

 **HAAS AUTOMATION, INC.**
ROTARY TABLES & INDEXERS



IN THE BEGINNING . . .

In 1983, Haas Automation, Inc., developed the first fully programmable 5C collet indexer. Built with quality materials and engineered to be dependable and highly accurate, the unit was a tremendous success. By closing the gap between cumbersome, manually operated indexers and very expensive true 4th-axis machining centers, Haas established itself as an industry leader in automated 4th-axis parts positioning. By assisting industry in the quest to increase productivity through automation, Haas has become America's leading builder of machine tools and rotary tables.

After more than two decades of ongoing refinement and development, Haas rotary products continue to dominate the industry with quality craftsmanship, dependable operation and affordable prices. Today, Haas manufactures more than 40 models of rotary tables and indexers that deliver the same high quality and extremely accurate performance that is the Haas made-in-America trademark.

The full line of Haas rotary products includes many specialized units designed for maximum productivity. From the multi-head HA5Cs to tilting T5Cs and dual-axis trunnion models, Haas continues to lead the way to higher productivity through automation.

Haas rotary products are built from top-quality materials and undergo constant re-engineering and refinement to offer only state-of-the-art technology. Constructed of heavy-duty materials, and designed for dependable day-in, day-out operation, Haas rotary products are the benchmark by which all others are measured.

Take a close look at the components that go into our rotary tables. Haas manufactures all critical components in-house at our modern California machining facility. By controlling the machining process, we're able to deliver the kind of quality and accuracy our customers demand.

One example of this is the indexing accuracy of our rotary tables. At the core of every Haas rotary table is a large-diameter, aluminum-bronze worm gear meshing with a ground alloy steel worm (hardened to 60 Rc) submerged in a synthetic oil bath. The secret to Haas' indexing accuracy is cutting the worm gear while it's attached to the spindle, rather than assembling the finished worm gear to the spindle as other rotary table manufacturers do. Each assembled spindle is individually trammed-in on a CNC gear hobber to a maximum 2-micron runout, and then the worm gear is precision cut.

This process guarantees the utmost concentricity between the large-diameter ball bearings and the worm gear, ensuring many years of smooth, extremely accurate and bind-free operation. This is just one of the many quality designs that go into every Haas product.



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A solid, robust design.

Fast Alignment – All Haas rotary tables and tailstocks have 0.6245" alignment keys. These keys are parallel to and centered on the spindle. When used on Haas VMCs with their precision T-slots, you can bolt on a rotary product without the need to indicate the table in. (Not shown)

Main Body – Class 30 iron is used for its superior damping qualities. Extremely rigid, it damps vibration and deflects machining forces. Machined by Haas in only two operations on FMS machinery.

2 Turntable Platter – Haas uses only 4140 alloy steel, heat-treated to 35-40 Rc, for our platters. Machined and rotary ground in-house, they deliver superior strength and durability. Made by Haas.

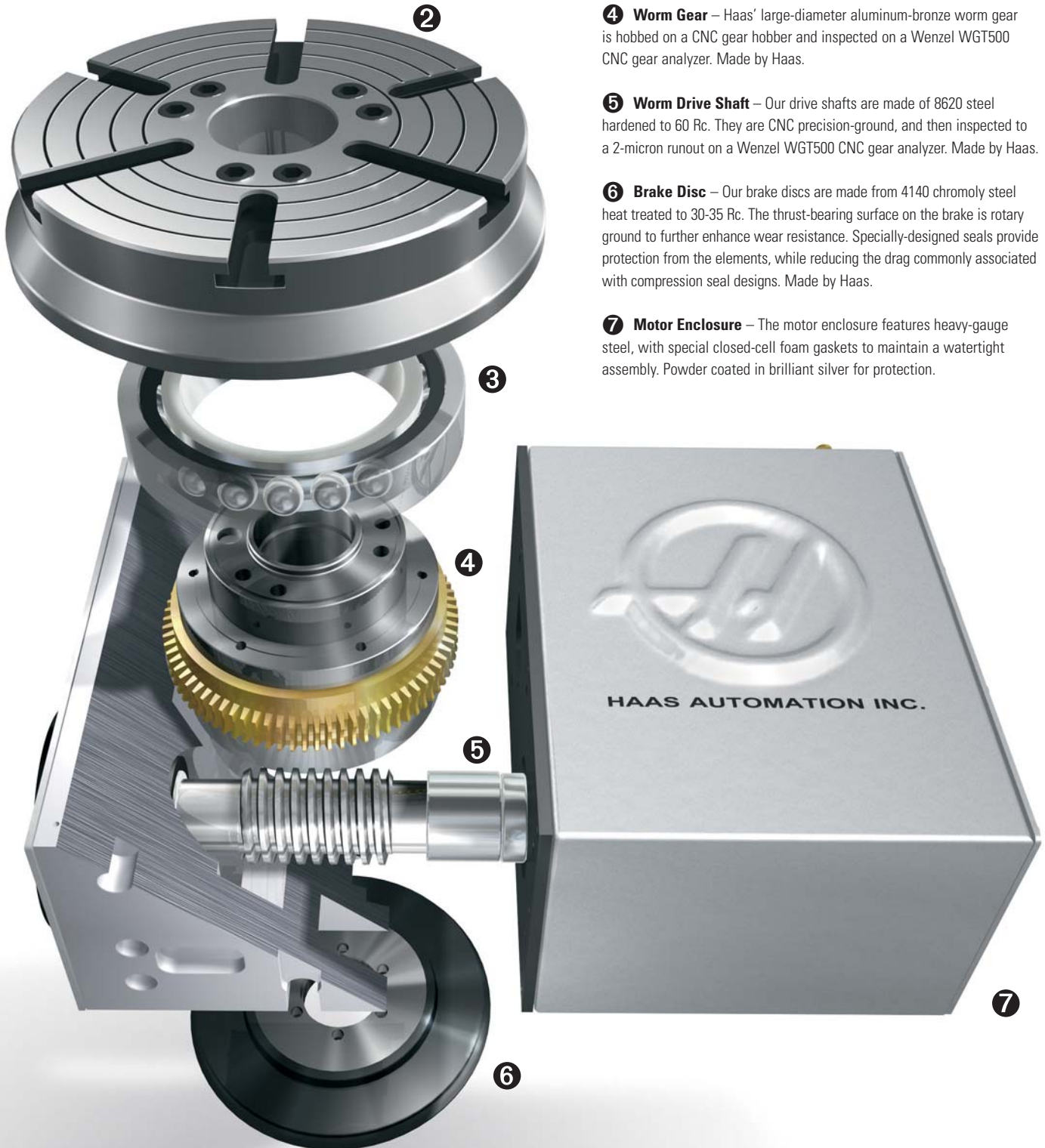
3 Bearings – Two pre-loaded, deep-groove radial bearings withstand loads up to 31,000 lb. By supporting the worm gear on both sides with these massive bearings, Haas is able to deliver superior performance and dependable operation. Precision-made in the USA.

4 Worm Gear – Haas' large-diameter aluminum-bronze worm gear is hobbled on a CNC gear hobber and inspected on a Wenzel WGT500 CNC gear analyzer. Made by Haas.

5 Worm Drive Shaft – Our drive shafts are made of 8620 steel hardened to 60 Rc. They are CNC precision-ground, and then inspected to a 2-micron runout on a Wenzel WGT500 CNC gear analyzer. Made by Haas.

6 Brake Disc – Our brake discs are made from 4140 chromoly steel heat treated to 30-35 Rc. The thrust-bearing surface on the brake is rotary ground to further enhance wear resistance. Specially-designed seals provide protection from the elements, while reducing the drag commonly associated with compression seal designs. Made by Haas.

7 Motor Enclosure – The motor enclosure features heavy-gauge steel, with special closed-cell foam gaskets to maintain a watertight assembly. Powder coated in brilliant silver for protection.



The Haas Servo Control



At the heart of all Haas rotary products is the Haas Servo Control. Refined by more than two decades of development, it offers the utmost in versatility, coupled with fast, easy, flexible programming. The Haas control always incorporates the latest high-speed microprocessor and drive technology.

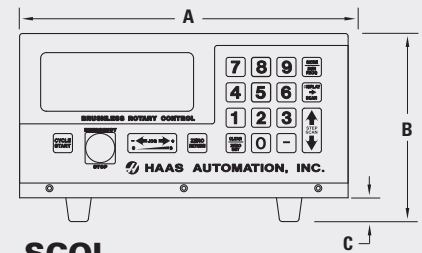
Haas' exclusive software replaces failure-prone mechanical components, and includes a self-diagnostic subroutine that maximizes uptime. A single circuit board controls all main functions.

When used with any CNC machining center, the control performs as a semi-4th axis, activated by a single M code. Easy interfacing, fast set up and low cost make Haas the perfect alternative to cumbersome, high-priced, offshore 4th-axis machines.

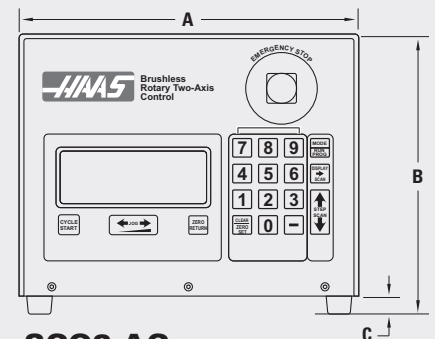
Using the control's standard features, odd-number bolt circles and uneven hole spacing are easily performed with simple programming.

You can program the control to rotate the spindle in either direction, in step sizes from 0.001° to 999.999°. There can be up to 99 different steps in memory, and each step can be repeated (or looped) up to 999 times. The memory is non-volatile, so programs are fully retained, even when the power is turned off. You may store up to 10 separate programs.

You can easily achieve three times the performance of a manual device with a Haas control operating the rotary table of your choice. Add to this built-in-the-USA Haas quality and reliability, and your decision becomes very simple. Haas has the solutions you need.



SCOL



SCO2-AC

DIMENSIONS (Inches Millimeters)

	A		B		C	
SCOL	11.12	282.5	6.19	157.2	0.62	15.8
SCO2-AC	11.12	282.5	9.19	233.4	0.62	15.8

- Fast, easy, flexible programming
- Simple CNC interfacing via M code
- Variable feedrates
- Linear, arc & spiral milling
- Fast setups
- High accuracy & repeatability
- Absolute or incremental programming
- Automatic circle division
- Non-volatile program storage
- RS-232 interface
- Operates on 110 to 120 VAC power
- 12-month limited warranty
- Made in the USA

The Rotary Interface

Has rotary products can be interfaced to virtually any type of machine. There are three distinct methods of interfacing listed below, each with different capabilities. Thousands of Haas rotary products have

been successfully interfaced to a very wide variety of machines over the years. Haas Automation's Service Department can provide expert advice on the best interface for any application.

True 4th-Axis* Direct Control Via Host Machine

This method does not use the Haas Servo Control unit; instead, an amplifier built into the host machine provides power and true multi-axis simultaneous motion control. All Haas machining centers can be fitted with additional amplifiers that work with off-the-shelf Haas rotary products. With this method, the rotary axis is programmed and controlled directly by the host control – just like the X, Y and Z axes. For direct control on machines other than Haas, some Haas rotary products can be refitted with compatible servomotors (Fanuc™, Yasnac™, Allen Bradley, etc.).

4th-Axis Control Via RS-232 Port

This method requires use of a Haas Servo Control unit and a host machine capable of sending data via an RS-232 line. All Haas CNC machine tools can send such data to control up to three daisy-chained Servo Controls. On Haas CNC machines, the rotary axis is programmed directly on the CNC control – just like the X, Y and Z axes – and no M codes are required. All other CNC machines require macro function capability, an external M-code controlled relay, and an M-FIN connection. Programming is still done at the CNC control.

Semi 4th-Axis Control Via CNC Interface Cable

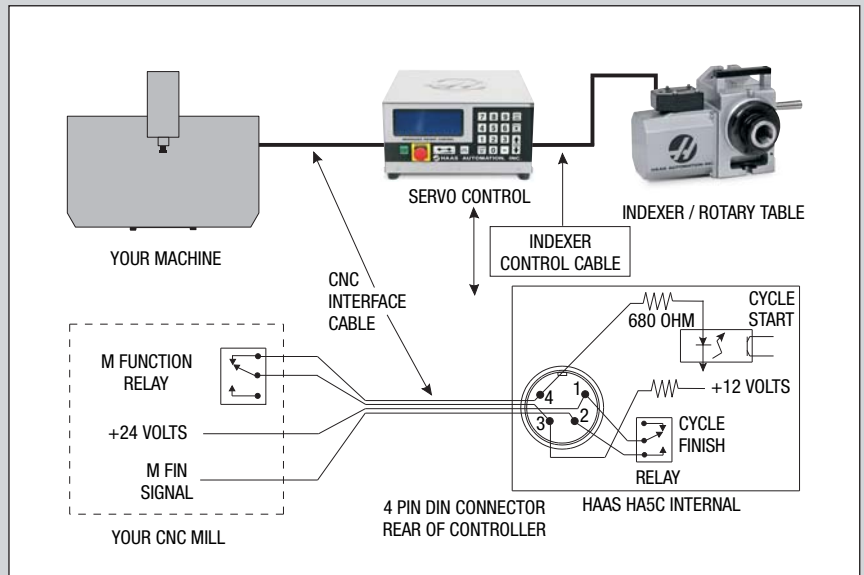
This method requires use of a Haas Servo Control unit and a host machine capable of closing a relay (or switch). Most CNC machine tools are equipped with spare M codes, which can be used to close a relay. Indexing commands are stored only in the Servo Control's program memory. Each pulse of the host machine's relay triggers the Servo Control to index to its next programmed position. After finishing the index, the Servo Control signals that it has finished and is ready for the next pulse. Fully-synchronized multi-axis motions cannot be performed with this method. This method can be used with machine tools that have no controls.

Notes:

The Haas Servo Control can also be interfaced to PLC units and computers for general-purpose use. Please contact Haas Automation for details.

*The term "4th axis" is used as a general description. Unit may operate as any axis depending on host machine.

Diagram of Control Indexer Interface



4th-axis ordering information

When ordering a Haas rotary table or indexer for use on a Haas machining center with a built-in 4th- and/or 5th-axis drive, it is not necessary to purchase the Haas Servo Control unit. However, we suggest you purchase the Servo Control so you can use your rotary table on other machines. Before placing your order, please discuss with your Haas distributor the make and model of CNC machine on which you intend to use your new rotary table.

New Ultra-compact 110 Series



The HRT110 is a single-axis rotary table driven by an 80:1 harmonic drive system coupled to a powerful brushless servomotor to provide indexing speeds up to 300°/sec, and spindle torque of 65 ft-lb. Smaller than a 7" cube and weighing just 29 lb, the HRT110 rotary table provides accurate positioning and simultaneous 4-axis motion for machining small parts.

HRT110	
SPINDLE	
Torque	65 ft-lb 88 Nm
Runout Max	0.001" 0.03 mm
Backlash	30 arc-sec
Speeds	0.001 to 300 °/sec
Tooling	3 Bolt Patterns x 6
Brake Torque	40 ft-lb @ 40 psi 54 Nm @ 2.8 bar
Center Height	3.000"±0.001 76.20 mm ±0.03
INDEXING¹	
Accuracy	±45 arc-sec
Repeatability	10 arc-sec
Resolution	0.001°
Max Rotation/Step	999.999°
MOTOR	
Gear Ratio	80:1 Harmonic Drive
OPERATING SPECIFICATIONS	
Duty Cycle full/low speed	50%/100%
Operating Temp. (max ambient)	100°F 38°C
Power Required (VAC) 1-axis control	115 ±5% @ 15 A
Power Required (VAC) 2-axis control	235 ±10% @ 20 A
Max Air Pressure	60 psi 4.1 bar
PLATTER	
Capacity	20 lb 9.1 kg
Platter Diameter	4.3" 110 mm
WEIGHT	
Table	29 lb 13.2 kg
Brushless Control	14.2 lb 6.4 kg



The TR110 dual-axis trunnion table provides accurate positioning and full 5-axis motion for machining small parts. Its small size and light weight make the TR110 the perfect 5-axis solution for even the smallest machining centers. Indexing speeds up to 300°/sec ensure fast cycle times.

TR110		
	Rotary B axis	Tilt A axis
SPINDLE		
Torque	65 ft-lb 88 Nm	65 ft-lb 88 Nm
Runout Max	0.001" 0.03 mm	N/A
Backlash	30 arc-sec	30 arc-sec
Speeds	0.001 to 300 °/sec	0.001 to 300 °/sec
Brake Torque (ft-lb @ 40 psi) (Nm @ 2.8 bar)	40 54	40 54
INDEXING¹		
Accuracy	±45 arc-sec	±45 arc-sec
Repeatability	10 arc-sec	10 arc-sec
Resolution	0.001°	0.001°
Max Rotation/Step	999.999°	±120°
MOTOR		
Gear Ratio	80:1 Harmonic Drive	80:1 Harmonic Drive
OPERATING SPECIFICATIONS		
Duty Cycle full/low speed	50% / 100%	
Operating Temp. (max ambient)	100°F 38°C	
Power Required (VAC) 1-axis control	115 ±5% @ 15 A	
Power Required (VAC) 2-axis control	235 ±10% @ 20 A	
Max Air Pressure	60 psi 4.1 bar	
PLATTER		
Part Swing (max)	7.35" 186.7 mm	
Capacity	20 lb 9.1 kg	
Platter Diameter	4.3" 110 mm	
WEIGHT		
Table	85 lb 39 kg	
Brushless Control	23.1 lb (2-axis) 10.5 kg (2-axis)	14.2 lb (1-axis) 6.4 kg (1-axis)

High-Speed 5C Collet Indexer



Our Super-High-Speed 5C Collet Indexer

The Haas HA5CSB collet indexer reduces cycle times and positions parts at

725° /sec

- High-torque brushless servo
- 725°/second feedrates
- Simple bolt-on mounting
- Reduces cycle times
- Speeds drill & tap operations
- High-speed engraving
- 20 ft-lb spindle torque

HA5C Series

Part #	Description
HA5CSB	Super-High-Speed Servo Indexer w/Manual Handle Collet Closer

Dimensions are the same as the HA5C (see page 6).

