXC10-M035	SXC16-M035	SXC25-M035
4.0 - 3.5mm	5/32"	SXC06-M040	SXC10-M040	SXC16-M040	SXC25-M040
4.5 - 4.0mm	11/64"	SXC06-M045	SXC10-M045	SXC16-M045	SXC25-M045
5.0 - 4.5mm	3/16"	SXC06-M050	SXC10-M050	SXC16-M050	SXC25-M050
5.5 - 5.0mm	13/64"	SXC06-M055	SXC10-M055	SXC16-M055	SXC25-M055
6.0 - 5.5mm	7/32"	SXC06-M060	SXC10-M060	SXC16-M060	SXC25-M060
6.5 - 6.0mm	1/4"		SXC10-M065	SXC16-M065	SXC25-M065
7.0 - 6.5mm	17/64"		SXC10-M070	SXC16-M070	SXC25-M070
7.5 - 7.0mm	9/32"		SXC10-M075	SXC16-M075	SXC25-M075
8.0 - 7.5mm	5/16"		SXC10-M080	SXC16-M080	SXC25-M080
8.5 - 8.0mm	21/64"		SXC10-M085	SXC16-M085	SXC25-M085
9.0 - 8.5mm	11/32"		SXC10-M090	SXC16-M090	SXC25-M090
9.5 - 9.0mm	3/8"		SXC10-M095	SXC16-M095	SXC25-M095
10.0 - 9.5mm	25/64"		SXC10-M100	SXC16-M100	SXC25-M100
10.5 - 10.0mm	13/32"			SXC16-M105	SXC25-M105
11.0 - 10.5mm	27/64"			SXC16-M110	SXC25-M110
11.5 - 11.0mm	7/16"			SXC16-M115	SXC25-M115
12.0 - 11.5mm	15/32"			SXC16-M120	SXC25-M120
12.5 - 12.0mm	31/64"			SXC16-M125	SXC25-M125
13.0 - 12.5mm	1/2"			SXC16-M130	SXC25-M130
13.5 - 13.0mm	17/32"			SXC16-M135	SXC25-M135
14.0 - 13.5mm	35/64"			SXC16-M140	SXC25-M140
14.5 - 14.0mm	9/16"			SXC16-M145	SXC25-M145
15.0 - 14.5mm	37/64"			SXC16-M150	SXC25-M150
15.5 - 15.0mm	19/32"			SXC16-M155	SXC25-M155
16.0 - 15.5mm	5/8"			SXC16-M160	SXC25-M160
16.5 - 16.0mm	41/64"				SXC25-M165
17.0 - 16.5mm	21/32"				SXC25-M170
17.5 - 17.0mm	11/16"				SXC25-M175
18.0 - 17.5mm	45/64"				SXC25-M180
18.5 - 18.0mm	23/32"				SXC25-M185
19.0 - 18.5mm	3/4"				SXC25-M190
19.5 - 19.0mm	49/64"				SXC25-M195
20.0 - 19.5mm	25/32"				SXC25-M200
20.5 - 20.0mm	51/64"				SXC25-M205
21.0 - 20.5mm	13/16"				SXC25-M210
21.5 - 21.0mm	27/32"				SXC25-M215
22.0 - 21.5mm	55/64"				SXC25-M220
22.5 - 22.0mm	7/8"				SXC25-M225
23.0 - 22.5mm	29/32"				SXC25-M230
23.5 - 23.0mm	59/64"				SXC25-M235
24.0 - 23.5mm	15/16"				SXC25-M240
24.5 - 24.0mm	61/64"				SXC25-M245
25.0 - 24.5mm	31/32"				SXC25-M250
25.4 - 25.0mm	1"				SXC25-M254

Performance & Durability for Long Life

Semi-Roughing & Finishing for Milling & Performance Drilling



Ultimate Precision 0.0001"

- Runout taper to bore within 3 Microns (0.0001") T.I.R.
- Designed for tools with h6 shank tolerances

H Series Tool Steel

- Manufactured from ISO-40CrMoV5 (USA-H13)
- Double Tempered for Optimal Life

Coolant Thru

- Coolant Thru the Center
- DIN AD+B Flange Coolant Included
- Optional Jet Slots for Coolant Around solid cutting tools

Dynamically Balanced

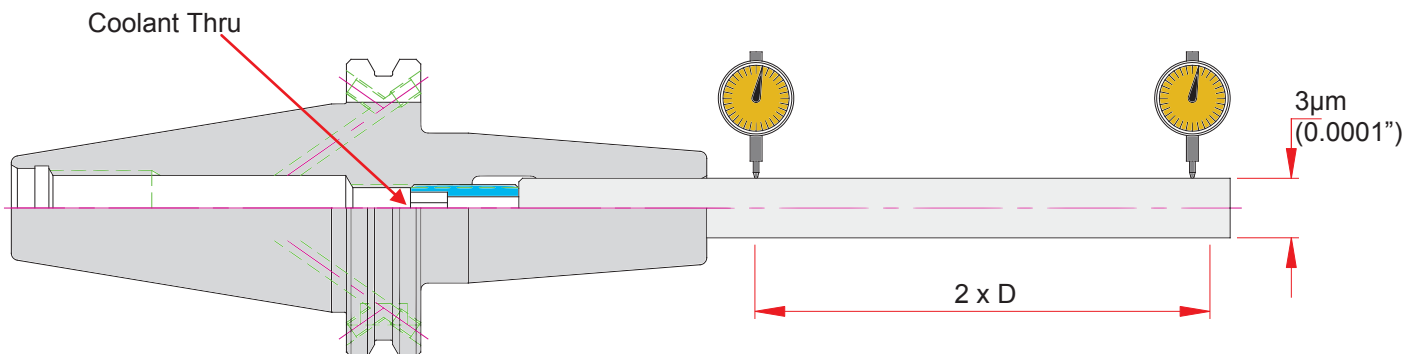
- Dynamically Balanced for G2.5 @ 25,000 RPM

ISO AT3 Taper Tolerance

- Tapers are ground better than AT3 for optimal T.I.R.

Preset Screw

- Preset Screw included for 1/4" & larger for positive stop



SD - Shrink Fit

Why use a Shrink Extension?

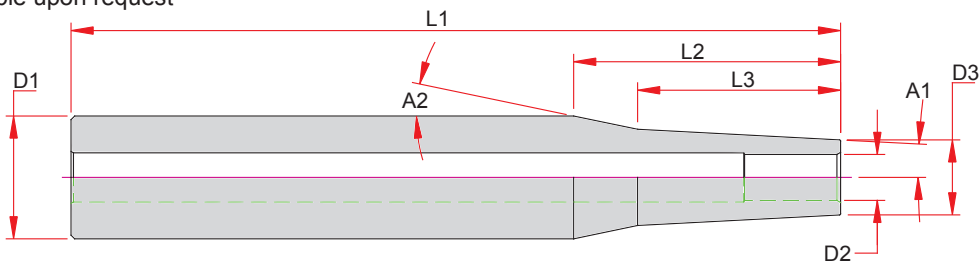
- Cost effective solution to special length holders.
- Replacement costs are lower than special length holders.
- HPI Extensions are manufactured from H13 Tool Steel and Double Tempered for long life.

Why use an Mill Chuck with Shrink Extensions?

- Mill Chucks Mass provides outstanding vibration dampening.
- Allows you to preset lengths within microns.
- Cost effective modular Shrink system.
- Coupled with an PIONEER Mill Chuck, extensions will provide similar effective run out as rigid holders.

Shrink Fit Standard Extensions

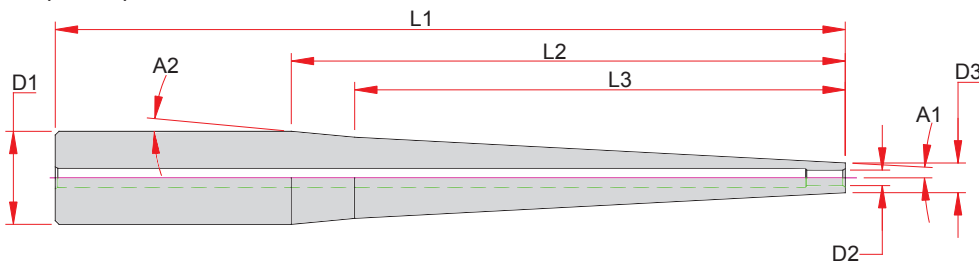
- Designed to work in standard Milling Chucks
- Designed for Cutting Tools with h6 tolerances
- Close Center to clear fixtures or part walls
- Specials available upon request



Part Number	D1	D2	D3	L1	L2	L3	A1	A2
S100-SD025-0800	1.0000	0.2500	0.49	8.00	2.17	1.65	3.0	17.9
S100-SD031-0800	1.0000	0.3125	0.55	8.00	2.17	1.65	3.0	14.9
S100-SD037-0800	1.0000	0.3750	0.61	8.00	2.17	1.65	3.0	11.8
S100-SD050-0800	1.0000	0.5000	0.81	8.00	1.71	1.43	2.5	6.5

Shrink Fit Small Nose Extensions

- Designed to work in standard Milling Chucks
- Designed for Cutting Tools with h6 tolerances
- Close Center to clear fixtures or part walls
- Specials available upon request



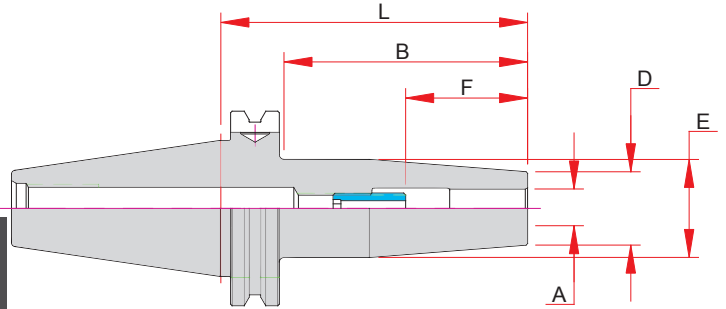
Part Number	D1	D2	D3	L1	L2	L3	A1	A2
S037-SN012-0315	0.3750	0.1250	0.24	3.15	1.40	-	2.8	-
S037-SN018-0315	0.3750	0.1875	0.31	3.15	1.40	-	1.5	-
S050-SN025-0315	0.5000	0.2500	0.37	3.15	1.40	-	2.8	-
S075-SN012-0800	0.7500	0.1250	0.24	8.00	4.46	3.95	3.0	5.4
S075-SN018-0800	0.7500	0.1875	0.31	8.00	4.46	-	2.9	-
S075-SN025-0800	0.7500	0.2500	0.37	8.00	4.46	-	2.5	-
S100-SN037-0800	1.0000	0.3750	0.49	8.00	4.33	3.82	3.0	6.0
S100-SN050-0800	1.0000	0.5000	0.62	8.00	4.33	3.82	2.0	6.0

SD - Shrink Fit

CAT40

Features

- Runout taper to bore within 3 Microns (0.0001") T.I.R.
- Manufactured from ISO-40CrMoV5 (USA-H13)
- Coolant Thru the Center
- Dynamically Balanced for G2.5 @ 25,000 RPM
- Tapers are ground better than AT3 for optimal T.I.R.
- Preset Screw included for 1/4" & larger for positive stop



Inch Bore

Part Number	A - Bore	B - Nose Step Up	D - Nose Dia	E - Nose Dia 2	F - Max Tool Enters	L - Projection
CAT40-SD012-080	0.1250	2.28	0.39	0.77	4.57	3.15
CAT40-SD012-160	0.1250	5.43	0.39	0.77	7.73	6.30
CAT40-SD018-080	0.1875	2.28	0.39	0.77	4.57	3.15
CAT40-SD018-160	0.1875	5.43	0.39	0.77	7.73	6.30
CAT40-SD025-080	0.2500	2.28	0.83	1.06	1.54	3.15
CAT40-SD025-160	0.2500	5.43	0.83	1.06	1.54	6.30
CAT40-SD031-080	0.3125	2.28	0.83	1.06	1.54	3.15
CAT40-SD031-160	0.3125	5.43	0.83	1.06	1.54	6.30
CAT40-SD037-080	0.3750	2.28	0.94	1.26	1.73	3.15
CAT40-SD037-160	0.3750	5.43	0.94	1.26	1.73	6.30
CAT40-SD043-080	0.4375	2.28	0.94	1.26	1.73	3.15
CAT40-SD043-160	0.4375	5.43	0.94	1.26	1.73	6.30
CAT40-SD050-080	0.5000	2.28	0.94	1.26	1.97	3.15
CAT40-SD050-160	0.5000	5.43	0.94	1.26	1.97	6.30
CAT40-SD062-080	0.6250	2.28	1.06	1.34	2.09	3.15
CAT40-SD062-160	0.6250	5.43	1.06	1.34	2.09	6.30
CAT40-SD075-080	0.7500	2.28	1.30	1.65	2.09	3.15
CAT40-SD075-160	0.7500	5.43	1.30	1.65	2.09	6.30
CAT40-SD100-100	1.0000	3.07	1.73	2.09	2.28	3.94
CAT40-SD100-160	1.0000	5.43	1.73	2.09	2.28	6.30
CAT40-SD125-100	1.2500	3.07	1.73	2.09	2.28	3.94
CAT40-SD125-160	1.2500	5.43	1.73	2.09	2.28	6.30

Metric Bore

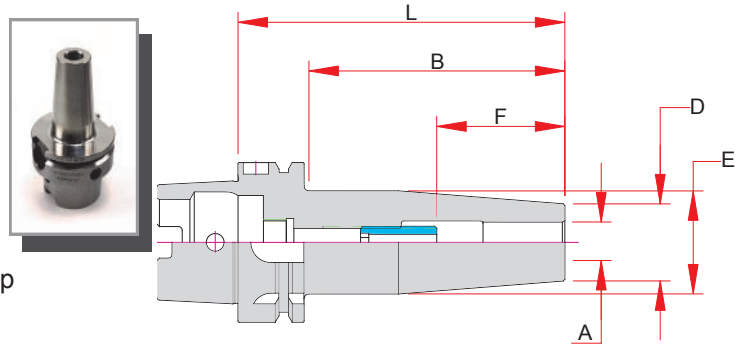
Part Number	A - Bore	B - Nose Step Up	D - Nose Dia	E - Nose Dia 2	F - Max Tool Enters	L - Projection
CAT40-SDM03-080	3.000	2.28	0.39	0.75	4.57	3.15
CAT40-SDM04-080	4.000	2.28	0.39	0.75	4.57	3.15
CAT40-SDM06-080	6.000	2.28	0.83	1.06	1.54	3.15
CAT40-SDM08-080	8.000	2.28	0.83	1.06	1.54	3.15
CAT40-SDM10-080	10.000	2.28	0.94	1.26	1.73	3.15
CAT40-SDM12-080	12.000	2.28	0.94	1.26	1.97	3.15
CAT40-SDM16-080	16.000	2.28	1.06	1.34	1.97	3.15
CAT40-SDM20-080	20.000	2.28	1.30	1.65	2.17	3.15
CAT40-SDM25-100	25.000	3.07	1.73	2.09	2.28	3.94
CAT40-SDM32-100	32.000	3.07	1.73	2.09	2.28	3.94

SD - Shrink Fit

HSK63A

Features

- Runout taper to bore within 3 Microns (0.0001") T.I.R.
- Manufactured from ISO-40CrMoV5 (USA-H13)
- Coolant Thru the Center
- Dynamically Balanced for G2.5 @ 25,000 RPM
- Tapers are ground better than AT3 for optimal T.I.R.
- Preset Screw included for 1/4" & larger for positive stop



Inch Bore

Part Number	A - Bore	B - Nose Step Up	D - Nose Dia	E - Nose Dia	F - Max Tool Enters	L - Projection
HSK 63A-SD012-080	0.1250	2.02	0.39	0.71	2.28	3.15
HSK 63A-SD012-160	0.1250	5.16	0.39	0.75	5.43	6.30
HSK 63A-SD018-080	0.1875	2.02	0.39	0.71	2.28	3.15
HSK 63A-SD018-160	0.1875	5.16	0.39	0.75	5.43	6.30
HSK 63A-SD025-080	0.2500	2.02	0.83	1.06	1.54	3.15
HSK 63A-SD025-160	0.2500	5.16	0.83	1.06	1.54	6.30
HSK 63A-SD037-085	0.3750	2.21	0.94	1.06	1.73	3.35
HSK 63A-SD037-160	0.3750	5.16	0.94	1.06	1.73	6.30
HSK 63A-SD050-090	0.5000	2.41	0.94	1.26	1.97	3.54
HSK 63A-SD050-160	0.5000	5.16	0.94	1.26	1.97	6.30
HSK 63A-SD062-095	0.6250	2.61	1.06	1.34	1.97	3.74
HSK 63A-SD062-160	0.6250	5.16	1.06	1.34	1.97	6.30
HSK 63A-SD075-100	0.7500	2.80	1.30	1.65	2.05	3.94
HSK 63A-SD075-160	0.7500	5.16	1.30	1.65	2.05	6.30
HSK 63A-SD100-115	1.0000	3.50	1.73	2.09	2.28	4.53
HSK 63A-SD100-160	1.0000	5.16	1.73	2.09	2.28	6.30
HSK 63A-SD125-120	1.2500	3.70	1.73	2.09	2.40	4.72
HSK 63A-SD125-160	1.2500	5.16	1.73	2.09	2.40	6.30

Metric Bore

Part Number	A - Bore	B - Nose Step Up	D - Nose Dia	E - Nose Dia 2	F - Max Tool Enters	L - Projection
HSK 63A-SDM03-080	3.000	2.02	0.39	0.71	2.28	3.15
HSK 63A-SDM03-160	3.000	5.16	0.39	0.75	5.43	6.30
HSK 63A-SDM04-080	4.000	2.02	0.39	0.71	2.28	3.15
HSK 63A-SDM04-160	4.000	5.16	0.39	0.75	5.43	6.30
HSK 63A-SDM06-080	6.000	2.02	0.83	1.06	1.54	3.15
HSK 63A-SDM06-160	6.000	5.16	0.83	1.06	1.54	6.30
HSK 63A-SDM08-080	8.000	2.02	0.83	1.06	1.54	3.15
HSK 63A-SDM08-160	8.000	5.16	0.83	1.06	1.54	6.30
HSK 63A-SDM10-085	10.000	2.21	0.94	1.26	1.73	3.35
HSK 63A-SDM10-160	10.000	5.16	0.94	1.26	1.73	6.30
HSK 63A-SDM12-090	12.000	2.41	0.94	1.26	1.97	3.54
HSK 63A-SDM12-160	12.000	5.16	0.94	1.26	1.97	6.30
HSK 63A-SDM16-095	16.000	2.61	1.06	1.34	1.97	3.74
HSK 63A-SDM16-160	16.000	5.16	1.06	1.34	1.97	6.30
HSK 63A-SDM20-100	20.000	2.80	1.30	1.65	2.17	3.94
HSK 63A-SDM20-160	20.000	5.16	1.30	1.65	2.17	6.30
HSK 63A-SDM25-115	25.000	3.50	1.73	2.09	2.40	4.53
HSK 63A-SDM25-160	25.000	5.16	1.73	2.09	2.40	6.30

Shrink Fit Machines

XL

The Automatic Stand Device for Non-stop Tooling with Cycle Times < 30 Sec.



Use:

- For automatic shrinking and unshrinking of carbide and HSS tools
- The correct heating time and the coil energy level is calculated automatically: Enter the diameter and the cutting material – Ready
- Overheating of the shrink fit chucks is impossible
- 3 – 32 mm for carbide
- 6 – 32 mm for HSS

Design:

- Solid stand device on a floor cabinet with integrated electronics and cooling station
- Automatic induction coil
- 3 combined shrinking and cooling places
- Easy operation at the control panel
- Cooling via a closed water cycle
- Ergonomic arrangement of all elements

Standard Specification:

- Basic device made of die-cast aluminum
- 3 places for heating tools
- 3 cooling bushes
- Automatic induction coil
- Floor cabinet with integrated electronics and cooling device including drawer for storing adapter flanges
- Tray for cooling inserts
- Tray for milling cutters
- 4 stop rings
- 1 set of cooling inserts (5 pieces)
- 1 set of adapter flanges (3 pieces)

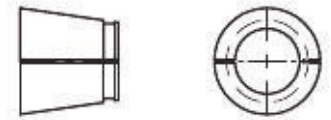
Part Number	B	H	T	Connection	Power input	Weight kg
SF312-010	900	1800	700	3 ~ AC 400 V 50 Hz + N + PE	11kW	230

Shrink Fit Machines

Adapter Flanges



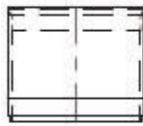
Cooling Inserts



Device	Tool Holder	Part Number
L, GL & XL (from serial no. 312.1400)	HSK 32	SF313-701
	HSK 40	SF313-702
	HSK 50	SF313-703
	HSK 63	SF313-704
	HSK 80	SF313-705
	HSK 100	SF313-706
	BT / SK 30	SF313-710
	BT / CAT / ISO 40	SF313-711
BT / CAT / ISO 50	SF313-712	

Use	Diameter	Part Number
for standard chucks	3 - 5	SF313-100
	6 - 8	SF313-101
	10 - 12	SF313-102
	14 - 16	SF313-103
	18 - 20	SF313-104
	25 - 32	SF313-105
	6 - 12	SF313-110
	blank	SF313-120
for shrink fit extensions and extremely slim shrink fit chucks	3 - 4, 2*30'	SF313-121
	5, 2*30'	SF313-122
	6, 2*30'	SF313-123
	8, 2*30'	SF313-124
	10, 2*30'	SF313-125
	12, 2*30'	SF313-126
	16, 2*30'	SF313-127
	20, 2*30'	SF313-128

Holding Sleeve



Device	Height	Part Number
L	65	SF313-741

Ejection Device



Ejection Device	Part Number
flange with damping disk and ejection pin	SF313-750

Stop Rings for Coils



Device	Diameter	Part Number
L, GL & XL	3 - 6	SF313-311
	6 - 12	SF313-322
	14 - 20	SF313-323
	25 - 32	SF313-324
	32 - 50	SF313-325
	6 - 12*	SF313-352
14 - 20*	SF313-353	

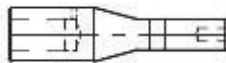
*split design

Stop Clamps



Set of 2 Stop Clamps	Part Number
for 3 - 12 and 14 - 32	SF313-803

Adjusting Adapters



Device	Diameter	Part Number
L, GL & XL	6	SF313-401
	8	SF313-402
	10	SF313-403
	12	SF313-404
	14	SF313-405
	16	SF313-406
	18	SF313-407
	20	SF313-408
	25	SF313-411
32	SF313-412	

Shrink Out Set



Shrink-out Set	Part Number
1 shrink-out pliers and 2 shrink-out springs 3 - 12 and 14 - 32	SF313-801

Gloves

Protective Gloves	Part Number
	SF317-620

ER - Collet Chuck

Best in Class T.I.R. & Effective Balance

Semi-Roughing & Finishing for Milling, Drilling, Reaming, Tapping



Premium Precision 0.0001"

- Runout taper to bore within 3 Microns (0.0001") T.I.R.

Premium Precision Collets

- Standard Collet @ 0.0004" @ 2 x Tool Diameter
- Premium-Precision @ 0.0002" @ 2 x Tool Diameter

Coolant Thru

- Coolant Thru the Center
- DIN AD+B Flange Coolant Included
- Rubber Seal & Steel Seal Collets Available

Dynamically Balanced

- Dynamically Balanced
 - 30, 40 & HSK63A - G6.3 @ 20,000 RPM
 - 50 & HSK100A - G6.3 @ 15,000 RPM
- Collet Nuts Dynamically Balanced Individually for Optimal Performance

ISO AT3 Taper Tolerance

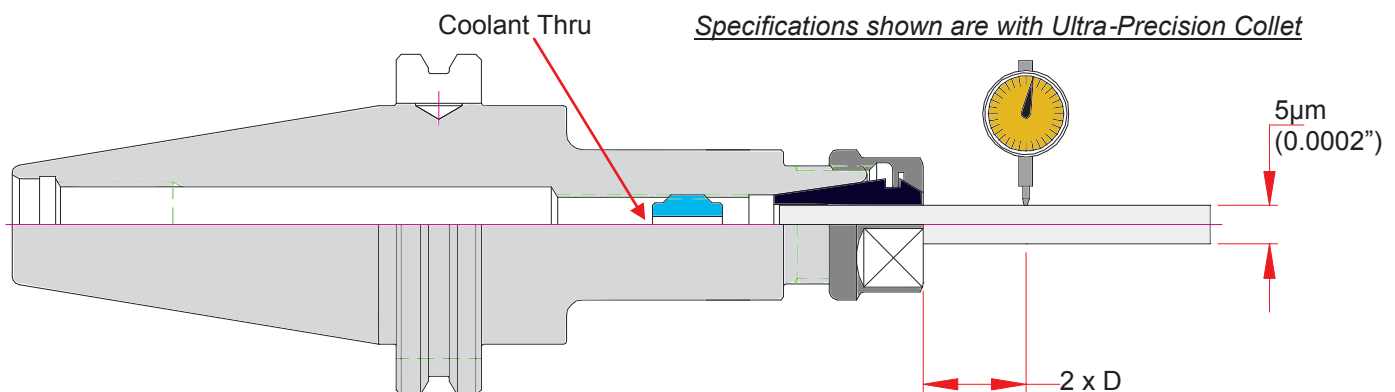
- Tapers are ground better than AT3 for optimal T.I.R.

Rigid Tapping

- Ideal for Rigid Tapping with TER Tap Collets

Interchangeable

- Meets and Exceeds all DIN and Industry Standards

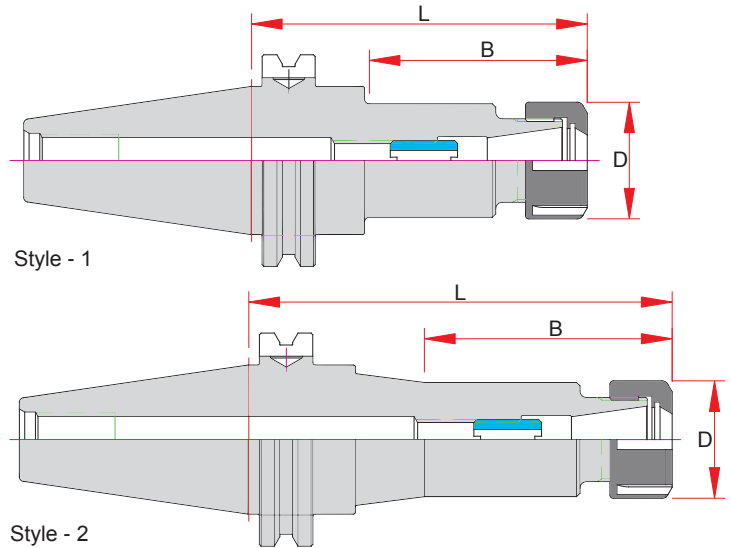


ER - Collet Chuck

CAT40

Features

- 3 μm - 0.0001" Runout Taper to Taper
- Coolant Thru Center
- DIN AD+B Flange Coolant Standard
- Balanced G6.3 @ 20,000 RPM
- Order Collets & Wrench Separately



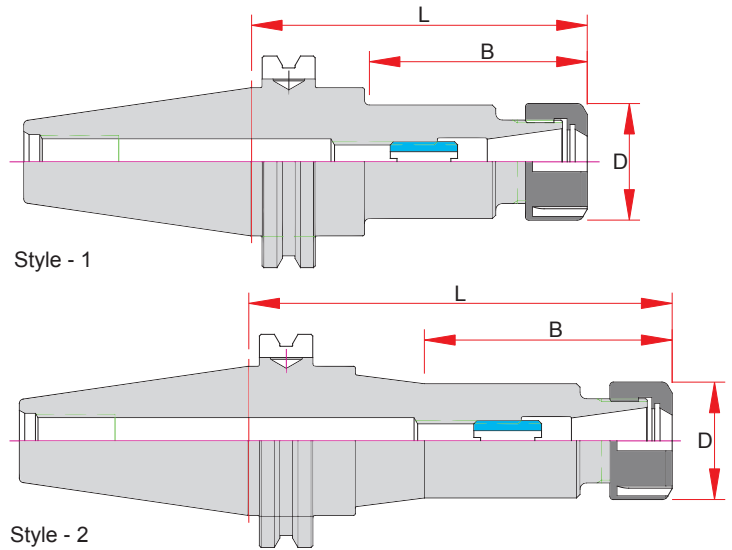
Capacity	Part Number	Range	L - Projection	B	D	Screw	Nut	Wrench	Style
1/4	CAT40-ER11H-0250	.019-.276	2.50	0.92	0.79	ASC-ER11	ERN-11H	ERW-11H	1
1/4	CAT40-ER11H-0400	.019-.276	4.00	2.50	0.79	ASC-ER11	ERN-11H	ERW-11H	1
1/4	CAT40-ER11H-0600	.019-.276	6.00	1.83	0.79	ASC-ER11	ERN-11H	ERW-11H	2
3/8	CAT40-ER16H-0250	.019-.394	2.50	1.55	1.10	ASC-ER16	ERN-16H	ERW-16H	1
3/8	CAT40-ER16H-0400	.019-.394	4.00	2.42	1.10	ASC-ER16	ERN-16H	ERW-16H	1
3/8	CAT40-ER16H-0600	.019-.394	6.00	4.42	1.10	ASC-ER16	ERN-16H	ERW-16H	1
3/8	CAT40-ER16H-0800	.019-.394	8.00	6.42	1.10	ASC-ER16	ERN-16H	ERW-16H	1
1/2	CAT40-ER20H-0250	.019-.512	2.50	1.63	1.33	ASC-ER20	ERN-20H	ERW-20H	1
1/2	CAT40-ER20H-0400	.019-.512	4.00	2.50	1.33	ASC-ER20	ERN-20H	ERW-20H	1
1/2	CAT40-ER20H-0600	.019-.512	6.00	4.60	1.33	ASC-ER20	ERN-20H	ERW-20H	1
1/2	CAT40-ER20H-0800	.019-.512	8.00	6.60	1.33	ASC-ER20	ERN-20H	ERW-20H	1
5/8	CAT40-ER25-0250	.019-.630	2.50	1.73	1.65	ASC-ER25	ERN-25	ERW-25	1
5/8	CAT40-ER25-0400	.019-.630	4.00	2.58	1.65	ASC-ER25	ERN-25	ERW-25	1
5/8	CAT40-ER25-0600	.019-.630	6.00	4.60	1.65	ASC-ER25	ERN-25	ERW-25	1
5/8	CAT40-ER25-0800	.019-.630	8.00	6.60	1.65	ASC-ER25	ERN-25	ERW-25	1
3/4	CAT40-ER32-0250	.039-.787	2.50	1.73	1.96	ASC-ER32	ERN-32	ERW-32	1
3/4	CAT40-ER32-0400	.039-.787	4.00	3.23	1.96	ASC-ER32	ERN-32	ERW-32	1
3/4	CAT40-ER32-0600	.039-.787	6.00	5.23	1.96	ASC-ER32	ERN-32	ERW-32	1
3/4	CAT40-ER32-0800	.039-.787	8.00	7.25	1.96	ASC-ER32	ERN-32	ERW-32	1
1"	CAT40-ER40-0250	.079-1.024	2.50	1.75	2.48	ASC-ER40	ERN-40	ERW-40	1
1"	CAT40-ER40-0400	.079-1.024	4.00	3.25	2.48	ASC-ER40	ERN-40	ERW-40	1
1"	CAT40-ER40-0600	.079-1.024	6.00	5.25	2.48	ASC-ER40	ERN-40	ERW-40	1

ER - Collet Chuck

CAT50

Features

- 3 μ m - 0.0001" Runout Taper to Taper
- Coolant Thru Center
- DIN AD+B Flange Coolant Standard
(* 15" Projection Holders additional fee)
- Balanced G6.3 @ 15,000 RPM
- Order Collets & Wrench Separately