	HA5C SB
SPINDLE	
Torque	20 ft-lb 27 Nm
Runout Max	0.0004" 0.010 mm
Backlash	40 arc-sec
Speeds	0.001 to 725 °/sec
Collets	std 5C (1/64" -1/16") std 5C (0.4 to 27 mm)
Nose Thread	2 3/16" -10
Center Height	4.000" ±0.001 101.60 mm ±0.03
INDEXING¹	
Accuracy	±30 arc-sec
Repeatability	10 arc-sec
Resolution	0.001°
Max Rotation/Step	999.999°
Worm Gear Diameter	2.8" 71 mm
MOTOR	
Gear Ratio (worm & gear)	33:1
OPERATING SPECIFICATIONS	
Duty Cycle*	75% @ full speed
Operating Temp. (max ambient)	100°F 38°C
Power Required (VAC)	115 ±5% @ 10 A
Max Air Pressure (air collets)	120 psi 8.3 bar
WEIGHT	
Rotary Head	48 lb 21.8 kg
Brushless Control	14.2 lb 6.4 kg

*Without tailstock. ¹See page 36.
Due to continual development, all machine specifications are subject to change.

See next page for standard 5C-series indexers

Standard

HA5C Series

The Haas HA5C series is the ideal choice for holding smaller parts. Clamp your parts using standard 5C collets, or chuck them by threading a 3-jaw chuck to the 2³/₁₆"-10 spindle nose. Collets can be closed with your choice of a manual handle or an optional air collet closer.

The HA5C series is easy to program, interface and set up. Haas' own precision in-house manufacturing and machining processes ensure high quality and years of dependable operation. With more than two decades of refinement, the Haas HA5C is the industry benchmark for quality, accuracy and dependability.

High-Productivity Multi-Spindle Indexers

By spacing the heads as close together as possible, Haas is able to obtain the most cost-effective multi-spindle designs on the market today. In higher-volume applications, loading multiple parts saves tool changes and reduces rapid-movement times, allowing your machine to run longer between part loadings. Together, these time savings add up to substantially increased profits.



HA5C Series

ID.	Part #	Description
A.	HA5C	Servo Indexer w/Manual Collet Closer
B.	HA5C 2*	Dual-Spindle Servo 5C System
C.	HA5C 3HD*	Triple-Spindle Servo 5C System
D.	HA5C 4HD*	Quad-Spindle Servo 5C System

*Note: Multi-head indexers are not designed to be used with spindles in the vertical position.

Specifications and Dimensions

HA5C Single Spindle

Note: Carry-handle omitted from front view

LOCATING PINS on base:
 ø0.6250" (±0.001") x 0.35" deep
 15.875 mm (±0.025 mm)
 x 8.9 mm deep

DIMENSIONS (Inches Millimeters)

A	7.80	198.1	J	3.0000 ±0.0003	76.20 ±0.008
B	7.38	187.5	K	5.47	138.9
C	2.62	66.6	L	3.25	82.6
D	15.32	389.1	M	0.750 ±0.002	19.05 ±0.05
E	7.00	177.8	N	3.0000 ±0.0003	76.20 ±0.008
F	2.12	53.9	P	1.750 ±0.001	44.45 ±0.03
G	0.520/0.530 TYP	13.21/13.46 TYP	Q	4.000 ±0.001	101.60 ±0.03
H	7.93	201.4			

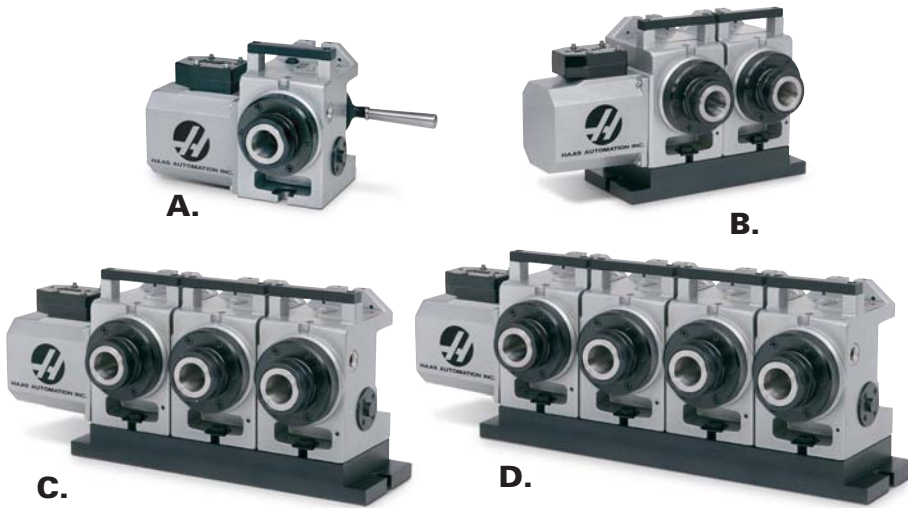
HA5C Two, Three & Four Spindle

DIMENSIONS (Inches Millimeters)

	HA5C 2		HA5C 3		HA5C 4	
A	4.45	113.0	7.27	184.6	7.27	184.7
B	16.62	422.2	24.65	626.1	29.65	753.1
C	11.10	281.9	11.10	281.9	11.10	281.9
D	10.18	258.6	10.18	258.6	10.18	258.6
E	9.25	235.0	9.25	235.0	9.25	235.0
F	5.000 ±0.002	127.00 ±0.05	5.000 ±0.002	127.00 ±0.05	5.000 ±0.002	127.00 ±0.05
G	0.68 TYP	17.3 TYP	0.68 TYP	17.3 TYP	0.68 TYP	17.3 TYP
H	3.88	98.6	3.88	98.6	3.88	98.6
J	5.875 ±0.002	149.23 ±0.05	5.875 ±0.002	149.23 ±0.05	5.875 ±0.002	149.23 ±0.05
K	0.70	17.8	0.70	17.8	0.70	17.8
L	0.75	19.1	0.75	19.1	0.75	19.1
M	0.53	13.5	0.53	13.5	0.53	13.5
N	2.75	69.9	2.75	69.9	2.75	69.9
P	7.93	201.4	7.93	201.4	7.93	201.4
Q	5.50	139.7	5.50	139.7	5.50	139.7
R						
w/AC-25	7.93	201.4	7.93	201.4	7.93	201.4
w/AC-100	14.75	374.7	14.75	374.7	14.75	374.7
w/AC-125	9.29	236.0	9.29	236.0	9.29	236.0

Features

- Uses standard 5C collets, step chucks and closers
- Threaded spindle nose for chucks
- Coolant-resistant polyurethane conduit & seals
- Fast, easy, flexible programming
- Simple CNC interfacing via M code
- Direct connection to Haas machines
- Variable feedrates
- Linear, arc & spiral milling
- Fast setups
- Accurate and repeatable
- 12-month limited warranty
- Made in the USA



	HA5C	HA5C 2	HA5C 3* HA5C 4*
SPINDLE			
Torque	60 ft-lb 81 Nm	25 ft-lb 34 Nm	25 ft-lb 34 Nm
Runout Max	0.0004" 0.010 mm	0.0004" 0.010 mm	0.0004" 0.010 mm
Backlash	40 arc-sec	50 arc-sec	50 arc-sec
Speeds	0.001 to 410 °/sec	0.001 to 200 °/sec	0.001 to 200 °/sec
Collets	std 5C (1/64" -1 1/16") std 5C (0.4 to 27 mm)	std 5C (1/64" -1 1/16") std 5C (0.4 to 27 mm)	std 5C (1/64" -1 1/16") std 5C (0.4 to 27 mm)
Nose Thread	2 3/16" -10	2 3/16" -10	2 3/16" -10
Center Height	4.000" ±0.001 101.60 mm ±0.03	5.875" ±0.002 149.23 mm ±0.05	5.875" ±0.002 149.23 ±0.05
INDEXING¹			
Accuracy	±30 arc-sec	±60 arc-sec	±60 arc-sec
Repeatability	10 arc-sec	10 arc-sec	10 arc-sec
Resolution	0.001°	0.001°	0.001°
Max Rotation/Step	999.999°	999.999°	999.999°
Worm Gear Diameter	2.8" 71 mm	2.8" 71 mm	2.8" 71 mm
MOTOR			
Gear Ratio (worm & gear)	60:1	60:1	60:1
OPERATING SPECIFICATIONS			
Duty Cycle**	75% @ full speed	75% @ full speed	75% @ full speed
Operating Temp. (max ambient)	100°F 38°C	100°F 38°C	100°F 38°C
Power Required (VAC)	115 ±5% @ 10 A	115 ±5% @ 10 A	115 ±5% @ 15 A
Max Air Pressure	120 psi 8.3 bar	120 psi 8.3 bar	120 psi 8.3 bar
WEIGHT			
Rotary Head	48 lb 21.8 kg	120 lb 54.4 kg	168 lb (3HD) 76.2 kg (3HD) 250 lb (4HD) 113.4 kg (4HD)
Brushless Control	14.2 lb 6.4 kg	14.2 lb 6.4 kg	14.2 lb 6.4 kg

* Not for use with tailstocks. **Without tailstock. ¹See page 36. Due to continual development, all machine specifications are subject to change.

HRT Series

For holding medium to large parts or fixtures, the HRT series of horizontal/vertical T-slotted rotary tables is the answer. Available in sizes from 160 mm to 600 mm, these rugged, heavy-duty tables can accommodate parts and fixtures weighing up to 1,475 lb (HRT600). Chucks and fixtures can easily be bolted to the table using the six precision T-slots, and large through-holes allow for bar feeding and special fixture-locating requirements.

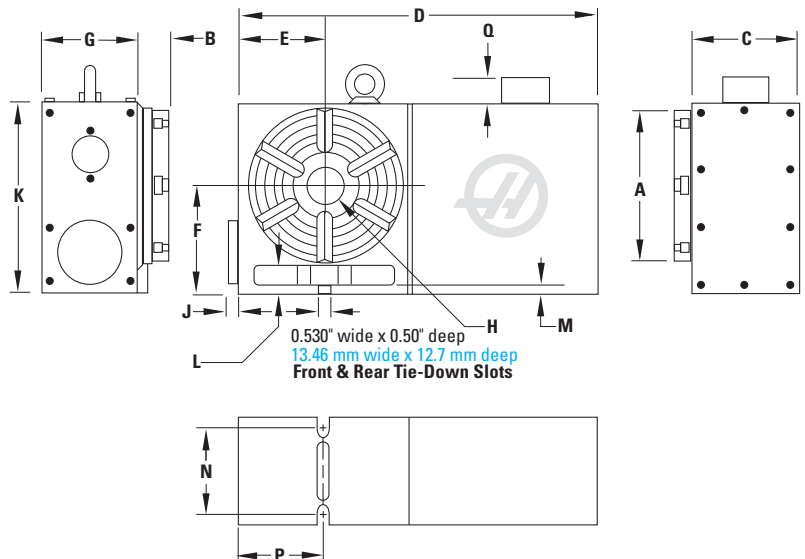
- Mount horizontally or vertically
- Heavy-duty design
- Large thru-holes
- Coolant-resistant polyurethane conduit & seals
- Fast, easy, flexible programming
- Simple CNC interfacing via M code
- Direct connection to Haas machines
- Variable feedrates
- Linear, arc & spiral milling
- High accuracy & repeatability
- 12-month limited warranty
- Made in the USA



Specifications and Dimensions

DIMENSIONS (Inches Millimeters)

	HRT160	HRT210	HRT310	HRT450	HRT600
A	6.3 160	8.3 210	12.2 310	17.7 450	23.6 600
B	1.50 38.1	1.75 44.5	2.00 50.8	2.25 57.2	2.50 63.5
C	5.50 139.7	5.84 148.3	7.82 198.6	9.00 228.6	9.00 228.6
D	16.20 411.5	17.80 452.1	22.80 579.1	28.55 725.2	34.82 884.4
E	3.63 92.2	4.63 117.6	6.88 174.8	9.25 235.0	12.134 308.2
F	5.000 127.00 ±0.001 ±0.03	6.000 152.40 ±0.001 ±0.03	9.000 228.60 ±0.001 ±0.03	11.500 292.10 ±0.001 ±0.03	14.500 368.30 ±0.001 ±0.03
G	4.500 114.30	5.250 133.35	7.875 200.03	9.000 228.60	9.000 228.60
H Ø	1.5000 38.100 +0.0005, -0 +0.013, -0	2.0000 50.800 +0.0005, -0 +0.013, -0	3.2500 82.550 +0.0005, -0 +0.013, -0	7.500 190.50 +0.001, -0 +0.03, -0	7.500 190.50 +0.001, -0 +0.03, -0
J	1.15 29.2	0.63 16.0	0.08 2.0	0.00 0.00	0.00 0.00
K	8.64 219.5	10.64 270.3	15.90 403.9	20.62 523.8	26.62 676.2
L	1.50 38.1	1.50 38.1	2.00 50.8	2.25 57.2	2.25 57.2
M	0.63 16.0	0.63 16.0	1.00 25.4	1.13 28.7	1.13 28.7
N	3.50 88.9	4.25 108.0	6.80 172.7	7.90 200.7	7.90 200.7
P	3.50 88.9	4.50 114.3	6.75 171.5	9.125 231.8	12.00 304.8
Q	1.75 44.5	1.75 44.5	1.75 44.5	1.75 44.5	1.75 44.5



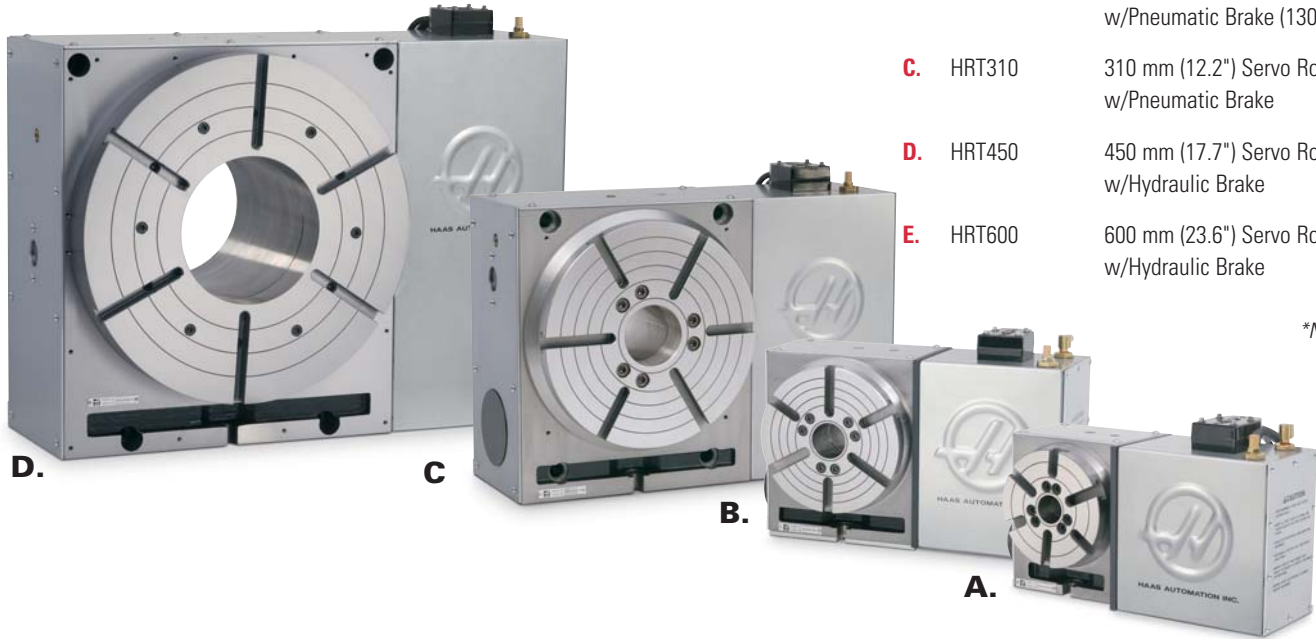
Using standard T-nuts

Locating Key on base:

0.6245" wide **15.86 mm**
 (+0. -0.001") **0.025 mm**
 by
 0.225" deep **5.72 mm**

Minimum Dia. Bolt Circle:

HRT160 – 3.92" **99.6 mm**
 HRT210 – 4.37" **111.0 mm**
 HRT310 – 6.00" **152.4 mm**
 HRT450 – 9.84" **249.9 mm**
 HRT600 – 9.84" **249.9 mm**



HRT Series

ID.	Part #	Description
A.	HRT160	160 mm (6.3") Servo Rotary Table w/Pneumatic Brake
B.	HRT210	210 mm (8.3") Servo Rotary Table w/Pneumatic Brake
	HRT210HS*	210 mm (8.3") Servo Rotary Table w/Pneumatic Brake (130°/sec)
C.	HRT310	310 mm (12.2") Servo Rotary Table w/Pneumatic Brake
D.	HRT450	450 mm (17.7") Servo Rotary Table w/Hydraulic Brake
E.	HRT600	600 mm (23.6") Servo Rotary Table w/Hydraulic Brake

*Not Shown.

	HRT160	HRT210	HRT210HS	HRT310	HRT450	HRT600
SPINDLE						
Torque	150 ft-lb 203 Nm	210 ft-lb 285 Nm	105 ft-lb 142 Nm	300 ft-lb 407 Nm	400 ft-lb 542 Nm	450 ft-lb 610 Nm
Runout Max	0.0005" 0.013 mm	0.0005" 0.013 mm	0.0005" 0.013 mm	0.0010" 0.025 mm	0.0015" 0.038 mm	0.0015" 0.038 mm
Backlash	30 arc-sec	30 arc-sec	45 arc-sec	30 arc-sec	30 arc-sec	30 arc-sec
Speeds	0.001 to 130 °/sec	0.001 to 100 °/sec	0.001 to 130 °/sec	0.001 to 75 °/sec	0.001 to 50 °/sec	0.001 to 50 °/sec
Tooling	6 std T-slots @ 60°	6 std T-slots @ 60°	6 std T-slots @ 60°	6 std T-slots @ 60°	6 std T-slots @ 60°	6 std T-slots @ 60°
Center Height	5.000" ±0.001 127.00 mm ±0.03	6.000" ±0.001 152.40 mm ±0.03	6.000" ±0.001 152.40 mm ±0.03	9.000" ±0.001 228.60 mm ±0.03	11.500" ±0.001 292.10 mm ±0.03	14.500" ±0.001 368.30 mm ±0.03
Brake Torque @ 100 psi @ 6.9 bar	100 ft-lb 136 Nm	200 ft-lb 271 Nm	200 ft-lb 271 Nm	500 ft-lb 678 Nm	1,800 ft-lb 2,440 Nm	1,800 ft-lb 2,440 Nm
INDEXING¹						
Accuracy	±15 arc-sec	±15 arc-sec	±20 arc-sec	±15 arc-sec	±15 arc-sec	±15 arc-sec
Repeatability	10 arc-sec	10 arc-sec	10 arc-sec	10 arc-sec	10 arc-sec	10 arc-sec
Resolution	0.001°	0.001°	0.001°	0.001°	0.001°	0.001°
Max Rotation/Step	999.999°	999.999°	999.999°	999.999°	999.999°	999.999°
Worm Gear Diameter	4.7" 119 mm	6.3" 160 mm	6.3" 160 mm	9.4" 239 mm	13.5" 343 mm	13.5" 343 mm
MOTOR						
Gear Ratio (worm & gear)	63:1	90:1	90:1	72:1	72:1	72:1
Timing Belt	2:1	2:1	1:1	2:1	3:1	3.5:1
OPERATING SPECIFICATIONS						
Duty Cycle full/low speed	50% / 100%	50% / 100%	50% / 100%	50% / 100%	50% / 100%	50% / 100%
Operating Temp. (max. ambient)	100°F 38°C	100°F 38°C	100°F 38°C	100°F 38°C	100°F 38°C	100°F 38°C
Power Required (VAC)	115 ±10% @ 15 A	115 ±10% @ 15 A	115 ±10% @ 15 A	115 ±10% @ 15 A	115 ±10% @ 15 A	115 ±10% @ 15 A
Max Air Pressure	120 psi 8.3 bar	120 psi 8.3 bar	120 psi 8.3 bar	120 psi 8.3 bar	120 psi 8.3 bar	120 psi 8.3 bar
WEIGHT						
Table	90 lb 40.8 kg	165 lb 74.8 kg	165 lb 74.8 kg	435 lb 197.3 kg	850 lb 385.6 kg	1,475 lb 669 kg
Brushless Control	14.2 lb 6.4 kg	14.2 lb 6.4 kg	14.2 lb 6.4 kg	14.2 lb 6.4 kg	14.2 lb 6.4 kg	14.2 lb 6.4 kg

¹See page 36.

Due to continual development, all machine specifications are subject to change.

HRT SP Series

The HRT SP Series gives you the same features and benefits as the standard HRT series, but the motor is wrapped behind the table to provide a substantially shorter overall length, and help you fit a lot of table into a small work envelope. (Available with A1-6 platter on the HRT 210SP, and A1-5 platter on the HRT 160SP, for a slight additional cost.)

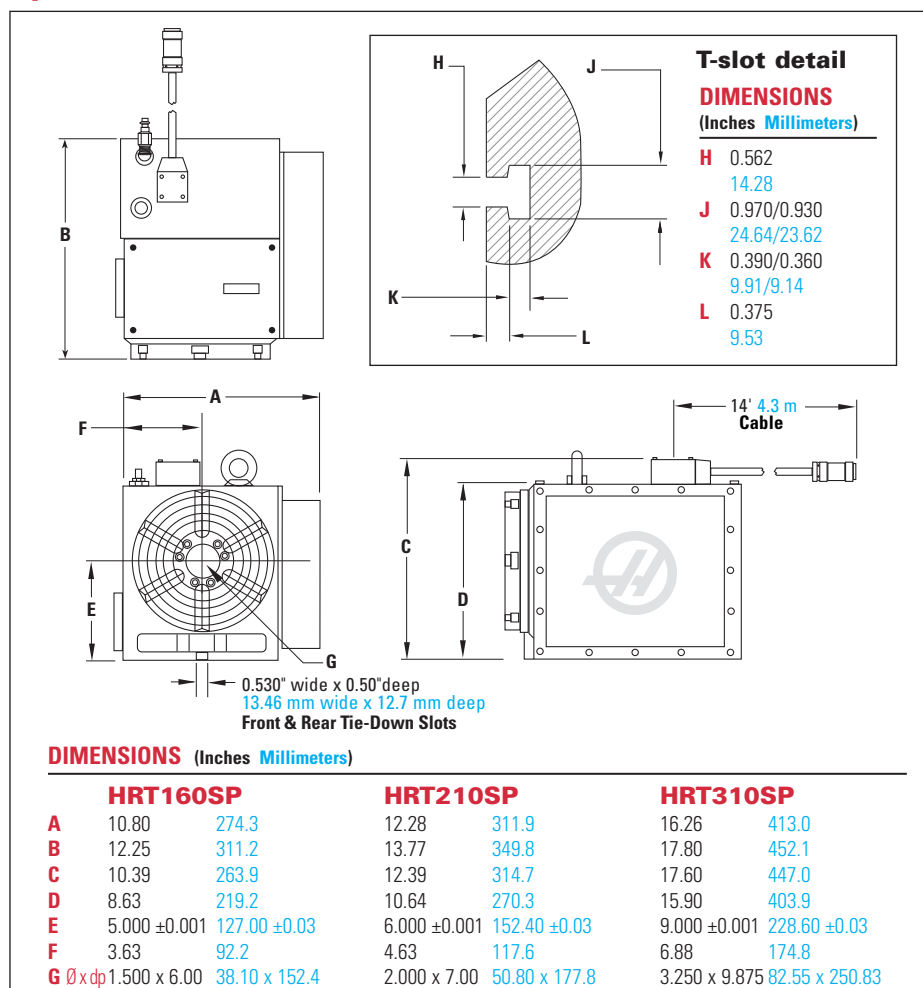


HRT SP Series

ID.	Part #	Description
A.	HRT 160SP	160 mm (6.3") Servo Rotary Table w/Motor in Back
B.	HRT 210SP	210 mm (8.3") Servo Rotary Table w/Motor in Back
C.	HRT 310SP	310 mm (12.2") Servo Rotary Table w/Motor in Back

- Heavy-duty design
- Coolant-resistant polyurethane conduit & seals
- Fast, easy, flexible programming
- Simple CNC interfacing via M code
- Direct connection to Haas machines
- Variable feedrates
- Linear, arc & spiral milling
- Fast setups
- High accuracy & repeatability
- 12-month limited warranty
- Made in the USA

Specifications and Dimensions



An HRT with shorter overall length.



	HRT 160SP	HRT 210SP	HRT 310SP
SPINDLE			
Torque	150 ft-lb 203 Nm	210 ft-lb 285 Nm	300 ft-lb 407 Nm
Runout Max	0.0005" 0.013 mm	0.0005" 0.013 mm	0.0010" 0.025 mm
Backlash	30 arc-sec	30 arc-sec	30 arc-sec
Speeds	0.001 to 130°/sec	0.001 to 100°/sec	0.001 to 75°/sec
Tooling	6 std T-slots @ 60°	6 std T-slots @ 60°	6 std T-slots @ 60°
Center Height	5.000" ±0.001 127.00 mm ±0.03	6.000" ±0.001 152.40 mm ±0.03	9.000" ±0.001 228.60 mm ±0.03
Brake Torque @100 psi @6.9 bar	100 ft-lb 136 Nm	200 ft-lb 271 Nm	500 ft-lb 678 Nm
INDEXING¹			
Accuracy	±15 arc-sec	±15 arc-sec	±15 arc-sec
Repeatability	10 arc-sec	10 arc-sec	10 arc-sec
Resolution	0.001°	0.001°	0.001°
Max Rotation/Step	999.999°	999.999°	999.999°
Worm Gear Diameter	4.7" 119 mm	6.3" 160 mm	9.4" 239 mm
MOTOR			
Gear Ratio (worm & gear)	63:1	90:1	72:1
Timing Belt	2:1	2:1	2:1
OPERATING SPECIFICATIONS			
Duty Cycle full/low speed	50% / 100%	50% / 100%	50% / 100%
Operating Temp. (max ambient)	100°F 38°C	100°F 38°C	100°F 38°C
Power Required (VAC)	115 ±10% @ 15 A	115 ±10% @ 15 A	115 ±10% @ 15 A
Max Air Pressure	120 psi 8.3 bar	120 psi 8.3 bar	120 psi 8.3 bar
WEIGHT			
Table	90 lb 40.8 kg	165 lb 74.8 kg	435 lb 197.3 kg
Brushless Control	14.2 lb 6.4 kg	14.2 lb 6.4 kg	14.2 lb 6.4 kg

¹See page 36.
Due to continual development, all machine specifications are subject to change.

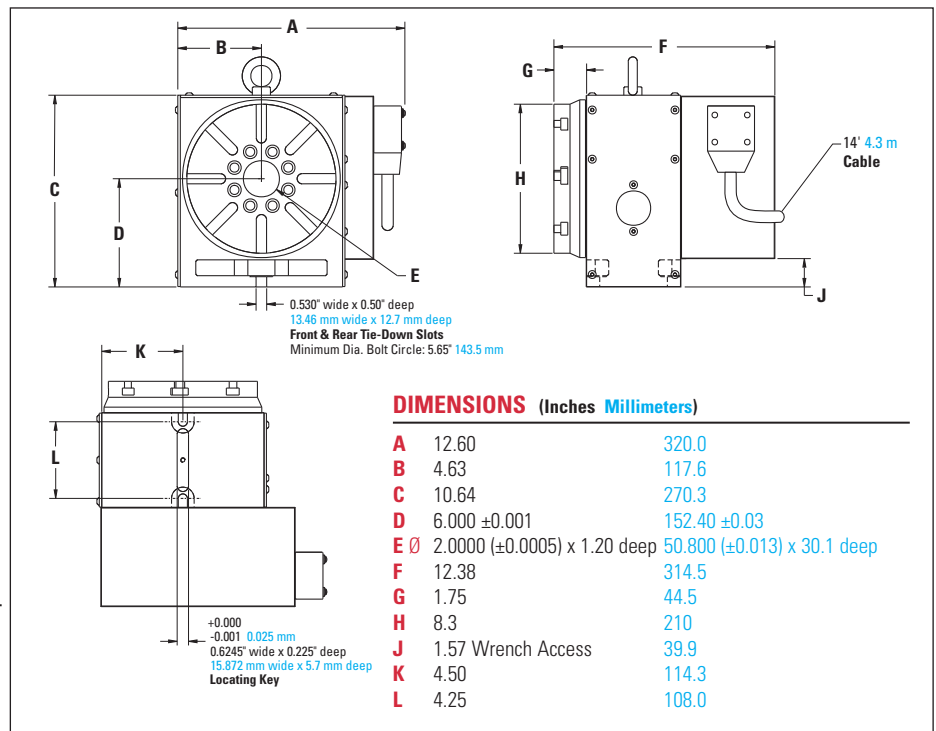
HRT Super High Speed

For small to medium parts, Haas boosts productivity through even shorter cycles times with the HRT210SHS. Nearly six times faster than the standard HRT210, the 210SHS greatly increases productivity with 360°/sec rapids and 270°/sec cutting feedrates. In addition to the increased speed, the HRT 210SHS also features a compact design like our SP Series.



Specifications and Dimensions

- Harmonic drive gear design
- Compact enclosure
- Brushless servomotor technology
- Coolant-resistant polyurethane conduit & seals
- Fast, easy, flexible programming
- Simple CNC interfacing via M code
- Direct connection to Haas machines
- Variable feedrates
- Linear, arc & spiral milling
- Fast setups
- High accuracy & repeatability
- 12-month limited warranty
- Made in the USA



HRT Super High Speed Series

Part #	Description
HRT210SHS	210 mm (8.3") Servo Rotary Table w/ Harmonic Gear Drive & Motor in Back

HRT210SHS-HD

SPINDLE

Torque	200 ft-lb 271 Nm
Runout Max	0.0005" 0.013 mm
Speeds, Feed	0.001 to 270 °/sec
Speeds, Rapid	0.001 to 360 °/sec
Tooling	8 std T-slots @ 45°
Center Height	6.000" ±0.001 152.40 mm ±0.03
Max Part Capacity	50 lb 22.7 kg

INDEXING¹

Accuracy	±30 arc-sec
Repeatability	10 arc-sec
Resolution	0.001°
Max Rotation/Step	999.999°
Drive	Harmonic Gear

MOTOR

Gear Ratio	50:1
OPERATING SPECIFICATIONS	
Duty Cycle full/low speed	50% / 100%
Operating Temp. (max ambient)	100°F 38°C
Power Required (VAC)	115 ±10% @ 15 amps
WEIGHT	
Table	165 lb 74.8 kg
Brushless Control	14.2 lb 6.4 kg

¹See page 36.

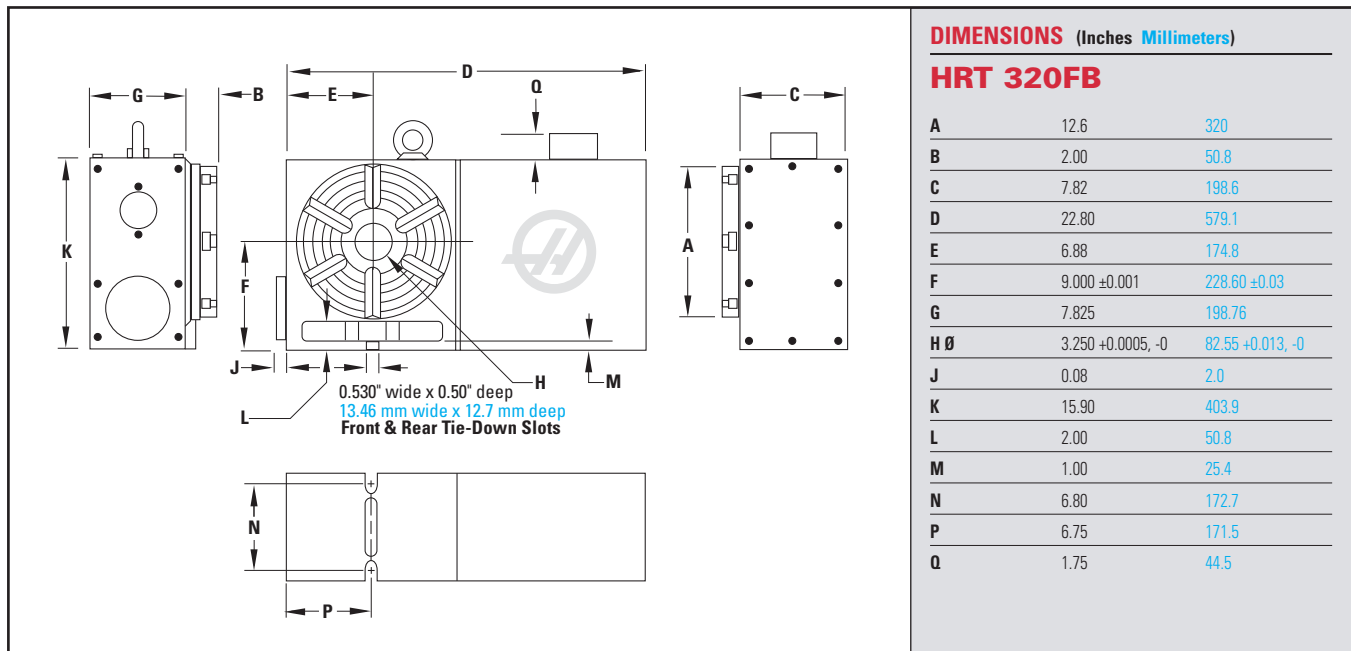
Due to continual development, all machine specifications are subject to change.

HRT320FB Table



The Haas HRT320FB rotary table features a high-precision face gear (Hirth type) that provides superior indexing accuracy and positioning. The design also provides extreme rigidity off-center milling, drilling and tapping operations. The platter can be positioned in 1-degree increments for maximum precision and repeatability.

HRT320FB	
SPINDLE	
Torque	500 ft-lb 678 Nm
Runout	0.0005" 0.013 mm
Speeds	0.001 to 80°/sec
Tooling	6 std T-slots @ 60°
Brake Torque @ 100 psi	@ 6.9 bar 3,500 ft-lb 4749 Nm
Center Height	9.000" ±0.001 228.6 mm ±0.03
INDEXING¹	
Accuracy	±3 arc-sec
Repeatability	±1 arc-sec
Resolution	1.0°
Max Rotation/Step	999°
Worm Gear Diameter	9.40" 238.8 mm
MOTOR	
Gear Ratio (worm & gear)	72:1
Timing Belt	2:1
OPERATING SPECIFICATIONS	
Operating Temp. (max ambient)	100°F 38°C
Power Required (VAC)	115 ±5% @ 15 A
Max Air Pressure	120 psi 8.3 bar
WEIGHT	
Table	450 lb 204.1 kg
Brushless Control	14.2 lb 6.4 kg



HRT Dual-Platter Series

Double your production with our HRT160-2 and HRT210-2 dual-platter models. The HRT160-2 provides two 160 mm platters on 10" centers, and the HRT210-2 provides two 210 mm platters on 12" centers. Both models yield maximum productivity in minimal space.



May be special ordered in SP style, and with A1-6 and A1-5 platters, for an additional cost. Contact Haas or your local Haas Factory Outlet for details.