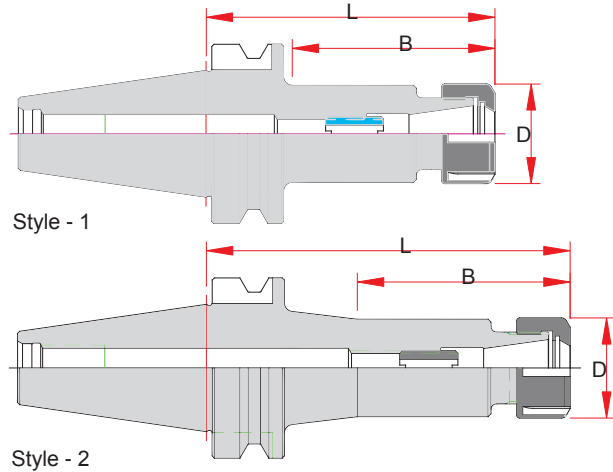
Capacity	Part Number	Range	L - Projection	B	D	Screw	Nut	Wrench	Style
1/4	CAT50-ER16H-0250	.019-.394	2.50	1.55	1.10	ASC-ER16	ERN-16H	ERW-16H	1
1/4	CAT50-ER16H-0400	.019-.394	4.00	2.42	1.10	ASC-ER16	ERN-16H	ERW-16H	1
1/4	CAT50-ER16H-0600	.019-.394	6.00	2.39	1.10	ASC-ER16	ERN-16H	ERW-16H	2
1/4	CAT50-ER16H-0800	.019-.394	8.00	2.39	1.10	ASC-ER16	ERN-16H	ERW-16H	2
1/4	CAT50-ER16H-1000	.019-.394	10.00	2.39	1.10	ASC-ER16	ERN-16H	ERW-16H	2
1/4	CAT50-ER16H-1200	.019-.394	12.00	2.39	1.10	ASC-ER16	ERN-16H	ERW-16H	2
1/4	CAT50-ER16H-1500*	.019-.394	15.00	2.39	1.10	ASC-ER16	ERN-16H	ERW-16H	2
1/2	CAT50-ER20H-0250	.019-.512	2.50	1.55	1.33	ASC-ER20	ERN-20H	ERW-20H	1
1/2	CAT50-ER20H-0400	.019-.512	4.00	2.42	1.33	ASC-ER20	ERN-20H	ERW-20H	1
1/2	CAT50-ER20H-0600	.019-.512	6.00	2.42	1.33	ASC-ER20	ERN-20H	ERW-20H	2
1/2	CAT50-ER20H-0800	.019-.512	8.00	2.42	1.33	ASC-ER20	ERN-20H	ERW-20H	2
5/8	CAT50-ER25-0250	.019-.630	2.50	1.55	1.65	ASC-ER25	ERN-25	ERW-25	1
5/8	CAT50-ER25-0400	.019-.630	4.00	2.42	1.65	ASC-ER25	ERN-25	ERW-25	1
5/8	CAT50-ER25-0600	.019-.630	6.00	4.42	1.65	ASC-ER25	ERN-25	ERW-25	1
5/8	CAT50-ER25-0800	.019-.630	8.00	2.44	1.65	ASC-ER25	ERN-25	ERW-25	2
3/4	CAT50-ER32-0250	.039-.787	2.50	1.71	1.96	ASC-ER32	ERN-32	ERW-32	1
3/4	CAT50-ER32-0400	.039-.787	4.00	2.50	1.96	ASC-ER32	ERN-32	ERW-32	1
3/4	CAT50-ER32-0500	.039-.787	5.00	3.50	1.96	ASC-ER32	ERN-32	ERW-32	1
3/4	CAT50-ER32-0600	.039-.787	6.00	4.50	1.96	ASC-ER32	ERN-32	ERW-32	1
3/4	CAT50-ER32-0800	.039-.787	8.00	6.50	1.96	ASC-ER32	ERN-32	ERW-32	1
3/4	CAT50-ER32-1000	.039-.787	10.00	4.45	1.96	ASC-ER32	ERN-32	ERW-32	2
3/4	CAT50-ER32-1200	.039-.787	12.00	4.45	1.96	ASC-ER32	ERN-32	ERW-32	2
3/4	CAT50-ER32-1500*	.039-.787	15.00	4.45	1.96	ASC-ER32	ERN-32	ERW-32	2
1"	CAT50-ER40-0400	.079-1.024	4.00	2.54	2.48	ASC-ER40	ERN-40	ERW-40	1
1"	CAT50-ER40-0500	.079-1.024	5.00	3.54	2.48	ASC-ER40	ERN-40	ERW-40	1
1"	CAT50-ER40-0600	.079-1.024	6.00	4.54	2.48	ASC-ER40	ERN-40	ERW-40	1
1"	CAT50-ER40-0800	.079-1.024	8.00	6.54	2.48	ASC-ER40	ERN-40	ERW-40	1

ER - Collet Chuck

BT & HSK

Features

- 3 µm - 0.0001" Runout Taper to Taper
- Coolant Thru Center
- Balanced G6.3 @ 20,000 RPM
- Order Collets & Wrench Separately



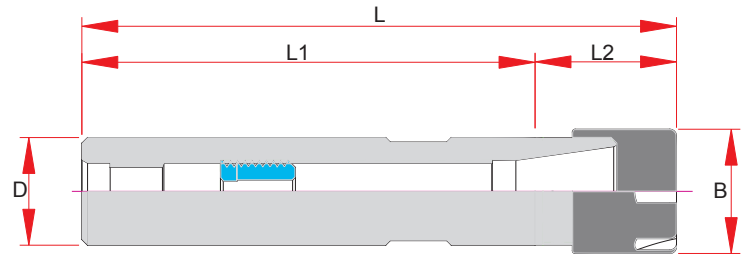
Capacity	Part Number	Range	L - Projection	B	D	Screw	Nut	Wrench	Style
1/4	BT30-ER11H-060	.019-.276	2.36	1.45	0.74	ASC-ER11	ERN-11H	ERW-11H	1
1/4	BT30-ER11H-100	.019-.276	3.94	2.95	0.74	ASC-ER11	ERN-11H	ERW-11H	1
3/8	BT30-ER16H-070	.019-.394	2.76	1.85	1.10	ASC-ER16	ERN-16H	ERW-16H	1
3/8	BT30-ER16H-100	.019-.394	3.94	3.03	1.10	ASC-ER16	ERN-16H	ERW-16H	1
1/2	BT30-ER20H-070	.019-.512	2.76	1.85	1.33	ASC-ER20	ERN-20H	ERW-20H	1
1/2	BT30-ER20H-100	.019-.512	3.94	3.03	1.33	ASC-ER20	ERN-20H	ERW-20H	1
5/8	BT30-ER25-070	.019-.630	2.76	1.93	1.65	ASC-ER25	ERN-25	ERW-25	1
5/8	BT30-ER25-100	.019-.630	3.94	3.11	1.65	ASC-ER25	ERN-25	ERW-25	1
3/4	BT30-ER32-070	.039-.787	2.76	1.93	1.96	ASC-ER32	ERN-32	ERW-32	1
1/4	BT40-ER11H-060	.019-.276	2.36	1.18	0.74	ASC-ER11	ERN-11H	ERW-11H	1
1/4	BT40-ER11H-100	.019-.276	3.94	2.75	0.74	ASC-ER11	ERN-11H	ERW-11H	1
1/4	BT40-ER11H-150	.019-.276	5.91	1.57	0.74	ASC-ER11	ERN-11H	ERW-11H	1
3/8	BT40-ER16H-060	.019-.394	2.36	1.18	1.10	ASC-ER16	ERN-16H	ERW-16H	1
3/8	BT40-ER16H-100	.019-.394	3.94	2.75	1.10	ASC-ER16	ERN-16H	ERW-16H	1
3/8	BT40-ER16H-160	.019-.394	6.30	5.11	1.10	ASC-ER16	ERN-16H	ERW-16H	2
1/2	BT40-ER20H-070	.019-.512	2.76	1.57	1.33	ASC-ER20	ERN-20H	ERW-20H	1
1/2	BT40-ER20H-100	.019-.512	3.94	2.75	1.33	ASC-ER20	ERN-20H	ERW-20H	1
1/2	BT40-ER20H-160	.019-.512	6.30	5.11	1.33	ASC-ER20	ERN-20H	ERW-20H	1
5/8	BT40-ER25-060	.019-.630	2.36	1.26	1.65	ASC-ER25	ERN-25	ERW-25	1
5/8	BT40-ER25-100	.019-.630	3.94	2.83	1.65	ASC-ER25	ERN-25	ERW-25	1
5/8	BT40-ER25-160	.019-.630	6.30	5.19	1.65	ASC-ER25	ERN-25	ERW-25	1
3/4	BT40-ER32-075	.039-.787	2.95	1.88	1.96	ASC-ER32	ERN-32	ERW-32	1
3/4	BT40-ER32-100	.039-.787	3.94	2.87	1.96	ASC-ER32	ERN-32	ERW-32	1
3/4	BT40-ER32-160	.039-.787	6.30	5.23	1.96	ASC-ER32	ERN-32	ERW-32	1
1"	BT40-ER40-080	.079-1.024	3.15	2.04	2.48	ASC-ER40	ERN-40	ERW-40	1
1"	BT40-ER40-160	.079-1.024	6.30	4.40	2.48	ASC-ER40	ERN-40	ERW-40	1
3/8	HSK63A-ER16H-100G	.019-.394	3.94	2.79	1.10	ASC-ER16	ERN-16H	ERW-16H	1
3/8	HSK63A-ER16H-160G	.019-.394	6.30	2.79	1.10	ASC-ER16	ERN-16H	ERW-16H	1
1/2	HSK63A-ER20H-100G	.019-.512	3.94	2.72	1.33	ASC-ER20	ERN-20H	ERW-20H	1
1/2	HSK63A-ER20H-160G	.019-.512	6.30	2.72	1.33	ASC-ER20	ERN-20H	ERW-20H	1
5/8	HSK63A-ER25-100G	.019-.630	3.94	2.72	1.65	ASC-ER25	ERN-25	ERW-25	1
5/8	HSK63A-ER25-160G	.019-.630	6.30	2.72	1.65	ASC-ER25	ERN-25	ERW-25	1
3/4	HSK63A-ER32-100G	.039-.787	3.94	2.72	1.96	ASC-ER32	ERN-32	ERW-32	1
3/4	HSK63A-ER32-160G	.039-.787	6.30	2.72	1.96	ASC-ER32	ERN-32	ERW-32	1
1"	HSK63A-ER40-120G	.079-1.024	4.72	3.50	2.48	ASC-ER40	ERN-40	ERW-40	1
1"	HSK63A-ER40-150G	.079-1.024	5.91	4.68	2.48	ASC-ER40	ERN-40	ERW-40	1

ER - Collet Chuck

Mini-Nut ER Straight Shank

Features

- 3µm 0.0001" Runout Shank to Taper
- Coolant Thru Center
- Mini-Nut for Close Center Work

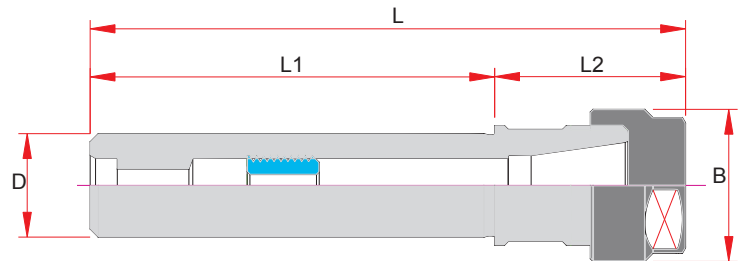


Part Number	Collet Type	B	D	L	L1	L2	Set Screw	Wrench	Nut Type	Coolant Thru
S037-ER08M-0394	ER8	0.47	0.375	4.88	3.94	0.94	-	ERW-08M	Mini	N
S050-ER11M-0552	ER11	0.63	0.500	6.56	5.51	1.04	-	ERW-11M	Mini	N
S050-ER16M-0552	ER16	0.87	0.500	6.97	5.51	1.46	-	ERW-16M	Mini	N
S062-ER11M-0552	ER11	0.63	0.625	6.24	5.51	0.73	-	ERW-11M	Mini	N
S075-ER16M-0552	ER16	0.87	0.750	6.50	5.51	0.98	ASC-ER16-SS	ERW-16M	Mini	Y
S100-ER20M-0552	ER20	1.10	1.000	6.61	5.51	1.10	ASC-ER16-SS	ERW-20M	Mini	Y

ER Straight Shank

Features

- 3µm 0.0001" Runout Shank to Taper
- Coolant Thru Center



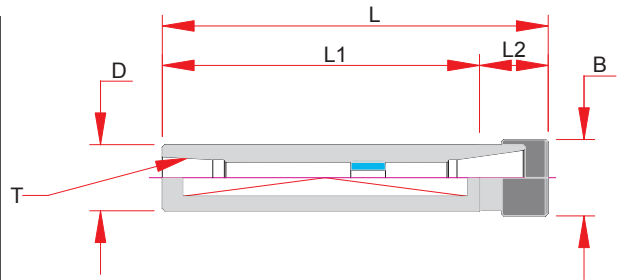
Part Number	Collet Type	B	D	L	L1	L2	Set Screw	Wrench	Nut Type	Coolant Thru
S050-ER11H-0552	ER11	0.75	0.500	6.87	5.51	0.85	-	ERW-11H	Hex	N
S062-ER11H-0552	ER11	0.75	0.625	6.87	5.51	0.85	-	ERW-11H	Hex	N
S062-ER16H-0236	ER16	1.10	0.625	3.74	2.36	1.38	-	ERW-16H	Hex	N
S075-ER16H-0197	ER16	1.10	0.750	3.35	1.97	1.38	ASC-ER16-SS	ERW-16H	Hex	Y
S075-ER16H-0394	ER16	1.10	0.750	5.32	3.94	1.38	ASC-ER16-SS	ERW-16H	Hex	Y
S075-ER16H-0552	ER16	1.10	0.750	6.89	5.51	1.38	ASC-ER16-SS	ERW-16H	Hex	Y
S075-ER20H-0250	ER20	1.34	0.750	3.94	2.50	1.50	ASC-ER16-SS	ERW-20H	Hex	Y
S100-ER20H-0552	ER20	1.34	1.000	7.11	5.51	1.59	ASC-ER16-SS	ERW-20H	Hex	Y
S100-ER25-0197	ER25	1.65	1.000	3.98	1.97	2.01	ASC-ER32-SS	ERW-25A	Spanner	Y
S100-ER32-0197	ER32	1.97	1.000	4.00	1.97	2.03	ASC-ER32-SS	ERW-32A	Spanner	Y
S125-ER32-0236	ER32	1.97	1.250	4.39	2.36	2.03	ASC-ER32-SS	ERW-32A	Spanner	Y
S125-ER32-0552	ER32	1.97	1.250	7.54	5.51	2.03	ASC-ER32-SS	ERW-32A	Spanner	Y
S100-ER40-0197	ER40	2.48	1.000	4.53	1.97	2.56	ASC-ER16-SS	ERW-40A	Spanner	Y
S16-ER11H-0552	ER11	0.75	16mm	6.87	5.51	0.85	-	ERW-11H	Hex	N

ER - Collet Chuck

Coolant Thru Straight Shank

Features

- 3µm 0.0001" Runout Shank to Taper
- Coolant Thru Center
- Seals up to 1,500 PSI
- Flat on the Shank for Positive Lock
- Includes Pipe Thread for Coolant Line

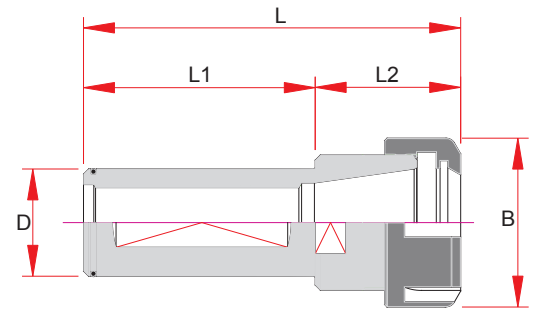


Part Number	Collet Type	B	D	L	L1	L2	T- Thread	Set Screw	Wrench	Nut Type
S075-ER16M-0342C	ER16	0.87	3/4"	4.34	3.42	0.92	1/4" NPT	ASC-ER16-SS	ERW-16M	Mini
S100-ER20M-0331C	ER20	1.10	1"	4.38	3.31	1.07	3/8" NPT	ASC-ER25-SS	ERW-20M	Mini
S125-ER32-0236C	ER32	1.97	1 1/4"	4.52	2.36	2.16	3/8" NPT	ASC-ER25-SS	ERW-32A	Spanner

CNC Lathe ER Straight Shank

Features

- 3µm 0.0001" Runout Shank to Taper
- Coolant Thru Center
- Seals up to 1,500 PSI
- Flat on the Shank for Positive Lock
- O-ring on the end of the shank for bore seal

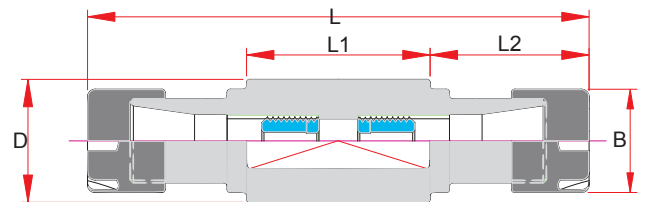


Part Number	Collet Type	B	D	L	L1	L2	ID Thread	Wrench	Nut Type	O-Ring
S125-ER25-0236NC	ER25	1.65	1-1/4"	3.82	2.36	1.46	M18 x 1.5	ERW-25A	Spanner	
S125-ER32-0236NC	ER32	1.97	1-1/4"	4.06	2.36	1.69	M22 x 1.5	ERW-32A	Spanner	
S125-ER40-0236NC	ER40	2.48	1-1/4"	4.72	2.36	2.36	M28 x 1.5	ERW-40A	Spanner	
S150-ER32-0315NC	ER32	1.97	1-1/2"	4.65	3.15	1.50	M22 x 1.5	ERW-32A	Spanner	
S150-ER40-0295NC	ER40	2.48	1-1/2"	5.31	2.95	2.36	M28 x 1.5	ERW-40A	Spanner	

Swiss Double Ended Collet Holder

Features

- 3µm 0.0001" Runout Shank to Taper
- Designed for CNC Swiss Style Machines



Part Number	Collet Type	B	D	L	L1	L2	Wrench	Nut Type
S075-ER11M-0173DE	ER11	0.63	3/4"	2.68	1.73	0.47	ERW-11M	Mini
S075-ER11M-0256DE	ER11	0.63	3/4"	3.50	2.56	0.47	ERW-11M	Mini
S075-ER11M-0303DE	ER11	0.63	3/4"	3.98	3.03	0.47	ERW-11M	Mini
S075-ER11M-0392DE	ER11	0.63	3/4"	4.86	3.92	0.47	ERW-11M	Mini

ER - Collets

ER Precision Inch Collets

- Standard .0004" T.I.R.
- Ultra Precision .0002" T.I.R.
- Collapse Range: 1mm (.039)

Note:

For Ultra Precision place "P" at the end of the part number.
Example: ER32-0375P



ER11 Inch Collets

Drill Shank	Tool Max	Tool Min	ER 11
1/16	0.0625	0.0425	ER11-0062
3/32	0.0938	0.0544	ER11-0093
1/8	0.1250	0.0856	ER11-0125
5/32	0.1563	0.1169	ER11-0156
3/16	0.1875	0.1481	ER11-0187
7/32	0.2188	0.1794	ER11-0218
1/4	0.2500	0.2106	ER11-0250

ER16 Inch Collets

Drill Shank	Tool Max	Tool Min	ER 16
1/16	0.0625	0.0231	ER16-0062
3/32	0.0938	0.0544	ER16-0093
1/8	0.1250	0.0856	ER16-0125
5/32	0.1563	0.1169	ER16-0156
3/16	0.1875	0.1481	ER16-0187
7/32	0.2188	0.1794	ER16-0218
1/4	0.2500	0.2106	ER16-0250
9/32	0.2813	0.2419	ER16-0281
5/16	0.3125	0.2731	ER16-0312
11/32	0.3438	0.3044	ER16-0344
3/8	0.3750	0.3356	ER16-0375
13/32	0.4063	0.3669	ER16-0406

ER20 Inch Collets

Drill Shank	Tool Max	Tool Min	ER 20
3/32	0.0938	0.0544	ER20-0093
1/8	0.1250	0.0856	ER20-0125
5/32	0.1563	0.1169	ER20-0156
3/16	0.1875	0.1481	ER20-0187
7/32	0.2188	0.1794	ER20-0218
1/4	0.2500	0.2106	ER20-0250
9/32	0.2813	0.2419	ER20-0281
5/16	0.3125	0.2731	ER20-0312
11/32	0.3438	0.3044	ER20-0344
3/8	0.3750	0.3356	ER20-0375
13/32	0.4063	0.3669	ER20-0406
7/16	0.4375	0.3981	ER20-0438
15/32	0.4688	0.4294	ER20-0469
1/2	0.5000	0.4606	ER20-0500



Collet Sets

Part Number	Collet Size	Pieces	Includes
ER11-ISET	ER11	7	1/16 - 1/4" by 1/32"
ER16-ISET	ER16	10	3/32 - 3/8" by 1/32"
ER20-ISET	ER20	12	5/32 - 1/2" by 1/32"
ER25-ISET	ER25	15	3/16 - 5/8" by 1/32"
ER32-ISET	ER32	18	7/32 - 3/4" by 1/32"
ER40-ISET	ER40	13	1/8 - 1" by 1/16"

ER - Collets

ER Precision Inch Collets

- Standard .0004" T.I.R.
- Ultra Precision .0002" T.I.R.
- Collapse Range: 1mm (.039)

Note:

For Ultra Precision place "P" at the end of the part number.

Example: ER32-0375P



ER25 Inch Collets

Drill Shank	Tool Max	Tool Min	ER 25
3/32	0.0938	0.0544	ER25-0093
1/8	0.1250	0.0856	ER25-0125
5/32	0.1563	0.1169	ER25-0156
3/16	0.1875	0.1481	ER25-0187
7/32	0.2188	0.1794	ER25-0218
1/4	0.2500	0.2106	ER25-0250
9/32	0.2813	0.2419	ER25-0281
5/16	0.3125	0.2731	ER25-0312
11/32	0.3438	0.3044	ER25-0344
3/8	0.3750	0.3356	ER25-0375
13/32	0.4063	0.3669	ER25-0406
7/16	0.4375	0.3981	ER25-0438
15/32	0.4688	0.4294	ER25-0469
1/2	0.5000	0.4606	ER25-0500
17/32	0.5313	0.4919	ER25-0531
9/16	0.5625	0.5231	ER25-0563
19/32	0.5938	0.5544	ER25-0594
5/8	0.6250	0.5856	ER25-0625

ER40 Inch Collets

Drill Shank	Tool Max	Tool Min	ER 40
1/8	0.1250	0.0856	ER40-0125
5/32	0.1563	0.1169	ER40-0156
3/16	0.1875	0.1481	ER40-0187
7/32	0.2188	0.1794	ER40-0218
1/4	0.2500	0.2106	ER40-0250
9/32	0.2813	0.2419	ER40-0281
5/16	0.3125	0.2731	ER40-0312
11/32	0.3438	0.3044	ER40-0344
3/8	0.3750	0.3356	ER40-0375
13/32	0.4063	0.3669	ER40-0406
7/16	0.4375	0.3981	ER40-0438
15/32	0.4688	0.4294	ER40-0469
1/2	0.5000	0.4606	ER40-0500
17/32	0.5313	0.4919	ER40-0531
9/16	0.5625	0.5231	ER40-0563
19/32	0.5938	0.5544	ER40-0594
5/8	0.6250	0.5856	ER40-0625
21/32	0.6563	0.6169	ER40-0656
11/16	0.6875	0.6481	ER40-0688
23/32	0.7188	0.6794	ER40-0719
3/4	0.7500	0.7106	ER40-0750
25/32	0.7813	0.7419	ER40-0781
13/16	0.8125	0.7731	ER40-0813
27/32	0.8438	0.8044	ER40-0844
7/8	0.8750	0.8356	ER40-0875
29/32	0.9063	0.8669	ER40-0906
15/16	0.9375	0.8981	ER40-0938
31/32	0.9688	0.9294	ER40-0969
1	1.0000	0.9606	ER40-1000
1 1/32	1.0313	0.9919	ER40-1031
1 1/16	1.0625	1.0231	ER40-1063
1 3/32	1.0938	1.0544	ER40-1094
1 1/8	1.1250	1.0856	ER40-1125
1 5/32	1.1563	1.1169	ER40-1156

ER32 Inch Collets

Drill Shank	Tool Max	Tool Min	ER 32
3/32	0.0938	0.0544	ER32-0093
1/8	0.1250	0.0856	ER32-0125
5/32	0.1563	0.1169	ER32-0156
3/16	0.1875	0.1481	ER32-0187
7/32	0.2188	0.1794	ER32-0218
1/4	0.2500	0.2106	ER32-0250
9/32	0.2813	0.2419	ER32-0281
5/16	0.3125	0.2731	ER32-0312
11/32	0.3438	0.3044	ER32-0344
3/8	0.3750	0.3356	ER32-0375
13/32	0.4063	0.3669	ER32-0406
7/16	0.4375	0.3981	ER32-0438
15/32	0.4688	0.4294	ER32-0469
1/2	0.5000	0.4606	ER32-0500
17/32	0.5313	0.4919	ER32-0531
9/16	0.5625	0.5231	ER32-0563
19/32	0.5938	0.5544	ER32-0594
5/8	0.6250	0.5856	ER32-0625
21/32	0.6563	0.6169	ER32-0656
11/16	0.6875	0.6481	ER32-0688
23/32	0.7188	0.6794	ER32-0719
3/4	0.7500	0.7106	ER32-0750

ER - Collets

ER Precision Metric Collets

- Standard .0004" T.I.R.
- Ultra Precision .0002" T.I.R.
- Collapse Range: .039

Note:

For Ultra Precision place "P" at the end of the part number.
Example: ER32-M100P



ER08 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	ER 8
1.0	0.5	0.0394	0.0197	ER08-M010
1.5	1.0	0.0591	0.0394	ER08-M015
2.0	1.5	0.0787	0.0591	ER08-M020
2.5	2.0	0.0984	0.0787	ER08-M025
3.0	2.5	0.1181	0.0984	ER08-M030
3.5	3.0	0.1378	0.1181	ER08-M035
4.0	3.5	0.1575	0.1378	ER08-M040
4.5	4.0	0.1772	0.1575	ER08-M045
5.0	4.5	0.1969	0.1772	ER08-M050

ER11 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	ER 11
1.0	0.5	0.0394	0.0197	ER11-M010
1.5	1.0	0.0591	0.0394	ER11-M015
2.0	1.5	0.0787	0.0591	ER11-M020
2.5	2.0	0.0984	0.0787	ER11-M025
3.0	2.5	0.1181	0.0984	ER11-M030
3.5	3.0	0.1378	0.1181	ER11-M035
4.0	3.5	0.1575	0.1378	ER11-M040
4.5	4.0	0.1772	0.1575	ER11-M045
5.0	4.5	0.1969	0.1772	ER11-M050
5.5	5.0	0.2165	0.1969	ER11-M055
6.0	5.5	0.2362	0.2165	ER11-M060
6.5	6.0	0.2559	0.2362	ER11-M065
7.0	6.5	0.2756	0.2559	ER11-M070

ER16 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	ER 16
1.0	0.5	0.0394	0.0197	ER16-M010
1.5	1.0	0.0591	0.0394	ER16-M015
2.0	1.0	0.0787	0.0394	ER16-M020
2.5	2.0	0.0984	0.0787	ER16-M025
3.0	2.0	0.1181	0.0787	ER16-M030
3.5	3.0	0.1378	0.1181	ER16-M035
4.0	3.0	0.1575	0.1181	ER16-M040
5.0	4.0	0.1969	0.1575	ER16-M050
6.0	5.0	0.2362	0.1969	ER16-M060
7.0	6.0	0.2756	0.2362	ER16-M070
8.0	7.0	0.3150	0.2756	ER16-M080
9.0	8.0	0.3543	0.3150	ER16-M090
10.0	9.0	0.3937	0.3543	ER16-M100



Collet Sets

Part Number	Collet Size	Pieces	Includes
ER08-MSET	ER8	9	1 - 5mm by 0.5mm
ER11-MSET	ER11	13	1 - 7mm by 0.5mm
ER16-MSET	ER16	10	1 - 10mm by 1.0mm
ER20-MSET	ER20	12	2 - 13mm by 1.0mm
ER25-MSET	ER25	15	2 - 16mm by 1.0mm
ER32-MSET	ER32	18	3 - 20mm by 1.0mm
ER40-MSET	ER40	23	4 - 26mm by 1.0mm
ER50-MSET	ER50	17	6 - 34mm by 2.0mm

ER - Collets

ER Precision Metric Collets

- Standard .0004" T.I.R.
- Ultra Precision .0002" T.I.R.
- Collapse Range: .039

Note:

For Ultra Precision place "P" at the end of the part number.