- Heavy-duty design
- Coolant-resistant polyurethane conduit & seals
- Simple CNC interfacing via M code
- Direct connection to Haas machines
- Variable feedrates
- Linear, arc & spiral milling
- High accuracy & repeatability
- 12-month limited warranty
- Made in the USA

Specifications and Dimensions

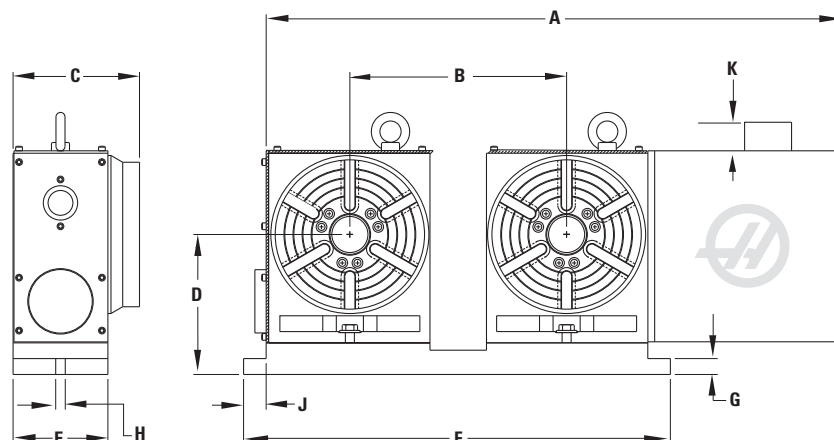
DIMENSIONS (Inches Millimeters)

	HRT160-2		HRT210-2	
A	26.10	662.9	30.30	769.6
B	10.000 ±0.001	254.00 ±0.03	12.000 ±0.001	304.80 ±0.03
C	6.00	152.4	7.00	177.8
D	6.750 ±0.002	171.45 ±0.05	7.750 ±0.002	196.85 ±0.05
E	4.50	114.3	5.25	133.4
F	19.63	498.6	23.63	600.2
G	0.88	22.4	0.88	22.4
H	0.053	1.35	0.053	1.35
J	1.25	31.8	1.25	31.8
K	1.75	44.5	1.75	44.5

HRT Dual Table Series

ID.	Part #	Description
A.	HRT160-2*	Dual-Spindle Servo Rotary Table, 10" (254 mm) Center Distance
B.	HRT210-2*	Dual-Spindle Servo Rotary Table, 12" (305 mm) Center Distance

*Note: Dual-table rotaries are not designed to be used with spindles in the vertical position.





A closeup view of an impeller-type machining process utilizing simultaneous 4th-axis machining with a Haas HRT 210-2.

These dual-platter rotary tables can boost your productivity considerably.



A.



B.

	HRT160-2	HRT210-2
SPINDLE		
Torque	110 ft-lb 149 Nm	170 ft-lb 230 Nm
Runout Max	0.0005" 0.013mm	0.0005" 0.013 mm
Backlash	30 arc-sec	30 arc-sec
Speeds	0.001 to 80°/sec	0.001 to 60°/sec
Tooling	6 std T-slots @ 60°	6 std T-slots @ 60°
Center Height	6.750" ±0.001" 171.45 mm ±0.03	7.750" ±0.001 196.85 mm ±0.03
Brake Torque	100 ft-lb @ 100 psi 136 Nm @ 6.9 bar	200 ft-lb @ 100 psi 271 Nm @ 6.9 bar
INDEXING¹		
Accuracy	±15 arc-sec	±15 arc-sec
Repeatability	10 arc-sec	10 arc-sec
Resolution	0.001°	0.001°
Max Rotation/Step	999.999°	999.999°
Worm Gear Diameter	4.7" 119 mm	6.3" 160 mm
MOTOR		
Gear Ratio (worm & gear)	63:1	90:1
Timing Belt	2:1	2:1
OPERATING SPECIFICATIONS		
Duty Cycle full/low speed	50% / 100%	50% / 100%
Operating Temp. (max ambient)	100°F 38°C	100°F 38°C
Power Required (VAC)	115 ±10% @ 15 A	115 ±10% @ 15 A
Max Air Pressure	120 psi 8.3 bar	120 psi 8.3 bar
WEIGHT		
Table	210 lb 95.3 kg	355 lb 161.0 kg
Brushless Control	14.2 lb 6.4 kg	14.2 lb 6.4 kg

¹See page 36.
Due to continual development, all machine specifications are subject to change.

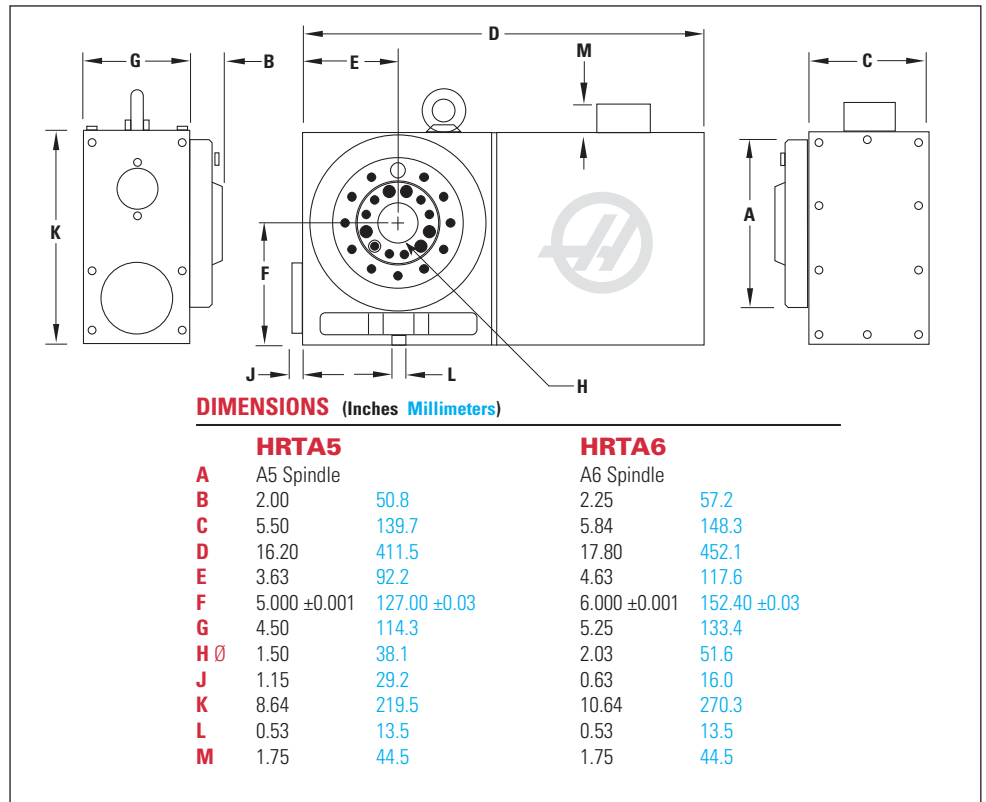
HRT A Series

If workholding versatility is important to you, the HRTA5 and HRTA6 rotary tables are the way to go. Chucks, faceplates and collet chucks can easily be mounted to their standard A1 spindle nose. For the HRTA6, Haas offers an 8" 3-jaw chuck, as well as 8" and 11" faceplates for making your own fixtures. For small parts,

we have 5C and 16C collet chucks that work with our A6AC pneumatic draw bar assembly. For the HRTA5, we offer a 6" top-reversible 3-jaw chuck. For both rotary tables, other accessories are available from your tooling supplier.



Specifications and Dimensions



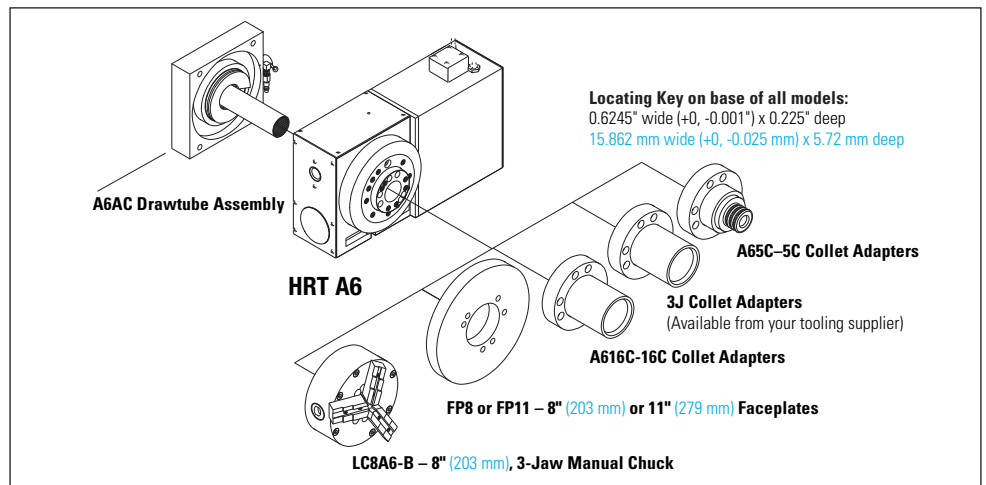
- Versatile workholding options
- Large thru holes
- Coolant-resistant polyurethane conduit & seals
- Pneumatic draw bar option (A1-6 model)
- Fast, easy, flexible programming
- Simple CNC interfacing via M code
- Direct connection to Haas machines
- Variable feedrates
- Linear, arc & spiral milling
- Fast setups
- High accuracy & repeatability
- 12-month limited warranty
- Made in the USA

HRT A Series

ID.	Part #	Description
A.	HRTA6	Rotary Table w/A1-6 Spindle Nose
B.	HRTA5 ^{1,2}	Rotary Table w/A1-5 Spindle Nose

¹Draw tube not available.

²Accessories for the HRT A5 available from your tooling supplier.





A.

B.

	HRTA5	HRTA6
SPINDLE		
Torque	150 ft-lb 203 Nm	210 ft-lb 285 Nm
Runout Max	0.0005" 0.013 mm	0.0005" 0.013 mm
Backlash	30 arc-sec	30 arc-sec
Speeds	0.001 to 130°/sec	0.001 to 100°/sec
Tooling	A1-5 Spindle	A1-6 Spindle
Center Height	5.000" ±0.001 127.00 mm ±0.03	6.000" ±0.001 152.40 mm ±0.03
Brake Torque	100 ft-lb @ 100 psi 136 Nm @ 6.9 bar	200 ft-lb @ 100 psi 271 Nm @ 6.9 bar
INDEXING¹		
Accuracy	±15 arc-sec	±15 arc-sec
Repeatability	10 arc-sec	10 arc-sec
Resolution	0.001°	0.001°
Max Rotation/Step	999.999°	999.999°
Worm Gear Diameter	4.7" 119 mm	6.3" 160 mm
MOTOR		
Gear Ratio (worm & gear)	63:1	90:1
Timing Belt	2:1	2:1
OPERATING SPECIFICATIONS		
Duty Cycle full/low speed	50% / 100%	50% / 100%
Operating Temp. (max ambient)	100°F 38°C	100°F 38°C
Power Required (VAC)	115 ±10% @ 15 A	115 ±10% @ 15 A
Max Air Pressure	120 psi 8.3 bar	120 psi 8.3 bar
WEIGHT		
Table	90 lb 40.8 kg	165 lb 74.8 kg
Brushless Control	14.2 lb 6.4 kg	14.2 lb 6.4 kg

Available in SP models; see page 10.

¹See page 36. Due to continual development, all machine specifications are subject to change.

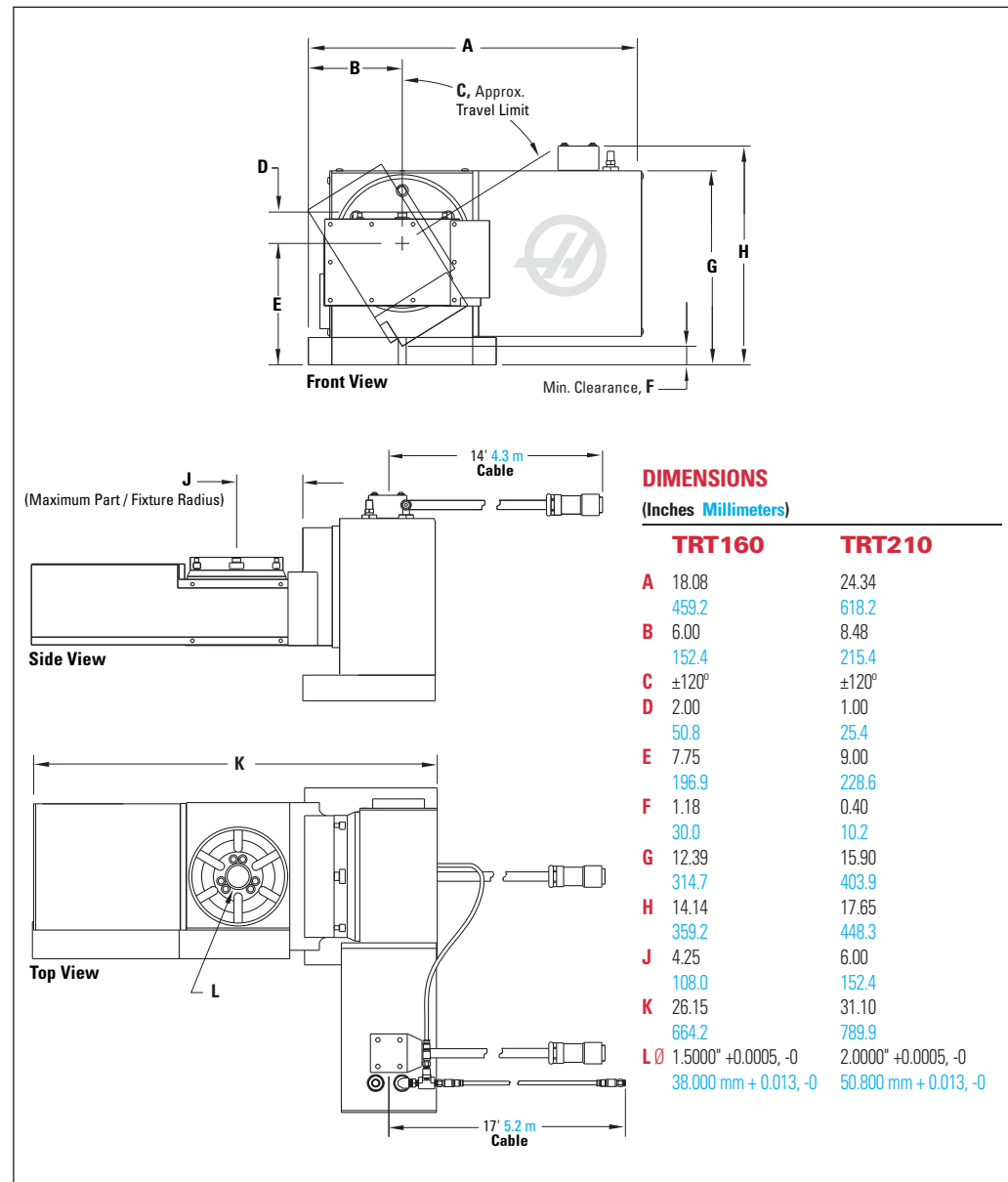
TRT Series

Eliminate second and third operations and setups by using the Haas TRT210 or TRT160 two-axis tilting rotary table. Machine up to five sides of a part, and easily program the table to reach virtually any compound angle. When used on a Haas VMC with the 5-axis option, complex geometries – such as impellers – are easily accomplished. The TRT160 and 210 are sturdy, high-precision tilting units that easily interface with a Haas VMC. Add the Haas servo control and they'll run on any other VMC.

The maximum capacity (part and fixture) for the TRT210 is 300 lb, and the maximum capacity for the TRT160 is 150 lb. With a 200 lb load on the TRT210, there is less than 0.0002" of deflection. By using massive castings, and mounting large-diameter bearings at both ends of the spindle, Haas is able to build an extremely rugged and durable tilting table. A 2-axis servo control is available for semi-4th and 5th-axis operation. Also available are an A1-5 platter for the TRT160, and an A1-6 platter for the TRT210.



Specifications and Dimensions



- Versatile workholding options
- Machine up to five sides
- Eliminate multiple setups
- Increase productivity
- Fast, easy, flexible programming
- Simple CNC interfacing via M code
- Direct connection to Haas machines
- Fast setups
- High accuracy & repeatability
- 12-month limited warranty
- Made in the USA



A.



B.

TRT Series

ID.	Part #	Description
A.	TRT160	Tilting 5th-Axis Rotary Table 160 mm (6.3")
B.	TRT210	Tilting 5th-Axis Rotary Table 210 mm (8.3")

	TRT160		TRT210	
	Rotary B axis	Tilt A axis	Rotary B axis	Tilt A axis
SPINDLE				
Torque	150 ft-lb 203 Nm	210 ft-lb 285 Nm	210 ft-lb 285 Nm	300 ft-lb 407 Nm
Runout Max	0.0005" 0.013 mm	0.0005" 0.013 mm	0.0005" 0.013 mm	0.0005" 0.013 mm
Backlash	30 arc-sec	30 arc-sec	30 arc-sec	30 arc-sec
Speeds	0.001 to 80°/sec	0.001 to 60°/sec	0.001 to 60°/sec	0.001 to 50°/sec
Center Height	N/A	7.750" ±0.001 196.85 mm ±0.03	N/A	9.000" ±0.001 228.60 mm ±0.03
Brake Torque @ 100 psi @ 6.9 bar	100 ft-lb 136 Nm	200 ft-lb 271 Nm	200 ft-lb 271 Nm	500 ft-lb 678 Nm
INDEXING¹				
Accuracy	±15 arc-sec	±25 arc-sec	±15 arc-sec	±25 arc-sec
Repeatability	10 arc-sec	10 arc-sec	10 arc-sec	10 arc-sec
Resolution	0.001°	0.001°	0.001°	0.001°
Max Rotation/Step	999.999°	±120°	999.999°	±120°
MOTOR				
Gear Ratio	63:1	90:1	90:1	72:1
Timing Belt	2:1	2:1	2:1	2:1
OPERATING SPECIFICATIONS				
Operating Temp. (max. ambient)	100°F 38°C		100°F 38°C	
Power Required (VAC) 1-axis control	115 ±10% @ 15 A		115 ±10% @ 15 A	
Power Required (VAC) 2-axis control	235 ±10% @ 20 A		235 ±10% @ 20 A	
Max Air Pressure	120 psi 8.3 bar		120 psi 8.3 bar	
WEIGHT				
Table	400 lb 181.4 kg		735 lb 333.4 kg	
Brushless Control	23.1 lb (2-axis) 14.2 lb (1-axis) 10.5 kg (2-axis) 6.4 kg (1-axis)		23.1 lb (2-axis) 14.2 lb (1-axis) 10.5 kg (2-axis) 6.4 kg (1-axis)	

¹See page 36.
Due to continual development, all machine specifications are subject to change.