Example: ER32-M100P



ER32 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	ER 32
2.0	1.5	0.0787	0.0591	ER32-M020
2.5	2.0	0.0984	0.0787	ER32-M025
3.0	2.0	0.1181	0.0787	ER32-M030
3.5	3.0	0.1378	0.1181	ER32-M035
4.0	3.0	0.1575	0.1181	ER32-M040
5.0	4.0	0.1969	0.1575	ER32-M050
6.0	5.0	0.2362	0.1969	ER32-M060
7.0	6.0	0.2756	0.2362	ER32-M070
8.0	7.0	0.3150	0.2756	ER32-M080
9.0	8.0	0.3543	0.3150	ER32-M090
10.0	9.0	0.3937	0.3543	ER32-M100
11.0	10.0	0.4331	0.3937	ER32-M110
12.0	11.0	0.4724	0.4331	ER32-M120
13.0	12.0	0.5118	0.4724	ER32-M130
14.0	13.0	0.5512	0.5118	ER32-M140
15.0	14.0	0.5906	0.5512	ER32-M150
16.0	15.0	0.6299	0.5906	ER32-M160
17.0	16.0	0.6693	0.6299	ER32-M170
18.0	17.0	0.7087	0.6693	ER32-M180
19.0	18.0	0.7480	0.7087	ER32-M190
20.0	19.0	0.7874	0.7480	ER32-M200

ER20 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	ER 20
1.0	0.5	0.0394	0.0197	ER20-M010
1.5	1.0	0.0591	0.0394	ER20-M015
2.0	1.0	0.0787	0.0394	ER20-M020
2.5	1.5	0.0984	0.0591	ER20-M025
3.0	2.0	0.1181	0.0787	ER20-M030
3.5	2.5	0.1378	0.0984	ER20-M035
4.0	3.0	0.1575	0.1181	ER20-M040
5.0	4.0	0.1969	0.1575	ER20-M050
6.0	5.0	0.2362	0.1969	ER20-M060
7.0	6.0	0.2756	0.2362	ER20-M070
8.0	7.0	0.3150	0.2756	ER20-M080
9.0	8.0	0.3543	0.3150	ER20-M090
10.0	9.0	0.3937	0.3543	ER20-M100
11.0	10.0	0.4331	0.3937	ER20-M110
12.0	11.0	0.4724	0.4331	ER20-M120
13.0	12.0	0.5118	0.4724	ER20-M130

ER25 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	ER 25
1.5	0.5	0.0591	0.0197	ER25-M015
2.0	1.0	0.0787	0.0394	ER25-M020
2.5	1.5	0.0984	0.0591	ER25-M025
3.0	2.0	0.1181	0.0787	ER25-M030
3.5	2.5	0.1378	0.0984	ER25-M035
4.0	3.0	0.1575	0.1181	ER25-M040
5.0	4.0	0.1969	0.1575	ER25-M050
6.0	5.0	0.2362	0.1969	ER25-M060
7.0	6.0	0.2756	0.2362	ER25-M070
8.0	7.0	0.3150	0.2756	ER25-M080
9.0	8.0	0.3543	0.3150	ER25-M090
10.0	9.0	0.3937	0.3543	ER25-M100
11.0	10.0	0.4331	0.3937	ER25-M110
12.0	11.0	0.4724	0.4331	ER25-M120
13.0	12.0	0.5118	0.4724	ER25-M130
14.0	13.0	0.5512	0.5118	ER25-M140
15.0	14.0	0.5906	0.5512	ER25-M150
16.0	15.0	0.6299	0.5906	ER25-M160

ER40 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	ER 40
3.0	2.5	0.1181	0.0984	ER40-M030
3.5	3.0	0.1378	0.1181	ER40-M035
4.0	3.0	0.1575	0.1181	ER40-M040
5.0	4.0	0.1969	0.1575	ER40-M050
6.0	5.0	0.2362	0.1969	ER40-M060
7.0	6.0	0.2756	0.2362	ER40-M070
8.0	7.0	0.3150	0.2756	ER40-M080
9.0	8.0	0.3543	0.3150	ER40-M090
10.0	9.0	0.3937	0.3543	ER40-M100
11.0	10.0	0.4331	0.3937	ER40-M110
12.0	11.0	0.4724	0.4331	ER40-M120
13.0	12.0	0.5118	0.4724	ER40-M130
14.0	13.0	0.5512	0.5118	ER40-M140
15.0	14.0	0.5906	0.5512	ER40-M150
16.0	15.0	0.6299	0.5906	ER40-M160
17.0	16.0	0.6693	0.6299	ER40-M170
18.0	17.0	0.7087	0.6693	ER40-M180
19.0	18.0	0.7480	0.7087	ER40-M190
20.0	19.0	0.7874	0.7480	ER40-M200
21.0	20.0	0.8268	0.7874	ER40-M210
22.0	21.0	0.8661	0.8268	ER40-M220
23.0	22.0	0.9055	0.8661	ER40-M230
24.0	23.0	0.9449	0.9055	ER40-M240
25.0	24.0	0.9843	0.9449	ER40-M250
26.0	25.0	1.0236	0.9843	ER40-M260
27.0	26.0	1.0630	1.0236	ER40-M270
28.0	27.0	1.1024	1.0630	ER40-M280
29.0	28.0	1.1417	1.1024	ER40-M290
30.0	29.0	1.1811	1.1417	ER40-M300

ER - Coolant Collets

SSER Steel Sealed - Inch ER Coolant Collets

- High Pressure Coolant - 1,500 PSI
- Standard .0004" T.I.R.
- Ultra Precision .0002" T.I.R.
- Collapse Range (see chart)

Note:

For Ultra Precision place "P" at the end of the part number.
Example: SSER32-0375P



SSER16 Inch Collets

Cutter Shank	Tool Max	Tool Min	SSER 16
3/32	0.0938	0.0908	SSER16-0093
1/8	0.1250	0.1200	SSER16-0125
5/32	0.1563	0.1463	SSER16-0156
3/16	0.1875	0.1775	SSER16-0187
7/32	0.2188	0.2038	SSER16-0218
1/4	0.2500	0.2350	SSER16-0250
9/32	0.2813	0.2663	SSER16-0281
5/16	0.3125	0.2975	SSER16-0312
11/32	0.3438	0.3288	SSER16-0344
3/8	0.3750	0.3550	SSER16-0375
13/32	0.4063	0.3863	SSER16-0406

SSER20 Inch Collets

Cutter Shank	Tool Max	Tool Min	SSER 20
5/32	0.1563	0.1463	SSER20-0156
3/16	0.1875	0.1725	SSER20-0187
7/32	0.2188	0.2038	SSER20-0218
1/4	0.2500	0.2350	SSER20-0250
9/32	0.2813	0.2663	SSER20-0281
5/16	0.3125	0.2925	SSER20-0312
11/32	0.3438	0.3238	SSER20-0344
3/8	0.3750	0.3500	SSER20-0375
13/32	0.4063	0.3813	SSER20-0406
7/16	0.4375	0.4125	SSER20-0438
15/32	0.4688	0.4438	SSER20-0469
1/2	0.5000	0.4606	SSER20-0500

SSER25 Inch Collets

Cutter Shank	Tool Max	Tool Min	SSER 25
5/32	0.1563	0.1523	SSER25-0156
3/16	0.1875	0.1835	SSER25-0187
7/32	0.2188	0.2148	SSER25-0218
1/4	0.2500	0.2450	SSER25-0250
9/32	0.2813	0.2763	SSER25-0281
5/16	0.3125	0.3025	SSER25-0312
11/32	0.3438	0.3338	SSER25-0344
3/8	0.3750	0.3650	SSER25-0375
13/32	0.4063	0.3913	SSER25-0406
7/16	0.4375	0.4225	SSER25-0438
15/32	0.4688	0.4538	SSER25-0469
1/2	0.5000	0.4800	SSER25-0500
17/32	0.5313	0.5113	SSER25-0531
9/16	0.5625	0.5425	SSER25-0563
19/32	0.5938	0.5688	SSER25-0594
5/8	0.6250	0.6000	SSER25-0625



Collet Sets - Inch and Metric

Part Number	Collet Size	Pieces	Includes
SSER16-MSET	ER16	7	4 - 10mm by 1.0mm
SSER20-MSET	ER20	10	4 - 13mm by 1.0mm
SSER25-MSET	ER25	13	4 - 16mm by 1.0mm
SSER32-MSET	ER32	17	4 - 20mm by 1.0mm
SSER40-MSET	ER40	21	6 - 26mm by 1.0mm
SSER16-ISET	ER16	10	3/32 - 3/8" by 1/32"
SSER20-ISET	ER20	12	5/32 - 1/2" by 1/32"
SSER25-ISET	ER25	16	5/32 - 5/8" by 1/32"
SSER32-ISET	ER32	18	7/32 - 3/4" by 1/32"
SSER40-ISET	ER40	13	1/4 - 1" by 1/16"

ER - Coolant Collets

SSER Steel Sealed - Inch ER Coolant Collets

- High Pressure Coolant - 1,500 PSI
- Standard .0004" T.I.R.
- Ultra Precision .0002" T.I.R.
- Collapse Range (see chart)

Note:

For Ultra Precision place "P" at the end of the part number.
Example: SSER32-0375P



SSER32 Inch Collets

Cutter Shank	Tool Max	Tool Min	SSER 32
5/32	0.1563	0.1533	SSER32-0156
3/16	0.1875	0.1825	SSER32-0187
7/32	0.2188	0.2138	SSER32-0219
1/4	0.2500	0.2400	SSER32-0250
9/32	0.2813	0.2713	SSER32-0281
5/16	0.3125	0.3025	SSER32-0312
11/32	0.3438	0.3338	SSER32-0344
3/8	0.3750	0.3650	SSER32-0375
13/32	0.4063	0.3963	SSER32-0406
7/16	0.4375	0.4275	SSER32-0438
15/32	0.4688	0.4588	SSER32-0469
1/2	0.5000	0.4900	SSER32-0500
17/32	0.5313	0.5163	SSER32-0531
9/16	0.5625	0.5475	SSER32-0563
19/32	0.5938	0.5788	SSER32-0594
5/8	0.6250	0.6100	SSER32-0625
21/32	0.6563	0.6413	SSER32-0656
11/16	0.6875	0.6725	SSER32-0688
23/32	0.7188	0.7038	SSER32-0719
3/4	0.7500	0.7350	SSER32-0750

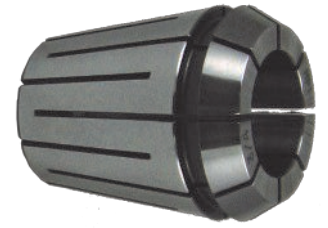
SSER40 Inch Collets

Cutter Shank	Tool Max	Tool Min	SSER 40
5/32	0.1563	0.1533	SSER40-0156
3/16	0.1875	0.1845	SSER40-0187
7/32	0.2188	0.2158	SSER40-0218
1/4	0.2500	0.2470	SSER40-0250
9/32	0.2813	0.2763	SSER40-0281
5/16	0.3125	0.3075	SSER40-0312
11/32	0.3438	0.3388	SSER40-0344
3/8	0.3750	0.3700	SSER40-0375
13/32	0.4063	0.4013	SSER40-0406
7/16	0.4375	0.4325	SSER40-0438
15/32	0.4688	0.4638	SSER40-0469
1/2	0.5000	0.4900	SSER40-0500
17/32	0.5313	0.5213	SSER40-0531
9/16	0.5625	0.5525	SSER40-0563
19/32	0.5938	0.5838	SSER40-0594
5/8	0.6250	0.6150	SSER40-0625
21/32	0.6563	0.6463	SSER40-0656
11/16	0.6875	0.6725	SSER40-0688
23/32	0.7188	0.7038	SSER40-0719
3/4	0.7500	0.7350	SSER40-0750
25/32	0.7813	0.7663	SSER40-0781
13/16	0.8125	0.7975	SSER40-0812
27/32	0.8438	0.8288	SSER40-0844
7/8	0.8750	0.8600	SSER40-0875
29/32	0.9063	0.8913	SSER40-0906
15/16	0.9375	0.9225	SSER40-0937
31/32	0.9688	0.9538	SSER40-0969
1	1.0000	0.9800	SSER40-1000
1 1/32	1.0313	1.0113	SSER40-1031
1 1/16	1.0625	1.0425	SSER40-1062
1 3/32	1.0938	1.0738	SSER40-1094
1 1/8	1.1250	1.1050	SSER40-1125
1 5/32	1.1563	1.1263	SSER40-1156

ER - Coolant Collets

SSER Steel Sealed - Metric ER Coolant Collets

- High Pressure Coolant - 1,500 PSI
- Standard .0004" T.I.R.
- Ultra Precision .0002" T.I.R.
- Collapse Range (see chart)



Note:

For Ultra Precision place "P" at the end of the part number.

Example: SSER32-M010P

SSER16 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	ER 16
4.0	3.7	0.1575	0.1475	SSER16-M040
5.0	4.7	0.1969	0.1869	SSER16-M050
6.0	5.6	0.2362	0.2212	SSER16-M060
7.0	6.6	0.2756	0.2606	SSER16-M070
8.0	7.6	0.3150	0.3000	SSER16-M080
9.0	8.6	0.3543	0.3393	SSER16-M090
10.0	9.5	0.3937	0.3737	SSER16-M100

SSER20 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	ER 20
4.0	3.7	0.1575	0.1475	SSER20-M040
5.0	4.6	0.1969	0.1819	SSER20-M050
6.0	5.6	0.2362	0.2212	SSER20-M060
7.0	6.6	0.2756	0.2606	SSER20-M070
8.0	7.5	0.3150	0.2950	SSER20-M080
9.0	8.5	0.3543	0.3343	SSER20-M090
10.0	9.4	0.3937	0.3687	SSER20-M100
11.0	10.4	0.4331	0.4081	SSER20-M110
12.0	11.4	0.4724	0.4474	SSER20-M120
13.0	12.0	0.5118	0.4724	SSER20-M130

SSER25 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	ER 25
4.0	3.9	0.1575	0.1535	SSER25-M040
5.0	4.9	0.1969	0.1929	SSER25-M050
6.0	5.9	0.2362	0.2312	SSER25-M060
7.0	6.9	0.2756	0.2706	SSER25-M070
8.0	7.7	0.3150	0.3050	SSER25-M080
9.0	8.7	0.3543	0.3443	SSER25-M090
10.0	9.7	0.3937	0.3837	SSER25-M100
11.0	10.6	0.4331	0.4181	SSER25-M110
12.0	11.6	0.4724	0.4574	SSER25-M120
13.0	12.5	0.5118	0.4918	SSER25-M130
14.0	13.5	0.5512	0.5312	SSER25-M140
15.0	14.4	0.5906	0.5656	SSER25-M150
16.0	15.4	0.6299	0.6049	SSER25-M160

SSER32 Metric Collets

Tool Max	Tool Min	Tool Max"	Tool Min"	ER 32
4.0	3.9	0.1575	0.1525	SSER32-M040
5.0	4.9	0.1969	0.1919	SSER32-M050
6.0	5.7	0.2362	0.2262	SSER32-M060
7.0	6.7	0.2756	0.2656	SSER32-M070
8.0	7.7	0.3150	0.3050	SSER32-M080
9.0	8.7	0.3543	0.3443	SSER32-M090
10.0	9.7	0.3937	0.3837	SSER32-M100
11.0	10.7	0.4331	0.4231	SSER32-M110
12.0	11.7	0.4724	0.4624	SSER32-M120
13.0	12.6	0.5118	0.4968	SSER32-M130
14.0	13.6	0.5512	0.5362	SSER32-M140
15.0	14.6	0.5906	0.5756	SSER32-M150
16.0	15.6	0.6299	0.6149	SSER32-M160
17.0	16.6	0.6693	0.6543	SSER32-M170
18.0	17.6	0.7087	0.6937	SSER32-M180
19.0	18.6	0.7480	0.7330	SSER32-M190
20.0	19.6	0.7874	0.7724	SSER32-M200

SSER40 Metric Collets

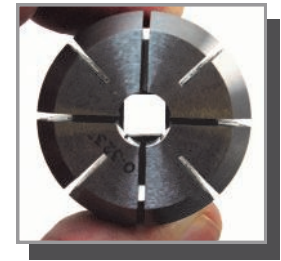
Tool Max	Tool Min	Tool Max"	Tool Min"	ER 40
6.0	5.9	0.2362	0.2312	SSER40-M060
7.0	6.9	0.2756	0.2706	SSER40-M070
8.0	7.9	0.3150	0.3100	SSER40-M080
9.0	8.9	0.3543	0.3493	SSER40-M090
10.0	9.9	0.3937	0.3887	SSER40-M100
11.0	10.9	0.4331	0.4281	SSER40-M110
12.0	11.7	0.4724	0.4624	SSER40-M120
13.0	12.7	0.5118	0.5018	SSER40-M130
14.0	13.7	0.5512	0.5412	SSER40-M140
15.0	14.7	0.5906	0.5806	SSER40-M150
16.0	15.7	0.6299	0.6199	SSER40-M160
17.0	16.7	0.6693	0.6593	SSER40-M170
18.0	17.7	0.7087	0.6987	SSER40-M180
19.0	18.6	0.7480	0.7330	SSER40-M190
20.0	19.6	0.7874	0.7724	SSER40-M200
21.0	20.6	0.8268	0.8118	SSER40-M210
22.0	21.6	0.8661	0.8511	SSER40-M220
23.0	22.6	0.9055	0.8905	SSER40-M230
24.0	23.6	0.9449	0.9299	SSER40-M240
25.0	24.5	0.9843	0.9643	SSER40-M250
26.0	25.5	1.0236	1.0036	SSER40-M260
27.0	26.5	1.0630	1.0430	SSER40-M270
28.0	27.5	1.1024	1.0824	SSER40-M280
29.0	28.5	1.1417	1.1217	SSER40-M290
30.0	29.2	1.1811	1.1511	SSER40-M300

ER - Tap Collets

ER Rigid Tap Collets Standard

Special design locks tap flats into the collet slots preventing the tap from spinning inside the collet.

- ANSI Shank and Square Standard
- Metric versions available upon request. Please provide shank and square of the tap prior to ordering.



TER16 Inch Collets

Shank	Square	Tap Size	ER 16
0.141	0.110	#6	TER16-141
0.168	0.131	#8	TER16-168
0.194	0.152	#10	TER16-194
0.220	0.165	#12	TER16-220
0.255	0.191	1/4"	TER16-255

TER20 Inch Collets

Shank	Square	Tap Size	ER20
0.141	0.110	#6	TER20-141
0.168	0.131	#8	TER20-168
0.194	0.152	#10	TER20-194
0.220	0.165	#12	TER20-220
0.255	0.191	1/4"	TER20-255
0.318	0.238	5/16"	TER20-318
0.323	0.242	7/16"	TER20-323
0.367	0.275	1/2"	TER20-367
0.381	0.286	3/8"	TER20-381

TER25 Inch Collets

Shank	Square	Tap Size	ER 25
0.141	0.110	#6	TER25-141
0.168	0.131	#8	TER25-168
0.194	0.152	#10	TER25-194
0.220	0.165	#12	TER25-220
0.255	0.191	1/4"	TER25-255
0.318	0.238	5/16"	TER25-318
0.323	0.242	7/16"	TER25-323
0.367	0.275	1/2"	TER25-367
0.381	0.286	3/8"	TER25-381
0.429	0.322	9/16"	TER25-429
0.437	0.328	1/8" NPT	TER25-437
0.480	0.360	5/8"	TER25-480

TER32 Inch Collets

Shank	Square	Tap Size	ER 32
0.141	0.110	#6	TER32-141
0.168	0.131	#8	TER32-168
0.194	0.152	#10	TER32-194
0.220	0.165	#12	TER32-220
0.255	0.191	1/4"	TER32-255
0.318	0.238	5/16"	TER32-318
0.323	0.242	7/16"	TER32-323
0.367	0.275	1/2"	TER32-367
0.381	0.286	3/8"	TER32-381
0.429	0.322	9/16"	TER32-429
0.437	0.328	1/8" NPT	TER32-437
0.480	0.360	5/8"	TER32-480
0.542	0.406	11/16"	TER32-542
0.562	0.421	1/4" NPT	TER32-562
0.590	0.442	3/4"	TER32-590
0.652	0.489	13/16"	TER32-652

TER40 Inch Collets

Shank	Square	Tap Size	ER 40
0.141	0.110	#6	TER40-141
0.168	0.131	#8	TER40-168
0.194	0.152	#10	TER40-194
0.220	0.165	#12	TER40-220
0.255	0.191	1/4"	TER40-255
0.318	0.238	5/16"	TER40-318
0.323	0.242	7/16"	TER40-323
0.367	0.275	1/2"	TER40-367
0.381	0.286	3/8"	TER40-381
0.429	0.322	9/16"	TER40-429
0.437	0.328	1/8" NPT	TER40-437
0.480	0.360	5/8"	TER40-480
0.542	0.406	11/16"	TER40-542
0.562	0.421	1/4" NPT	TER40-562
0.590	0.442	3/4"	TER40-590
0.652	0.489	13/16"	TER40-652
0.687	0.515	1/2" NPT	TER40-687
0.697	0.523	7/8"	TER40-697
0.700	0.531	3/8" NPT	TER40-700
0.760	0.570	15/16"	TER40-760
0.800	0.600	1"	TER40-800

ER - Coolant Collets

SER Rubber Sealed - Metric ER Coolant Collets

- High Pressure Coolant - 750 PSI
- Standard .0004" T.I.R.
- Ultra Precision .0002" T.I.R.
- On Size - h6 Tool Shank Tolerance Required

Note:

For Ultra Precision place "P" at the end of the part number.

Example: SER32-M010P



Size Inch	Size mm	ER 16	ER 20	ER 25	ER 32	ER 40
0.118"	3.0mm	SER16-M030	SER20-M030	SER25-M030	SER32-M030	
0.137"	3.5mm	SER16-M035	SER20-M035	SER25-M035	SER32-M035	
0.157"	4.0mm	SER16-M040	SER20-M040	SER25-M040	SER32-M040	
0.177"	4.5mm	SER16-M045	SER20-M045	SER25-M045	SER32-M045	
0.197"	5.0mm	SER16-M050	SER20-M050	SER25-M050	SER32-M050	
0.216"	5.5mm	SER16-M055	SER20-M055	SER25-M055	SER32-M055	
0.236"	6.0mm	SER16-M060	SER20-M060	SER25-M060	SER32-M060	SER40-M060
0.256"	6.5mm	SER16-M065	SER20-M065	SER25-M065	SER32-M065	SER40-M065
0.276"	7.0mm	SER16-M070	SER20-M070	SER25-M070	SER32-M070	SER40-M070
0.295"	7.5mm	SER16-M075	SER20-M075	SER25-M075	SER32-M075	SER40-M075
0.315"	8.0mm	SER16-M080	SER20-M080	SER25-M080	SER32-M080	SER40-M080
0.335"	8.5mm	SER16-M085	SER20-M085	SER25-M085	SER32-M085	SER40-M085
0.354"	9.0mm	SER16-M090	SER20-M090	SER25-M090	SER32-M090	SER40-M090
0.374"	9.5mm	SER16-M095	SER20-M095	SER25-M095	SER32-M095	SER40-M095
0.394"	10.0mm	SER16-M100	SER20-M100	SER25-M100	SER32-M100	SER40-M100
0.413"	10.5mm		SER20-M105	SER25-M105	SER32-M105	SER40-M105
0.433"	11.0mm		SER20-M110	SER25-M110	SER32-M110	SER40-M110
0.452"	11.5mm		SER20-M115	SER25-M115	SER32-M115	SER40-M115
0.472"	12.0mm		SER20-M120	SER25-M120	SER32-M120	SER40-M120
0.492"	12.5mm		SER20-M125	SER25-M125	SER32-M125	SER40-M125
0.500"	12.7mm		SER20-0500	SER25-0500	SER32-0500	SER40-0500
0.512"	13.0mm		SER20-M130	SER25-M130	SER32-M130	SER40-M130
0.532"	13.5mm			SER25-M135	SER32-M135	SER40-M135
0.551"	14.0mm			SER25-M140	SER32-M140	SER40-M140
0.571"	14.5mm			SER25-M145	SER32-M145	SER40-M145
0.590"	15.0mm			SER25-M150	SER32-M150	SER40-M150
0.610"	15.5mm			SER25-M155	SER32-M155	SER40-M155
0.630"	16.0mm			SER25-M160	SER32-M160	SER40-M160
0.649"	16.5mm				SER32-M165	SER40-M165
0.669"	17.0mm				SER32-M170	SER40-M170
0.689"	17.5mm				SER32-M175	SER40-M175
0.708"	18.0mm				SER32-M180	SER40-M180
0.728"	18.5mm				SER32-M185	SER40-M185
0.750"	19.0mm				SER32-0750	SER40-0750
0.767"	19.5mm				SER32-M195	SER40-M195
0.787"	20.0mm				SER32-M200	SER40-M200
0.807"	20.5mm					SER40-M205
0.827"	21.0mm					SER40-M210
0.846"	21.5mm					SER40-M215
0.866"	22.0mm					SER40-M220
0.886"	22.5mm					SER40-M225
0.906"	23.0mm					SER40-M230
0.926"	23.5mm					SER40-M235

ER - Accessories

Wrenches

Wrench Part Number	Description	Wrench Type	Max. Torque
ERW-11H	ER 11 Coated Nut -Hex	Hex	15-20 ft/lbs
ERW-16H	ER 16 Coated Nut -Hex	Hex	45-50 ft/lbs
ERW-20H	ER 20 Coated Nut -Hex	Hex	70-75 ft/lbs
ERW-16E	ER 16 Coated Nut - E Type	E Type	45-50 ft/lbs
ERW-20E	ER 20 Coated Nut - E Type	E Type	70-75 ft/lbs
ERW-25E	ER 25 Coated Nut - E Type	E Type	90-95 ft/lbs
ERW-32E	ER 32 Coated Nut - E Type	E Type	120-125 ft/lbs
ERW-40E	ER 40 Coated Nut - E Type	E Type	130-140 ft/lbs
ERW-50E	ER 50 Coated Nut - E Type	E Type	150-160 ft/lbs
ERW-32E	ER 32 Bearing Nut - E Type	E Type	120-125 ft/lbs
ERW-40E	ER 40 Bearing Nut - E Type	E Type	130-140 ft/lbs
ERW-8M	ER 8 Mini Nut	Mini E Type	5-7 ft/lbs
ERW-11M	ER 11 Mini Nut	Mini E Type	12-14 ft/lbs
ERW-16M	ER 16 Mini Nut	Mini E Type	20-22 ft/lbs
ERW-20M	ER 20 Mini Nut	Mini E Type	20-25 ft/lbs
ERW-25M	ER 25 Mini Nut	Mini E Type	25-29 ft/lbs
HSK- 63A	HSK 63A Coolant Tube Wrench	T Handle	
HSK-100A	HSK 100A Coolant Tube Wrench	T Handle	



Hex



E Type



Mini E Type

Torque Wrenches

The proper torque is a necessity in machining:

- Quality: Proper torque assures maximum cutting accuracy.
- Cost Savings: Proper torque extends the life of collets, tools, and holders.
- Safety: Proper torque reduces the possibility of tools loosening up and coming out of the holder.



Part Number	Description	Torque Range	Length	Weight	Spigot
TW-200	Torque Wrench	30-150 ft/lbs	16.5"	1.75 lbs.	16mm round
TW-300	Torque Wrench	45-228 ft/lbs	21.5"	2.5 lbs.	16mm round

Wrench Head Part Number	Description	Wrench Type	Max. Torque
TWH-ER16H	ER 16 Coated Nut -Hex	Hex	45-50 ft/lbs
TWH-ER20H	ER 20 Coated Nut -Hex	Hex	70-75 ft/lbs
TWH-ER16E	ER 16 Coated Nut - E Type	E Type	45-50 ft/lbs
TWH-ER20E	ER 20 Coated Nut - E Type	E Type	70-75 ft/lbs
TWH-ER25E	ER 25 Coated Nut - E Type	E Type	90-95 ft/lbs
TWH-ER32E	ER 32 Coated Nut - E Type	E Type	120-125 ft/lbs
TWH-ER40E	ER 40 Coated Nut - E Type	E Type	130-140 ft/lbs
TWH-ER50E	ER 50 Coated Nut - E Type	E Type	150-160 ft/lbs



HSK Coolant Tubes

- Fits HSK Form A Shanks
- Double Seal Design

Part Number	Description
TUBE-063A	HSK 63A Coolant Tube
TUBE-100A	HSK 100A Coolant Tube



ER - Nuts

Collet Nuts

Nut Part Number	Description	Wrench Part Number	Thread	Max. Torque
ERN-11H	ER 11 Coated Nut -Hex	ERW-11H	M14 x 0.75	15-20 ft/lbs
ERN-16H	ER 16 Coated Nut -Hex	ERW-16H	M22 x 1.5	45-50 ft/lbs
ERN-20H	ER 20 Coated Nut -Hex	ERW-20H	M25 x 1.5	70-75 ft/lbs
ERN-16	ER 16 Coated Nut - E Type	ERW-16	M22 x 1.5	45-50 ft/lbs
ERN-20	ER 20 Coated Nut - E Type	ERW-20	M25 x 1.5	70-75 ft/lbs
ERN-25	ER 25 Coated Nut - E Type	ERW-25	M32 x 1.5	90-95 ft/lbs
ERN-32	ER 32 Coated Nut - E Type	ERW-32	M40 x 1.5	120-125 ft/lbs
ERN-40	ER 40 Coated Nut - E Type	ERW-40	M50 x 1.5	130-140 ft/lbs
ERN-50	ER 50 Coated Nut - E Type	ERW-50	M64 x 2.0	150-160 ft/lbs
ERN-8M	ER 8 Mini Nut	ERW-8M	M10 x 0.75	5-7 ft/lbs
ERN-11M	ER 11 Mini Nut	ERW-11M	M13 x 0.75	12-14 ft/lbs
ERN-16M	ER 16 Mini Nut	ERW-16M	M19 x 1.0	20-22 ft/lbs
ERN-20M	ER 20 Mini Nut	ERW-20M	M24 x 1.0	20-25 ft/lbs
ERN-25M	ER 25 Mini Nut	ERW-25M	M30 x 1.0	25-29 ft/lbs



Hex Style



E Type



Mini Type

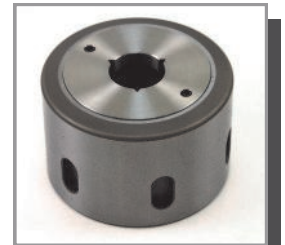
ER Coolant Cap Collet Nuts with SX Coolant Caps

- For coolant pressures up to 1,500 PSI.
- Fits most standard ER collet chucks.
- Jet-Blast Caps Available Upon Request
- Coolant Disk on following page.

Nut Part Number	Description	Coolant Cap	Wrench Part Number	Thread	Max. Torque
ERN11-CC	ER 11 Nut - Hex	SX06	ERW-11H	M14 x 0.75	15-20 ft/lbs
ERN16-CC	ER 16 Nut - Hex	SX10	ERW-16H	M22 x 1.50	45-50 ft/lbs
ERN20-CC	ER 20 Nut - Hex	SX16	ERW-20H	M25 x 1.50	70-75 ft/lbs
ERN25-CC	ER 25 Nut - E Type	SX16	ERW-25	M32 x 1.50	90-95 ft/lbs
ERN32-CC	ER 32 Nut - E Type	SX25	ERW-32	M40 x 1.50	120-125 ft/lbs
ERN40-CC	ER 40 Nut - E Type	SX25	ERW-40	M50 x 1.50	130-140 ft/lbs



ER w/ Coolant Cap



Coolant Cap w/ Jet Blast (Special Order)



Thread Coolant Cap into ER nut, snug with wrench after the collet has been assembled.



Insert cutting tool with the seal engaged on the round part of the shank

SX - Super Chuck Coolant Caps

ER Coolant Caps

Features

- O-ring seal for pressures up to 1500 PSI
- Prevents chips, dust & swarf from entering the holder
- Seal range +0 / -.50mm (+0 / -.020")
- Requires Coolant Cap Nut (See Below)
- Jet Slot for Non-Coolant Cutting Tools Available
 - Order by adding a "C" to the end of the Cap part number
- Blanks available for custom applications



Jet Slot Version

Range	Inch Shank	ER11	ER 16	ER 20	ER 25	ER 32	ER 40
1.0 - 0.7mm	1/32	SXC06-M010	SXC10-M010				
1.5 - 1.2mm	3/64	SXC06-M015	SXC10-M015				
2.0 - 1.5mm	1/16	SXC06-M020	SXC10-M020				
2.5 - 2.0mm	3/32	SXC06-M025	SXC10-M025				
3.0 - 2.5mm	7/64	SXC06-M030	SXC10-M030	SXC16-M030	SXC16-M030	SXC25-M030	SXC25-M030
3.5 - 3.0mm	1/8"	SXC06-M035	SXC10-M035	SXC16-M035	SXC16-M035	SXC25-M035	SXC25-M035
4.0 - 3.5mm	5/32"	SXC06-M040	SXC10-M040	SXC16-M040	SXC16-M040	SXC25-M040	SXC25-M040
4.5 - 4.0mm	11/64"	SXC06-M045	SXC10-M045	SXC16-M045	SXC16-M045	SXC25-M045	SXC25-M045
5.0 - 4.5mm	3/16"	SXC06-M050	SXC10-M050	SXC16-M050	SXC16-M050	SXC25-M050	SXC25-M050
5.5 - 5.0mm	13/64"	SXC06-M055	SXC10-M055	SXC16-M055	SXC16-M055	SXC25-M055	SXC25-M055
6.0 - 5.5mm	7/32"	SXC06-M060	SXC10-M060	SXC16-M060	SXC16-M060	SXC25-M060	SXC25-M060
6.5 - 6.0mm	1/4"		SXC10-M065	SXC16-M065	SXC16-M065	SXC25-M065	SXC25-M065
7.0 - 6.5mm	17/64"		SXC10-M070	SXC16-M070	SXC16-M070	SXC25-M070	SXC25-M070
7.5 - 7.0mm	9/32"		SXC10-M075	SXC16-M075	SXC16-M075	SXC25-M075	SXC25-M075
8.0 - 7.5mm	5/16"		SXC10-M080	SXC16-M080	SXC16-M080	SXC25-M080	SXC25-M080
8.5 - 8.0mm	21/64"		SXC10-M085	SXC16-M085	SXC16-M085	SXC25-M085	SXC25-M085
9.0 - 8.5mm	11/32"		SXC10-M090	SXC16-M090	SXC16-M090	SXC25-M090	SXC25-M090
9.5 - 9.0mm	3/8"		SXC10-M095	SXC16-M095	SXC16-M095	SXC25-M095	SXC25-M095
10.0 - 9.5mm	25/64"		SXC10-M100	SXC16-M100	SXC16-M100	SXC25-M100	SXC25-M100
10.5 - 10.0mm	13/32"			SXC16-M105	SXC16-M105	SXC25-M105	SXC25-M105
11.0 - 10.5mm	27/64"			SXC16-M110	SXC16-M110	SXC25-M110	SXC25-M110
11.5 - 11.0mm	7/16"			SXC16-M115	SXC16-M115	SXC25-M115	SXC25-M115
12.0 - 11.5mm	15/32"			SXC16-M120	SXC16-M120	SXC25-M120	SXC25-M120
12.5 - 12.0mm	31/64"			SXC16-M125	SXC16-M125	SXC25-M125	SXC25-M125
13.0 - 12.5mm	1/2"			SXC16-M130	SXC16-M130	SXC25-M130	SXC25-M130
13.5 - 13.0mm	17/32"				SXC16-M135	SXC25-M135	SXC25-M135
14.0 - 13.5mm	35/64"				SXC16-M140	SXC25-M140	SXC25-M140
14.5 - 14.0mm	9/16"				SXC16-M145	SXC25-M145	SXC25-M145
15.0 - 14.5mm	37/64"				SXC16-M150	SXC25-M150	SXC25-M150
15.5 - 15.0mm	19/32"				SXC16-M155	SXC25-M155	SXC25-M155
16.0 - 15.5mm	5/8"				SXC16-M160	SXC25-M160	SXC25-M160
16.5 - 16.0mm	41/64"					SXC25-M165	SXC25-M165
17.0 - 16.5mm	21/32"					SXC25-M170	SXC25-M170
17.5 - 17.0mm	11/16"					SXC25-M175	SXC25-M175
18.0 - 17.5mm	45/64"					SXC25-M180	SXC25-M180
18.5 - 18.0mm	23/32"					SXC25-M185	SXC25-M185
19.0 - 18.5mm	3/4"					SXC25-M190	SXC25-M190
19.5 - 19.0mm	49/64"					SXC25-M195	SXC25-M195
20.0 - 19.5mm	25/32"					SXC25-M200	SXC25-M200
20.5 - 20.0mm	51/64"						SXC25-M205
21.0 - 20.5mm	13/16"						SXC25-M210
21.5 - 21.0mm	27/32"						SXC25-M215
22.0 - 21.5mm	55/64"						SXC25-M220
22.5 - 22.0mm	7/8"						SXC25-M225
23.0 - 22.5mm	29/32"						SXC25-M230
23.5 - 23.0mm	59/64"						SXC25-M235
24.0 - 23.5mm	15/16"						SXC25-M240
24.5 - 24.0mm	61/64"						SXC25-M245
25.0 - 24.5mm	31/32"						SXC25-M250
25.4 - 25.0mm	1"						SXC25-M254

TG - Collet Chuck

Best in Class T.I.R.

Semi-Roughing & Finishing for Milling, Drilling, Reaming, Tapping



Premium Precision 0.0001"

- Runout taper to taper within 3 Microns (0.0001") T.I.R.