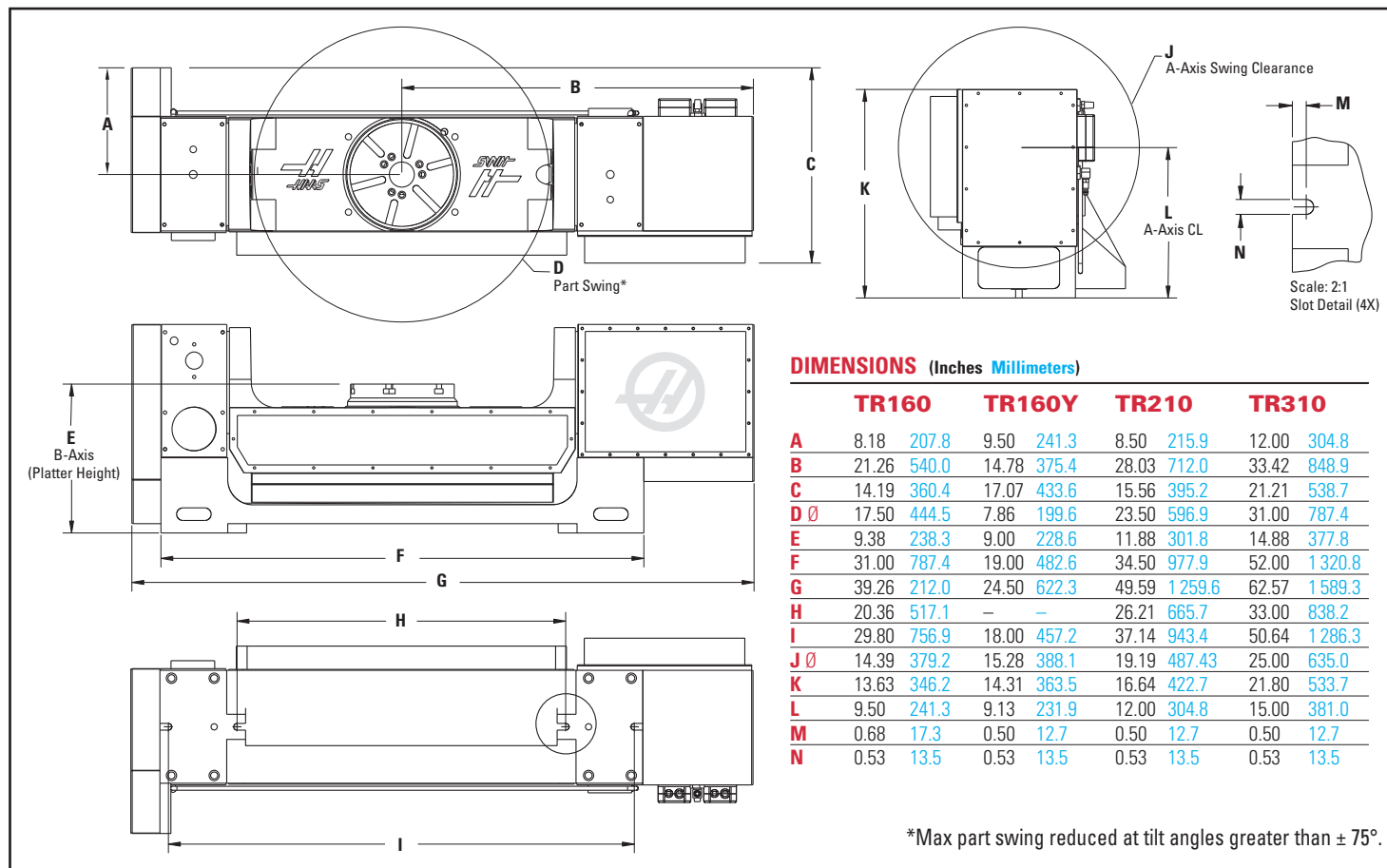
TR Series Trunnion



A.

If you need a 5-axis solution for your 3-axis mill, look to the Haas trunnion rotary tables for a simple bolt-on solution for machining complex parts. These dual-axis trunnion tables bolt directly to the mill's table to provide 5-axis simultaneous motion, or position parts to nearly any angle for multi-sided machining.

Specifications and Dimensions



- $\pm 120^\circ$ tilt, 360° rotation
- Simple bolt-on mounting
- Machine multiple sides in one setup
- Fast setups
- High accuracy & repeatability
- Brushless Servomotors
- 12-month limited warranty
- Made in the USA

TR Trunnion Series

ID.	Part #	Description
A.	TR160	Dual-Axis Trunnion Table w/160 mm Platter
B.	TR210	Dual-Axis Trunnion Table w/210 mm Platter
C.	TR310	Dual-Axis Trunnion Table w/310 mm Platter



B.



C.

	TR160		TR160Y		TR210		TR310	
	Rotary B axis	Tilt A axis	Rotary B axis	Tilt A axis	Rotary B axis	Tilt A axis	Rotary B axis	Tilt A axis
SPINDLE								
Torque	100 ft-lb 136 Nm	150 ft-lb 203 Nm	100 ft-lb 136 Nm	150 ft-lb 203 Nm	210 ft-lb 285 Nm	300 ft-lb 407 Nm	300 ft-lb 407 Nm	300 ft-lb 407 Nm
Runout Max.	0.0005" 0.013 mm	N/A	0.0005" 0.013 mm	N/A	0.0005" 0.013 mm	N/A	0.001" 0.025 mm	N/A
Platter Pilot ID	1.500" x 4.8" dp	N/A	1.500" x 4.8" dp	N/A	2.000" x 5.1" dp	N/A	3.250" 82.55 mm (thru)	N/A
Backlash	30 arc-sec	30 arc-sec	30 arc-sec	30 arc-sec	30 arc-sec	30 arc-sec	30 arc-sec	30 arc-sec
Speeds	0.001 to 80°/sec	0.001 to 80°/sec	0.001 to 80°/sec	0.001 to 80°/sec	0.001 to 60°/sec	0.001 to 60°/sec	0.001 to 50°/sec	0.001 to 50°/sec
Brake Torque @ 100 psi @ 6.9 bar	100 ft-lb 136 Nm	200 ft-lb 271 Nm	100 ft-lb 136 Nm	200 ft-lb 271 Nm	200 ft-lb 271 Nm	400 ft-lb 542 Nm	500 ft-lb 678 Nm	1,000 ft-lb 1356 Nm
INDEXING¹								
Accuracy	± 15 arc-sec	± 35 arc-sec	± 15 arc-sec	± 35 arc-sec	± 15 arc-sec	± 35 arc-sec	± 15 arc-sec	± 35 arc-sec
Repeatability	10 arc-sec	10 arc-sec	10 arc-sec	10 arc-sec	10 arc-sec	10 arc-sec	10 arc-sec	10 arc-sec
Resolution	0.001°	0.001°	0.001°	0.001°	0.001°	0.001°	0.001°	0.001°
Max Rotation/Step	999.999°	$\pm 120^\circ$	999.999°	$\pm 120^\circ$	999.999°	$\pm 120^\circ$	999.999°	$\pm 120^\circ$
MOTOR								
Gear Ratio	63:1	63:1	63:1	63:1	90:1	90:1	72:1	72:1
Timing Belt	2:1	2:1	2:1	2:1	2:1	2:1	3:1	3:1
PLATTER								
Part Swing (max)	17.5" 445 mm		7.5" 191 mm		23.5" 597 mm		31" 787 mm	
Capacity	80 lb 36 kg		80 lb 36 kg		200 lb 91 kg		500 lb 227 kg	
Platter Diameter	6.3" 160 mm		6.3" 160 mm		8.3" 210 mm		12.2" 310 mm	
OPERATING SPECIFICATIONS								
Duty Cycle full/low speed	50% / 100%		50% / 100%		50% / 100%		50% / 100%	
Operating Temp. (max ambient)	100°F 38°C		100°F 38°C		100°F 38°C		100°F 38°C	
Power Required (VAC) 1-axis control	115 $\pm 10\%$ @ 15 A		115 $\pm 10\%$ @ 15 A		115 $\pm 10\%$ @ 15 A		115 $\pm 10\%$ @ 15 A	
Power Required (VAC) 2-axis control	235 $\pm 10\%$ @ 20 A		235 $\pm 10\%$ @ 20 A		235 $\pm 10\%$ @ 20 A		235 $\pm 10\%$ @ 20 A	
Max Air Pressure	120 psi 8.3 bar		120 psi 8.3 bar		120 psi 8.3 bar		120 psi 8.3 bar	
WEIGHT								
Table	425 lb 193 kg				815 lb 370 kg		1,720 lb 780 kg	
Brushless Control	23.1 lb (2-axis) 14.2 lb (1-axis) 10.5 kg (2-axis) 6.4 kg (1-axis)		23.1 lb (2-axis) 14.2 lb (1-axis) 10.5 kg (2-axis) 6.4 kg (1-axis)		23.1 lb (2-axis) 14.2 lb (1-axis) 10.5 kg (2-axis) 6.4 kg (1-axis)		23.1 lb (2-axis) 14.2 lb (1-axis) 10.5 kg (2-axis) 6.4 kg (1-axis)	

¹See page 36.
Due to continual development, all machine specifications are subject to change.

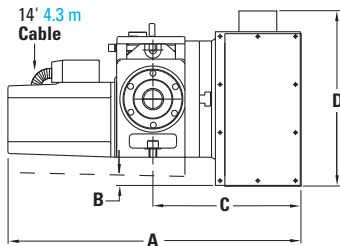
T5C Series

Use the T5C Series tilting collet indexers to eliminate second and third operations by automatically positioning parts to nearly any angle for machining. Or, use them for simultaneous 5-axis motion for machining complex geometries. All four versions – single-, dual-, triple- and quad-head – increase productivity by eliminating multiple setups and reducing the number of tool changes. With the multi-head units, multiple parts can be machined by each tool before making a tool change. The T5Cs provide 240° of tilt and a full 360° of rotation to reach all five sides of a part. The tilt is provided by an HRT 210, and the rotation is provided by either one, two, three or four HA5C heads.



Specifications and Dimensions

T5C Single Spindle

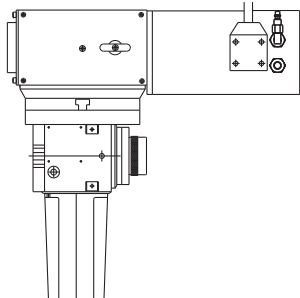
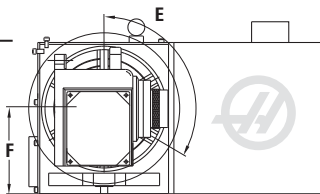


DIMENSIONS

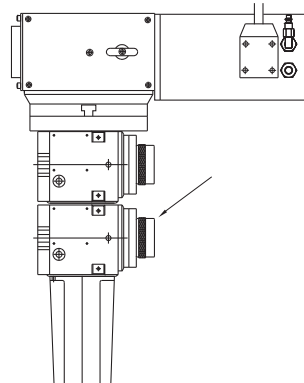
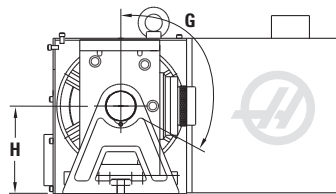
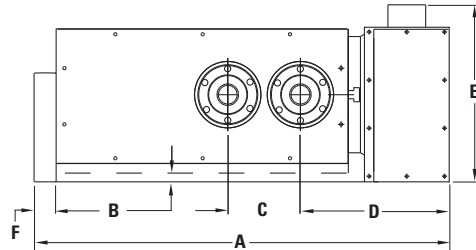
(Inches Millimeters)

A	18.52 470.4
B	0.70 17.8
C	10.20 259.1
D	12.39 314.7
E	+90°/-120°
F	6.000 152.40

B = Minimum Clearance



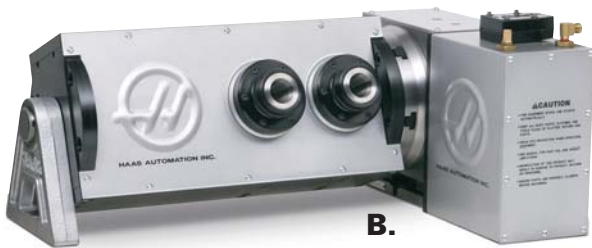
T5C Two, Three & Four Spindle



DIMENSIONS (Inches Millimeters)

	T5C-2	T5C-3	T5C-4
A	28.64 727.5	33.64 854.5	38.64 981.5
B	0.55 14.0	0.55 14.0	0.55 14.0
C	5.000 TYP 127.00 TYP	5.000 TYP 127.00 TYP	5.000 TYP 127.00 TYP
D	10.30 261.6	10.30 261.6	10.30 261.6
E	12.39 314.7	12.39 314.7	12.39 314.7
F	1.50 34.1	1.50 34.1	1.50 34.1
G	±120°	±120°	±120°
H	6.000 152.40	6.000 152.40	6.000 152.40
J	4.47" ±0.02 113.5 ±0.5	4.47" ±0.02 113.5 ±0.5	4.47" ±0.02 113.5 ±0.5

B = Minimum Clearance



B.



C.



D.

T5C Series

ID. Part # Description

- A.** T5C Tilting 5-Axis Rotary Table, HRT210 tilting w/HA5C rotation
- B.** T5C-2 Tilting 5-Axis Rotary Table, HRT210 tilting w/HA5C-2 rotation
- C.** T5C-3 Tilting 5-Axis Rotary Table, HRT210 tilting, w/HA5C-3 rotation
- D.** T5C-4 Tilting 5-Axis Rotary Table, HRT210 tilting, w/HA5C-4 rotation

Collet closers not supplied. Use AC-25 or AC-125. See pages 30-31.

T5C: One, Two, Three & Four Spindle Configuration

Tilt A Axis		Rotary B Axis	T5C*	T5C-2*	T5C-3* T5C-4*
SPINDLE		SPINDLE			
Torque	210 ft-lb 285 Nm	Torque	60 ft-lb 81 Nm	25 ft-lb 34 Nm	25 ft-lb 34 Nm
Runout Max	0.0005" 0.013 mm	Runout Max	0.0004" 0.010 mm	0.0004" 0.010 mm	0.0004" 0.010 mm
Backlash	30 arc-sec	Backlash	40 arc-sec	50 arc-sec	50 arc-sec
Speeds	0.001 to 60°/sec	Speeds	0.001 to 330°/sec	0.001 to 200°/sec	0.001 to 200°/sec
Tooling	6 std T-slots @ 60°	Collets	std 5C (1/64" -1 1/16")	std 5C (1/64" -1 1/16")	std 5C (1/64" -1 1/16")
Center Height	6.000" ±0.001" 152.40 ±0.03 mm	Nose Thread	2 3/16" - 10	2 3/16" - 10	2 3/16" - 10
Brake Torque @ 100 psi @ 6.9 bar	200 ft-lb 271 Nm	Center Height	4.000" ±0.001 101.60 mm ±0.03	5.875" ±0.002 149.23 mm ±0.05	5.875" ±0.002 149.23 mm ±0.05
INDEXING¹		INDEXING¹			
Accuracy	±15 arc-sec	Accuracy	±30 arc-sec	±60 arc-sec	±60 arc-sec
Repeatability	10 arc-sec	Repeatability	10 arc-sec	10 arc-sec	10 arc-sec
Resolution	0.001°	Resolution	0.001°	0.001°	0.001°
Max Rotation/Step	999.999°	Max Rotation/Step	999.999°	999.999°	999.999°
Worm Gear Diameter	6.3" 160 mm	Worm Gear Diameter	2.8" 71 mm	2.8" 71 mm	2.8" 71 mm
MOTOR		MOTOR			
Gear Ratio (worm & gear)	90:1	Gear Ratio (worm & gear)	60:1	60:1	60:1
Timing Belt	2:1				
OPERATING SPECIFICATIONS		OPERATING SPECIFICATIONS			
Duty Cycle full/low speed	50% / 100%	Duty Cycle full/low speed	75% @ full speed	75% @ full speed	75% @ full speed
Operating Temp. (max ambient)	100°F 38°C	Operating Temp. (max. ambient)	100°F 38°C	100°F 38°C	100°F 38°C
Power Required (VAC) 1-axis control	115 ±10% @ 15 A	Power Required (VAC) 1-axis control	115 ±5% @ 10 A	115 ±5% @ 10 A	115 ±5% @ 10 A
Power Required (VAC) 2-axis control	235 ±10% @ 20 A	Power Required (VAC) 2-axis control	235 ±10% @ 20 A	235 ±10% @ 20 A	235 ±10% @ 20 A
Max Air Pressure	120 psi 8.3 bar	Max. Air Pressure	120 psi 8.3 bar	120 psi 8.3 bar	120 psi 8.3 bar
WEIGHT		WEIGHT			
Brushless Control	23.1 lb (2-axis) 14.2 lb (1-axis) 10.5 kg (2-axis) 6.4 kg (1-axis)	Table	255 lb 116 kg	370 lb 168 kg	420 lb (3HD) 520 lb (4HD) 191 kg (3HD) 236 kg (4HD)

* Not for use with tailstocks. ¹See page 36. Due to continual development, all machine specifications are subject to change.

HA2TS

The HA2TS is a self-contained setup of an HA5C-2 and two pneumatic tailstocks mounted on a subplate. Utilizing this high-productivity design guarantees accurate alignment while

maintaining high output. The HA2TS allows fast setups, and increases productivity by reducing the number of tool changes and handling time. The tailstocks adjust to the length of your parts by sliding on precision T-slots. The minimum distance from HA5C to tailstock when the spindle is extended is 2.30", while the maximum distance is 12" with the spindle retracted. The distance between centers is 5".



Tailstocks

Part # Description

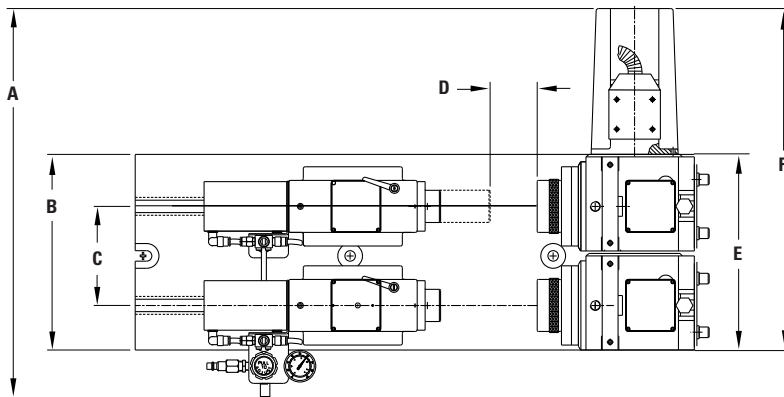
HA2TS Dual Spindle Mounted on Plate w/Tailstocks

Specifications and Dimensions

Collet closers not included. Use AC-25 or AC-125. See pages 30-31.

See page 26 for specifications.

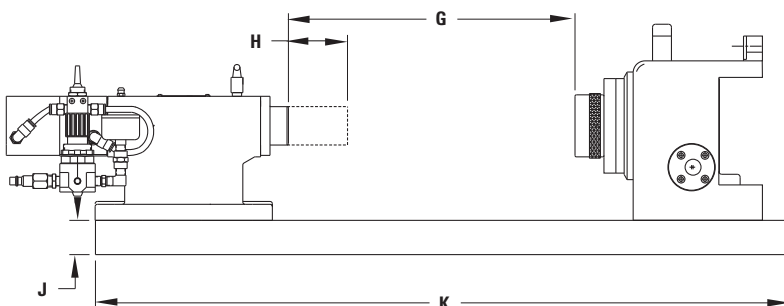
HA2TS - Top View



DIMENSIONS (Inches Millimeters)

A	19.50	495.3
B	9.875	250.83
C	5.0000 ±0.0005	127.000 ±0.013
D	2.30 min	58.4 min
E	9.95	252.7
F	17.50	444.5

HA2TS - Side View



DIMENSIONS (Inches Millimeters)

G	12.00 max	304.8 max
H	2.50 min	63.5 min
J	1.875	47.63
K	29.50	749.3

Tailstocks



Tailstocks are available for all Haas rotary products. All mounting surfaces are accurately ground, and the spindles are individually fitted to their bores for minimum deflection. Bottom alignment pins are provided for fast setup without indicating.

Tailstocks are available in manual or pneumatic types, with center heights to match corresponding Haas rotary products. All tailstocks are Morse taper #3. Live centers are recommended, but not included.

Pneumatic Tailstocks

Part #	Description
HPTS14.5	Pneumatic Tailstock, 14.5" (368 mm) center height for HRT 600
HPTS11.5	Pneumatic Tailstock, 11.5" (292 mm) center height for HRT 450
HPTS9	Pneumatic Tailstock, 9" (229 mm) center height for HRT 310
HPTS6	Pneumatic Tailstock, 6" (152 mm) center height for HRT 210
HPTS5	Pneumatic Tailstock, 5" (127 mm) center height for HRT 160
HPTS4	Pneumatic Tailstock, 4" (102 mm) center height for HA5C

Manual Tailstocks

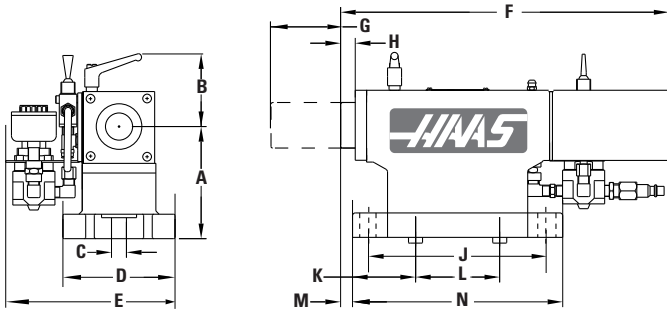
Part #	Description
HTS14.5	Tailstock, 14.5" (368 mm) center height for HRT 600
HTS11.5	Tailstock, 11.5" (292 mm) center height for HRT 450
HTS9	Tailstock, 9" (229 mm) center height for HRT 310
HTS6	Tailstock, 6" (152 mm) center height for HRT 210
HTS5	Tailstock, 5" (127 mm) center height for HRT 160
HTS4	Tailstock, 4" (102 mm) center height for HA5C



Tailstocks

Specifications and Dimensions

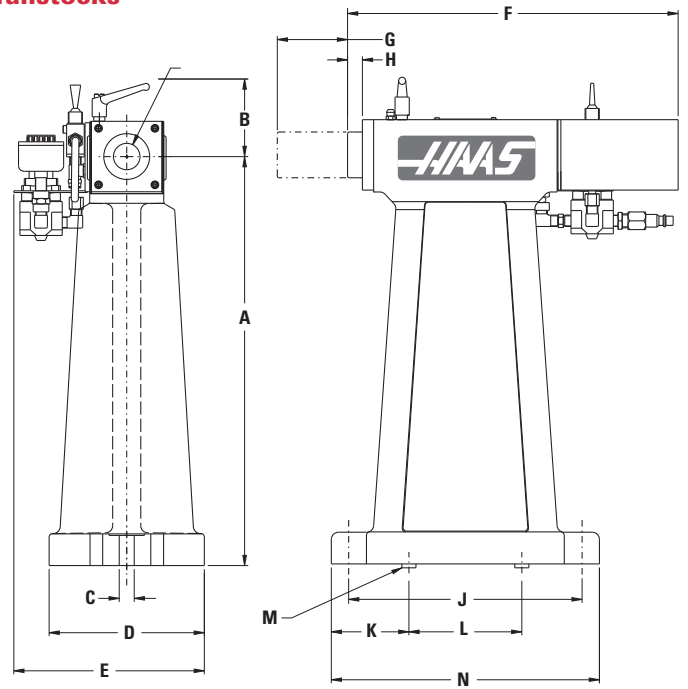
Pneumatic Tailstocks



DIMENSIONS (Inches Millimeters)

	HPTS4		HPTS5	
A	4.000 ±0.001	101.60 ±0.03	5.000 ±0.001	127.00 ±0.03
B	2.75	69.9	2.75	69.9
C	0.53	13.5	0.53	13.5
D	4.00	101.6	4.00	101.6
E	6.00	152.4	6.00	152.4
F	11.715	297.56	11.715	297.56
G	2.50 Travel	63.5 Travel	2.50 Travel	63.5 Travel
H	0.525	13.34	0.525	13.34
J	6.28 ±0.01	159.5 ±0.3	6.28 ±0.01	159.5 ±0.3
K	2.25	57.2	2.25	57.2
L	3.0000 ±0.0003	76.200 ±0.008	3.0000 ±0.0003	76.200 ±0.008
M	0.425	10.80	0.425	10.80
N	7.50	190.5	7.50	190.5

	HPTS6		HPTS9	
A	6.000 ±0.001	152.40 ±0.03	9.000 ±0.001	228.60 ±0.03
B	2.75	69.9	2.75	69.85
C	0.53	13.5	0.53	13.5
D	4.00	101.6	4.00	101.6
E	6.00	152.4	6.00	152.4
F	11.715	297.56	11.715	297.56
G	2.50 Travel	63.5 Travel	2.50 Travel	63.5 Travel
H	0.525	13.34	0.525	13.34
J	6.28 ±0.01	159.5 ±0.3	6.28 ±0.01	159.5 ±0.3
K	2.25	57.2	2.25	57.2
L	3.0000 ±0.0003	76.200 ±0.008	3.0000 ±0.0003	76.200 ±0.008
M	0.425	10.80	0.425	10.80
N	7.50	190.5	7.50	190.5



DIMENSIONS (Inches Millimeters)

	HPTS11.5		HPTS14.5	
A	11.500 ±0.001	292.10 ±0.03	14.500 ±0.001	368.30 ±0.03
B	2.75	69.9	2.75	69.9
C	0.53	13.5	0.53	13.5
D	5.50	139.7	5.50	139.7
E	6.75	171.5	6.75	171.5
F	11.715	297.56	11.715	297.56
G	2.50 Travel	63.5 Travel	2.50 Travel	63.5 Travel
H	0.525	13.34	0.525	13.34
J	8.28	210.3	8.28	210.3
K	2.75	69.9	2.75	69.9
L	4.0000 ±0.0003	101.600 ±0.008	4.0000 ±0.0003	101.600 ±0.008
M ∅	0.625 ±0.001	15.88 ±0.03	0.625 ±0.001	15.88 ±0.03
N	9.50	241.3	9.50	241.3

HA2TS Two-Spindle with Tailstocks

SPINDLE	
Torque	25 ft-lb 34 Nm
Runout Max	0.0004" 0.010 mm
Speeds	0.001 to 200°/sec
Collets	std 5C (1/8" - 1 1/16") std 5C (0.4 to 27 mm)
Nose Thread	2 3/16" - 10
Spindle Center	5.875" ±0.002 149.20 mm ±0.05
INDEXING ¹	
Accuracy	±60 arc-sec
Repeatability	10 arc-sec
Backlash	50 arc-sec
Worm Gear Diameter	2.8" 71 mm
Resolution	0.001°
Max Step Size	999.999°

MOTOR	
Gear Ratio (worm & gear)	60:1
OPERATING SPECIFICATIONS	
Duty Cycle	75% @ full speed
Operating Temp. (max ambient)	100°F 38°C
Power Required (VAC)	115 VAC ±5% @ 10 A
WEIGHT	
Rotary Assembly	280 lb 127 kg
Brushless Control	14.2 lb 6.4 kg

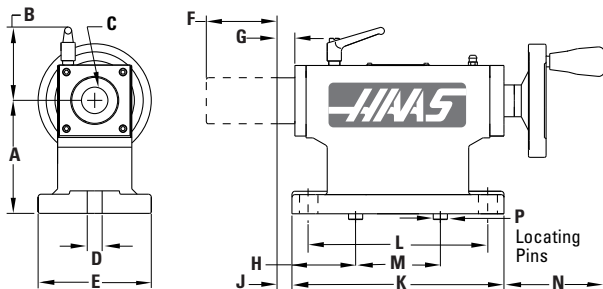
¹See page 36.
Due to continual development, all machine specifications are subject to change.



A Haas tailstock used to support a long workpiece with complex cutting requirements. Haas tailstocks are available for every size rotary table in our line, and are available in manual or pneumatic types.

Specifications and Dimensions

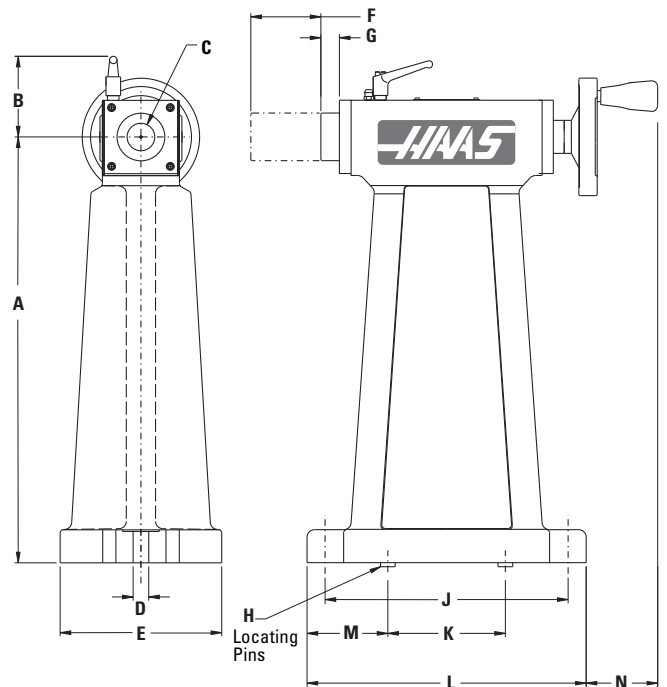
Manual Tailstocks



DIMENSIONS (Inches Millimeters)

	HTS4		HTS5	
A	4.000 ±0.001	101.60 ±0.03	5.000 ±0.001	127.00 ±0.03
B	2.75	69.9	2.75	69.9
C	#3 Morse Taper		#3 Morse Taper	
D	0.53	13.5	0.53	13.5
E	4.00	101.6	4.00	101.6
F	2.50 Travel	63.5 Travel	2.50 Travel	63.5 Travel
G	0.63	16.0	0.63	16.0
H	2.25	57.2	2.25	57.2
J	0.50	12.7	0.50	12.7
K	7.50	190.5	7.50	190.5
L	6.28 ±0.01	159.5 ±0.3	6.28 ±0.01	159.5 ±0.3
M	3.0000 ±0.0003	76.200 ±0.008	3.0000 ±0.0003	76.200 ±0.008
N	3.44	87.4	3.44	87.4
P Ø	0.625 ±0.001	15.88 ±0.03	0.625 ±0.001	15.88 ±0.03

	HTS6		HTS9	
A	6.000 ±0.001	152.40 ±0.035	9.000 ±0.001	228.60 ±0.03
B	2.75	69.9	2.75	69.9
C	#3 Morse Taper		#3 Morse Taper	
D	0.53	13.5	0.53	13.5
E	4.00	101.6	4.00	101.6
F	2.50 Travel	63.5 Travel	2.50 Travel	63.5 Travel
G	0.63	16.0	0.63	16.0
H	2.25	57.2	2.25	57.2
J	0.50	12.7	0.50	12.7
K	7.50	190.5	7.50	190.5
L	6.28 ±0.01	159.5 ±0.3	6.28 ±0.01	159.5 ±0.3
M	3.0000 ±0.0003	76.200 ±0.008	3.0000 ±0.0003	76.200 ±0.008
N	3.44	87.4	3.44	87.4
P Ø	0.625 ±0.001	15.88 ±0.03	0.625 ±0.001	15.88 ±0.03



DIMENSIONS (Inches Millimeters)

	HTS11.5		HTS14.5	
A	11.500 ±0.001	292.10 ±0.03	14.500 ±0.001	368.30 ±0.03
B	2.75	69.9	2.75	69.9
C	#3 Morse Taper		#3 Morse Taper	
D	0.53	13.5	0.53	13.5
E	5.50	139.7	5.50	139.7
F	2.50 Travel	63.5 Travel	2.50 Travel	63.5 Travel
G	0.63	16.0	0.63	16.0
H Ø	0.625 ±0.001	15.88 ±0.03	0.625 ±0.001	15.88 ±0.03
J	8.28	210.3	8.28	210.3
K	4.0000 ±0.0003	101.600 ±0.008	4.0000 ±0.0003	101.600 ±0.008
L	9.50	241.3	9.50	241.3
M	2.75	69.9	2.75	69.9
N	2.44	62.0	2.44	62.0

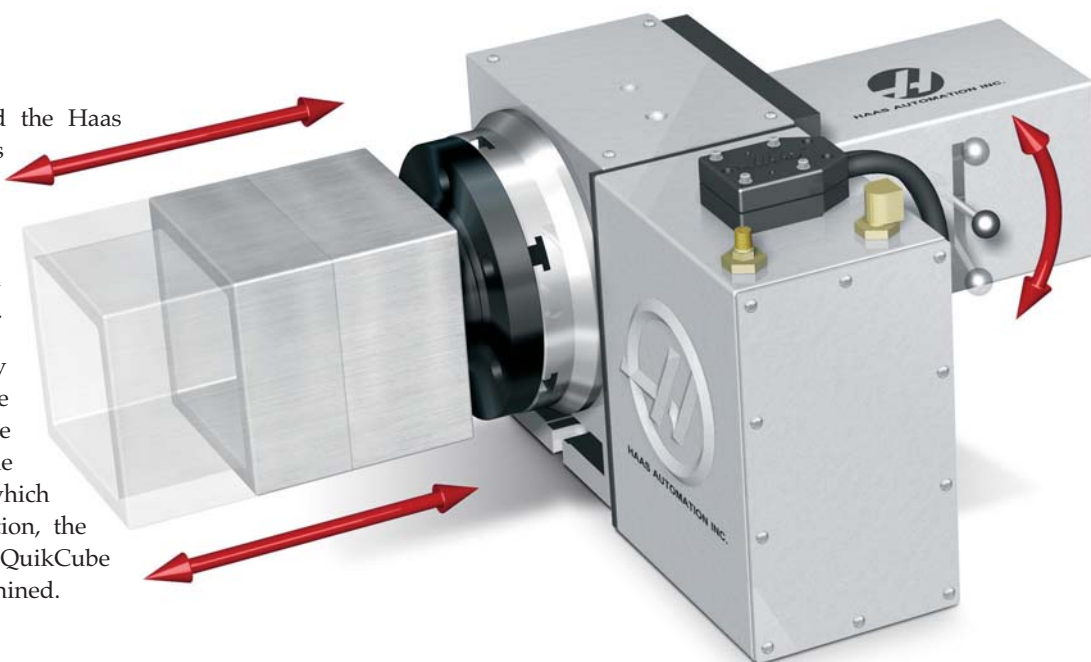
QuikChange Tooling System

QuikCube System

For increased productivity, add the Haas QuikCube System to the Haas HRT210 or HRTA6 rotary table. The fixture cubes are loaded and released via pneumatic actuator, allowing the user to change from cube to cube in less than five seconds.

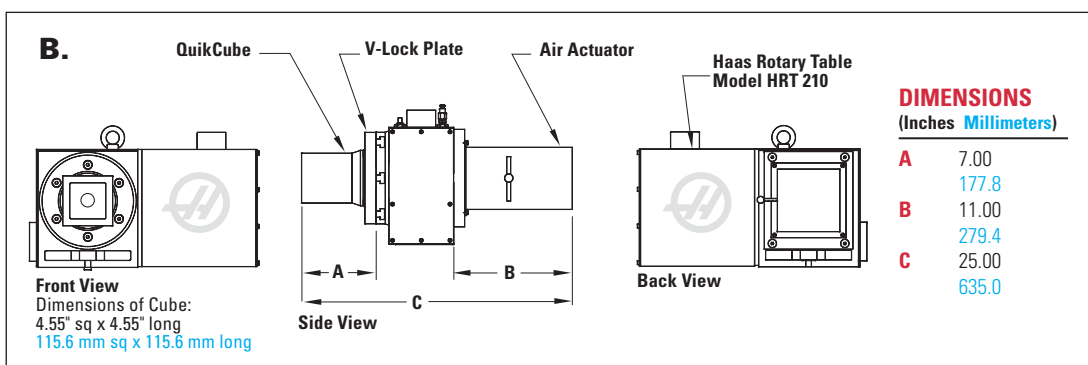
Productivity is increased by mounting multiple parts to the fixtures, so more parts and more sides are machined per setup. The result is reduced cycle times, which means increased profits. In addition, the operator can load parts on one QuikCube fixture while another is being machined.