Premium Precision Collets

- Standard Collet 0.0004" @ 2 x Tool Diameter
- Ultra-Precision 0.0002" @ 2 x Tool Diameter

Coolant Thru

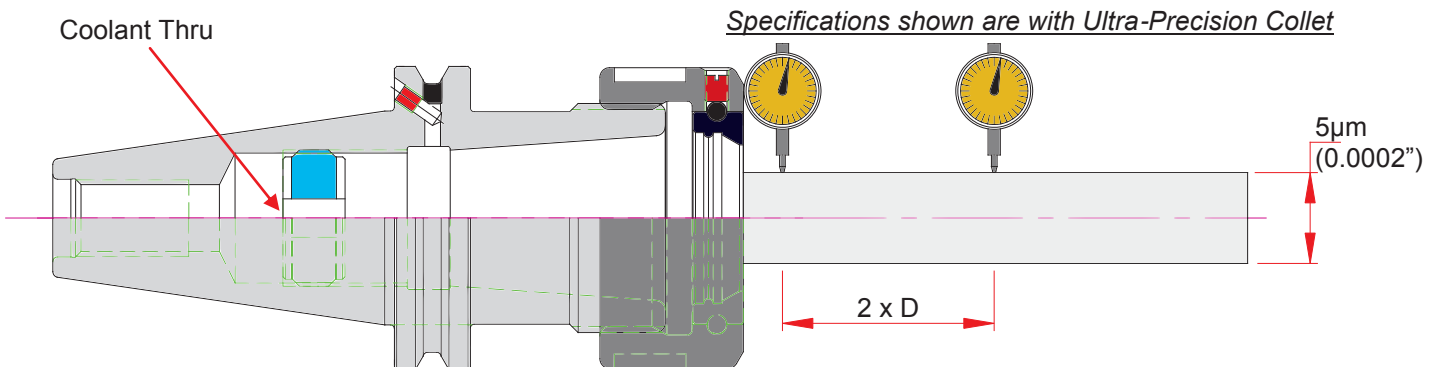
- Coolant Thru the Center
- DIN AD+B Flange Coolant Included

Dynamically Balanced

- Dynamically Balanced
 - 30, 40 & HSK63A - G6.3 @ 20,000 RPM
 - 50 & HSK100A - G6.3 @ 15,000 RPM

ISO AT3 Taper Tolerance

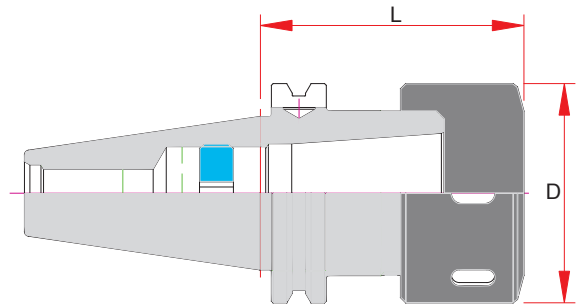
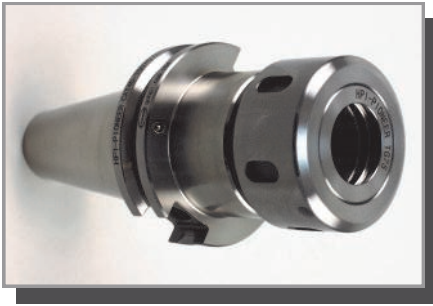
- Tapers are ground better than AT3 for optimal T.I.R.



TG - Collet Chuck

Features

- 3 μm - 0.0001" Runout Taper to Taper
- Coolant Thru Center
- DIN AD+B Flange Coolant Standard
- Balanced G6.3 @ 20,000 RPM
- Order Collets & Wrench Separately



Capacity	Part Number	Range	L - Projection	D	Collet	Screw	Nut	Wrench
3/4	CAT40-TG075-0300	.094 - .750	3.00	1.97	TG075	ASC-TG075	TGN075	TGW075
3/4	CAT40-TG075-0500	.094 - .750	5.00	1.97	TG075	ASC-TG075	TGN075	TGW075
1"	CAT40-TG100-0300	.094 - 1.00	3.00	2.48	TG100	ASC-ER40	TGN100	TGW100
1"	CAT40-TG100-0550	.094 - 1.00	5.50	2.48	TG100	ASC-ER40	TGN100	TGW100
1"	CAT50-TG100-0350	.094 - 1.00	3.50	2.48	TG100	ASC-ER40	TGN100	TGW100
1"	CAT50-TG100-0550	.094 - 1.00	5.50	2.48	TG100	ASC-ER40	TGN100	TGW100
1"	CAT50-TG100-0750	.094 - 1.00	7.50	2.48	TG100	ASC-ER40	TGN100	TGW100
1-1/2	CAT50-TG150-0350	.500 - 1.50	3.50	3.23	TG150	ASC-TG150	TGN150	TGW150
1-1/2	CAT50-TG150-0550	.500 - 1.50	5.50	3.23	TG150	ASC-TG150	TGN150	TGW150
1"	BT40-TG100-0300	.094 - 1.00	3.00	2.48	TG100	ASC-ER40	TGN100	TGW100
1"	BT40-TG100-0550	.094 - 1.00	5.50	2.48	TG100	ASC-ER40	TGN100	TGW100

Wrenches

Wrench Part Number	Description	Wrench Type	Max. Torque
TGW-075	TG75 Spanner Bearing Nut	Hook Spanner	55-60 ft/lbs
TGW-100	TG100 Spanner Bearing Nut	Hook Spanner	75-80 ft/lbs
TGW-150	TG150 Spanner Bearing Nut	Hook Spanner	75/80 ft/lbs



Hook Spanner

Collet Nuts

Nut Part Number	Description	Wrench Part Number	Coolant Cap	Thread	Max. Torque
TGN-075	TG75 Spanner Bearing Nut	TGW-075	-	1 1/2-12 Acme	55-60 ft/lbs
TGN-100	TG100 Spanner Bearing Nut	TGW-100	-	1 7/8-12 Acme	75-80 ft/lbs
TGN-150	TG150 Spanner Bearing Nut	TGW-150	-	2 5/8-12 Acme	75/80 ft/lbs
TGN-075-CC	TG75 Coolant Cap Nut	TGW-075	SXCC-25	1 1/2-12 Acme	55-60 ft/lbs
TGN-100-CC	TG100 Coolant Cap Nut	TGW-100	SXCC-25	1 7/8-12 Acme	75-80 ft/lbs



Thread Coolant Cap into TG nut, snug with wrench after the collet has been assembled.



Insert cutting tool with the seal engaged on the round part of the shank

TG - Collets

TG Precision Inch Collets

Features:

- Standard .0004" T.I.R.
- Collapse Range: .020

Our TG collets are the most accurate in the industry. We use only the best material and a Swiss grinding technique that ensures accuracy on each grind.



TG075 Inch Collets

Nominal Tool	Tool Max	Tool Min	TG075
3/32	0.0938	0.0781	TG075-0094
7/64	0.1094	0.0938	TG075-0109
1/8	0.1250	0.1094	TG075-0125
9/64	0.1406	0.1250	TG075-0141
5/32	0.1563	0.1406	TG075-0156
11/64	0.1719	0.1563	TG075-0172
3/16	0.1875	0.1719	TG075-0188
13/64	0.2031	0.1875	TG075-0203
7/32	0.2188	0.2031	TG075-0219
15/64	0.2344	0.2188	TG075-0234
1/4	0.2500	0.2344	TG075-0250
17/64	0.2656	0.2500	TG075-0266
9/32	0.2813	0.2656	TG075-0281
19/64	0.2969	0.2813	TG075-0297
5/16	0.3125	0.2969	TG075-0313

Nominal Tool	Tool Max	Tool Min	TG075
21/64	0.3281	0.3125	TG075-0328
11/32	0.3438	0.3281	TG075-0344
23/64	0.3594	0.3438	TG075-0359
3/8	0.3750	0.3594	TG075-0375
25/64	0.3906	0.3750	TG075-0391
13/32	0.4063	0.3906	TG075-0406
27/64	0.4219	0.4063	TG075-0422
7/16	0.4375	0.4219	TG075-0438
29/64	0.4531	0.4375	TG075-0453
15/32	0.4688	0.4531	TG075-0469
31/64	0.4844	0.4688	TG075-0484
1/2	0.5000	0.4844	TG075-0500
33/64	0.5156	0.5000	TG075-0516
17/32	0.5313	0.5156	TG075-0531
35/64	0.5469	0.5313	TG075-0547

Nominal Tool	Tool Max	Tool Min	TG075
9/16	0.5625	0.5469	TG075-0563
37/64	0.5781	0.5625	TG075-0578
19/32	0.5938	0.5781	TG075-0594
39/64	0.6094	0.5938	TG075-0609
5/8	0.6250	0.6094	TG075-0625
41/64	0.6406	0.6250	TG075-0641
21/32	0.6563	0.6406	TG075-0656
43/64	0.6719	0.6563	TG075-0672
11/16	0.6875	0.6719	TG075-0688
45/64	0.7031	0.6875	TG075-0703
23/32	0.7188	0.7031	TG075-0719
47/64	0.7344	0.7188	TG075-0734
3/4	0.7500	0.7344	TG075-0750

Collet Sets

Part Number	Collet Size	Pieces	Range	Increments
TG075-SET11	TG75	11	3/32-3/4	1/16
TG075-SET22	TG75	22	3/32-3/4	1/32
TG075-SET43	TG75	43	3/32-3/4	1/64
TG100-SET15	TG100	15	1/8-1"	1/16
TG100-SET21	TG100	21	3/8-1"	1/32
TG100-SET30	TG100	30	3/32-1"	1/32
TG100-SET41	TG100	41	3/8-1"	1/64
TG100-SET59	TG100	59	3/32-1"	1/64
TG150-SET17	TG150	17	1/2-1-1/2	1/16
TG150-SET33	TG150	33	1/2-1-1/2	1/32
TG150-SET65	TG150	65	1/2-1-1/2	1/64

TG - Collets

TG100 Inch Collets

Nominal Tool	Tool Max	Tool Min	TG100
3/32	0.0938	0.0781	TG100-0094
7/64	0.1094	0.0938	TG100-0109
1/8	0.1250	0.1094	TG100-0125
9/64	0.1406	0.1250	TG100-0141
5/32	0.1563	0.1406	TG100-0156
11/64	0.1719	0.1563	TG100-0172
3/16	0.1875	0.1719	TG100-0188
13/64	0.2031	0.1875	TG100-0203
7/32	0.2188	0.2031	TG100-0219
15/64	0.2344	0.2188	TG100-0234
1/4	0.2500	0.2344	TG100-0250
17/64	0.2656	0.2500	TG100-0266
9/32	0.2813	0.2656	TG100-0281
19/64	0.2969	0.2813	TG100-0297
5/16	0.3125	0.2969	TG100-0313
21/64	0.3281	0.3125	TG100-0328
11/32	0.3438	0.3281	TG100-0344
23/64	0.3594	0.3438	TG100-0359
3/8	0.3750	0.3594	TG100-0375
25/64	0.3906	0.3750	TG100-0391

Nominal Tool	Tool Max	Tool Min	TG100
13/32	0.4063	0.3906	TG100-0406
27/64	0.4219	0.4063	TG100-0422
7/16	0.4375	0.4219	TG100-0438
29/64	0.4531	0.4375	TG100-0453
15/32	0.4688	0.4531	TG100-0469
31/64	0.4844	0.4688	TG100-0484
1/2	0.5000	0.4844	TG100-0500
33/64	0.5156	0.5000	TG100-0516
17/32	0.5313	0.5156	TG100-0531
35/64	0.5469	0.5313	TG100-0547
9/16	0.5625	0.5469	TG100-0563
37/64	0.5781	0.5625	TG100-0578
19/32	0.5938	0.5781	TG100-0594
39/64	0.6094	0.5938	TG100-0609
5/8	0.6250	0.6094	TG100-0625
41/64	0.6406	0.6250	TG100-0641
21/32	0.6563	0.6406	TG100-0656
43/64	0.6719	0.6563	TG100-0672
11/16	0.6875	0.6719	TG100-0688
45/64	0.7031	0.6875	TG100-0703

Nominal Tool	Tool Max	Tool Min	TG100
23/32	0.7188	0.7031	TG100-0719
47/64	0.7344	0.7188	TG100-0734
3/4	0.7500	0.7344	TG100-0750
49/64	0.7656	0.7500	TG100-0766
25/32	0.7813	0.7656	TG100-0781
51/64	0.7969	0.7813	TG100-0797
13/16	0.8125	0.7969	TG100-0813
53/64	0.8281	0.8125	TG100-0828
27/32	0.8438	0.8281	TG100-0844
55/64	0.8594	0.8438	TG100-0859
7/8	0.8750	0.8594	TG100-0875
57/64	0.8906	0.8750	TG100-0891
29/32	0.9063	0.8906	TG100-0906
59/64	0.9219	0.9063	TG100-0922
15/16	0.9375	0.9219	TG100-0938
61/64	0.9531	0.9375	TG100-0953
31/32	0.9688	0.9531	TG100-0969
63/64	0.9844	0.9688	TG100-0984
1	1.0000	0.9844	TG100-1000

TG150 Inch Collets

Nominal Tool	Tool Max	Tool Min	TG150
1/2	0.5000	0.4844	TG150-0500
33/64	0.5156	0.5000	TG150-0516
17/32	0.5313	0.5156	TG150-0531
35/64	0.5469	0.5313	TG150-0547
9/16	0.5625	0.5469	TG150-0563
37/64	0.5781	0.5625	TG150-0578
19/32	0.5938	0.5781	TG150-0594
39/64	0.6094	0.5938	TG150-0609
5/8	0.6250	0.6094	TG150-0625
41/64	0.6406	0.6250	TG150-0641
21/32	0.6563	0.6406	TG150-0656
43/64	0.6719	0.6563	TG150-0672
11/16	0.6875	0.6719	TG150-0688
45/64	0.7031	0.6875	TG150-0703
23/32	0.7188	0.7031	TG150-0719
47/64	0.7344	0.7188	TG150-0734
3/4	0.7500	0.7344	TG150-0750
49/64	0.7656	0.7500	TG150-0766
25/32	0.7813	0.7656	TG150-0781
51/64	0.7969	0.7813	TG150-0797
13/16	0.8125	0.7969	TG150-0813
53/64	0.8281	0.8125	TG150-0828

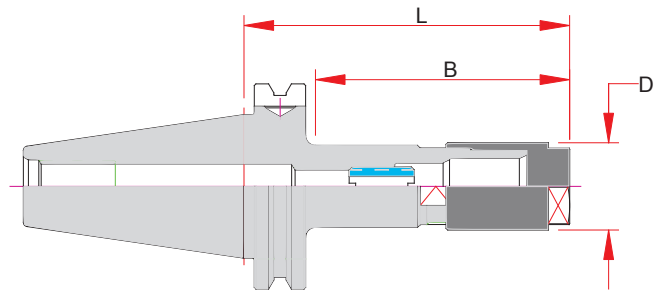
Nominal Tool	Tool Max	Tool Min	TG150
27/32	0.8438	0.8281	TG150-0844
55/64	0.8594	0.8438	TG150-0859
7/8	0.8750	0.8594	TG150-0875
57/64	0.8906	0.8750	TG150-0891
29/32	0.9063	0.8906	TG150-0906
59/64	0.9219	0.9063	TG150-0922
15/16	0.9375	0.9219	TG150-0938
61/64	0.9531	0.9375	TG150-0953
31/32	0.9688	0.9531	TG150-0969
63/64	0.9844	0.9688	TG150-0984
1	1.0000	0.9844	TG150-1000
1 1/64	1.0156	1.0000	TG150-1016
1 1/32	1.0313	1.0156	TG150-1031
1 3/64	1.0469	1.0313	TG150-1047
1 1/16	1.0625	1.0469	TG150-1063
1 5/64	1.0781	1.0625	TG150-1078
1 3/32	1.0938	1.0781	TG150-1094
1 7/64	1.1094	1.0938	TG150-1109
1 1/8	1.1250	1.1094	TG150-1125
1 9/64	1.1406	1.1250	TG150-1141
1 5/32	1.1563	1.1406	TG150-1156
1 11/64	1.1719	1.1563	TG150-1172

Nominal Tool	Tool Max	Tool Min	TG150
1 3/16	1.1875	1.1719	TG150-1188
1 13/64	1.2031	1.1875	TG150-1203
1 7/32	1.2188	1.2031	TG150-1219
1 15/64	1.2344	1.2188	TG150-1234
1 1/4	1.2500	1.2344	TG150-1250
1 17/64	1.2656	1.2500	TG150-1266
1 9/32	1.2813	1.2656	TG150-1281
1 19/64	1.2969	1.2813	TG150-1297
1 5/16	1.3125	1.2969	TG150-1313
1 21/64	1.3281	1.3125	TG150-1328
1 11/32	1.3438	1.3281	TG150-1344
1 23/64	1.3594	1.3438	TG150-1359
1 3/8	1.3750	1.3594	TG150-1375
1 25/64	1.3906	1.3750	TG150-1391
1 13/32	1.4063	1.3906	TG150-1406
1 27/64	1.4219	1.4063	TG150-1422
1 7/16	1.4375	1.4219	TG150-1438
1 29/64	1.4531	1.4375	TG150-1453
1 15/32	1.4688	1.4531	TG150-1469
1 31/64	1.4844	1.4688	TG150-1484
1 1/2	1.5000	1.4844	TG150-1500

DA - Collet Chuck

Features

- Coolant Thru Center
- DIN AD+B Flange Coolant Standard
- Balanced G6.3 @ 20,000 RPM
- Order Collets & Wrench Separately

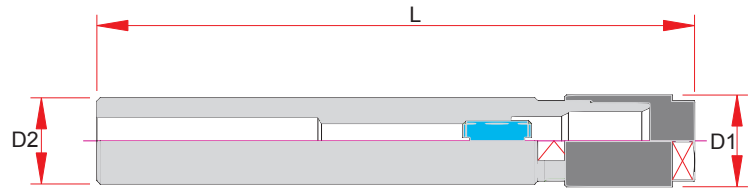


Capacity	Part Number	Range	L - Projection	B	D	Collet	Screw	Nut	Wrench
1/4	CAT40-DA300-0338	3/64 - 1/4	3.38	1.88	0.57	DA300	ASC-DA300	DAN300	DAW300
3/8	CAT40-DA200-0300	1/16 - 3/8	3.00	1.58	0.83	DA200	ASC-ER16	DAN200	DAW200
3/8	CAT40-DA200-0500	1/16 - 3/8	5.00	1.57	0.83	DA200	ASC-ER16	DAN200	DAW200
9/16	CAT40-DA100-0350	1/16 - 9/16	3.50	2.00	1.06	DA100	ASC-DA100	DAN100	DAW100
9/16	CAT40-DA100-0600	1/16 - 9/16	6.00	4.50	1.06	DA100	ASC-DA100	DAN100	DAW100
3/4	CAT40-DA180-0295	1/16 - 3/4	2.95	2.15	1.48	DA180	ASC-TG075	DAN180	DAW180
3/4	CAT40-DA180-0515	1/16 - 3/4	5.15	3.73	1.48	DA180	ASC-TG075	DAN180	DAW180
3/4	CAT50-DA180-0338	1/16 - 3/4	3.38	1.88	1.48	DA180	ASC-TG075	DAN180	DAW180
3/4	CAT50-DA180-0600	1/16 - 3/4	6.00	4.42	1.48	DA180	ASC-TG075	DAN180	DAW180

DA Collet Extensions

Features

- Mini-Nut for Close Center Work



Part Number	Collet Range	D1	D2	L	Adjust Screw	Nut	Wrench
S050-DA300-0683	3/64 - 1/4	0.57	0.5000	6.83	AS-DAX300	DAN300	DAW300
S075-DA200-0709	1/16 - 3/8	0.83	0.7500	7.08	AS-DAX200	DAN200	DAW200
S100-DA100-0749	1/16 - 9/16	1.06	1.0000	7.49	AS-DAX100	DAN100	DAW100
S125-DA180-0749	1/16 - 3/4	1.48	1.2500	7.49	AS-DAX125	DAN180	DAW180

Wrenches



Wrench Part Number	Description	Wrench Type	Max. Torque
DAW-300	DA300 Close Center Nut	Hex	18-20 ft/lbs
DAW-200	DA200 Close Center Nut	Hex	25-30 ft/lbs
DAW-100	DA100 Close Center Nut	Hex	30-35 ft/lbs
DAW-180	DA180 Close Center Nut	Hex	34-40 ft/lbs

Nuts

Nut Part Number	Description	Wrench Part Number	Thread	Max. Torque
DAN-300	DA300 Close Center Nut	DAW-300	7/16-32	18-20 ft/lbs
DAN-200	DA200 Close Center Nut	DAW-200	3/4-16	25-30 ft/lbs
DAN-100	DA100 Close Center Nut	DAW-100	15/16-20	30-35 ft/lbs
DAN-180	DA180 Close Center Nut	DAW-180	1 1/4-12	34-40 ft/lbs



DA - Collets

DA Inch Collets

Features:

- Collapse Range: .020
- Fits all standard DA collet chucks in the industry today.



Size	DA 180	DA 100	DA 200	DA 300
3/64"			DA200-0047	DA300-0047
1/16"	DA180-0063	DA100-0063	DA200-0063	DA300-0063
5/64"	DA180-0078	DA100-0078	DA200-0078	DA300-0078
3/32"	DA180-0094	DA100-0094	DA200-0094	DA300-0094
7/64"	DA180-0109	DA100-0109	DA200-0109	DA300-0109
1/8"	DA180-0125	DA100-0125	DA200-0125	DA300-0125
9/64"	DA180-0141	DA100-0141	DA200-0141	DA300-0141
5/32"	DA180-0156	DA100-0156	DA200-0156	DA300-0156
11/64"	DA180-0172	DA100-0172	DA200-0172	DA300-0172
3/16"	DA180-0188	DA100-0188	DA200-0188	DA300-0188
13/64"	DA180-0203	DA100-0203	DA200-0203	DA300-0203
7/32"	DA180-0219	DA100-0219	DA200-0219	DA300-0219
15/64"	DA180-0234	DA100-0234	DA200-0234	DA300-0234
1/4"	DA180-0250	DA100-0250	DA200-0250	DA300-0250
17/64"	DA180-0266	DA100-0266	DA200-0266	
9/32"	DA180-0281	DA100-0281	DA200-0281	
19/64"	DA180-0297	DA100-0297	DA200-0297	
5/16"	DA180-0313	DA100-0313	DA200-0313	
21/64"	DA180-0328	DA100-0328	DA200-0328	
11/32"	DA180-0344	DA100-0344	DA200-0344	
23/64"	DA180-0359	DA100-0359	DA200-0359	
3/8"	DA180-0375	DA100-0375	DA200-0375	
25/64"	DA180-0391	DA100-0391		
13/32"	DA180-0406	DA100-0406		
27/64"	DA180-0422	DA100-0422		
7/16"	DA180-0438	DA100-0438		
29/64"	DA180-0453	DA100-0453		
15/32"	DA180-0469	DA100-0469		
31/64"	DA180-0484	DA100-0484		
1/2"	DA180-0500	DA100-0500		
33/64"	DA180-0516	DA100-0516		
17/32"	DA180-0531	DA100-0531		
35/64"	DA180-0547	DA100-0547		
9/16"	DA180-0563	DA100-0563		
37/64"	DA180-0578			
19/32"	DA180-0594			
39/64"	DA180-0609			
5/8"	DA180-0625			
41/64"	DA180-0641			
21/32"	DA180-0656			
43/64"	DA180-0672			
11/16"	DA180-0688			
45/64"	DA180-0703			
23/32"	DA180-0719			
47/64"	DA180-0734			
3/4"	DA180-0750			

Collet Sets

Part Number	Collet Size	Pieces	Range	Incr.
DA180-SET9	DA180	9	1/4-3/4	1/16
DA180-SET17	DA180	17	1/4-3/4	1/32
DA180-SET21	DA180	21	1/8-3/4	1/32
DA180-SET33	DA180	33	1/4-3/4	1/64
DA180-SET41	DA180	41	1/8-3/4	1/64
DA100-SET8	DA100	8	1/8-9/16	1/16
DA100-SET15	DA100	15	1/8-9/16	1/32
DA100-SET21	DA100	21	1/4-9/16	1/64
DA100-SET29	DA100	29	1/8-9/16	1/64
DA100-SET33	DA100	33	1/16-9/16	1/64
DA200-SET9	DA200	9	1/8-3/8	1/32
DA200-SET17	DA200	17	1/8-3/8	1/64
DA200-SET21	DA200	21	1/16-3/8	1/64
DA300-SET7	DA300	7	1/16-1/4	1/32
DA300-SET14	DA300	14	3/64-1/4	1/64

EM - End Mill Adapters

Best in Class T.I.R. & Options

Roughing & Semi-Finishing for Milling



Premium Precision 0.0001"

- Runout taper to bore within 3 Microns (0.0001") T.I.R.
- Bore ground to H5 tolerance or better!

Coolant Thru

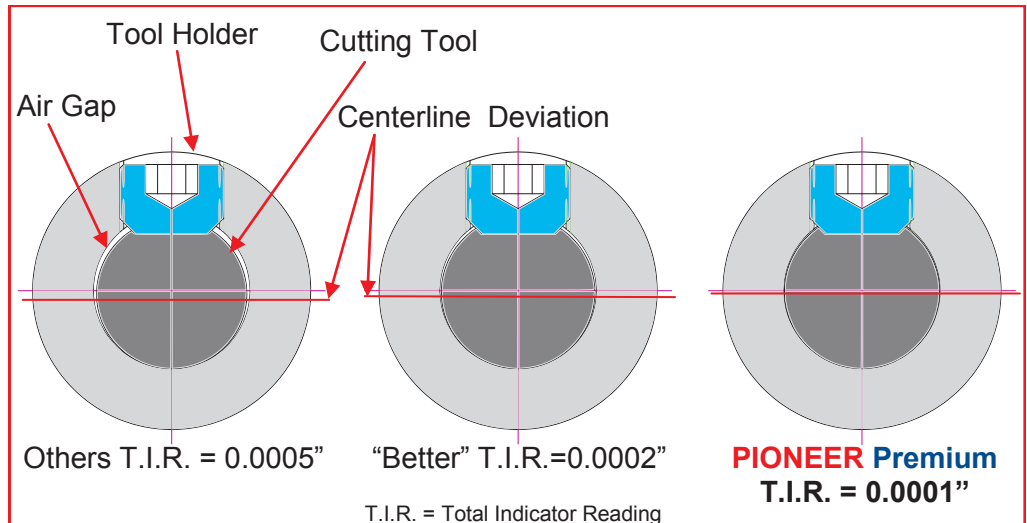
- Coolant Thru the Center
- DIN AD+B Flange Coolant Included
- Jet Slot Versions Available

Dynamically Balanced

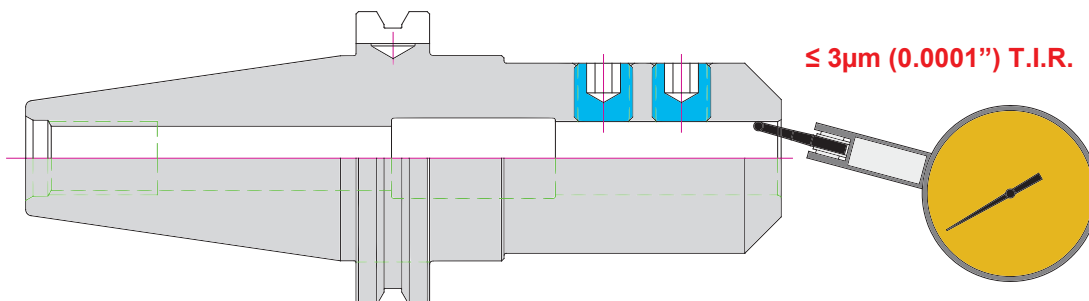
- Dynamically Balanced
 - 30, 40 & HSK63A - G6.3 @ 20,000 RPM
 - 50 & HSK100A - G6.3 @ 15,000 RPM

ISO AT3 Taper Tolerance

- Tapers are ground better than AT3 for optimal T.I.R.



You lose 10% of cutter life for every 0.0001" of T.I.R.

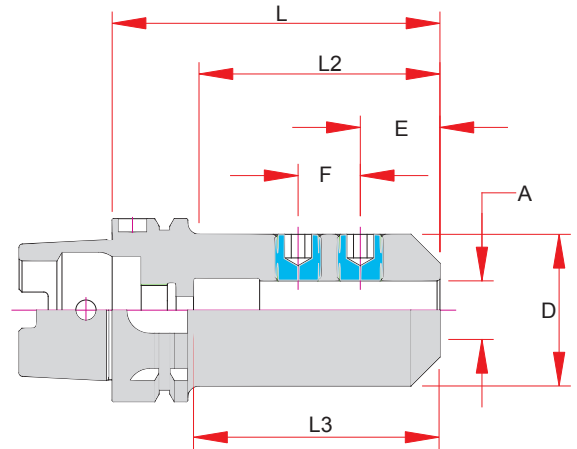


EM - End Mill Adapters

HSK63A

Features

- 3 μm - 0.0001" Bore Runout
- H5 Bore Tolerance
- Coolant Thru Center
- Balanced G6.3 @ 20,000 RPM
- Order Wrench Separately
- See page #71 for Screw Info

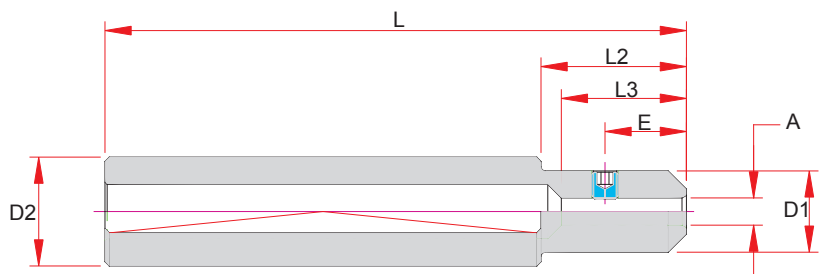


	Part Number	A Bore	L Projection	D	E	F	L2	L3	Screw #
1/8	HSK63A-EM012-0250	0.1250	2.50	1.00	0.19	-	1.28	1.63	3
3/16	HSK63A-EM018-0250	0.1875	2.50	1.00	0.44	-	1.28	1.63	
1/4	HSK63A-EM025-0250	0.2500	2.50	1.00	0.44	-	1.28	1.63	4
5/16	HSK63A-EM031-0250	0.3125	2.50	1.00	0.44	-	1.28	1.63	
3/8	HSK63A-EM037-0250	0.3750	2.50	1.00	0.75	-	1.28	1.50	5
1/2	HSK63A-EM050-0315	0.5000	3.15	1.25	0.88	-	1.93	2.10	6
5/8	HSK63A-EM062-0315	0.6250	3.15	1.50	0.94	-	1.93	2.10	7
3/4	HSK63A-EM075-0315	0.7500	3.15	1.75	1.00	-	2.08	1.97	8
1	HSK63A-EM100-0400	1.0000	4.00	2.00	1.12	1.00	2.94	2.95	(2) 10
1 1/4	HSK63A-EM125-0435	1.2500	4.35	2.50	1.12	1.00	3.32	3.23	(2) 11

Straight Shank

Features:

- Coolant Thru
- Flats for Lathe Applications
- See page #71 for Screw Info



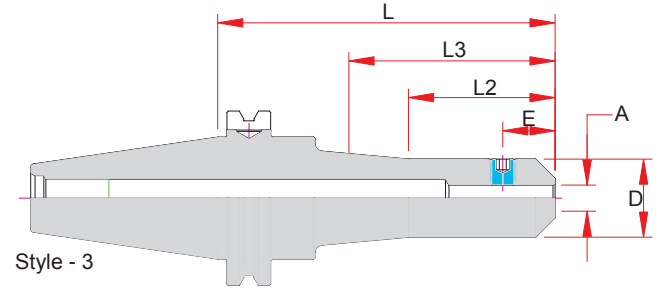
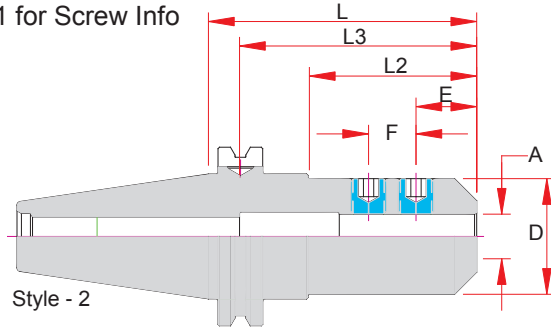
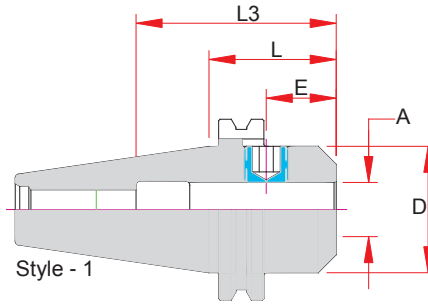
	Part Number	A	D1	D2	E	L	L2	L3	Screw #
1/8	S075-EM012-0600	0.1250	0.50	0.7500	0.19	6.00	2.00	0.63	1
3/16	S075-EM018-0600	0.1875	0.56	0.7500	0.44	6.00	2.00	0.87	2
1/4	S075-EM025-0600	0.2500	0.75	0.7500	0.59	6.00	-	1.10	4
5/16	S075-EM031-0600	0.3125	0.75	0.7500	0.44	6.00	-	1.26	4
3/8	S100-EM037-0600	0.3750	1.00	1.0000	0.75	6.00	-	1.26	5
1/2	S100-EM050-0600	0.5000	1.00	1.0000	0.39 & 0.98	6.00	-	1.50	(2) 4

EM - End Mill Adapters

CAT40

Features

- 3 μm - 0.0001" Bore Runout
- H5 Bore Tolerance
- Coolant Thru Center
- DIN AD+B Flange Coolant Standard
- Balanced G6.3 @ 20,000 RPM
- Order Wrench Separately
- See page #71 for Screw Info



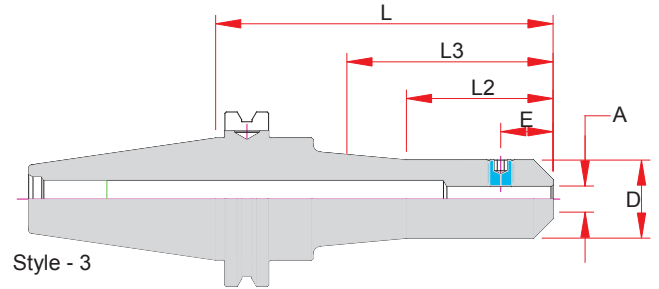
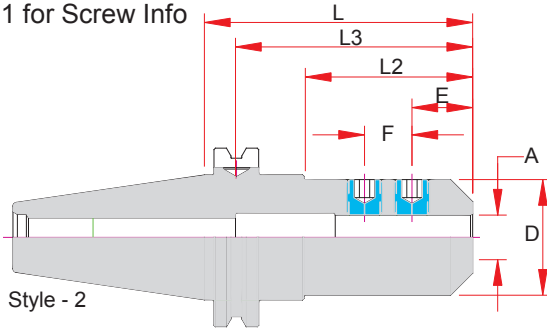
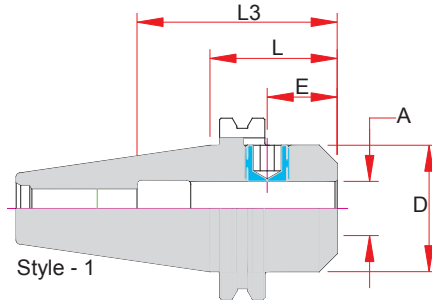
Part Number	A - Bore	L - Projection	D	E	F	L2	L3	Screw #	Style
1/8 CAT40-EM012-0175	0.1250	1.75	0.69	0.19	-	0.80	3.32	3	1
1/8 CAT40-EM012-0250	0.1250	2.50	0.69	0.19	-	0.92	4.07	3	2
1/8 CAT40-EM012-0400	0.1250	4.00	1.00	0.19	-	2.42	5.57	3	2
1/8 CAT40-EM012-0500	0.1250	5.00	1.00	0.19	-	1.57	6.57	3	3
1/8 CAT40-EM012-0600	0.1250	6.00	1.00	0.19	-	1.57	7.57	3	3
3/16 CAT40-EM018-0175	0.1875	1.75	0.69	0.44	-	0.88	3.32	3	1
3/16 CAT40-EM018-0250	0.1875	2.50	0.69	0.44	-	0.92	4.07	3	2
3/16 CAT40-EM018-0400	0.1875	4.00	1.00	0.44	-	2.42	5.57	3	2
3/16 CAT40-EM018-0600	0.1875	6.00	1.00	0.44	-	2.50	7.57	3	3
1/4 CAT40-EM025-0175	0.2500	1.75	0.88	0.44	-	0.80	3.32	4	1
1/4 CAT40-EM025-0250	0.2500	2.50	0.88	0.44	-	0.92	4.07	4	2
1/4 CAT40-EM025-0400	0.2500	4.00	1.00	0.44	-	2.42	5.57	4	2
1/4 CAT40-EM025-0500	0.2500	5.00	1.00	0.44	-	2.50	6.57	4	3
1/4 CAT40-EM025-0600	0.2500	6.00	1.00	0.44	-	2.50	7.57	4	3
5/16 CAT40-EM031-0175	0.3125	1.75	1.00	0.44	-	0.88	3.32	4	1
5/16 CAT40-EM031-0250	0.3125	2.50	1.00	0.44	-	0.92	4.07	4	2
5/16 CAT40-EM031-0400	0.3125	4.00	1.00	0.44	-	2.42	5.57	4	2
5/16 CAT40-EM031-0600	0.3125	6.00	1.00	0.44	-	3.00	7.57	4	3
3/8 CAT40-EM037-0175	0.3750	1.75	1.00	0.75	-	0.88	4.07	5	1
3/8 CAT40-EM037-0250	0.3750	2.50	1.00	0.75	-	1.00	4.07	5	2
3/8 CAT40-EM037-0400	0.3750	4.00	1.00	0.75	-	2.50	5.57	5	2
3/8 CAT40-EM037-0450	0.3750	4.50	1.00	0.75	-	1.00	6.07	5	3
3/8 CAT40-EM037-0500	0.3750	5.00	1.00	0.75	-	1.00	6.57	5	3
3/8 CAT40-EM037-0600	0.3750	6.00	1.00	0.75	-	2.50	7.57	5	3
7/16 CAT40-EM043-0250	0.4375	2.50	1.25	0.75	-	1.00	4.07	5	2
1/2 CAT40-EM050-0175	0.5000	1.75	1.75	0.88	-	0.96	3.32	6	1
1/2 CAT40-EM050-0250	0.5000	2.50	1.25	0.88	-	1.00	4.07	6	2
1/2 CAT40-EM050-0262	0.5000	2.62	1.25	0.88	-	1.12	4.19	6	2
1/2 CAT40-EM050-0400	0.5000	4.00	1.25	0.88	-	2.58	5.57	6	2
1/2 CAT40-EM050-0462	0.5000	4.62	1.25	0.88	-	3.20	6.19	6	2
1/2 CAT40-EM050-0500	0.5000	5.00	1.25	0.88	-	3.50	6.57	6	2
1/2 CAT40-EM050-0600	0.5000	6.00	1.25	0.88	-	3.00	7.57	6	3

EM - End Mill Adapters

CAT40

Features

- **3 μm - 0.0001" Bore Runout**
- H5 Bore Tolerance
- Coolant Thru Center
- DIN AD+B Flange Coolant Standard
- Balanced G6.3 @ 20,000 RPM
- Order Wrench Separately
- See page #71 for Screw Info



	Part Number	A - Bore	L - Projection	D	E	F	L2	L3	Screw #	Style
5/8	CAT40-EM062-0175	0.6250	1.75	1.75	0.94	-	0.95	3.25	7	1
5/8	CAT40-EM062-0250	0.6250	2.50	1.50	0.94	-	1.70	3.62	7	2
5/8	CAT40-EM062-0300	0.6250	3.00	1.50	0.94	-	1.50	3.50	7	2
5/8	CAT40-EM062-0400	0.6250	4.00	1.50	0.94	-	2.50	3.50	7	2
5/8	CAT40-EM062-0500	0.6250	5.00	1.50	0.94	-	3.50	3.50	7	2
5/8	CAT40-EM062-0600	0.6250	6.00	1.50	0.94	-	4.50	3.50	7	2
3/4	CAT40-EM075-0175	0.7500	1.75	1.75	1.00	-	0.95	3.23	8	1
3/4	CAT40-EM075-0250	0.7500	2.50	1.75	1.00	-	1.70	3.94	8	2
3/4	CAT40-EM075-0300	0.7500	3.00	1.75	1.00	-	2.20	3.94	8	2
3/4	CAT40-EM075-0350	0.7500	3.50	1.75	1.00	-	2.70	3.94	8	2
3/4	CAT40-EM075-0400	0.7500	4.00	1.75	1.00	-	3.20	3.94	8	2
3/4	CAT40-EM075-0500	0.7500	5.00	1.75	1.00	-	4.20	3.94	8	2
3/4	CAT40-EM075-0600	0.7500	6.00	1.75	1.00	-	5.20	3.94	8	2
7/8	CAT40-EM087-0175	0.8750	1.75	1.75	1.00	-	0.95	2.38	8	1
7/8	CAT40-EM087-0350	0.8750	3.50	1.75	1.00	0.81	2.70	4.25	8	2
7/8	CAT40-EM087-0600	0.8750	6.00	1.88	1.00	0.81	5.24	4.25	8	2
1	CAT40-EM100-0175	1.0000	1.75	1.75	1.12	-	0.95	2.38	9	1
1	CAT40-EM100-0300	1.0000	3.00	2.00	1.12	1.00	2.24	3.15	9 & 10	2
1	CAT40-EM100-0400	1.0000	4.00	2.00	1.12	1.00	3.24	4.50	(2) 10	2
1	CAT40-EM100-0500	1.0000	5.00	2.00	1.12	1.00	4.24	4.50	(2) 10	2
1	CAT40-EM100-0600	1.0000	6.00	2.00	1.12	1.00	5.24	4.50	(2) 10	2
1 1/4	CAT40-EM125-0200**	1.2500	2.00	2.25**	1.12	-	1.20	2.38	9	1
1 1/4	CAT40-EM125-0400	1.2500	4.00	2.50	1.12	1.00	3.24	3.54	(2) 11	2
1 1/4	CAT40-EM125-0425	1.2500	4.25	2.50	1.12	1.00	3.49	3.54	(2) 11	2
1 1/4	CAT40-EM125-0600	1.2500	6.00	2.50	1.12	1.00	5.24	3.54	(2) 11	2
1 1/2	CAT40-EM150-0400	1.5000	4.00	2.62	1.12	1.00	3.24	2.52	(2) 11	2
1 1/2	CAT40-EM150-0462	1.5000	4.62	2.62	1.12	1.00	3.86	2.52	(2) 11	2
1 1/2	CAT40-EM150-0600	1.5000	6.00	2.62	1.12	1.00	5.24	3.15	(2) 11	2

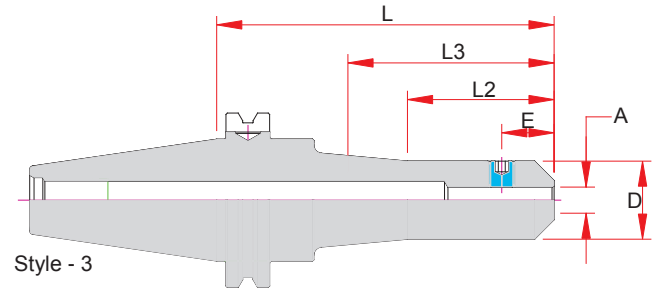
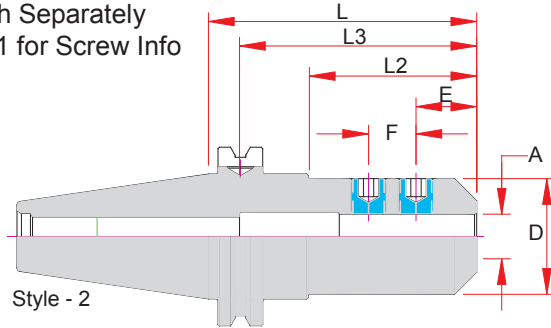
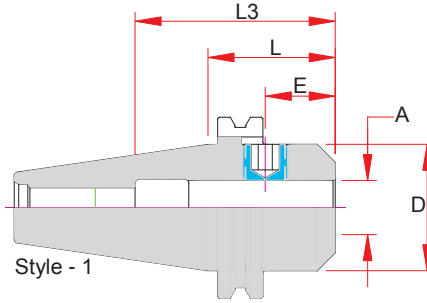
** No DIN AD+B Option Available - No ANSI Safety Area due to bore size.

EM - End Mill Adapters

CAT50

Features

- 3 μm - 0.0001" Bore Runout
- H5 Bore Tolerance
- Coolant Thru Center
- DIN AD+B Flange Coolant Standard
(* 15" Projection Holders additional fee)
- Balanced G6.3 @ 15,000 RPM
- Order Wrench Separately
- See page #71 for Screw Info



	Part Number	A - Bore	L Projection	D	E	F	L2	L3	Screw #	Style
	1/8 CAT50-EM012-0250	0.1250	2.50	0.69	0.19	-	0.92	4.75	3	2
	1/8 CAT50-EM012-0531	0.1250	5.31	0.69	0.19	-	1.57	7.56	3	3
	3/16 CAT50-EM018-0250	0.1875	2.50	0.69	0.44	-	0.92	4.75	3	2
	3/16 CAT50-EM018-0531	0.1875	5.31	0.69	0.44	-	1.57	7.56	3	3
	1/4 CAT50-EM025-0250	0.2500	2.50	0.88	0.44	-	0.92	4.75	4	2
	1/4 CAT50-EM025-0400	0.2500	4.00	0.88	0.44	-	2.42	6.25	4	2
	1/4 CAT50-EM025-0531	0.2500	5.31	0.88	0.44	-	1.57	7.56	4	3
	1/4 CAT50-EM025-0600	0.2500	6.00	0.88	0.44	-	1.57	8.25	4	3
	5/16 CAT50-EM031-0250	0.3125	2.50	1.00	0.44	-	1.00	4.75	4	2
	5/16 CAT50-EM031-0400	0.3125	4.00	1.00	0.44	-	2.42	6.25	4	2
	5/16 CAT50-EM031-0531	0.3125	5.31	1.00	0.44	-	1.57	7.56	4	3
	5/16 CAT50-EM031-0600	0.3125	6.00	1.00	0.44	-	1.57	8.25	4	3
	3/8 CAT50-EM037-0250	0.3750	2.50	1.00	0.75	-	1.00	4.75	5	2
	3/8 CAT50-EM037-0300	0.3750	3.00	1.00	0.75	-	1.42	5.25	5	2
	3/8 CAT50-EM037-0400	0.3750	4.00	1.00	0.75	-	2.42	6.25	5	2
	3/8 CAT50-EM037-0450	0.3750	4.50	1.00	0.75	-	2.92	6.75	5	2
	3/8 CAT50-EM037-0600	0.3750	6.00	1.00	0.75	-	3.00	8.25	5	3
	3/8 CAT50-EM037-0650	0.3750	6.50	1.00	0.75	-	3.00	8.75	5	3
	3/8 CAT50-EM037-0800	0.3750	8.00	1.00	0.75	-	3.00	10.25	5	3
	3/8 CAT50-EM037-1000	0.3750	10.00	1.00	0.75	-	3.00	12.25	5	3
	3/8 CAT50-EM037-1200	0.3750	12.00	1.00	0.75	-	3.00	14.25	5	3
	3/8 CAT50-EM037-1500 **	0.3750	15.00	1.00	0.75	-	3.00	17.25	5	3
	7/16 CAT50-EM043-0262	0.4375	2.62	1.25	0.88	-	1.12	4.87	5	2
	7/16 CAT50-EM043-0400	0.4375	4.00	1.25	0.88	-	2.42	6.25	5	2
	7/16 CAT50-EM043-0600	0.4375	6.00	1.25	0.88	-	1.96	8.25	5	3
	1/2 CAT50-EM050-0262	0.5000	2.62	1.25	0.88	-	1.20	4.87	6	2
	1/2 CAT50-EM050-0300	0.5000	3.00	1.25	0.88	-	1.42	5.25	6	2
	1/2 CAT50-EM050-0400	0.5000	4.00	1.25	0.88	-	2.42	6.25	6	2
	1/2 CAT50-EM050-0462	0.5000	4.62	1.25	0.88	-	3.04	6.87	6	2
	1/2 CAT50-EM050-0600	0.5000	6.00	1.25	0.88	-	3.13	8.25	6	3
	1/2 CAT50-EM050-0662	0.5000	6.62	1.25	0.88	-	3.13	8.87	6	3
	1/2 CAT50-EM050-0800	0.5000	8.00	1.25	0.88	-	3.13	10.25	6	3
	1/2 CAT50-EM050-1000	0.5000	10.00	1.25	0.88	-	3.13	12.25	6	3
	1/2 CAT50-EM050-1200	0.5000	12.00	1.25	0.88	-	3.13	14.25	6	3
	1/2 CAT50-EM050-1500 **	0.5000	15.00	1.25	0.88	-	3.13	17.25	6	3

EM - End Mill Adapters

CAT50

Continued ...

	Part Number	A - Bore	L Projection	D	E	F	L2	L3	Screw #	Style
9/16	CAT50-EM056-0262	0.5625	2.62	1.50	0.88	-	1.12	4.87	6	2
5/8	CAT50-EM062-0300	0.6250	3.00	1.50	0.94	-	1.50	5.25	7	2
5/8	CAT50-EM062-0375	0.6250	3.75	1.50	0.94	-	2.25	6.00	7	2
5/8	CAT50-EM062-0400	0.6250	4.00	1.50	0.94	-	2.50	6.25	7	2
5/8	CAT50-EM062-0600	0.6250	6.00	1.50	0.94	-	4.42	8.25	7	2
5/8	CAT50-EM062-0775	0.6250	7.75	1.50	0.94	-	4.25	10.00	7	3
3/4	CAT50-EM075-0175	0.7500	1.75	1.75	1.00	-	0.25	2.76	8	1
3/4	CAT50-EM075-0300	0.7500	3.00	1.75	1.00	-	1.50	3.86	8	2
3/4	CAT50-EM075-0375	0.7500	3.75	1.75	1.00	-	2.25	4.00	8	2
3/4	CAT50-EM075-0400	0.7500	4.00	1.75	1.00	-	2.50	3.94	8	2
3/4	CAT50-EM075-0575	0.7500	5.75	1.75	1.00	-	4.17	3.94	8	2
3/4	CAT50-EM075-0600	0.7500	6.00	1.75	1.00	-	1.96	3.94	8	3
3/4	CAT50-EM075-0800	0.7500	8.00	1.75	1.00	-	1.96	3.94	8	3
3/4	CAT50-EM075-1000	0.7500	10.00	1.75	1.00	-	1.96	3.94	8	3
3/4	CAT50-EM075-1200	0.7500	12.00	1.75	1.00	-	1.96	3.94	8	3
3/4	CAT50-EM075-1500 **	0.7500	15.00	1.75	1.00	-	1.96	N/A	8	3
7/8	CAT50-EM087-0350	0.8750	3.50	1.88	1.00	0.81	2.00	4.19	8	2
7/8	CAT50-EM087-0600	0.8750	6.00	1.88	1.00	0.81	4.42	4.06	8	2
7/8	CAT50-EM087-0775	0.8750	7.75	1.88	1.00	0.81	6.17	4.06	8	2
1	CAT50-EM100-0162	1.0000	1.62	2.75	1.12	-	0.62	2.50	10	1
1	CAT50-EM100-0300	1.0000	3.00	2.00	1.12	-	1.50	4.44	10	1
1	CAT50-EM100-0400	1.0000	4.00	2.00	1.12	1.00	2.54	4.44	(2) 10	2
1	CAT50-EM100-0600	1.0000	6.00	2.00	1.12	1.00	4.50	4.44	(2) 10	2
1	CAT50-EM100-0800	1.0000	8.00	2.00	1.12	1.00	6.50	4.44	(2) 10	2
1	CAT50-EM100-1000	1.0000	10.00	2.00	1.12	1.00	4.50	4.44	(2) 10	3
1 1/4	CAT50-EM125-0200	1.2500	2.00	2.75	1.50	-	1.20	3.50	11	1
1 1/4	CAT50-EM125-0300	1.2500	3.00	2.75	1.12	1.00	2.20	3.50	(2) 11	2
1 1/4	CAT50-EM125-0400	1.2500	4.00	2.75	1.12	1.00	2.58	3.35	(2) 11	2
1 1/4	CAT50-EM125-0600	1.2500	6.00	2.75	1.12	1.00	4.58	3.35	(2) 11	2
1 1/4	CAT50-EM125-0800	1.2500	8.00	2.75	1.12	1.00	6.58	3.35	(2) 11	2
1 1/4	CAT50-EM125-1000	1.2500	10.00	2.75	1.12	1.00	8.58	3.35	(2) 11	2
1 1/2	CAT50-EM150-0225	1.5000	2.25	2.75	1.50	-	1.45	2.44	11	1
1 1/2	CAT50-EM150-0400	1.5000	4.00	2.75	1.12	1.00	3.20	4.50	(2) 11	2
1 1/2	CAT50-EM150-0600	1.5000	6.00	2.75	1.12	1.00	5.20	4.50	(2) 11	2
1 1/2	CAT50-EM150-0800	1.5000	8.00	2.75	1.12	1.00	7.20	4.50	(2) 11	2
1 1/2	CAT50-EM150-1000	1.5000	10.00	2.75	1.12	1.00	9.20	4.50	(2) 11	2
2	CAT50-EM200-0362 **	2.0000	3.62	3.75	1.41	1.50	2.82	3.66	12 & 13	2
2	CAT50-EM200-0562	2.0000	5.62	3.75	1.41	1.50	4.86	4.13	(2) 13	2
2	CAT50-EM200-0800	2.0000	8.00	3.75	1.41	1.50	7.24	4.13	(2) 13	2
2	CAT50-EM200-1000	2.0000	10.00	3.75	1.41	1.50	9.24	4.13	(2) 13	2
2 1/2	CAT50-EM250-0650	2.5000	6.50	4.00	1.50	1.56	5.74	4.00	(2) 13	2

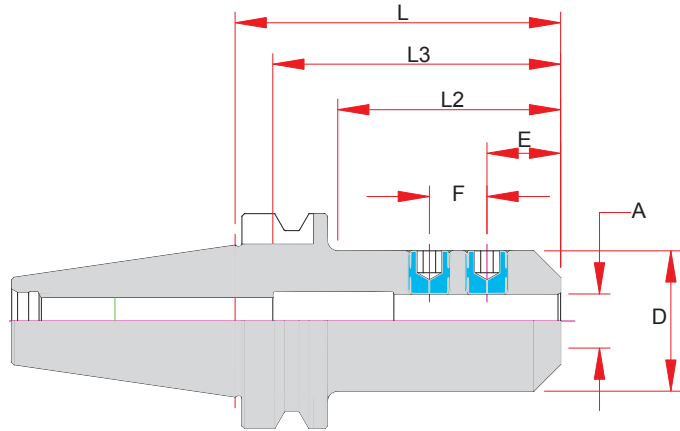
** No DIN AD+B Option Available - No ANSI Safety Area due to bore size. Check Tool Change Clearance prior to ordering.

EM - End Mill Adapters

BT30 End Mill Adapters

Features

- 3 μm - 0.0001" Bore Runout
- H5 Bore Tolerance
- Coolant Thru Center
- Balanced G6.3 @ 20,000 RPM
- Order Wrench Separately
- See page #71 for Screw Info



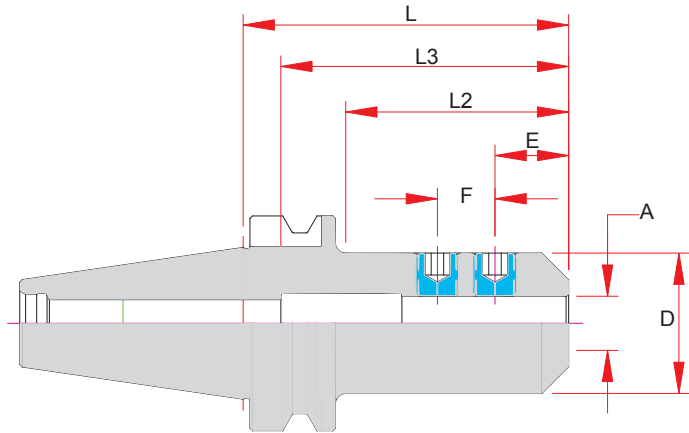
	Part Number	A Bore	L Projection	D	E	F	L2	L3	Screw #
1/8	BT30-EM012-0236	0.1250	2.36	0.75	0.38	-	1.37	3.32	3
1/8	BT30-EM012-0400	0.1250	4.00	0.75	0.38	-	3.00	4.96	3
3/16	BT30-EM018-0236	0.1875	2.36	0.75	0.50	-	1.37	3.32	4
3/16	BT30-EM018-0400	0.1875	4.00	0.75	0.50	-	3.00	4.96	4
1/4	BT30-EM025-0236	0.2500	2.36	0.81	0.38	-	1.37	3.32	4
1/4	BT30-EM025-0400	0.2500	4.00	0.81	0.38	-	3.00	4.96	4
5/16	BT30-EM031-0236	0.3125	2.36	1.00	0.60	-	1.37	3.32	4
5/16	BT30-EM031-0400	0.3125	4.00	1.00	0.60	-	3.00	2.96	4
3/8	BT30-EM037-0236	0.3750	2.36	1.38	0.75	-	1.37	2.36	5
3/8	BT30-EM037-0400	0.3750	4.00	1.38	0.75	-	3.00	2.36	5
1/2	BT30-EM050-0236	0.5000	2.36	1.38	0.88	-	1.37	2.56	6
1/2	BT30-EM050-0400	0.5000	4.00	1.38	0.88	-	3.00	2.56	6
5/8	BT30-EM062-0236	0.6250	2.36	1.44	0.94	-	1.37	2.25	7
5/8	BT30-EM062-0400	0.6250	4.00	1.44	0.94	-	3.00	2.25	7
3/4	BT30-EM075-0236	0.7500	2.36	2.00	1.00	-	1.57	2.56	8
3/4	BT30-EM075-0400	0.7500	4.00	2.00	1.00	-	3.21	2.56	8
7/8	BT30-EM087-0354	0.8750	3.54	2.00	1.00	0.81	2.75	3.15	(2) 8
1	BT30-EM100-0275	1.0000	2.75	2.38	1.12	-	1.96	2.50	10

EM - End Mill Adapters

BT40 End Mill Adapters

Features

- 3 μm - 0.0001" Bore Runout
- H5 Bore Tolerance
- Coolant Thru Center
- DIN AD+B Flange Coolant Standard
- Balanced G6.3 @ 20,000 RPM
- Order Wrench Separately
- See page #71 for Screw Info



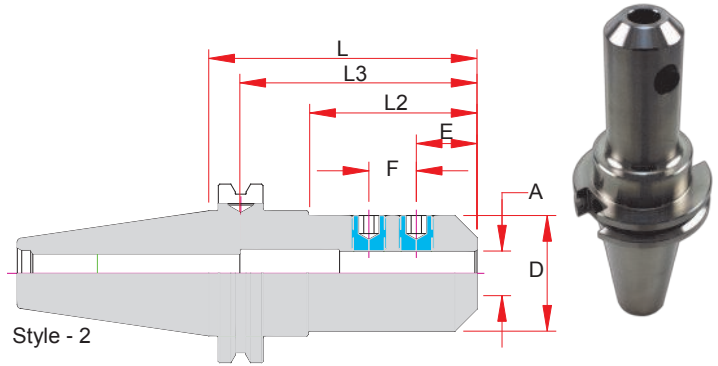
	Part Number	A Bore	L Projection	D	E	F	L2	L3	Screw #	Style
1/8	BT40-EM012-0250	0.1250	2.50	0.69	0.19	-	1.31	3.89	3	1
1/8	BT40-EM012-0400	0.1250	4.00	0.69	0.19	-	1.00	5.39	3	2
3/16	BT40-EM018-0250	0.1875	2.50	0.69	0.44	-	1.31	3.89	4	1
3/16	BT40-EM018-0400	0.1875	4.00	0.69	0.44	-	2.81	5.39	4	1
1/4	BT40-EM025-0250	0.2500	2.50	0.88	0.44	-	1.31	3.89	4	1
1/4	BT40-EM025-0400	0.2500	4.00	0.88	0.44	-	2.81	5.39	4	1
1/4	BT40-EM025-0600	0.2500	6.00	0.88	0.44	-	2.50	7.39	4	2
5/16	BT40-EM031-0250	0.3125	2.50	1.00	0.44	-	1.31	3.89	4	1
5/16	BT40-EM031-0400	0.3125	4.00	1.00	0.44	-	2.81	5.41	4	1
3/8	BT40-EM037-0250	0.3750	2.50	1.00	0.75	-	1.31	3.89	5	1
3/8	BT40-EM037-0400	0.3750	4.00	1.00	0.75	-	2.81	5.39	5	1
3/8	BT40-EM037-0600	0.3750	6.00	1.00	0.75	-	2.50	7.39	5	2
1/2	BT40-EM050-0250	0.5000	2.50	1.25	0.88	-	1.31	2.56	6	1
1/2	BT40-EM050-0400	0.5000	4.00	1.25	0.88	-	2.81	2.56	6	1
1/2	BT40-EM050-0600	0.5000	6.00	1.25	0.88	-	2.50	2.56	6	1
5/8	BT40-EM062-0250	0.6250	2.50	1.50	0.94	-	1.31	3.50	7	1
5/8	BT40-EM062-0400	0.6250	4.00	1.50	0.94	-	2.81	3.50	7	1
5/8	BT40-EM062-0600	0.6250	6.00	1.50	0.94	-	4.81	3.50	7	1
3/4	BT40-EM075-0175	0.7500	1.75	1.75	1.00	-	0.56	2.38	8	1
3/4	BT40-EM075-0250	0.7500	2.50	1.75	1.00	-	1.31	2.38	8	1
3/4	BT40-EM075-0400	0.7500	4.00	1.75	1.00	-	2.81	4.00	8	1
3/4	BT40-EM075-0600	0.7500	6.00	1.75	1.00	-	4.81	4.00	8	1
7/8	BT40-EM087-0335	0.8750	3.35	1.88	1.00	0.81	2.28	4.18	8	1
7/8	BT40-EM087-0500	0.8750	5.00	1.88	1.00	0.81	3.93	4.18	8	1
1	BT40-EM100-0200	1.0000	2.00	2.00	1.12	-	0.97	2.38	10	1
1	BT40-EM100-0300	1.0000	3.00	2.00	1.12	-	1.97	3.15	10	1
1	BT40-EM100-0400	1.0000	4.00	2.00	1.12	1.00	2.97	4.44	(2) 10	1
1	BT40-EM100-0600	1.0000	6.00	2.00	1.12	1.00	4.97	4.44	(2) 10	1
1 1/4	BT40-EM125-0200	1.2500	2.00	2.25	1.12	-	0.97	2.36	9	1
1 1/4	BT40-EM125-0356	1.2500	3.56	2.50	1.12	1.00	2.57	3.54	(2) 11	1
1 1/4	BT40-EM125-0600	1.2500	6.00	2.50	1.12	1.12	5.00	3.54	(2) 11	1
1 1/2	BT40-EM150-0433	1.5000	4.33	2.62	1.12	1.00	3.34	2.52	(2) 11	1

EM - End Mill Adapters

Metric End Mill Adapters

Features

- **3 μm - 0.0001" Bore Runout**
- H5 Bore Tolerance
- Coolant Thru Center
- DIN AD+B Flange Coolant Standard
- Dynamically Balanced
 - 40 Tapers - G6.3 @ 20,000 RPM
 - 50 Tapers - G6.3 @ 15,000 RPM
- Order Wrench Separately
- See page #71 for Screw Info

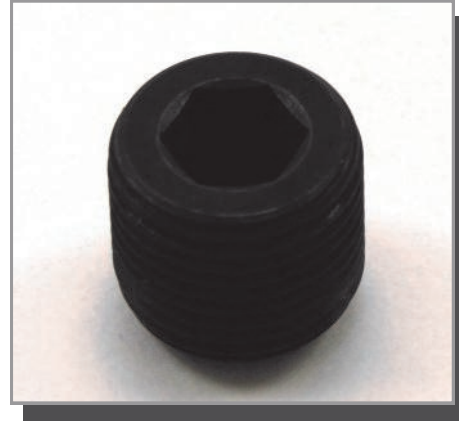


Bore Size	Part Number	A - Bore	L - Projection	D	E	F	L2	L3	Screw #	Style
6	CAT40-EMM06-0250	6.00	2.50	0.88	0.71	-			14	2
8	CAT40-EMM08-0250	8.00	2.50	1.00	0.71	-			15	2
10	CAT40-EMM10-0250	10.00	2.50	1.00	0.79	-			16	2
12	CAT40-EMM12-0250	12.00	2.50	1.25	0.89	-			17	2
16	CAT40-EMM16-0250	16.00	2.50	1.50	0.95	-			18	2
20	CAT40-EMM20-0300	20.00	3.00	1.75	0.95	-			19	2
25	CAT40-EMM25-0400	25.00	4.00	2.00	0.95	0.98			(2) 20	2
32	CAT40-EMM32-0400	32.00	4.00	2.50	0.95	1.10			(2) 21	2
6	CAT50-EMM06-0250	6.00	2.50	0.88	0.71	-			14	2
8	CAT50-EMM08-0250	8.00	2.50	1.00	0.71	-			15	2
10	CAT50-EMM10-0250	10.00	2.50	1.00	0.79	-			16	2
12	CAT50-EMM12-0263	12.00	2.63	1.25	0.89	-			17	2
16	CAT50-EMM16-0300	16.00	3.00	1.50	0.95	-			18	2
20	CAT50-EMM20-0300	20.00	3.00	1.75	0.95	-			19	2
25	CAT50-EMM25-0400	25.00	4.00	2.00	0.95	0.98			(2) 20	2
32	CAT50-EMM32-0400	32.00	4.00	2.50	0.95	1.10			(2) 21	2

EM - End Mill Screws

Control Point End Mill Adapter Screws

- Exceeds industry standard for material and heat treat
- Ground control point for angular locking
- Use holder part number to verify screw size and length



Screw #	Part Number	End Mill Bore Size	Thread	OD Screw	Length	Hex	Max. Torque ft/lbs
1	SCW-EM01	1/8	#6-32	0.14	0.19	1/16	1
2	SCW-EM02	3/16	#8-32	0.16	0.19	5/64	2
3	SCW-EM03	1/8	#10-32	0.19	0.25	3/32	3
4	SCW-EM04	3/16, 1/4, 5/16	1/4-28	0.25	0.25	1/8	4
5	SCW-EM05	3/8, 7/16	3/8-24	0.38	0.31	3/16	12
6	SCW-EM06	1/2	7/16-20	0.44	0.37	7/32	17
7	SCW-EM07	5/8	9/16-18	0.56	0.50	9/32	31
8	SCW-EM08	3/4, 7/8	5/8-18	0.63	0.50	5/16	48
9	SCW-EM09	1", 1-1/4 STUB	3/4-16	0.75	0.37	3/8	69
10	SCW-EM10	1", 1-1/4, 1-1/2	3/4-16	0.75	0.50	3/8	69
11	SCW-EM11	1", 1-1/4, 1-1/2	3/4-16	0.75	0.62	3/8	69
12	SCW-EM12	2", 2-1/2	1"-14	1.00	0.47	1/2	125
13	SCW-EM13	2", 2-1/2	1"-14	1.00	0.87	1/2	125
14	SCW-EM14	6mm	M6X1.0	6mm	8mm	3mm	7
15	SCW-EM15	8mm	M8X1.25	8mm	8mm	4mm	9
16	SCW-EM16	10mm	M10X1.5	10mm	7mm	5mm	12
17	SCW-EM17	12mm	M12X1.75	12mm	9mm	6mm	17
18	SCW-EM18	16mm	M14X2.0	14mm	11mm	7mm	31
19	SCW-EM19	20mm	M16X2.0	16mm	12mm	8mm	43
20	SCW-EM20	25mm	M20X2.0	20mm	12mm	10mm	69
21	SCW-EM21	32mm	M20X2.0	20mm	15mm	10mm	69

EM - Coolant End Mill Adapters

Jet-Blast Coolant

For Coolant Flow Around Solid Cutting Tools



Premium Precision 0.0001"

- Runout taper to bore within 3 Microns (0.0001") T.I.R.
- Bore ground to H5 tolerance or better!