- Note: Repeatability is 0.0005".



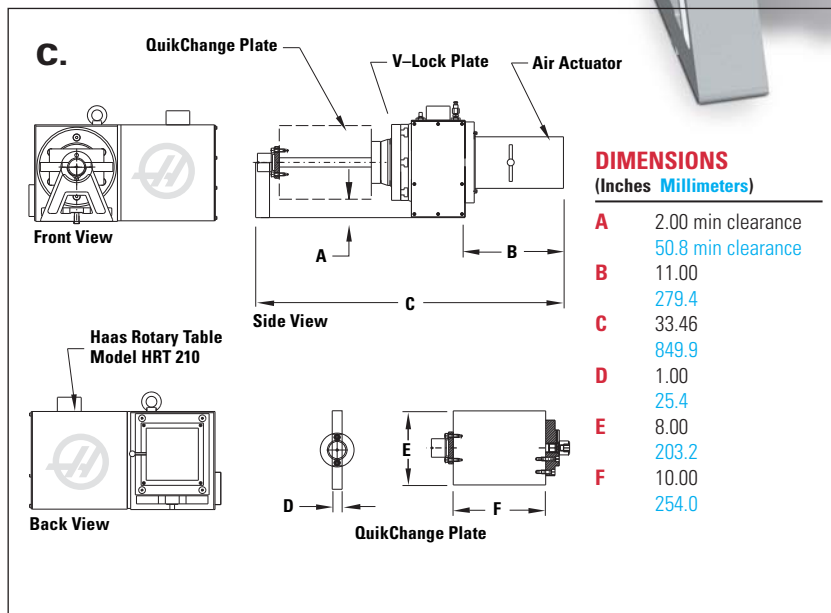
Shown with Optional Cube

Specifications and Dimensions



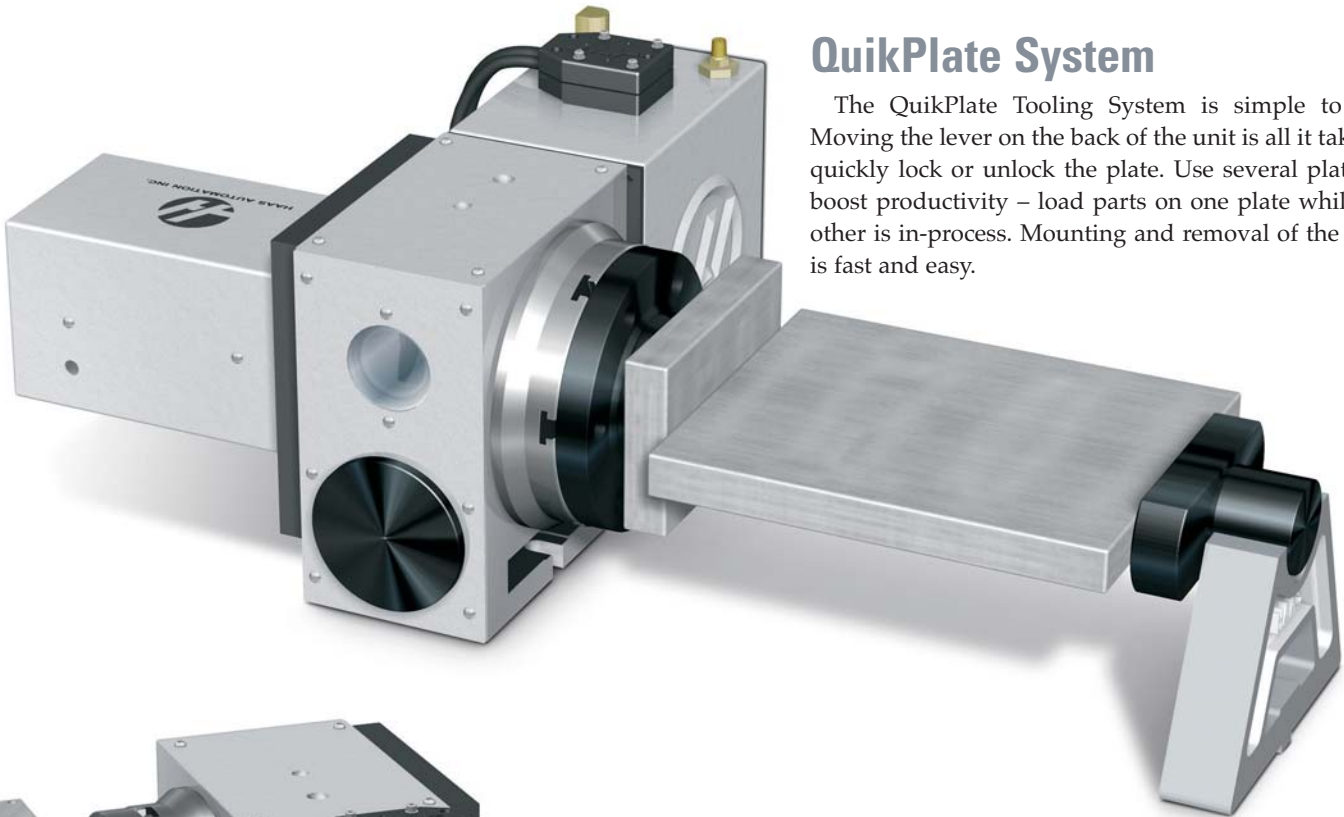
Tooling Systems

Part #	Description
HQCCS	QuikChange System for HRT210 (cubes or plates not included)
HQCCSA6	QuikChange System for HRTA6 (cubes or plates not included)
TBS 160 ¹	Tooling Block System for HRT160
TBS 210	Tooling Block System for HRT210
TBS 310	Tooling Block System for HRT310
CUBE	Cube only
PLATE KIT	QuikChange plate and support
PLATE	QuikChange plate only

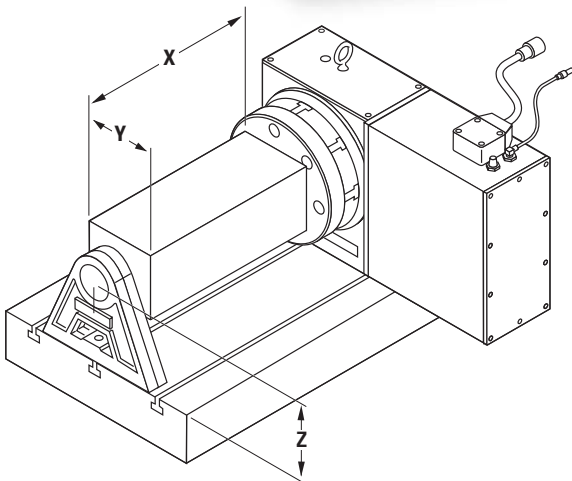


QuikPlate System

The QuikPlate Tooling System is simple to use. Moving the lever on the back of the unit is all it takes to quickly lock or unlock the plate. Use several plates to boost productivity – load parts on one plate while the other is in-process. Mounting and removal of the plate is fast and easy.



Shown with Optional Plate



Tooling Block System

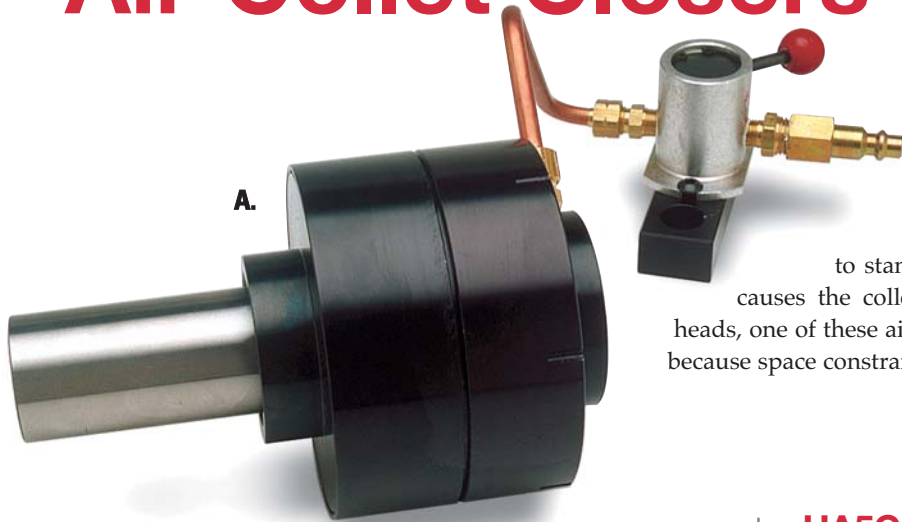
Another great productivity tool is the Haas Tooling Block System, for mounting on any Haas HRT160, HRT210 or HRT310 rotary table.

The Tooling Block System is made from 6061-T6 aluminum alloy and can be easily machined to meet your requirements. The system includes the aluminum tooling block, an outboard A-frame support and a steel mounting plate. They are designed for bolt-together alignment when used on a precision 5/8" T-slot. Since the tombstone can be loaded with 8, 12, 16 or more parts, all can be machined with the same tool before going on to the next tool.

DIMENSIONS Inches (Millimeters)

Part#	Rotary Table	X (Length)	Y (SQ)	Z (Center Dist.)
TBS160	HRT160	12.00 304.8	4.00 101.6	5.00 127.0
TBS210	HRT210	12.00 304.8	4.50 114.3	6.00 152.4
TBS210-20	HRT210	20.00 508.0	4.50 114.3	6.00 152.4
TBS310	HRT310	19.00 482.6	6.00 152.4	9.00 228.6

Air Collet Closers

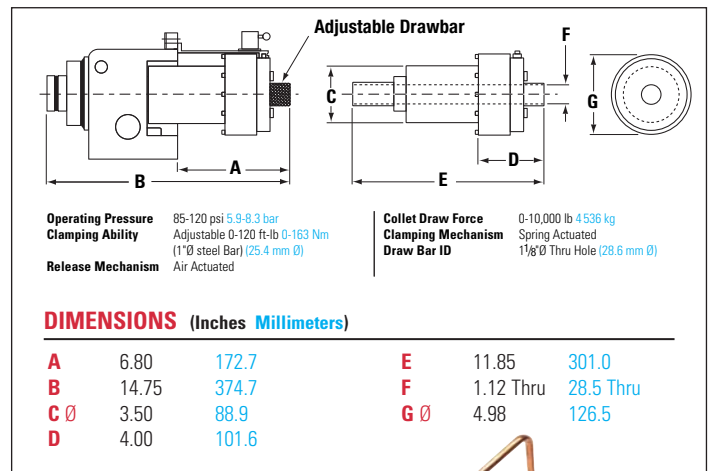


Has offers three types of collet closers for use on HA5C indexing heads. Each of the designs offers unique benefits you should consider before making a selection. AC-125 and AC-25 use shop air to drive a piston through a mechanical multiplier to close the collet. This provides greater holding force and reduces operator fatigue, compared to standard manual-handle closers. A simple flick of a lever causes the collet to open or close without effort. On multi-spindle heads, one of these air-actuated closers is required if you plan to use collets, because space constraints prevent the use of manual closers.

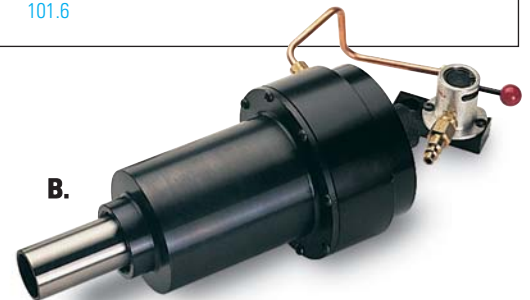
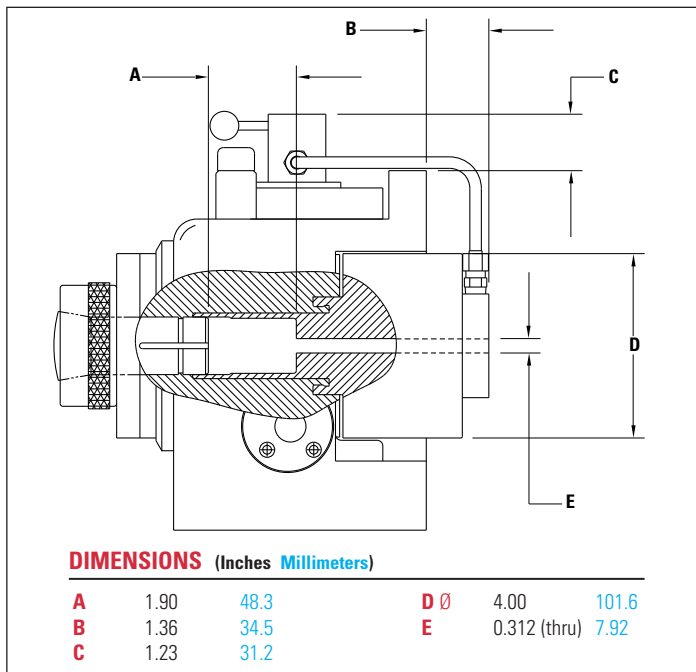
AC-125

The AC-125 is our most popular design and provides up to 12,000 lb of draw-tube force with 0.060" of travel – allowing part diameter variation of 0.015" without readjusting the collet. Its design is similar to the AC-25 but uses two pistons, which more than double the available draw force. A large internal spring is used for part release. The AC-125 can be tightened from the rear and provides a 5/16" thru-hole. Its compact size allows it to be used with all models of HA5Cs, and with the use of a small spacer, it can be operated vertically. Clamping force pressure is varied by regulating air pressure supplied to the unit (normal operating range is 45 to 60 psi). The AC-125 air collet closer can be used with all types of 5C collets, including step collets. Closers will not remain clamped if air pressure is lost.

HA5C with AC-100 Installed



HA5C with AC-125 Installed



AC-100

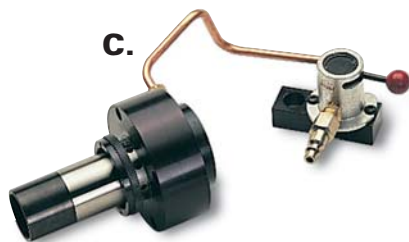
The AC-100 uses spring force for part clamping, and air pressure for release. It will retain full part clamping even if air pressure is removed. The AC-100 provides a 1 1/8" diameter thru-hole, and collets are easily tightened from the rear. It provides up to 10,000 lb of draw-tube force, with 0.025" travel, and can be used for drilling and milling in most applications. The 0.025" travel allows for a part diameter variation of 0.006" without the need to readjust the collet. Due to its long rearward length, the AC-100 cannot be used vertically, and is not recommended for tilting HA5Cs. Also, some consideration must be given to clearances when using the AC-100 parallel to the Y axis, as its length may collide with the Z-axis waycover. Closers will remain clamped if air pressure is lost.

Air Collet Closers

ID.	Part #	Description
A.	AC-125	High Torque, 5/16" Thru-Hole Air Collet Closer for HA5C
B.	AC-100	High Torque, 1 1/8" Thru-Hole Air Collet Closer for HA5C
C.	AC-25	Compact, Non Thru-Hole Air Collet Closer for HA5C
D.	A6-AC	High-Torque, 1 3/4" Thru-Hole Air Collet Closer for HRT A6

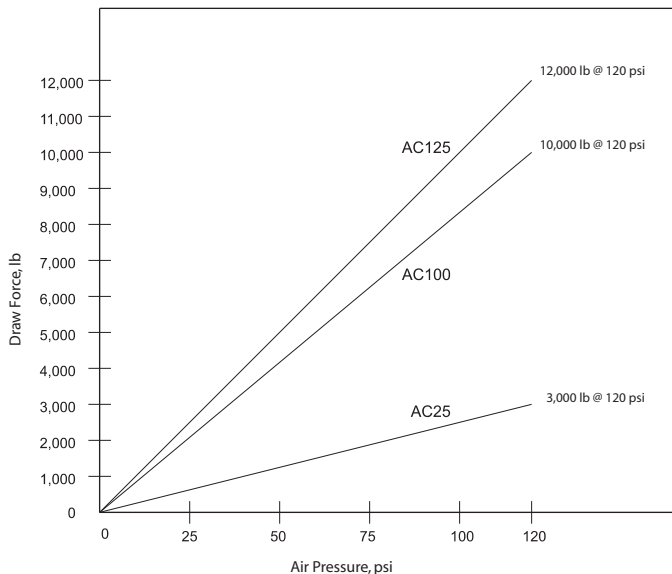
AC-25

The AC-25 is our smallest and most economical closer. It fits entirely inside the HA5C body, and can be used both vertically and horizontally. Since it utilizes air pressure to close, part clamping pressure can be varied easily by regulating the applied air pressure. The AC-25 provides medium holding power of up to 3,000 lb draw force, with 0.030" of travel. It is recommended for drilling and light milling of collet-size parts. The 0.030" travel allows for a part diameter variation of 0.007" without the need to readjust the collet. The AC-25 should not be used with step collets. The AC-25 does not have a thru-hole,



and collets must be tightened using a 9/64" Allen wrench through the collet. Collet stops may be used, but must be drilled completely through to accommodate the Allen wrench. Closers will not remain clamped if air pressure is lost.

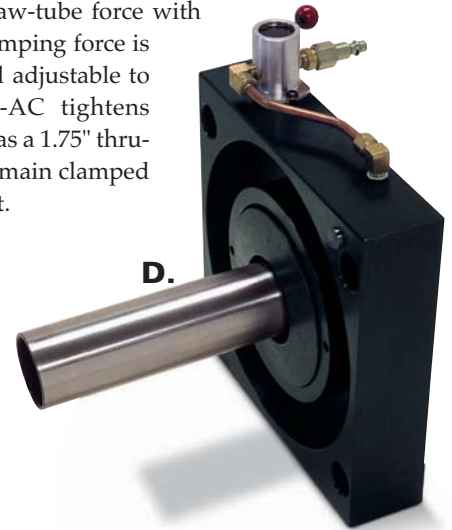
HA5C AIR COLLETS
DRAW FORCE vs. AIR PRESSURE



Air collet closers reduce operator fatigue and provide greater holding force on HA5C indexing heads – all with the simple flip of a lever. Three different designs are available to meet your machining needs.