Jet-Blast Around Solid Tool Coolant Thru

- Coolant Thru the Center
- DIN AD+B Flange Coolant Included
- **Jet-Blast** Coolant Around the Cutting Tool

Dynamically Balanced

- Dynamically Balanced
 - CAT40 - G6.3 @ 20,000 RPM
 - CAT50 - G6.3 @ 15,000 RPM

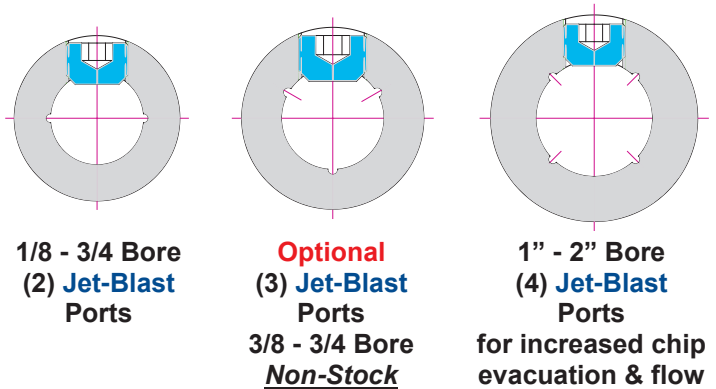
ISO AT3 Taper Tolerance

- Tapers are ground better than AT3 for optimal T.I.R.

Need a different projection?

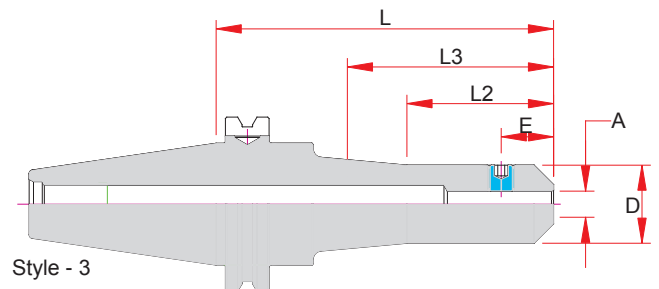
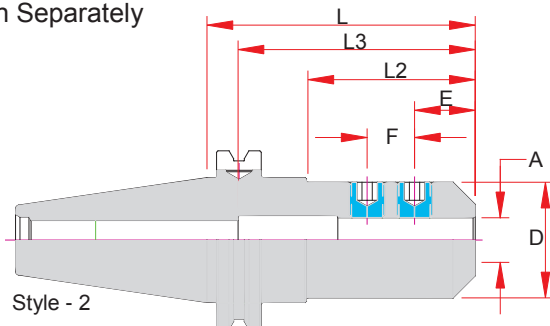
All standard PIONEER End Mill Adapters can be altered in Chicago for Jet-Blast!

Coolant Groove Configuration



Features

- 3 μ m - 0.0001" Bore Runout
- H5 Bore Tolerance
- Coolant Thru Center
- DIN AD+B Flange Coolant Standard
- Balanced G6.3 @ 20,000 RPM
- Order Wrench Separately



EM - Coolant End Mill Adapters

	Part Number	A - Bore	L - Projection	D	E	F	L2	L3	Screw	# Ports	Style
1/8	CAT40-EM012-0250-C	0.1250	2.50	0.69	0.19	-	0.92	4.07	3	2	2
1/8	CAT40-EM012-0400-C	0.1250	4.00	1.00	0.19	-	2.42	5.57	3	2	2
1/8	CAT40-EM012-0600-C **	0.1250	6.00	1.00	0.19	-	1.57	7.57	3	2	3
3/16	CAT40-EM018-0250-C	0.1875	2.50	0.69	0.44	-	0.92	4.07	3	2	2
3/16	CAT40-EM018-0400-C	0.1875	4.00	1.00	0.44	-	2.42	5.57	3	2	2
3/16	CAT40-EM018-0600-C **	0.1875	6.00	1.00	0.44	-	2.50	7.57	3	2	3
1/4	CAT40-EM025-0250-C	0.2500	2.50	0.88	0.44	-	0.92	4.07	4	2	2
1/4	CAT40-EM025-0400-C	0.2500	4.00	1.00	0.44	-	2.42	5.57	4	2	2
1/4	CAT40-EM025-0600-C	0.2500	6.00	1.00	0.44	-	2.50	7.57	4	2	3
5/16	CAT40-EM031-0250-C	0.3125	2.50	1.00	0.44	-	0.92	4.07	4	2	2
5/16	CAT40-EM031-0400-C	0.3125	4.00	1.00	0.44	-	2.42	5.57	4	2	2
5/16	CAT40-EM031-0600-C **	0.3125	6.00	1.00	0.44	-	3.00	7.75	4	2	3
3/8	CAT40-EM037-0250-C	0.3750	2.50	1.00	0.75	-	1.00	4.07	5	2	2
3/8	CAT40-EM037-0400-C	0.3750	4.00	1.00	0.75	-	2.50	5.57	5	2	2
3/8	CAT40-EM037-0600-C	0.3750	6.00	1.00	0.75	-	2.50	7.57	5	2	3
1/2	CAT40-EM050-0250-C	0.5000	2.50	1.25	0.88	-	1.00	4.07	6	2	2
1/2	CAT40-EM050-0400-C	0.5000	4.00	1.25	0.88	-	2.58	5.57	6	2	2
1/2	CAT40-EM050-0600-C	0.5000	6.00	1.25	0.88	-	3.00	7.57	6	2	3
5/8	CAT40-EM062-0250-C	0.6250	2.50	1.50	0.94	-	1.70	3.62	7	2	2
5/8	CAT40-EM062-0400-C	0.6250	4.00	1.50	0.94	-	2.50	3.50	7	2	2
5/8	CAT40-EM062-0600-C **	0.6250	6.00	1.50	0.94	-	4.50	3.50	7	2	2
3/4	CAT40-EM075-0250-C	0.7500	2.50	1.75	1.00	-	1.70	3.94	8	2	2
3/4	CAT40-EM075-0400-C	0.7500	4.00	1.75	1.00	-	3.20	3.94	8	2	2
3/4	CAT40-EM075-0600-C	0.7500	6.00	1.75	1.00	-	5.20	3.94	8	2	2
1	CAT40-EM100-0400-C	1.0000	4.00	2.00	1.12	1.00	3.24	4.50	(2) 10	4	2
1	CAT40-EM100-0600-C **	1.0000	6.00	2.00	1.12	1.00	5.24	4.50	(2) 10	4	2
1 1/4	CAT40-EM125-0400-C	1.2500	4.00	2.50	1.12	1.00	3.24	3.54	(2) 11	4	2
1 1/4	CAT40-EM125-0600-C	1.2500	6.00	2.50	1.12	1.00	5.24	3.54	(2) 11	4	2
1 1/2	CAT40-EM150-0400-C	1.5000	4.00	2.62	1.12	1.00	3.24	2.52	(2) 11	4	2
1/4	CAT50-EM025-0400-C	0.2500	4.00	0.88	0.44	-	2.42	6.25	3	4	2
1/4	CAT50-EM025-0600-C	0.2500	6.00	0.88	0.44	-	1.57	8.25	3	4	3
3/8	CAT50-EM037-0400-C	0.3750	4.00	1.00	0.75	-	2.42	6.25	5	4	2
3/8	CAT50-EM037-0600-C	0.3750	6.00	1.00	0.75	-	3.00	8.25	5	4	3
3/8	CAT50-EM037-0800-C	0.3750	8.00	1.00	0.75	-	3.00	10.25	5	4	3
1/2	CAT50-EM050-0400-C	0.5000	4.00	1.25	0.88	-	2.42	6.25	6	4	2
1/2	CAT50-EM050-0600-C	0.5000	6.00	1.25	0.88	-	3.13	8.25	6	4	3
1/2	CAT50-EM050-0800-C	0.5000	8.00	1.25	0.88	-	3.13	10.25	6	4	3
5/8	CAT50-EM062-0400-C	0.6250	4.00	1.50	0.94	-	2.50	6.25	7	4	2
5/8	CAT50-EM062-0600-C	0.6250	6.00	1.50	0.94	-	4.25	10.00	7	4	2
3/4	CAT50-EM075-0400-C	0.7500	4.00	1.75	1.00	-	2.50	3.94	8	4	2
3/4	CAT50-EM075-0600-C	0.7500	6.00	1.75	1.00	-	1.96	3.94	8	4	3
3/4	CAT50-EM075-0800-C	0.7500	8.00	1.75	1.00	-	1.96	3.94	8	4	3
1	CAT50-EM100-0400-C	1.0000	4.00	2.00	1.12	1.00	2.54	4.44	(2) 10	4	2
1	CAT50-EM100-0600-C	1.0000	6.00	2.00	1.12	1.00	4.50	4.44	(2) 10	4	2
1	CAT50-EM100-0800-C	1.0000	8.00	2.00	1.12	1.00	6.50	4.44	(2) 10	4	2
1 1/4	CAT50-EM125-0400-C	1.2500	4.00	2.75	1.12	1.00	2.58	3.35	(2) 11	4	2
1 1/4	CAT50-EM125-0600-C	1.2500	6.00	2.75	1.12	1.00	4.58	3.35	(2) 11	4	2
1 1/4	CAT50-EM125-0800-C	1.2500	8.00	2.75	1.12	1.00	6.58	3.35	(2) 11	4	2
1 1/2	CAT50-EM150-0400-C	1.5000	4.00	2.75	1.12	1.00	3.20	4.50	(2) 11	4	2
1 1/2	CAT50-EM150-0600-C **	1.5000	6.00	2.75	1.12	1.00	5.20	4.50	(2) 11	4	2
2	CAT50-EM200-0562-C	2.0000	5.62	3.75	1.41	1.50	4.86	4.13	(2) 13	4	2

** Check Stock Prior to Ordering

Options & Sizes for all cutter designs

Rough Milling - FX Coolant Ports for High Feed Cutters



Coolant Thru

- Coolant Thru the Center
- DIN AD+B Flange Coolant Included
- FX Coolant Ports Versions Available (See Chart)

Dynamically Balanced

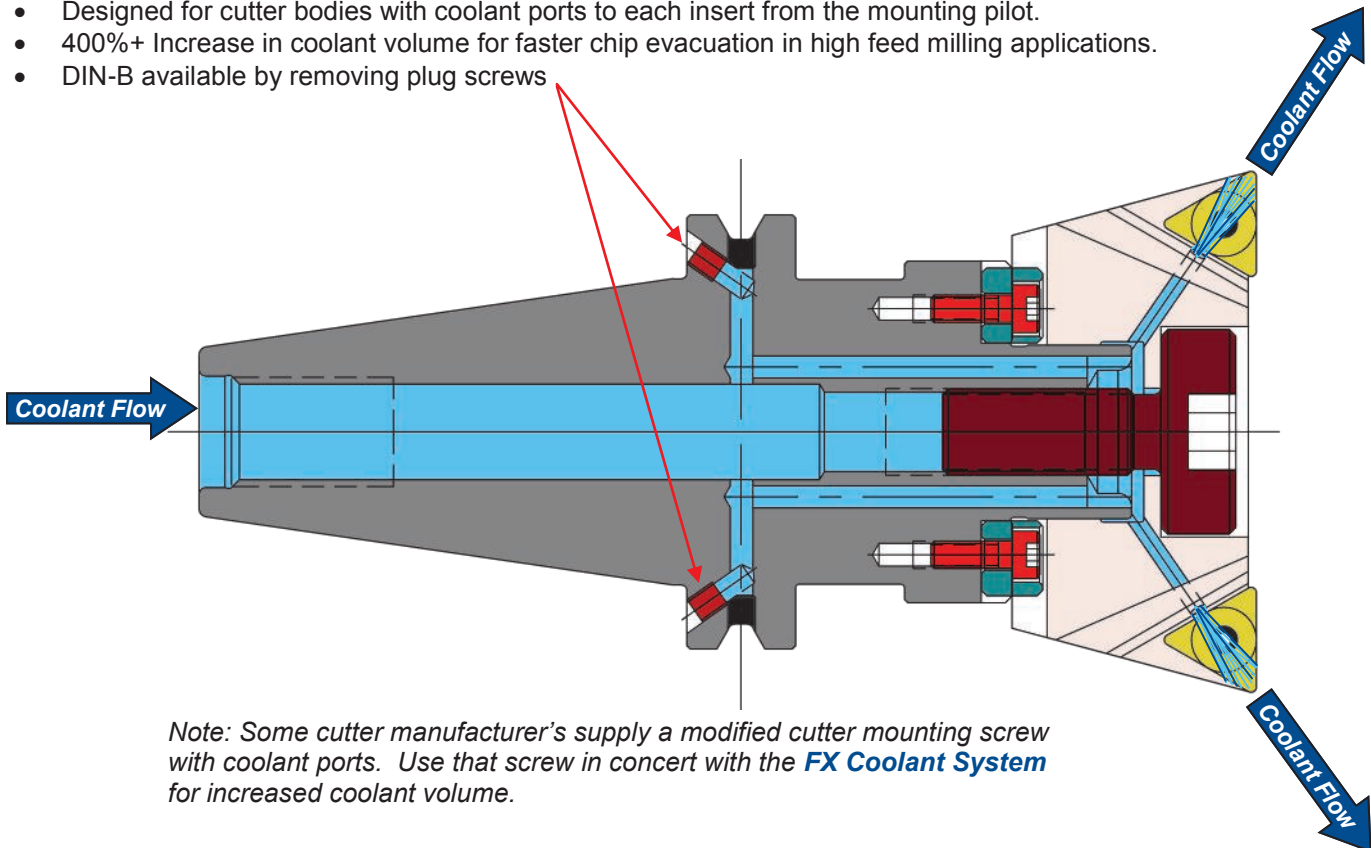
- Dynamically Balanced
 - 30, 40 & HSK63A - G6.3 @ 20,000 RPM
 - 50 & HSK100A - G6.3 @ 15,000 RPM

ISO AT3 Taper Tolerance

- Tapers are ground better than AT3 for optimal T.I.R.

FX Coolant System

- Designed for cutter bodies with coolant ports to each insert from the mounting pilot.
- 400%+ Increase in coolant volume for faster chip evacuation in high feed milling applications.
- DIN-B available by removing plug screws



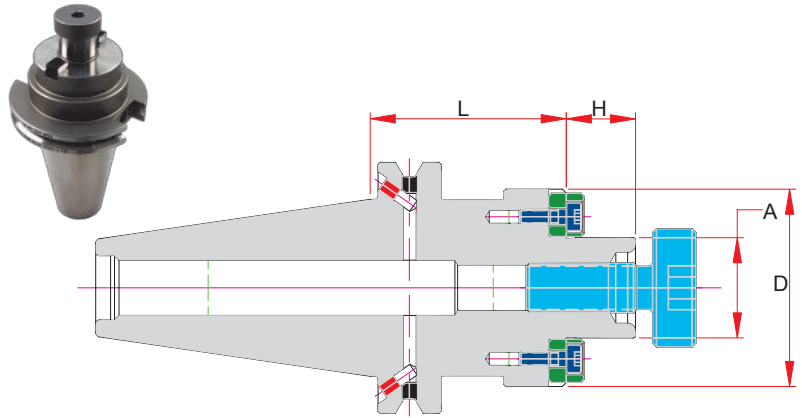
Note: Some cutter manufacturer's supply a modified cutter mounting screw with coolant ports. Use that screw in concert with the FX Coolant System for increased coolant volume.

SM - Shell Mill Adapters

CAT40 & 50

Features

- Body - Coolant Thru Center
- DIN AD+B Flange Coolant Standard
- Balanced G6.3 @ 20,000 RPM
- Order Wrench Separately
- FX Option Available, Add -F to the part number:
 - -F = Normally Stocked
 - BOD = Build on Demand



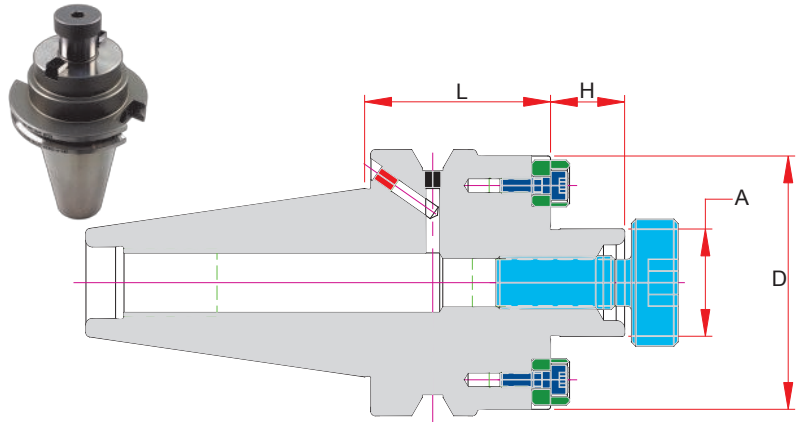
Pilot Size	Part Number	Standard	FX Ported Coolant	A Pilot	L Proj.	D	H	Drive Key Size	Drive Key#	Mounting Screw Thread	Mounting Screw#
3/4	CAT40-SM075-0175	Y	-F	0.75	1.75	1.75	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
3/4	CAT40-SM075-0400	Y	-F	0.75	4.00	1.75	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
3/4	CAT40-SM075-0600	Y	-F	0.75	6.00	1.75	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
3/4	CAT40-SM075-0800	Y	BOD	0.75	8.00	1.75	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
1"	CAT40-SM100-0200	Y	-F	1.00	2.00	1.97	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1"	CAT40-SM100-0400	Y	-F	1.00	4.00	2.36	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1"	CAT40-SM100-0600	Y	BOD	1.00	6.00	2.36	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1"	CAT40-SM100-0800	Y	BOD	1.00	8.00	2.36	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1-1/4	CAT40-SM125-0225	Y	-F	1.25	2.25	2.87	0.69	0.500	DK-SM125	5/8-18	SCW-SM125
1-1/2	CAT40-SM150-0240	Y	-F	1.50	2.40	3.82	0.94	0.625	DK-SM150	3/4-16	SCW-SM150
2"	CAT40-SM200-0240	Y	-F	2.00	2.40	4.37	0.94	0.750	DK-SM200	1"-14	SCW-SM200
3/4	CAT50-SM075-0150	Y	-F	0.75	1.50	1.75	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
3/4	CAT50-SM075-0350	Y	-F	0.75	3.50	1.75	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
3/4	CAT50-SM075-0550	Y	-F	0.75	5.50	1.75	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
3/4	CAT50-SM075-0800	Y	BOD	0.75	8.00	1.75	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
3/4	CAT50-SM075-1000	Y	BOD	0.75	10.00	1.75	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
3/4	CAT50-SM075-1200	Y	BOD	0.75	12.00	1.75	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
1"	CAT50-SM100-0200	Y	-F	1.00	2.00	2.36	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1"	CAT50-SM100-0400	Y	-F	1.00	4.00	2.36	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1"	CAT50-SM100-0600	Y	-F	1.00	6.00	2.36	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1"	CAT50-SM100-0800	Y	BOD	1.00	8.00	2.36	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1"	CAT50-SM100-1000	Y	BOD	1.00	10.00	2.36	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1"	CAT50-SM100-1200	Y	BOD	1.00	12.00	2.36	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1-1/4	CAT50-SM125-0150	Y	-F	1.25	1.50	2.75	0.69	0.500	DK-SM125	5/8-18	SCW-SM125
1-1/4	CAT50-SM125-0350	Y	-F	1.25	3.50	2.87	0.69	0.500	DK-SM125	5/8-18	SCW-SM125
1-1/4	CAT50-SM125-0550	Y	-F	1.25	5.50	2.87	0.69	0.500	DK-SM125	5/8-18	SCW-SM125
1-1/4	CAT50-SM125-0800	Y	BOD	1.25	8.00	2.87	0.69	0.500	DK-SM125	5/8-18	SCW-SM125
1-1/2	CAT50-SM150-0240	Y	-F	1.50	2.40	3.82	0.94	0.625	DK-SM150-C	3/4-16	SCW-SM150
1-1/2	CAT50-SM150-0400	Y	-F	1.50	4.00	3.82	0.94	0.625	DK-SM150	3/4-16	SCW-SM150
1-1/2	CAT50-SM150-0600	Y	-F	1.50	6.00	3.82	0.94	0.625	DK-SM150	3/4-16	SCW-SM150
1-1/2	CAT50-SM150-0800	Y	BOD	1.50	8.00	3.82	0.94	0.625	DK-SM150	3/4-16	SCW-SM150
2"	CAT50-SM200-0240	Y	-F	2.00	2.40	4.37	0.94	0.750	DK-SM200	1"-14	SCW-SM200
2"	CAT50-SM200-0400	Y	BOD	2.00	4.00	4.37	0.94	0.750	DK-SM200	1"-14	SCW-SM200

SM - Shell Mill Adapters

BT & HSK

Features

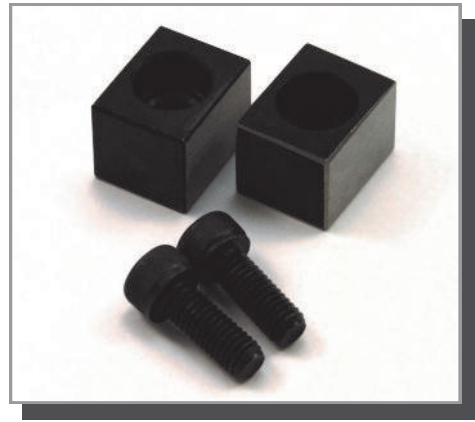
- Body - Coolant Thru Center
- Balanced G6.3 @ 20,000 RPM
- Order Wrench Separately
- FX Option Available, Add -F to the part number:
 - -F = Normally Stocked
 - BOD = Build on Demand



Pilot Size	Part Number	Standard	FX Ported Coolant	A Pilot	L Proj.	D	H	Drive Key Size	Drive Key#	Mounting Screw Thread	Mounting Screw#
1/2	BT30-SM050-0119	Y	BOD	0.50	1.38	1.19	0.57	0.250	DK-SM050	1/4-28	SCW-SM050
3/4	BT30-SM075-0119	Y	BOD	0.75	1.75	1.19	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
1"	BT30-SM100-0119	Y	BOD	1.00	2.36	1.19	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
3/4	BT40-SM075-0175	Y	BOD	0.75	1.75	1.75	0.69	0.500	DK-SM125	3/8-24	SCW-SM075
3/4	BT40-SM075-0400	Y	BOD	0.75	1.75	4.00	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
1"	BT40-SM100-0175	Y	BOD	1.00	2.36	1.75	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1"	BT40-SM100-0400	Y	BOD	1.00	2.36	4.00	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1-1/4	BT40-SM125-0200	Y	BOD	1.25	2.87	2.00	0.69	0.500	DK-SM125	5/8-18	SCW-SM125
1-1/4	BT40-SM125-0400	Y	BOD	1.25	2.87	4.00	0.69	0.500	DK-SM125	5/8-18	SCW-SM125
1-1/2	BT40-SM150-0200	Y	BOD	1.50	3.82	2.00	0.94	0.625	DK-SM150	3/4-16	SCW-SM150
3/4	HSK63A-SM075-0177	Y	BOD	0.75	1.77	1.71	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
3/4	HSK63A-SM075-0394	Y	BOD	0.75	3.94	1.71	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
3/4	HSK63A-SM075-0630	Y	BOD	0.75	6.30	1.71	0.69	0.312	DK-SM075	3/8-24	SCW-SM075
1"	HSK63A-SM100-0197	Y	BOD	1.00	1.97	2.17	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1"	HSK63A-SM100-0394	Y	BOD	1.00	3.94	2.17	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1"	HSK63A-SM100-0630	Y	BOD	1.00	6.30	2.17	0.69	0.375	DK-SM100	1/2-20	SCW-SM100
1-1/4	HSK63A-SM125-0236	Y	BOD	1.25	2.36	2.75	0.69	0.500	DK-SM125	5/8-18	SCW-SM125
1-1/4	HSK63A-SM125-0394	Y	BOD	1.25	3.94	2.75	0.69	0.500	DK-SM125	5/8-18	SCW-SM125
1-1/4	HSK63A-SM125-0630	Y	BOD	1.25	6.30	2.75	0.69	0.500	DK-SM125	5/8-18	SCW-SM125
1-1/2	HSK63A-SM150-0236	Y	BOD	1.50	2.36	3.78	0.94	0.625	DK-SM150	3/4-16	SCW-SM150
1-1/2	HSK63A-SM150-0394	Y	BOD	1.50	3.94	3.78	0.94	0.625	DK-SM150	3/4-16	SCW-SM150
1-1/2	HSK63A-SM150-0630	Y	BOD	1.50	6.30	3.78	0.94	0.625	DK-SM150	3/4-16	SCW-SM150

Shell Mill Drive Key

- Kit includes
 - (2) Drive Keys
 - (2) Mounting Screws



Shell Mill Pilot	Drive Key #	Drive Key Size	Specifications
1/2	DK-SM050	0.250	
3/4	DK-SM075	0.312	
1"	DK-SM100	0.375	
1"	DK-SM100-B	0.375	Fits BT30-SM100-0119
1-1/4	DK-SM125	0.500	
1-1/2	DK-SM150	0.625	
1-1/2	DK-SM150-C	0.625	Fits CAT50-SM150-0240
2"	DK-SM200	0.750	

Shell Mill Screw

- Replacement screw for catalog holders
- For coolant hole thru the center of the screw add -C to the part number.



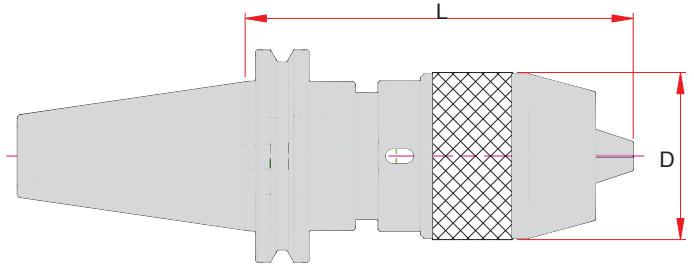
Shell Mill Pilot	Mount Screw #	Mount Screw Size
1/2	SCW-SM050	1/4-28
3/4	SCW-SM075	3/8-24
1"	SCW-SM100	1/2-20
1-1/4	SCW-SM125	5/8-18
1-1/2	SCW-SM150	3/4-16
2"	SCW-SM200	1"-14

Drill Chuck / Test Bars / Blanks

Drill Chuck

Features:

- Non Coolant
- Keyless w/ slots for spanner wrench (sold separately)

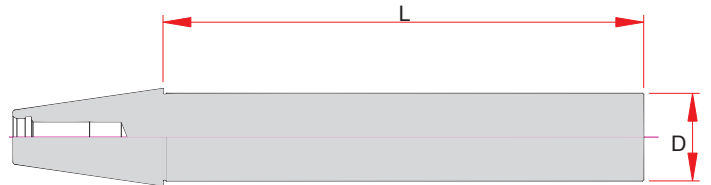


Part Number	Range	L - Projection	D	Wrench
CAT40-DC050-0413	0.04 - 0.50	4.13	1.96	DCW13
CAT50-DC050-0394	0.04 - 0.50	3.94	1.96	DCW13
BT30-DC13-105	0.04 - 0.50	4.13	1.96	DCW13
BT40-DC13-110	0.04 - 0.50	4.33	1.96	DCW13

TB - Test Bar

Features

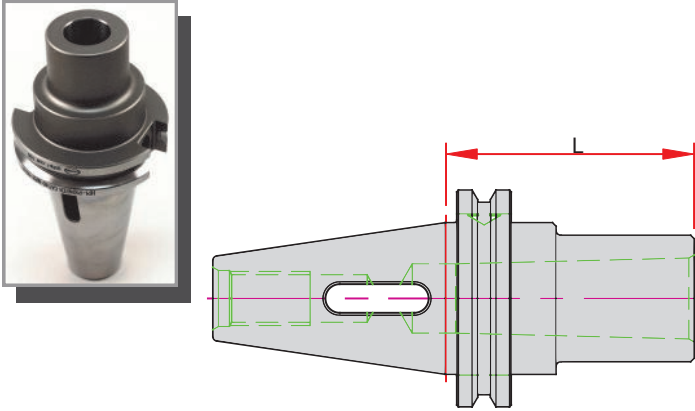
- Concentric to Taper within 3 μ m (0.0001") TIR
- Hardened & Normalized for consistency
- 100% Individually inspected with Certification Sheet included
- Wood Box Included



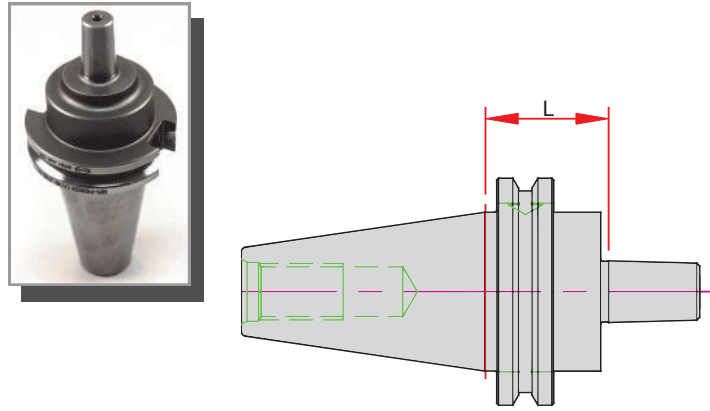
Part Number	D	L - Projection
CAT40-TB150-1000	1.50	10.00
CAT50-TB200-1200	2.00	12.00
BT40-TB150-1000	1.50	10.00
HSK63A-TB150-1000	1.50	10.00

Morse & Jacobs Adapters

MA - Morse Taper Adapter



JT - Jacobs Taper Adapter



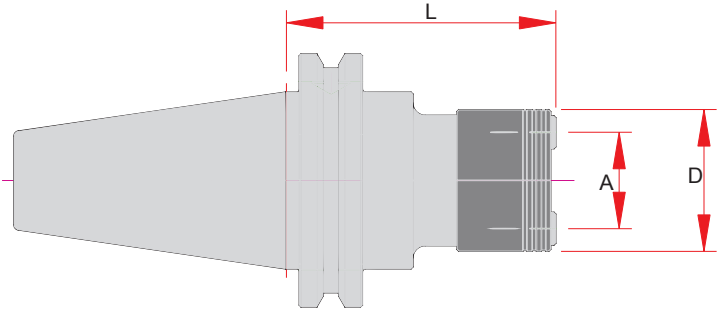
Part Number	Morse Taper#	L - Projection
CAT40-MA1-0177	1	1.77
CAT40-MA1-0472	1	4.72
CAT40-MA2-0236	2	2.36
CAT40-MA2-0472	2	4.72
CAT40-MA3-0295	3	2.95
CAT40-MA3-0531	3	5.31
CAT40-MA4-0374	4	3.74
CAT40-MA4-0650	4	6.50
CAT50-MA1-0177	1	1.77
CAT50-MA2-0177	2	1.77
CAT50-MA2-0531	2	5.31
CAT50-MA2-0709	2	7.09
CAT50-MA3-0177	3	1.77
CAT50-MA3-0591	3	5.91
CAT50-MA3-0709	3	7.09
CAT50-MA4-0295	4	2.95
CAT50-MA4-0709	4	7.09
CAT50-MA5-0413	5	4.13
BT30-MA1-045	1	1.77
BT30-MA2-060	2	2.36
BT40-MA1-045	1	1.77
BT40-MA1-120	1	4.72
BT40-MA2-050	2	1.97
BT40-MA2-120	2	4.72
BT40-MA3-070	3	2.76
BT40-MA3-135	3	5.31
BT40-MA4-095	4	3.74
BT40-MA4-165	4	6.50

Part Number	Jacobs Taper#	L - Projection
CAT40-JT02-0177	2	1.77
CAT40-JT02-0354	2	3.54
CAT40-JT03-0177	3	1.77
CAT40-JT03-0354	3	3.54
CAT40-JT06-0177	6	1.77
CAT40-JT06-0354	6	3.54
CAT40-JT33-0177	33	1.77
CAT40-JT33-0354	33	3.54
CAT50-JT03-0177	3	1.77
CAT50-JT03-0413	3	4.13
CAT50-JT06-0177	6	1.77
CAT50-JT06-0413	6	4.13
CAT50-JT33-0177	33	1.77
CAT50-JT33-0413	33	4.13
BT30-JT01-030	1	1.18
BT30-JT02-030	2	1.18
BT30-JT06-030	6	1.18
BT40-JT02-045	2	1.77
BT40-JT03-045	3	1.77
BT40-JT03-090	3	3.54
BT40-JT06-045	6	1.77
BT40-JT06-090	6	3.54
BT40-JT33-045	33	1.77
BT40-JT33-090	33	3.54

RT - Rigid Tapping

Features

- Body - Coolant Thru Center

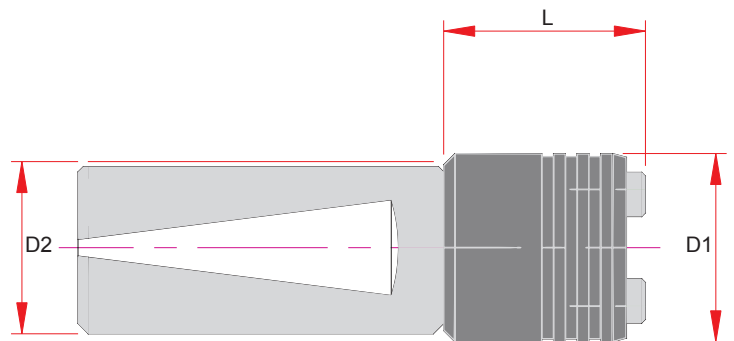


Adapter Size	Part Number	Capacity	A	L - Projection	D
1	CAT40-RT1-72	#6-9/16	0.75	2.83	1.34
2	CAT40-RT2-91	5/16-7/8	1.22	3.58	1.93
3	CAT40-RT3-130	9/16-1-3/8	1.89	5.12	2.89
1	CAT50-RT1-72	#6-9/16	0.75	2.83	1.34
2	CAT50-RT2-91	5/16-7/8	1.22	3.58	1.93
3	CAT50-RT3-130	9/16-1-3/8	1.89	5.12	2.89
1	BT40-RT1-72	#6-9/16	0.75	2.83	1.34
2	BT40-RT2-91	5/16-7/8	1.22	3.58	1.93
3	BT40-RT3-130	9/16-1-3/8	1.89	5.12	2.89
1	HSK 63A-RT1-65	#6-9/16	0.75	2.56	1.34
2	HSK 63A-RT2-98	5/16-7/8	1.22	3.86	1.93

Straight Shank

Features:

- Flats for Lathe Applications
- Compatible with industry standards

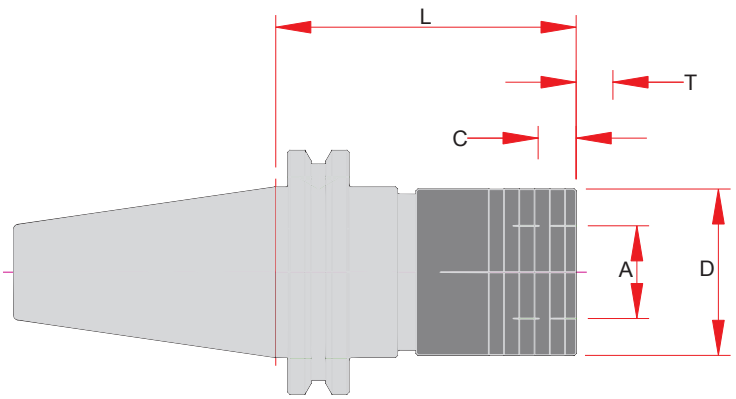


Part Number	Capacity	Adapter Size	D1	D2	L Projection
S100-RT1-0158	#6 - 9/16	1	1.34	1"	1.57
S100-RT2-0237	5/16 - 7/8	2	1.93	1"	2.36
S125-RT3-0375	9/16 - 1-3/8	3	2.89	1-1/4"	3.74

TC - T&C Tapping

Features

- Tension and Compression Stroke for improved tap life
- Pressure Point Mechanism to increase the cutting pressure and ensure a positive start

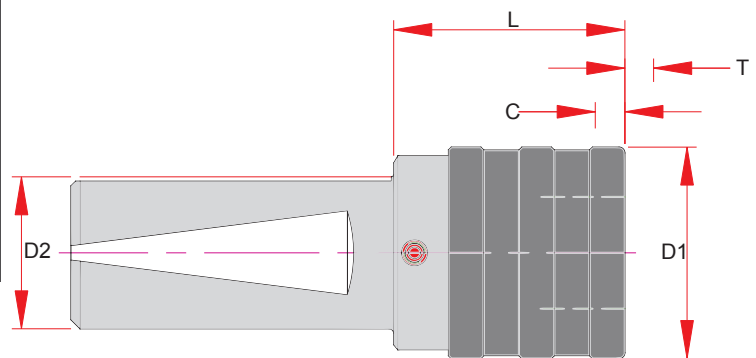


Adapter Size	Part Number	Capacity	A	L - Projection	D	T - Tension	C - Compression
1	CAT40-TC1-59	#6-9/16	0.75	2.32	1.42	0.30	0.30
2	CAT40-TC2-97	5/16-7/8	1.22	3.82	2.09	0.49	0.49
3	CAT40-TC3-149	9/16-1-3/8	1.89	5.87	3.07	0.79	0.79
1	CAT50-TC1-59	#6-9/16	0.75	2.32	1.42	0.30	0.30
2	CAT50-TC2-97	5/16-7/8	1.22	3.82	2.09	0.49	0.49
3	CAT50-TC3-141	9/16-1-3/8	1.89	5.55	3.07	0.79	0.79
1	BT40-TC1-67	#6-9/16	0.75	2.64	1.42	0.30	0.30
2	BT40-TC2-94	5/16-7/8	1.22	3.70	2.09	0.49	0.49
3	BT40-TC3-167	9/16-1-3/8	1.89	6.57	3.07	0.79	0.79
1	HSK 63A-TC1-102	#6-9/16	0.75	4.02	1.42	0.30	0.30
2	HSK 63A-TC2-137	5/16-7/8	1.22	5.39	2.09	0.49	0.49

Straight Shank

Features:

- Non Coolant
- Flats for Lathe Applications
- Compatible with industry standards



Adapter Size	Non Coolant Part Number	Capacity	D1	D2	L Projection	T - TENSION	C - COMP.
1	S100-TC1-0158	#6 - 9/16	1.42	1"	1.57	0.30	0.30
2	S100-TC2-0256	5/16 - 7/8	2.09	1"	2.36	0.49	0.49
3	S125-TC3-0504	9/16 - 1-3/8	3.07	1-1/4"	3.94	0.79	0.79

RA - Rigid Tap Adapters

Features:

- Direct Drive for Rigid Tapping
- Bilz Quick Change Compatible
- Push to load / release system for quick tool change
- DIN / ISO / JIS Available - Please provide tap shank and square when ordering
- See Chart on Page 112-113 for Metric Shank & Square Information



ANSI Tap Size	Metric	Shank"	Shank MM	Square"	Square MM	SIZE 0	SIZE 1	SIZE 2	SIZE 3
#0 - #6	M1.6	0.141	3.58	0.110	2.79	RA0U-0141	RA1U-0141		
#8	M4	0.168	4.27	0.131	3.33	RA0U-0168	RA1U-0168		
#10	M4.5, M5	0.194	4.93	0.152	3.86	RA0U-0194	RA1U-0194		
#12		0.220	5.59	0.165	4.19	RA0U-0220	RA1U-0220		
	M6, M8		6.00		4.90	RA0D-M060X049	RA1D-M060X049		
1/4	M6, M6.3	0.255	6.48	0.191	4.85	RA0U-0255	RA1U-0255		
	M7, M9, M10		7.00		5.50		RA1D-M070X055		
	M11		8.00		6.00		RA1J-M080X060		
	M8, M11		8.00		6.20		RA1D-M080X062		
5/16	M7, M8	0.318	8.08	0.238	6.05		RA1U-0318	RA2U-0318	
3/8	M10	0.381	9.68	0.286	7.26		RA1U-0381	RA2U-0381	
7/16		0.323	8.20	0.242	6.15		RA1U-0323	RA2U-0323	
	M9, M12		9.00		7.00		RA1D-M090X070		
1/2	M12, M12.5	0.367	9.32	0.275	6.99		RA1U-0367	RA2U-0367	
9/16	M14	0.429	10.90	0.322	8.18		RA1U-0429	RA2U-0429	RA3U-0429
	M16		12.00		9.00			RA2D-M120X090	
5/8	M16	0.480	12.19	0.360	9.14			RA2U-0480	RA3U-0480
11/16	M18	0.542	13.77	0.406	10.31			RA2U-0542	RA3U-0542
3/4		0.590	14.99	0.442	11.23			RA2U-0590	RA3U-0590
13/16	M20	0.652	16.56	0.489	12.42			RA2U-0652	RA3U-0652
7/8	M22	0.697	17.70	0.523	13.28			RA2U-0697	RA3U-0697
15/16	M24	0.760	19.30	0.570	14.48				RA3U-0760
1"	M25	0.800	20.32	0.600	15.24				RA3U-0800
1-1/16 - 1-1/8	M27	0.896	22.76	0.672	17.07				RA3U-0896
1-3/16 - 1-1/4	M30	1.021	25.93	0.766	19.46				RA3U-1021
1-5/16 - 1-3/8	M33	1.108	28.14	0.831	21.11				RA3U-1108
PIPE TAP									
1/8 PIPE SS		0.313	7.95	0.234	5.94		RA1U-0313		
1/8 PIPE LS		0.438	11.13	0.328	8.33		RA1U-0438		
1/4 PIPE		0.563	14.30	0.421	10.69			RA2U-0563	
3/8 PIPE		0.700	17.78	0.531	13.49			RA2U-0700	RA3U-0700
1/2 PIPE		0.688	17.48	0.515	13.08			RA2U-0688	RA3U-0688
3/4 PIPE		0.906	23.01	0.679	17.25				RA3U-0906
1" PIPE		1.125	28.58	0.843	21.41				RA3U-1125

TC - Torque Control Adapters

Features:

- Direct Drive for Rigid Tapping
- Bilz Quick Change Compatible
- Push to load / release system for quick tool change
- DIN / ISO / JIS Available - Please provide tap shank and square when ordering
- See Chart on Page 112-113 for Metric Shank & Square Information

Recommended Usage: Tension and Compression Holders Only!



ANSI Tap Size	ANSI Metric	Shank"	Shank MM	Square"	Square MM	SIZE 0	SIZE 1	SIZE 2	SIZE 3
#0 - #6	M1.6	0.141	3.58	0.110	2.79	TC0U-0141	TC1U-0141		
#8	M4	0.168	4.27	0.131	3.33	TC0U-0168	TC1U-0168		
#10	M4.5, M5	0.194	4.93	0.152	3.86	TC0U-0194	TC1U-0194		
#12		0.220	5.59	0.165	4.19	TC0U-0220	TC1U-0220		
1/4	M6, M6.3	0.255	6.48	0.191	4.85	TC0U-0255	TC1U-0255		
5/16	M7, M8	0.318	8.08	0.238	6.05		TC1U-0318	TC2U-0318	
3/8	M10	0.381	9.68	0.286	7.26		TC1U-0381	TC2U-0381	
7/16		0.323	8.20	0.242	6.15		TC1U-0323	TC2U-0323	
1/2	M12, M12.5	0.367	9.32	0.275	6.99		TC1U-0367	TC2U-0367	
9/16	M14	0.429	10.90	0.322	8.18		TC1U-0429	TC2U-0429	TC3U-0429
5/8	M16	0.480	12.19	0.360	9.14			TC2U-0480	TC3U-0480
11/16	M18	0.542	13.77	0.406	10.31			TC2U-0542	TC3U-0542
3/4		0.590	14.99	0.442	11.23			TC2U-0590	TC3U-0590
13/16	M20	0.652	16.56	0.489	12.42			TC2U-0652	TC3U-0652
7/8	M22	0.697	17.70	0.523	13.28			TC2U-0697	TC3U-0697
15/16	M24	0.760	19.30	0.570	14.48				TC3U-0760
1"	M25	0.800	20.32	0.600	15.24				TC3U-0800
1-1/16 - 1-1/8	M27	0.896	22.76	0.672	17.07				TC3U-0896
1-3/16 - 1-1/4	M30	1.021	25.93	0.766	19.46				TC3U-1021
1-5/16 - 1-3/8	M33	1.108	28.14	0.831	21.11				TC3U-1108
PIPE TAP									
1/8 PIPE SS		0.313	7.95	0.234	5.94		TC1U-0313		
1/8 PIPE LS		0.438	11.13	0.328	8.33		TC1U-0438		
1/4 PIPE		0.563	14.30	0.421	10.69			TC2U-0563	
3/8 PIPE		0.700	17.78	0.531	13.49			TC2U-0700	TC3U-0700
1/2 PIPE		0.688	17.48	0.515	13.08			TC2U-0688	TC3U-0688
3/4 PIPE		0.906	23.01	0.679	17.25				TC3U-0906
1" PIPE		1.125	28.58	0.843	21.41				TC3U-1125

Height Gage

Height Gage Fixtures

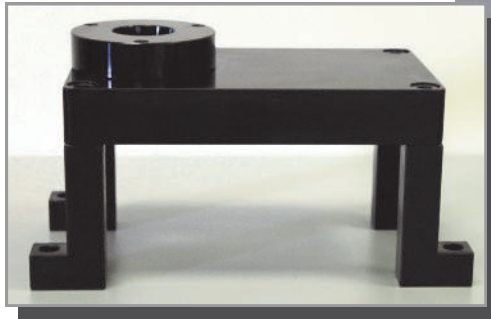
- Bolts to Workbench
- Uses standard Height Stand (purchased separately)

This low cost height stand uses any standard height stand, (20" Digital shown) analog or digital to provide simple accurate height preset.

Legs provide height so the pull stud does not hit the table. The legs are equipped with bolt holes so the unit can be mounted to the table top.



Part Number	Shank
HG-BT30	BT30, SK30
HG-CAT40	BT40, CAT40, SK40
HG-CAT50	BT50, CAT50, SK50
HG-HSK63A	HSK63A HSK80F
HG-HSK100A	HSK100A



Locking Fixtures

Tool Boy Locking Fixture

Features

- Bolts to Workbench
- 4 x 90 degree positions
- Optimum position for all manipulations on tooling
- Prevents tools from injuring hands
- No spine torsion thanks to horizontal tool position
- Safe tool handling - even of heavy tools - w/ auto-lock in desired working position
- Optimum protection of toolholder thanks to brass taper sleeve
- Improved tool clamping ensures longer tool life and protects machine spindle
- No wear as major elements such as clamping dog and locking disc are hard anodized.
- Available for Cat, BT, NMTB, ISO7388, DIN2080, DIN69871, HSK, KM, VDI and Capto.



Part Number	Description
TB-BASE	Single Rotating Base

Part Number	Shank Size
TB-30 HEAD	BT30, ISO30
TB-40 HEAD	BT40, CAT40, ISO40
TB-45 HEAD	CAT45
TB-50 HEAD	BT50, CAT50, ISO50
TB-HSK63A HEAD	HSK63A
TB-HSK100A HEAD	HSK100A



Locking Fixtures

- Bolts to Workbench
- Easy Access to Retention Knob

Part Number	Shank
TLD-BT30	BT30
TLD-BT40	BT40
TLD-CAT40	Cat40
TLD-CAT50	Cat50



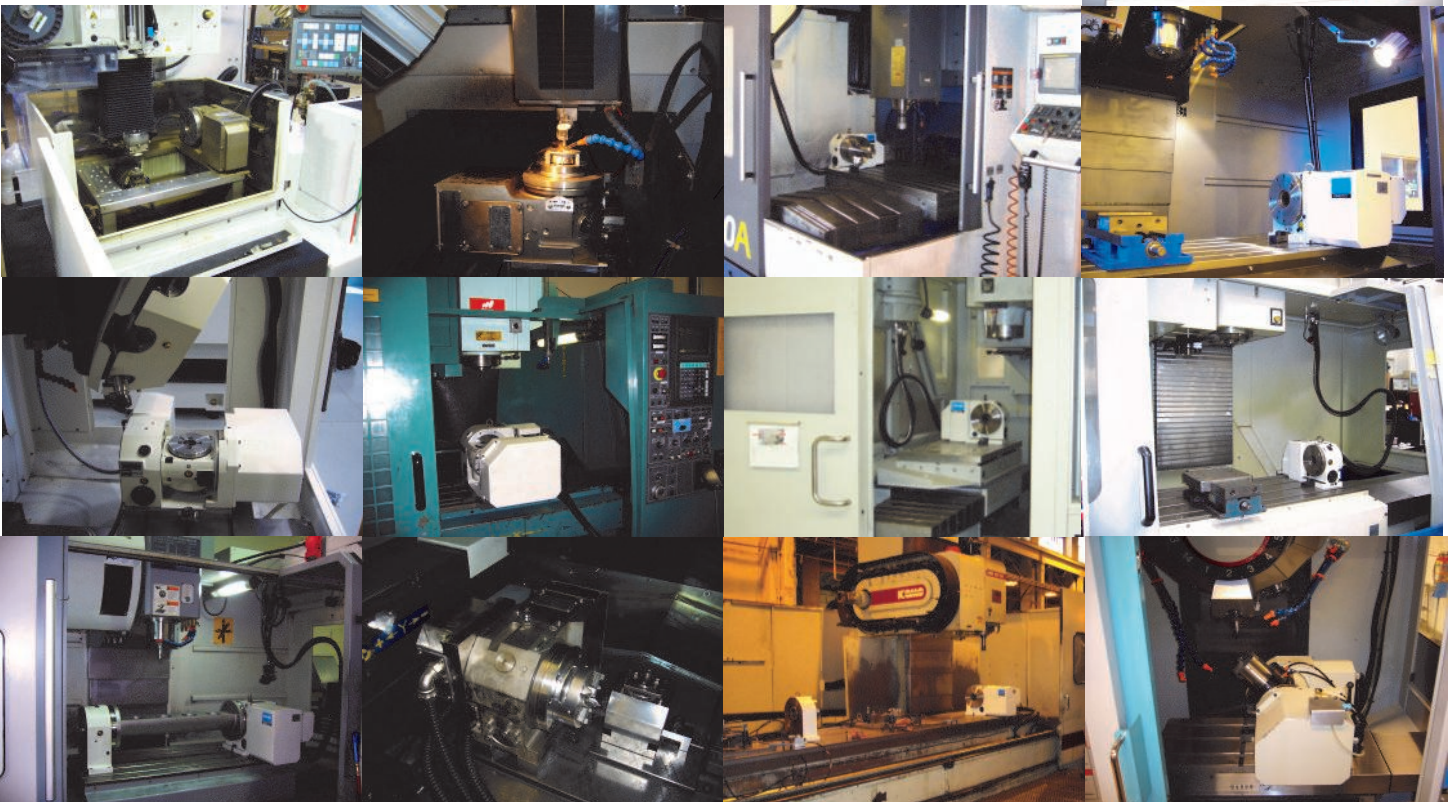
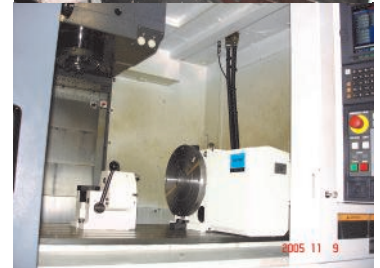
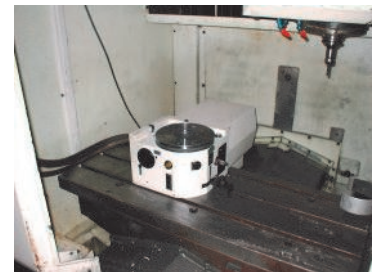
Why Yukiwa?

- 100% Sealed Table with Complete Air Purge System
- 20% Larger Breaks & Drive System
- Nose & Tail Bearing Design for Improved Rigidity
- Lowest Deflection Rate of any table in the market
- 100% Inspected & Run for 4 hours at the factory
- Built in Air / Hydraulic Break Booster (YNCP170+)
- Lowest Cost EDM Table
- Indexer Style with AC4 Control System
 - Compatible with all machining centers
 - Off Line Programming Option (Macro β)
- Full Integration Available
- 4th & 5th Axis Tables
- Over 25 Years of Experience
- Built in Japan



Why PIONEER?

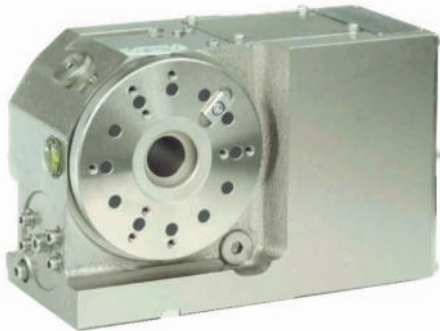
- Full Turnkey Installations with Over 25 Years of Experience
- 100mm-250mm Tables in Stock in Chicago
- All Service and Support out of Chicago
- Standard & Custom Cables & Wiring Built in Chicago
- Special Design Services Available





JNC Heavy Duty.....89

- Available in 140mm, 170mm, 200mm & 250mm
- Strong Clamping:
1.7X over competitive models
- Accurate Indexing
- High Durability
- Sealed for Submersed Applications
- Auto-Air Purging System (PAT.)



JNC-EDM.....94

- Available in 140mm
- Accurate Indexing
- High Durability
- Sealed for Submersed Applications
- Auto-Air Purging System (PAT.)
- Isolated Bearings & Ground Stainless Steel Face Plate for Wire EDM
- Optional Nickel Plating



YNCP Super Heavy Duty.....88

- Available in 170mm, 200mm & 250mm
- 20% Larger Bearings & Breaks than JNC Model
- Accurate Indexing
- High Durability
- Sealed for Submersed Applications
- Auto-Air Purging System (PAT.)



TNT 5 Axis.....92

- Available in 100mm, 130mm & 180mm
- Accurate Indexing
- High Durability
- Sealed for Submersed Applications
- Auto-Air Purging System (PAT.)



AC4 Indexer Control.....95

- Compact Design
- Simple programming, 10,000 block memory
- 0.001 Degree Accuracy
- RS232C Ready
- G Code Ready
- LED Diagnostics for easy trouble shooting

YNCP Series

Super Heavy Duty

- Air over Hydraulic Breaking System w/ “Built In” Booster
The only 170mm table in the market with this feature...
- Up to ±10 Second Indexing Accuracy
- Heavy Duty Nose & Tail Bearing Spindle Design for “Best in Class” Rigidity
- Complete Unit Water Protection w/ Auto Air Purging System
- Oil Bath Lubrication System
- Horizontal Installation Standard (Vertical Optional)
- Available as a
 - Indexer w/ Secondary Controller
 - Full 4th Axis Install (Compatible Machine Control Required)
 - Right & Left Hand Configurations
- Easy Maintenance



Model	YNCP170	YNCP200	YNCP250
Table Dia (mm)	170	200	250
Center Height (mm)	135	160	200
Table Pilot Dia (mm)	60 H7 X 10	70 H7 X 10	90 H7 X 10
Center Hole (mm)	45	56	72
Location Key (h7) (mm)	14	18	18
Clamp System	Air Pressure (0.3-0.5 Mpa) (43-72 psi)		
Clamp Torque	550Nm @ 0.5Mpa (405.6 lb-ft @ 72 psi)	850Nm @ 0.5Mpa (626.9 lb-ft @ 72 psi)	1,050Nm @ 0.5Mpa (774.4 lb-ft @ 72 psi)
RPM	33.3	33.3	33.3
Max. Weight Load	V: 110kg / H: 220kg	V: 130kg / H: 260kg	V: 180kg / H: 360kg
Vertical Load (N)	9000	10000	11000
Horizontal Load (N)	4000	6000	7000
Circumference Load (N)	4000	6200	7000
Inertia Vertical (kg.m ²)	0.50 (140kg @ Ø170)	1.0 (200kg @ Ø200)	2.0 (250kg @ Ø250)
Inertia Horizontal (kg.m ²)	0.25 (70kg @ Ø170)	0.5 (100kg @ Ø200)	1.0 (125kg @ Ø250)
Work Max. Diameter (mm)	170	200	250
Reduction Ratio	1 / 90	1 / 90	1 / 90
Indexing Accuracy (Cumulative)	±0°0'15" (0.0041°)	0°0'12.5" (0.0035°)	±0°0'10" (0.0028°)
Weight	43 kg (95 lbs)	69 kg (152 lbs)	114 kg (251 lbs)
Recommended Chuck Size	5-6"	6-7"	7-9"

JNC Series

Heavy Duty

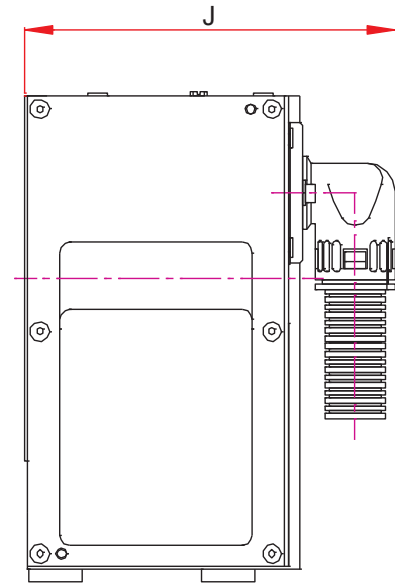
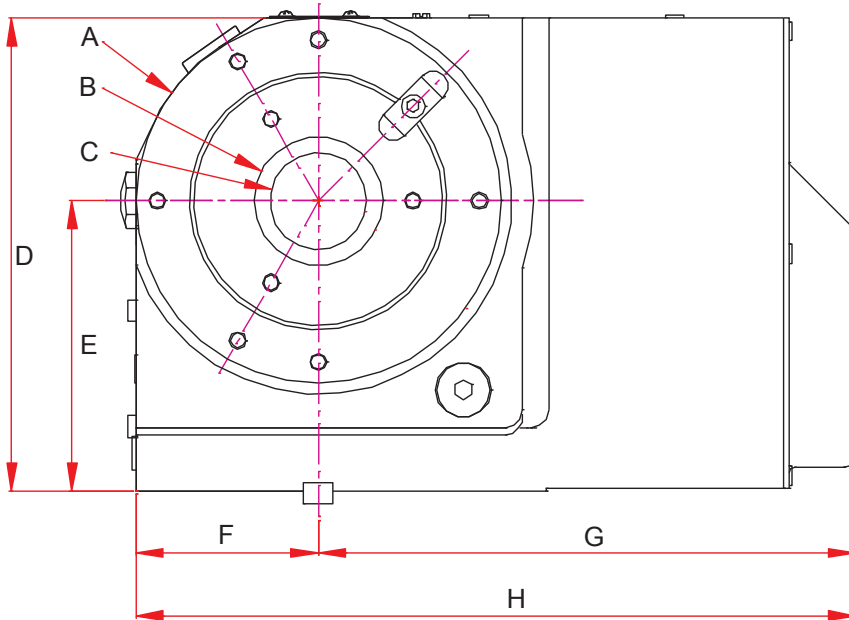
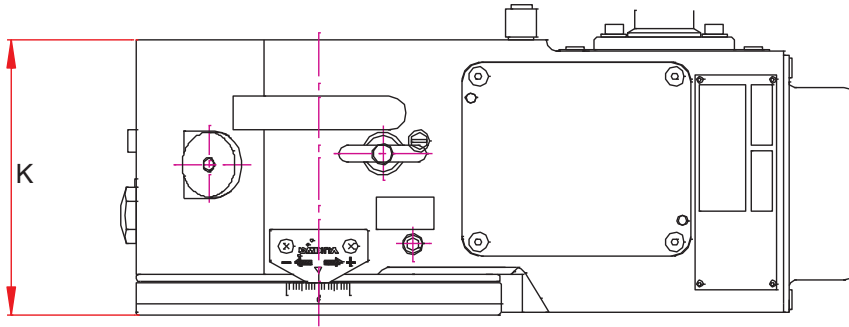
- Strong Clamping - 1.7 Times Greater than similar class models
- Accurate Indexing
- High Durability
- Nose & Tail Bearing Spindle Design for Superior Rigidity
- Complete Unit Water Protection w/ Auto Air Purging System
- Oil Bath Lubrication System
- Horizontal Installation Standard (Vertical Optional)
- Available as a:
 - Indexer w/ Secondary Controller
 - Full 4th Axis Install (Compatible Machine Control Required)
 - Right & Left Hand Configurations
- Easy Maintenance



Model	JNC140	JNC170	JNC200	JNC250
Table Dia (mm)	140	170	200	250
Center Height (mm)	110	135	160	200
Table Pilot Dia (mm)	40 H7 X 10	60 H7 X 10	70 H7 X 10	90 H7 X 10
Center Hole (mm)	28	45	56	72
Location Key (h7) (mm)	14	14	18	18
Clamp System	Air Pressure (0.5-0.7 Mpa) (72-101 psi)			
Clamp Torque	120Nm @ 0.5Mpa (88.5 lb-ft @ 72 psi)	230Nm @ 0.5Mpa (169.6 lb-ft @ 72 psi)	450Nm @ 0.5Mpa (331.9 lb-ft @ 72 psi)	650Nm @ 0.5Mpa (479.4 lb-ft @ 72 psi)
RPM	41.6	33.3	33.3	33.3
Max. Weight Load	V: 50kg / H: 100kg	V: 70kg / H: 140kg	V: 100kg / H: 200kg	V: 125kg / H: 250kg
Vertical Load (N)	4000	5000	7000	8000
Horizontal Load (N)	2000	3000	4000	5000
Circumference Load (N)	2000	1700	2600	3500
Inertia Vertical (kg.m ²)	0.25 (100kg @ Ø140)	0.50 (140kg @ Ø170)	1.0 (200kg @ Ø200)	2.0 (250kg @ Ø250)
Inertia Horizontal (kg.m ²)	0.125 (50kg @ Ø140)	0.25 (70kg @ Ø170)	0.5 (100kg @ Ø200)	1.0 (125kg @ Ø250)
Work Max. Diameter (mm)	140	170	200	250
Reduction Ratio	1 / 72	1 / 90	1 / 90	1 / 90
Indexing Accuracy	±0°0'20" (0.0056°)	±0°0'20" (0.0056°)	±0°0'20" (0.0056°)	±0°0'15" (0.0041°)
Weight	27 kg (60 lbs)	38 kg (84 lbs)	58 kg (128 lbs)	86 kg (190 lbs)
Recommended Chuck Size	4-5"	5-6"	6-7"	7-9"

Dimensional Information

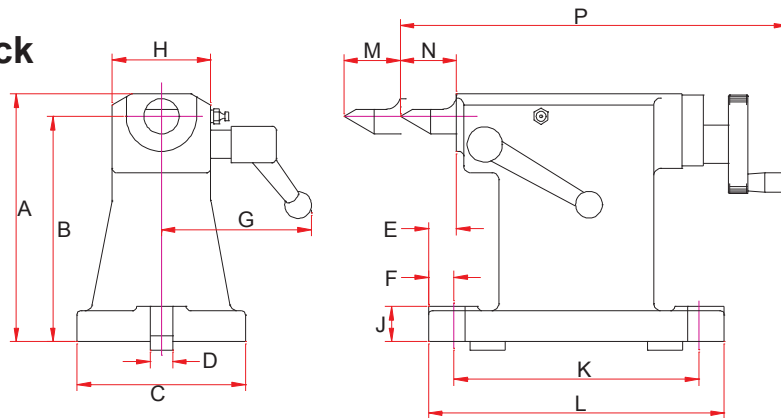
YNCP & JNC Series



Part Number	A Spindle	B Pilot	C Hole Thru	D	E Center Height	F	G	H	J	K	Motor Size
JNC140 & EDM	140	40 h7	28	180	110	77	211.5	288.5	172.2	128	βiS1
JNC170	170	60 h7	45	220	135	92	219	311	172.2	128	αiF1
JNC200	200	70 h7	56	270	160	117	285	402	192.2	148	αiF2
JNC250	250	90 h7	72	325	200	132	300	432	168	168	αiF4
YNCP170	170	60 h7	45	220	135	94	274	368	219.2	168	αiF1
YNCP200	200	70 h7	56	260	160	110	289	399	243.2	192	αiF4
YNCP250	250	90 h7	72	325	200	136	305	441	270.2	220	αiF8

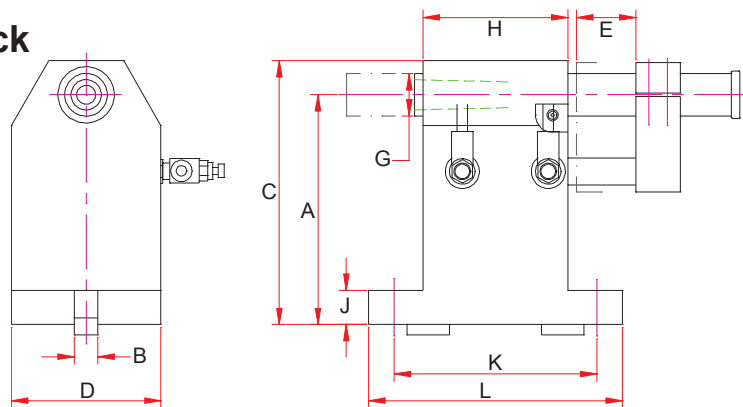
Yukiwa Rotary

Manual Tail Stock



Model	Applicable Model	Center (shaft)	Weight (kg)	A	B	C	D	E	F	G	H	J	K	L	M	N	P
TSB110S	JNC140	OD 25	7.8	126	110	110	14	10	22	88	50	20	160	190	20	25	205
TSB135S	JNC170,YNCP170	OD 25	10.0	151	135	110	14	20	26	107	70	23	174	210	40	40	275
TSB160S	JNC200,YNCP200	OD 25	11.0	176	160	120	18	20	26	107	70	25	174	210	40	40	275
TSB200S	JNC250,YNCP250	OD 38	25.0	227	200	140	18	10	25	128	90	35	228	260	40	50	395

Pneumatic Tail Stock

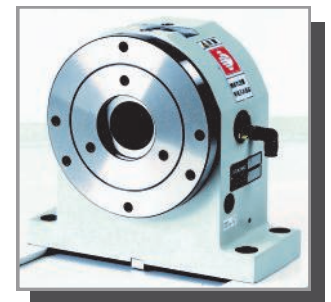
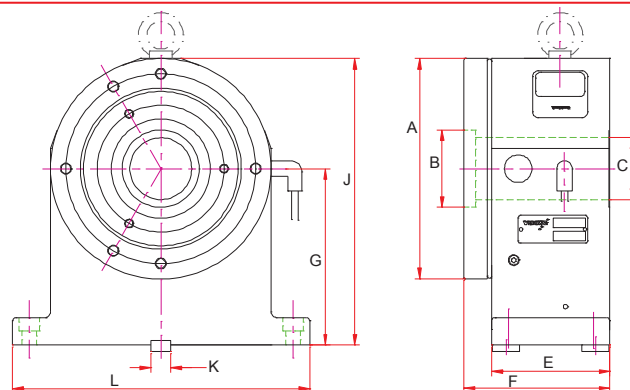


Model	Applicable Model	A Center Height	B h7	C	D	E Stroke	F	G	H	J	K	L	Shaft Thrust	Weight (kg)	ID Taper
TPA110	JNC140	110	14	130	88	40	25	25	85	20	119	149	310	5.9	MT2
TPA135	JNC170,YNCP170	135	14	155	88	40	25	25	85	20	119	149	310	7.0	MT2
TPA160	JNC200,YNCP200	160	18	180	120	40	25	25	85	25	119	149	310	8.8	MT2
TPA200	JNC250,YNCP250	200	18	225	120	40	32	32	89	25	123	153	490	12.4	MT3

Side Table

Features:

- Air Break System for additional holding power



Model	Applicable Model	Clamp Torque (Nm)	Weight (kg)	A Spindle Dia	B Pilot	C Hole Thru	E	F	G Center Height	J	K	L
ST135	JNC170,YNCP170	153	21	170	60	45	98	117	135	220	14	240
ST160	JNC200,YNCP200	415	33	200	70	56	107	132	160	270	18	270
ST200	JNC250,YNCP250	517	58	250	90	72	124	151	200	325	18	320

TNT Series

Heavy Duty

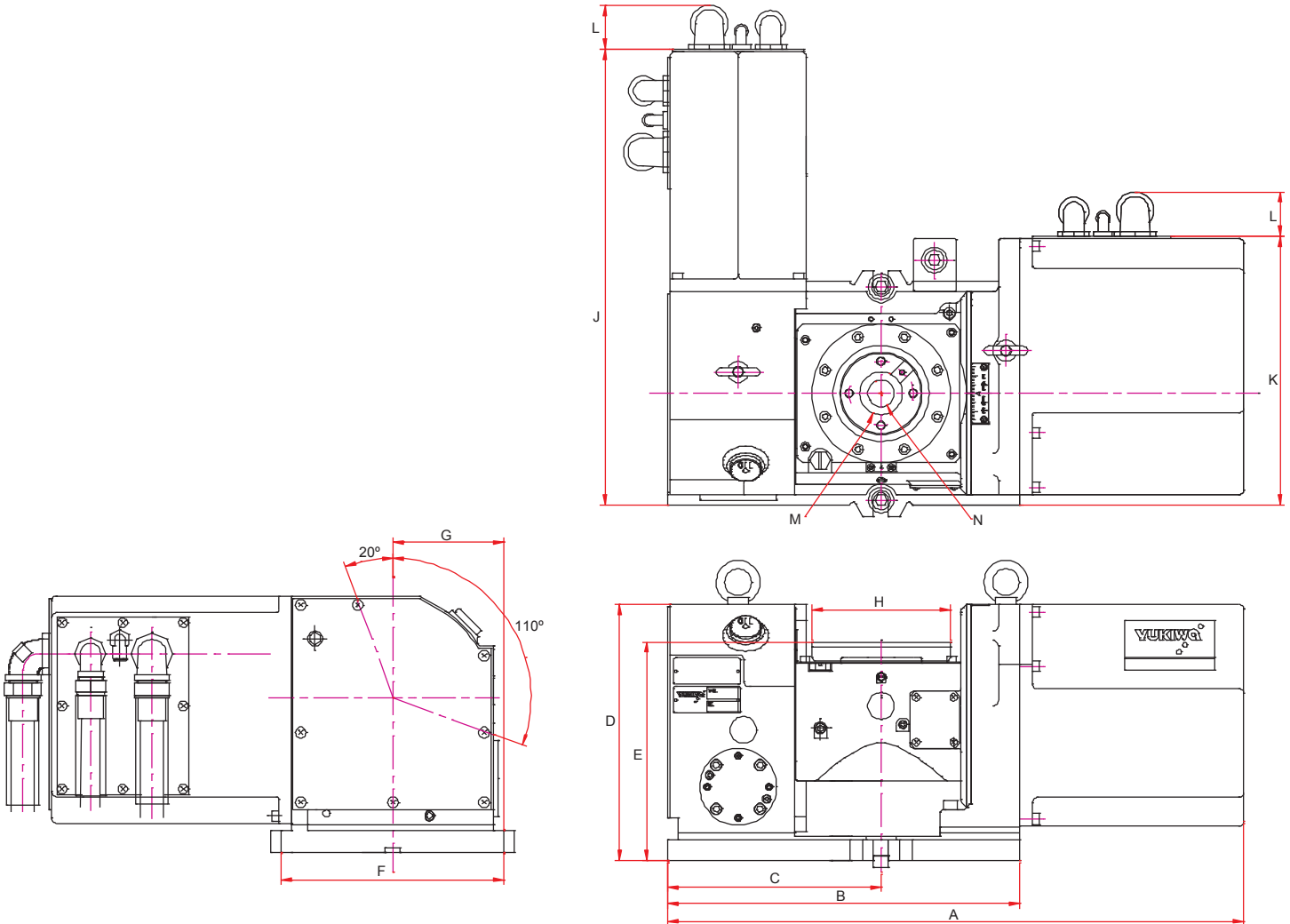
- Compact Design - For small machining centers
- High Speed - Indexing @ 41.6 RPM's
- Accurate Indexing
- High Durability
- Complete Unit Water Protection w/ Auto Air Purging System
- Available as a
 - Indexer w/ Secondary Controller
 - Full 4th Axis Install (Compatible Machine Control Required)
 - Right & Left Hand Configurations (TNT100 Left Hand Only)
- Easy Maintenance



Model	TNT100L		TNT130		TNT180	
	Rotating Axis	Tilting Axis	Rotating Axis	Tilting Axis	Rotating Axis	Tilting Axis
Table Dia (mm)	100		200		250	
Table Height @ Vertical (mm)	180		160		200	
Table Pilot Dia (mm)	50 H7 X 23		70 H7 X 10		90 H7 X 10	
Center Hole (mm)	36x86 Deep / 28 Thru		56		72	
Tilting Axis Center Height		135				
Tilting Range		110° to -20°				
Location Key (h7) (mm)	14		18		18	
Clamp System	Air Pressure (0.5-0.7 Mpa) (72-101 psi)					
Clamp Torque	200Nm @ 0.5Mpa (147.5 lb-ft @ 72 psi)	320Nm @ 0.5Mpa (236 lb-ft @ 72 psi)	120Nm @ 0.5Mpa (88.5 lb-ft @ 72 psi)	270Nm @ 0.5Mpa (199 lb-ft @ 72 psi)	500Nm @ 0.5Mpa (368.8 lb-ft @ 72 psi)	900Nm @ 0.5Mpa (663.8 lb-ft @ 72 psi)
RPM	41.6	25	41.6	25	41.6	25
Allowable Weight (Vertical)	30kg		30kg		60kg	
Allowable Weight (Horizontal)	20kg		20kg		40kg	
Work Max. Diameter (mm)	170		200		250	
Reduction Ratio	1 / 72	1 / 120	1 / 72	1 / 120	1 / 72	1 / 120
Indexing Accuracy	±0°0'17.5" (0.0049°)	±0°0'20" (0.0056°)	±0°0'15" (0.0041°)	±0°0'20" (0.0056°)	±0°0'15" (0.0041°)	±0°0'22.5" (0.0063°)
Weight	38 kg (84 lbs)		58 kg (128 lbs)		86 kg (190 lbs)	
Recommended Chuck Size	4-5"		4-5"		6"	

Dimensional Information

TNT Series

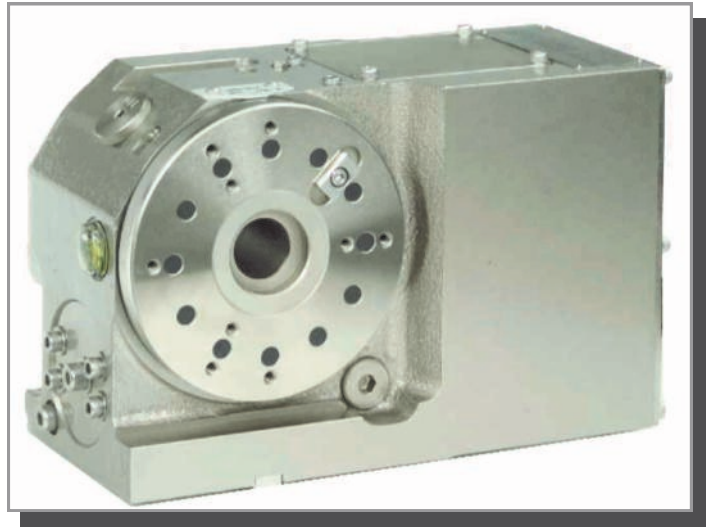


Part Number	A	B	C	D	E	F	G	H	J	K	L	M	N
TNT100L	477	388	215	230	180	210	95	100	355	305	51.3	50	28
TNT130	510	330	200	240	205	210	105	130	355	260	51.5	40	25
TNT180	620	505	305	320.5	260	250	115	180	445	325	51.3	60	50

JNC-EDM

Sealed, Air Purge, Ultra Precision

- Economically Priced EDM Rotary Solution
- Submersible Protection w/ Auto Air Purging System
- Isolated Spindle Design for Wire EDM applications
- Stainless Steel Face Plate
- Optional Nickel Plating for corrosion protection
- Strong Clamping - 1.7 Times Greater than similar class models
- Precision Indexing w/ Optional Rotary Encoder for Micron Movement
- High Durability
- Nose & Tail Bearing Spindle Design for Superior Rigidity
- Oil Bath Lubrication System
- Horizontal Installation Standard (Vertical Optional)
- Available as a
 - Indexer w/ Secondary Controller
 - Full 4th Axis Install (Compatible Machine Control Required)
 - Right & Left Hand Configurations
- Easy Maintenance



Model	JNC140-EDM
Table Dia (mm)	140
Center Height (mm)	110
Table Pilot Dia (mm)	40 H7 X 10
Center Hole (mm)	28
Location Key (h7) (mm)	14
Clamp System	Air Pressure (0.5-0.7 Mpa) (72-101 psi)
Clamp Torque	120Nm @ 0.5Mpa (88.5 lb-ft @ 72 psi)
RPM	41.6
Max. Weight Load	
Vertical Load (N)	4000
Horizontal Load (N)	2000
Circumference Load (N)	2000
Inertia Vertical (kg.m ²)	0.25 (100kg @ Ø140)
Inertia Horizontal (kg.m ²)	0.125 (50kg @ Ø140)
Work Max. Diameter (mm)	140
Reduction Ratio	1 / 72
Indexing Accuracy	±0°0'20" (0.0056°)
Weight	27 kg (60 lbs)
Recommended Chuck Size	4-5"

AC4

Indexer Control Box

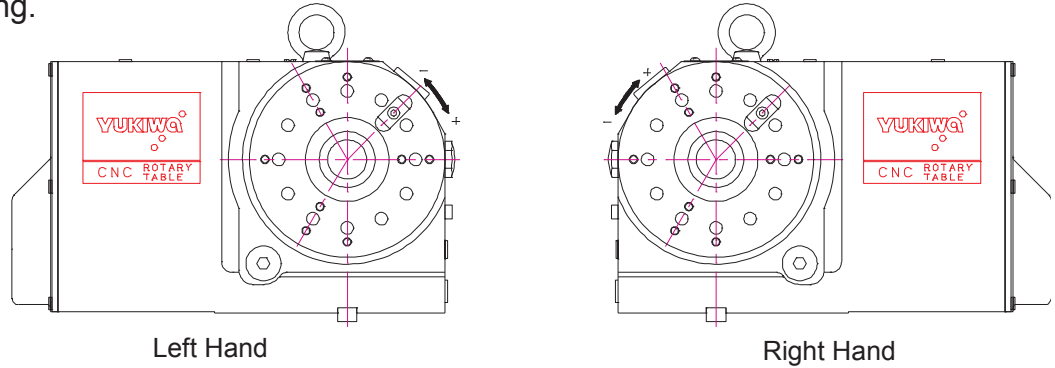
- Direct Programming up to 100 programs, total storage of 10,000 Steps
- Machine Control / Off Line Programmable w/ Machine Macro β Function & RS232 Connection
- Compact Design
- Closed Construction to prevent contamination from oil mist



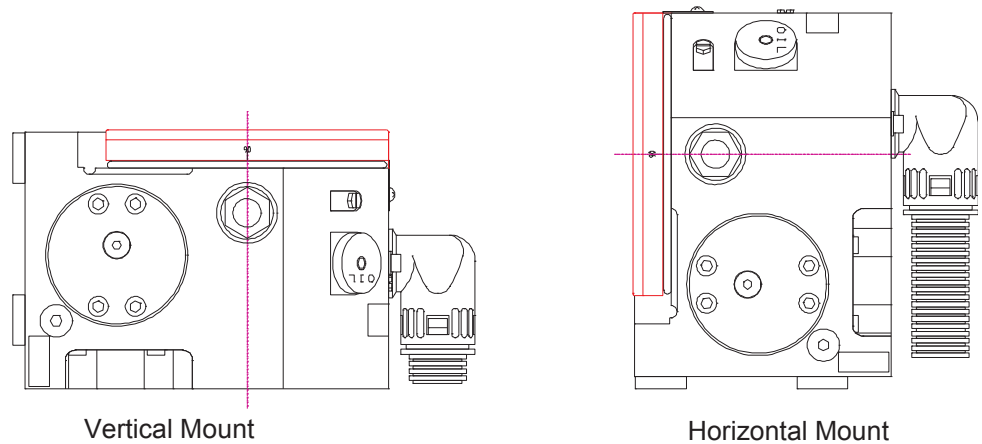
Model	AC4-10	AC4-30
Voltage	Single phase AC200V~230V + 10~-15% 50/60Hz	
Rated output of AC servo-motor	300W	750W
Power consumption	Max	2.2A
	Min	7.5A
External dimensions & Mass (including cables)	W260 X H199 X D228, 7.8kg	
Number of control axis	Rotary axis, 1 axis	
Position detection method	Incremental encoder	
Angle setting unit & Max. command angle	0.001 , '999.999 , 999 rotations (Max rotation is continuous rotation: 5,965)	
Speed setting range	0~99999 (but limited by the reduction ratio and the motor rotation)	
JOG (manual feed) function	Selecting the rotation speed with the JOG key and the numeric keys	
Rapid override	Selecting the rapid transverse speed from 10 steps (setting 0~100% with parameter)	
Movement Mode	Auto (AUT), Manual (MAN), Return to machine origin (MZ), Return to work origin (WZ), Jog (JOG), Program edit (EDT), Parameter (PRM)	
Programming	Command method (Incremental, Absolute, Shortcut), Equal division, Sector division, Cutting feed, Multi-rotation (999 rotations), Continuous start, Interlocking start, Return to machine origin, Setting of work coordinate, Continuous block operation, Dwell, FIN, output change, Jump, Subprogram (repeating 1~999 times), Clamp valid/invalid, Running function (for trial operation)	
Program edit function	1 step/inserting deleting the steps of specified range, 1 program/deleting the programs of specified range	
Program capacity & External selection	100 programs X 100 steps, Binary mode: 16 programs, M signal mode: 100 programs	
Program/parameter memory	Non-volatile memory (Rewriting 100,000 times)	
Stroke limit	Setting with the parameter or the program (Selectable of the machine coordinate or the work coordinate)	
Diagnosis & Alarm history	Alarm number, Executing program, Current position, Shift remain, Override %, Rotation speed, Motor load torque, etc. Memorized automatically in alarming (past 69 times)	
Interlocking input	Number of point	8 points (DC24V, Non-contract Bipolar)
	Function	Start, Return to origin, Program selection signal 0~3, Program set, interlocking
Interlocking output	Number of point	4 points (DC24V, Non-contract Bipolar, Max.50mA)
	Function	Block termination signal 1&2, Ready, Alarming
External emergency stop input	1 point (b-connection input. Interlocking cable inside), Connect the switch having contact.	
Serial interface	RS232C 1port, Dsub connector 9 pins	
Internal interlocking cable	AC3-W01	
External interlocking cable	AC3-60-W02	

Technical Information

Rotary Tables are manufactured in 2 types, Left Hand and Right Hand Motor Mounts. Right Hand is the most common but in some applications Left Hand Mount will provide the appropriate clearance for the work piece or fixturing.



Rotary Tables can be mounted in 2 positions, Horizontal and Vertical. Vertical mounts require the cable set to be moved to the side or back plate depending on the series of table.



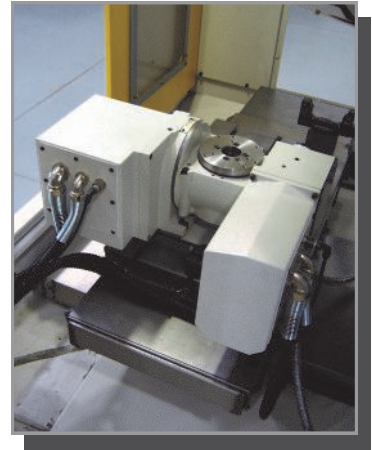
Installation

HPI - PIONEER brings a Installation and Service department second to none. With over 20 years experience in full rotary table 4th and 5th Axis installations as well as repair and service on many popular brands.

- Full Turnkey Installations on many models including Fanuc 0i, 16i, 18i, 21i and many more.
- Guaranteed Compatibility - We only install OEM Motors & Controllers to guarantee 100% compatibility with the machine control.
- All Tables are run for 4 hours at our factory to guarantee repeatability and re-checked after shipping in Chicago to verify all parameters exceed specification.

Installation includes:

- Drive (Amplifier) Installation
- Table Installation
- Parameter Updates
- Cable Set
 - Communication Cables
 - Fiber Optic Cables
 - Bulkhead Cable Set
 - External Cable Installation
- Travel Expenses

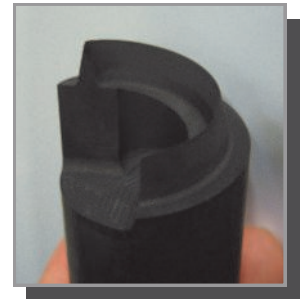


Rotary Tables are configured 2 different ways:

- **Indexer:** using a secondary controller for part positioning (simultaneous or contour milling is not possible).
- **Integrated Rotary Table:** which is wired directly to the machine control and functions as an additional true axis of the machine. This configuration can be used for positioning and simultaneous cutting.

While the cost of installation is a little higher than a secondary controller, the benefits and options are dramatically improved. With a Integrated Rotary Table, true 4th and 5th axis work can be performed (see picture).

Indexers only allow positional changes, cutting and turning are only possible on integrated installations. For a Rotary Table installation the machine and control must be 4th or 5th axis ready.



Machine Control Types:

Due to the amount of different machine control types in the market today we install on any Fanuc based control system. Some custom controls (Haas, Mazak, Okuma, etc) are available but with the assistance of the machine tool dealer for parts and control programming.

The machine must have open ports for 4th and or 5th axis controls, amplifiers, etc for installation of any true axis. If no ports are available, installation is still possible using a secondary index controller but this limits the table to positioning only. Contour milling is not possible in this configuration.

For additional information please contact our customer service at the numbers below.

ロータリーワイパー

R.M.T.

Rotary Wiper

RW-V2

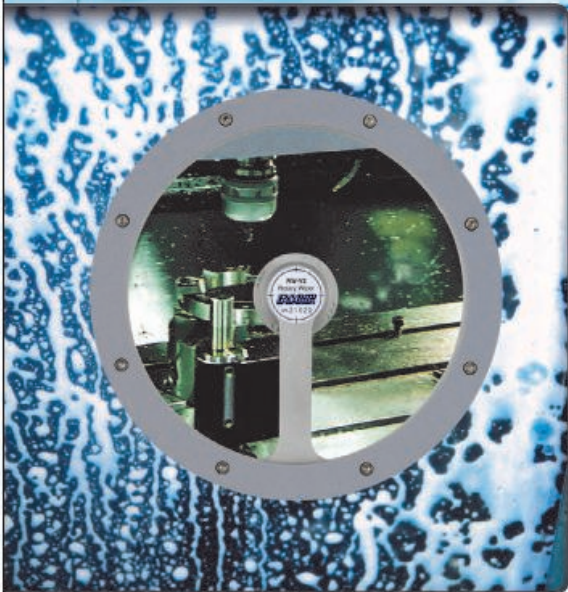


- 機械ドア窓の内側に簡単に取り付けられ、クーラント使用の切削中にも内部がはっきり見えます。
- 試運転管理、破損防止、作業能率アップのお役に立ちます。

ROTARY WIPER makes it possible to view the production process clearly within the machine enclosure.

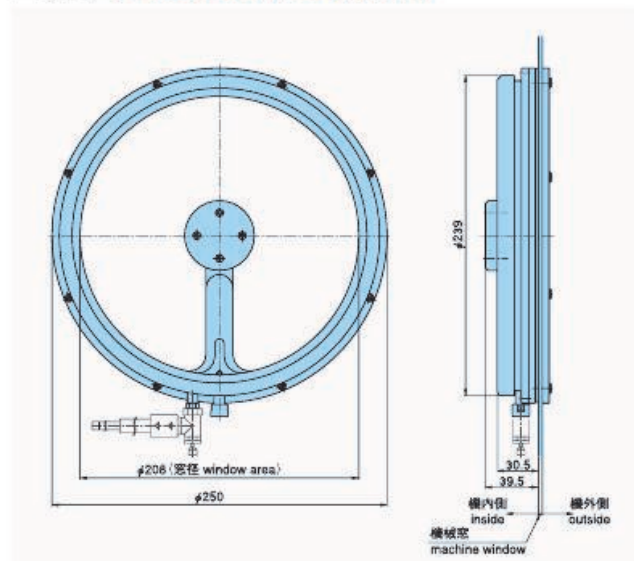
Window always get dirty because of oils, coolants and chips.

By installing Rotary Wiper, even large amount of coolants, etc., will not prevent an operator from being able to observe set-ups and production runs of all sorts.



- より向上した可視性!
- エア消費量、騒音レベルを更に低減!
- より安易なメンテナンス作業!
- 対クーラントシール性の大幅向上!
- Improved Visibility
- Less Air Consumption & Lower Noise Level
- Easier Maintenance Work
- Improved Sealing Performance against Coolant

■ 寸法図 DIMENSIONAL DRAWING



■ 型 式 TYPE

RW-V2-25	2.5Mケーブル付 (ボルト固定タイプ) 2.5M Cable (Bolt Fitting)
RW-V2-50	5.0Mケーブル付 (ボルト固定タイプ) 5.0M Cable (Bolt Fitting)
RW-V2-T25	2.5Mケーブル付 (接着テープ固定タイプ) 2.5M Cable (Tape Fitting)
RW-V2-T50	5.0Mケーブル付 (接着テープ固定タイプ) 5.0M Cable (Tape Fitting)

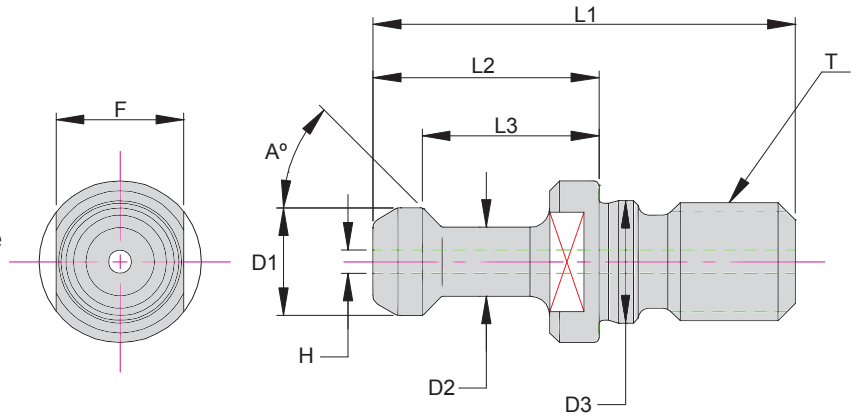
Retention Knobs (Pull Studs)

Features

- Manufactured to the Industry Standards or machine builders specifications.

Note:

- Other pull studs and special pull studs are available upon request.
- Please specify dimension and machine make and model when inquiring on pull studs.
- It is critical that the correct retention knob is used with each machining center. Please verify all dimensions prior to ordering. Machine specifications will be located in your machine manual.

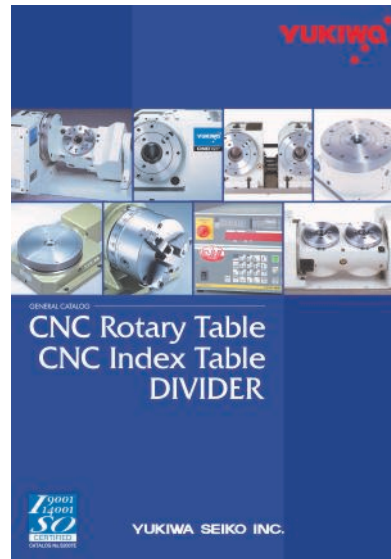


- * **Due to the continual changes by the machine builders the list below can only be used as a guide and all dimensions must be verified prior to ordering.**
- * **Please verify & use retention knob locking torque from the machine manual.**
- * **For optimal performance use workable thread lock with machine specifications.**



	Part No.	A Angle	D1 Head	D2 Neck	D3 Pilot	L1 OAL	L2 Proj.	L3 - Pull Loc.	H Hole	F Flats	T Thread	Notes
BT30	HPS- 16	45	0.433	0.276	0.492	1.693	0.906	0.709	-	13mm	M12	MAS P30T-1
	HPS- 17	60	0.433	0.276	0.492	1.693	0.906	0.709	-	13mm		MAS P30T-2
BT40	HPS- 1	45	0.591	0.394	0.669	2.362	1.378	1.102	-	19mm	M16	MAS P40T-1
	HPS- 2	60	0.591	0.394	0.669	2.362	1.378	1.102	-	19mm		MAS P40T-2
	HPS-806 -1	75	0.748	0.551	0.669	2.126	1.142	0.906	0.236	19mm		JIS B6339. Coolant
	HPS-G51	45	0.740	0.490	0.669	1.736	0.752	0.552	0.276	19mm		Coolant
	HPS-O 8	90	0.591	0.394	0.669	2.362	1.378	1.102	-	19mm		90 degree angle type
CAT40	HPS- 26	60	0.591	0.394	0.630	2.252	1.268	0.992	-	19mm	5/8-11	MAS P40T-2
	HPS- 72	45	0.591	0.394	0.641	2.250	1.266	0.990	-	19mm		MAS P40T-1
	HPS- 72C	45	0.591	0.394	0.641	2.250	1.266	0.990	0.120	19mm		MAS P40T-1
	HPS-806U-1	75	0.748	0.551	-	1.882	1.024	0.787	0.236	19mm		JIS B6339
	HPS-B64-1	45	0.740	0.490	0.641	1.624	0.640	0.440	0.157	0.750		Coolant w/ O'ring on OD Pilot
	HPS-D72	45	0.740	0.490	-	1.500	0.640	0.440	0.283	0.750		ANSI B5. 50-1985
	HPS-G53	45	0.740	0.490	0.641	1.624	0.640	0.440	0.276	0.750		Coolant
	HPS-G60	45	0.740	0.490	0.641	1.624	0.640	0.440	-	0.750		
	HPS-H30	45	0.591	0.394	-	2.252	1.268	0.992	-	19mm		
HPS-O14	90	0.591	0.394	-	2.244	1.260	0.984	-	17mm			
CAT50	HPS- 53	45	0.906	0.669	1.031	3.354	1.780	1.386	-	30mm	1"-8	MAS P50T-1
	HPS- 54	45	0.906	0.669	1.031	3.354	1.780	1.386	0.236	30mm		MAS P50T-1
	HPS- 63	60	0.906	0.669	1.024	3.248	1.772	1.378	-	30mm		MAS P50T-2
	HPS-B61	60	0.906	0.669	0.984	3.248	1.772	1.378	0.236	30mm		Coolant
	HPS-D92	45	1.140	0.820	-	2.300	1.000	0.700	0.461	1.250		ANSI B5. 50-1985
	HPS-G43	45	1.140	0.820	1.031	2.303	1.000	0.700	0.394	1.187		Coolant
	HPS-O19	90	0.906	0.669	-	3.346	1.780	1.386	-	30mm		
	HPS-P14	90	0.945	0.709	-	2.520	1.220	0.906	0.315	30mm		Coolant

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