A6-AC

The A6-AC pneumatic draw-tube assembly works with A65C and A616C collet adapter chucks to provide 5C and 16C air collet closing capabilities for the HRT A6. With the A6-AC, collets can be clamped with the flip of a switch. The A6-AC is also compatible with 3J collet adapters that may be purchased through your local tooling supplier. The A6-AC provides up to 5,000 pounds of draw-tube force with 0.125" of travel. Clamping force is spring actuated and adjustable to 100 ft-lb. The A6-AC tightens from the rear, and has a 1.75" thru-hole. Closers will remain clamped if air pressure is lost.

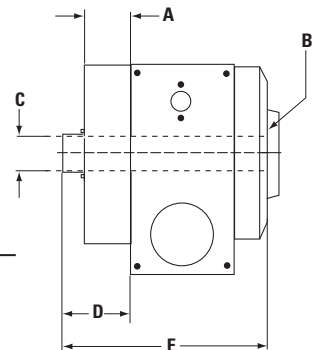


HRT A6 with A6-AC Installed

Operating Pressure	80-120 psi	5.5-8.3 bar
Clamping Ability	Adjustable 0-100 ft-lb 0-135.6 Nm (1"Ø Steel Bar) (25.4 mm Ø)	
Collet Draw Force	Adjustable 0-5,000 lb 0-2,268 kg	
Collet Draw	Adjustable 0-0.125" 0-3.2 mm	
Clamping Mechanism	Spring Actuated	

DIMENSIONS (Inches Millimeters)

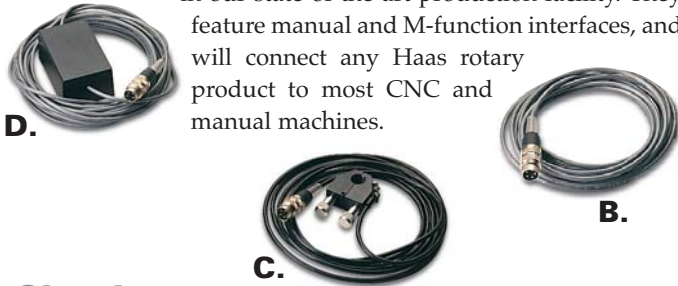
A	2.21	56.1
B	1.875-16UN-2B	
C Ø	1.75 Thru	44.5 Thru
D	3.18	81.3
E	10.05	255.8



Accessories

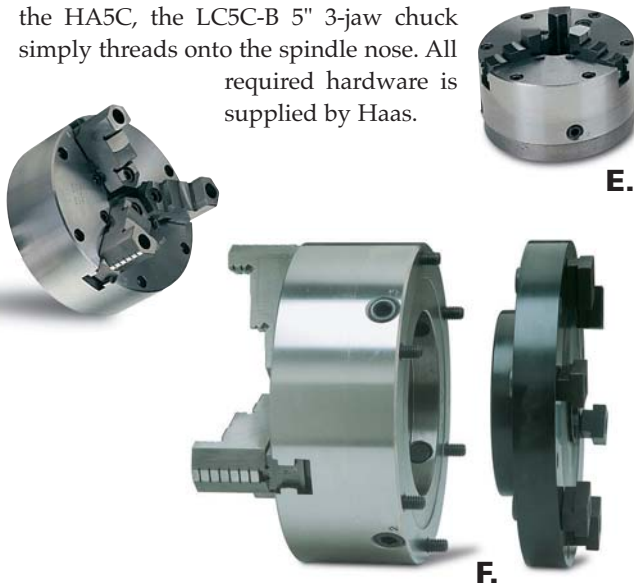
Interface Cables

Haas offers a variety of cables to make interfacing Haas rotary tables to your machines quick and easy. We build and test each interface cable assembly in our state-of-the-art production facility. They feature manual and M-function interfaces, and will connect any Haas rotary product to most CNC and manual machines.



Chucks

Eight-inch, 3-jaw chucks, models LC8A6-B & LC8-B, for the HRT A6 and HRT 210 respectively, can be mounted in minutes with superb accuracy and concentricity. For the HA5C, the LC5C-B 5" 3-jaw chuck simply threads onto the spindle nose. All required hardware is supplied by Haas.



8" & 11" Faceplates

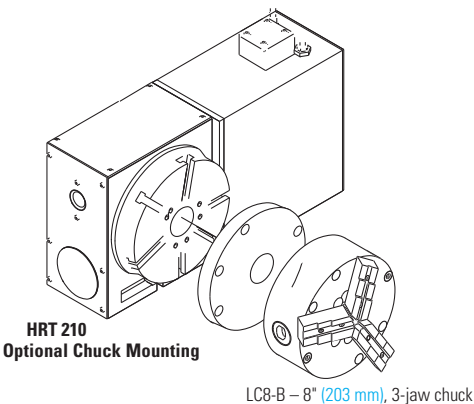
The HRT A6 model can use the optional 8" or 11" faceplates (models FP8 and FP11, shown here) to accommodate your own special fixtures and parts. The recess on the backside of the faceplate simply slips over the A1-6 platter and is bolted down. All required hardware is supplied by Haas.

5C & 16C Collet Adapters

A 5C (A65C) or 16C (A616C) collet adapter can be mounted on the HRT A6, and collets can be closed with the optional factory-installed pneumatic draw tube assembly (A6AC). The adapter from draw tube to collet is included with the A65C. Keep in mind, the 5C spindle adapter has a 2³/₁₆"-10 threaded nose, which can also be used for oversized collets, collet chucks and small fixtures. It can also use 3J and 16C collet adapters, which are available from your tooling supplier. All required hardware is supplied by Haas.



Accessories



ID.	Part #	Description	ID.	Part #	Description
A.	CA1417	Cable Adapter, 14-pin control to 17-pin rotary		LC10-B ¹	10" 3-Jaw Chuck for HRT 310
	CA1714 ¹	Cable Adapter, 17-pin control to 14-pin rotary		LC6-B ¹	6" Top Reversible, 3-Jaw Chuck for HRT 160
B.	CNC	Extra CNC Interface Cable		LC6A5-B ¹	6" A1-5 Top Reversible, 3-Jaw Chuck for HRT A5
C.	RQS	Remote Quill Switch	G.	FP11	11" A1-6 Faceplate for HRT A6
D.	IB	Interface Box & Cable	H.	FP8	8" A1-6 Faceplate for HRT A6
E.	LC5C-B	5" Solid-Jaw, Reversible, 3-Jaw Chuck for HA5C	J.	A65C	5C Collet Chuck Adapter for HRT A6
F.	LC8-B	8" Top Reversible, 3-Jaw Chuck for HRT 210			
	LC8A6-B ¹	8" A1-6 Top Reversible, 3-Jaw Chuck for HRT A6			

¹Not Shown

Applications



An HA5C being used in a 4th-axis milling application. With simple programming and easy interfacing to any CNC machine, the HA5C functions competently as a semi-4th axis activated by one M function. Both arc and spiral milling operations are easily achievable. These attributes make the HA5C the perfect alternative to cumbersome and expensive offshore fourth-axis machines. A standard interface cable is included.



This HA5C is being used for a simple, point-to-point positioning application. Used in this way, there are 360,000 different positions programmable to within 0.001°. A program can contain up to 99 different steps, and each of these steps can be repeated up to 999 times.



Loading a part is easy with the HA5C manual collet closer. Install the collet by aligning the keyway on the collet with the key inside the HA5C spindle. Turn the collet draw tube until proper collet tightness is obtained, insert your part and pull back on the handle to clamp.



All T-slot rotary tables can be easily fitted with 3-jaw chucks. Flat-back chucks are usually installed and aligned by clamping a bar a few thousandths of an inch smaller than the diameter of the thru-hole and leaving an inch or two hanging out the back of the chuck. Insert the bar into the thru-hole of the rotary table, rotate the chuck until the bolt holes align with the T-slots, then insert the T-nuts and bolts.



All Haas rotary products can be used as a true 4th axis when integrated on a Haas machining center, or as a semi-4th axis on any other CNC machine. Simultaneous rotational milling, as well as spiral milling, can be easily performed.



HA5C utilizing the 2³/₁₆"-10 threaded spindle nose to mount a 5" 3-jaw chuck. By entering a G98 code, a circle can be evenly divided into anywhere from 2 to 999 divisions. Also, odd-numbered bolt circles and uneven hole spacing are easily handled through simple programming.

Accessories Chart

HA5C HA5C, 2, 3, 4 HRT, TR110

	HA5C	HA5C, 2, 3, 4	HRT, TR110
Collet Closers			
AC-25 Compact, Non Thru-Hole	•	•	
AC-100 High Torque, with 1" Thru-Hole	•	•	
AC-125 High Torque, with 5/16" Thru-Hole	•	•	
A6AC Pneumatic Draw Tube, 1.75" I.D. Thru-Hole			
MANCCA Manual Collet Closer Assembly	•		
HMDT Haas Manual Draw Tube	•	•	
Chucks			
LC5C-B 5" (130 mm) Adjust True, Solid Reversible, 3-Jaw	•	•	
LC8-B 8" (210) Adjust True, Top, Reversible, 3-Jaw			
LC8A6-B 8" (210 mm) Adjust True, A1-6 Top Reversible, 3-Jaw			
LC8-BSHH 8" (210 mm) 3-Jaw Chuck			
LC10-B 10" (250 mm) Adjust True, Top Reversible, 3-Jaw			
LC6-B 6" (160 mm) Adjust True, Top Reversible, 3-Jaw			
LC6A5-B 6" (160 mm) Adjust True, A1-5 Top Reversible, 3-Jaw			
MC4 4" (102 mm) Manual 3-Jaw Chuck			•
Haas Tailstocks #3 Morse Taper¹			
HTS4 Manual Tailstock, 4" Center Height	•		
HTS5 Manual Tailstock, 5" Center Height			•
HTS6 Manual Tailstock, 6" Center Height			
HTS9 Manual Tailstock, 9" Center Height			
HTS11.5 Manual Tailstock, 11.5" Center Height			
HTS14.5 Manual Tailstock, 14.5" Center Height			
HPTS4 Pneumatic Tailstock, 4" Center Height	•		
HPTS5 Pneumatic Tailstock, 5" Center Height			•
HPTS6 Pneumatic Tailstock, 6" Center Height			
HPTS9 Pneumatic Tailstock, 9" Center Height			
HPTS11.5 Pneumatic Tailstock, 11.5" Center Height			
HPTS14.5 Pneumatic Tailstock, 14.5" Center Height			
HRT A6 Accessories			
FP8 8" (203 mm) A6 Faceplate			
FP11 11" (279 mm) A6 Faceplate			
A65C 5C Collet Chuck			
A616C 16C Collet Chuck			
HQCCSA6 QuikChange System (cube or plates not included)			
HQCA6KIT Adapter Kit (required to adapt HQCCS to HRT A6)			
Fixturing Accessories			
HQCCS QuikChange System (cube or plates not included)			
CUBE QuikChange Cube (4.55" cubed)			
PLATEKIT QuikChange Plate and Support - Use with HQCCS			
PLATE QuikChange Plate Only (8"W x 10" x 1")			
TBS-160 Complete Tooling Block System (12" length x 4"square)			•
TBS-210 Complete Tooling Block System (12" length x 4.5"square)			
TBS-210-20 Complete Tooling Block (20" length x 4"square)			
TBS-310 Complete Tooling Block System (19" length x 6"square)			
ADP5 Adapter Plate Only, HRT160			•
ADP6 Adapter Plate Only, HRT210			
ADP9 Adapter Plate Only, HRT310			
BLK5-12 Aluminum Tombstone Only, 4" x 4" x 12"			•
BLK6-12 Aluminum Tombstone Only, 4.5" x 4.5" x 12"			
BLK6-20 Aluminum Tombstone Only, 4.5" x 4.5" x 20"			
BLK9-16 Aluminum Tombstone Only, 6" x 6" x 19"			
SUP5 A-Frame Support Only, HRT160 (5"Center)			•
SUP6 A-Frame Support Only, HRT210 (6"Center)			
SUP9 A-Frame Support Only, HRT310 (9"Center)			
SUP5XP A-Frame Support, Plain Bearing, for HRT210M (6"Center), includes 1" spacer			
SUP5XR A-Frame Support, Needle Bearing, for HRT210M (6"Center), includes 1" spacer			
20-4333 A-Frame Support for HRT210 w/Half Plain Bearing (6"Center)			
20-4334 Riser Block for HRT210M			
Accessory Cables			
EXT17 Motor Extension Cable, 10 ft.	•	•	•
CA1417 Cable Adapter, 14 pin control to 17 pin rotary	•	•	•
CA1714 Cable Adapter, 17 pin control to 14 pin rotary	•	•	•
Interfaces			
CNC Extra CNC Interface Cable, 15 ft.	•	•	•
RQS Remote Quill Switch	•	•	•
CNC 30 Extra CNC Interface Cable, 30 ft.	•	•	•
CNC-VF1 CNC Interface Cable for Haas Machines	•	•	•

¹Use live center only (not provided). ²Not available for HRT 210SP. ³T5C only. ⁴HRT 210M only. ⁵HRT A5 only. ⁶HRT A6 only. ⁷Not compatible with AC brushless models. All prices subject to change without notice.

HRT 160	HRT 210	HRT A5/A6	HRT 310	HRT 450	HRT 600	T5C, 2, 3, 4	TRT 160. 210	HRT 210SHS
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Without prior notice. 15% restocking charge on all returns/exchanges.

Haas Automation, Inc.

2800 Sturgis Road, Oxnard, California 93030



General Definitions, Terms & Conditions

Accuracy

The accuracy of Haas rotary products is measured in an unloaded condition, without any attachments. It is important to note that your indexing accuracy results can be affected by a number of things, including the fixtures used, the size and weight of the part, off-center parts, outboard supports, tailstock pressures, off-axis drilling and milling, inadequate or uneven fixture mounting surfaces, out of alignment (TIR) tailstocks or supports, etc. Haas Automation is dedicated to helping you get the most from your new rotary table. If you need assistance choosing the best Haas rotary solution for your needs, or with setting up your application, please contact Haas or your local Haas Factory Outlet. We're here to help.

Customer Modifications

The customer assumes all responsibility for modifications. Your warranty is void if you disassemble the motor covers or remove any portion of the worm, spindle or related parts. We do not recommend that customers adjust backlash, as this is extremely critical to the life of the unit. Your local HFO can do this for you. Customers who install chucks and air collets assume all responsibility for any damage done. Your HFO can help you with these devices also.

Torque Ratings

Quoted torque is peak torque for short durations only. Units that have high duty cycles (>50%) cannot sustain peak torque. Excessive torque demands may be the result of an undersized table, excessive tailstock pressure or misaligned end supports. You may contact Haas or your local HFO for assistance with your application.

Critical Alignments

Alignments of outboard supports to the indexing device are critical. If the tailstock support is not centered to the table axis, you are, in effect, bending the part. This requires substantial energy and causes indexing inaccuracy, as well as substantially reducing the life of the indexing device. If you need assistance setting up your application, please give us a call.

Responsibility

The user is solely responsible for properly sizing the rotary table to the work required. However, Haas Automation and your local Haas Factory Outlet are available to help you make the right choice. Here are two good rules of thumb: The working size of the part should not exceed the diameter of the worm gear. Working outside this dimension requires significantly lower feeds and loads. And, the part and fixture should not exceed one-half the weight of the indexing device without tailstock.

Warranty – 12-month Limited Warranty

All warranty work is provided at Haas Automation, Inc., in Oxnard, California. The user is responsible for first obtaining an RMA number, and then returning the unit to Haas. We will return the unit, freight pre-paid, via ground service. Allow 10 working days for repairs. Faster turn-around is available at additional cost.

• Specifications subject to change without notice.

Haas Automation Online

Online Rotary Table Calculator

You can find online help choosing the correct Haas rotary table to fit your needs by going to www.HaasCNC.com. Click through to the Rotary Table area in the Products category. Follow the instructions and answer a few simple questions about your manufacturing requirements. The Haas online rotary calculator will make a number of product suggestions based on your needs. Then, you can explore the suggested product's capabilities and specifications.

Find Your Rotary Distributor

To find your local Haas rotary and CNC machine tool distributor online, go to www.HaasCNC.com, click on the Dealer Network category and follow the instructions. You will find the Haas worldwide, factory-authorized CNC distributor network, and a USA-specific zip code quick-find search option.

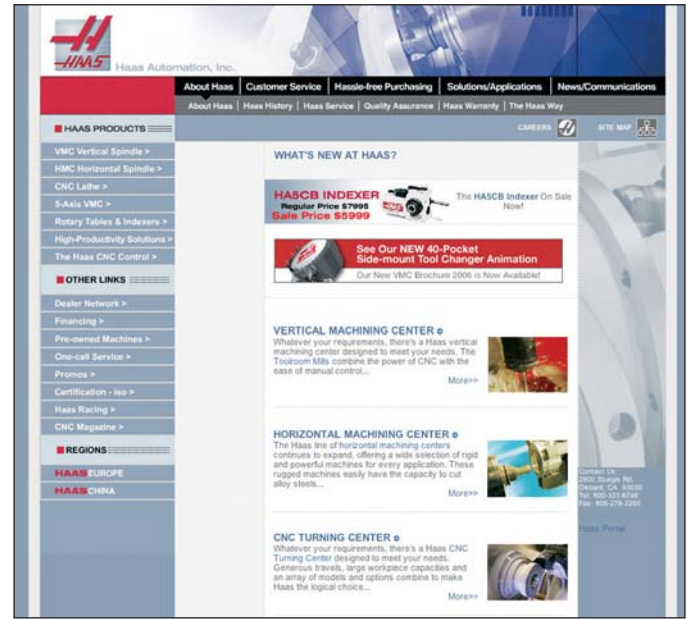
Contacting Haas Automation

To contact Haas Automation directly, call 800-331-6746 and ask for Inside Sales. Our sales assistants will answer all your questions and direct you to your local Haas rotary and CNC machine tool distributor. Alternately, you can contact Haas at:

Phone: 800-331-6746

Fax: 805-278-8540

Mail: 2800 Sturgis Road, Oxnard, CA 93030 – USA



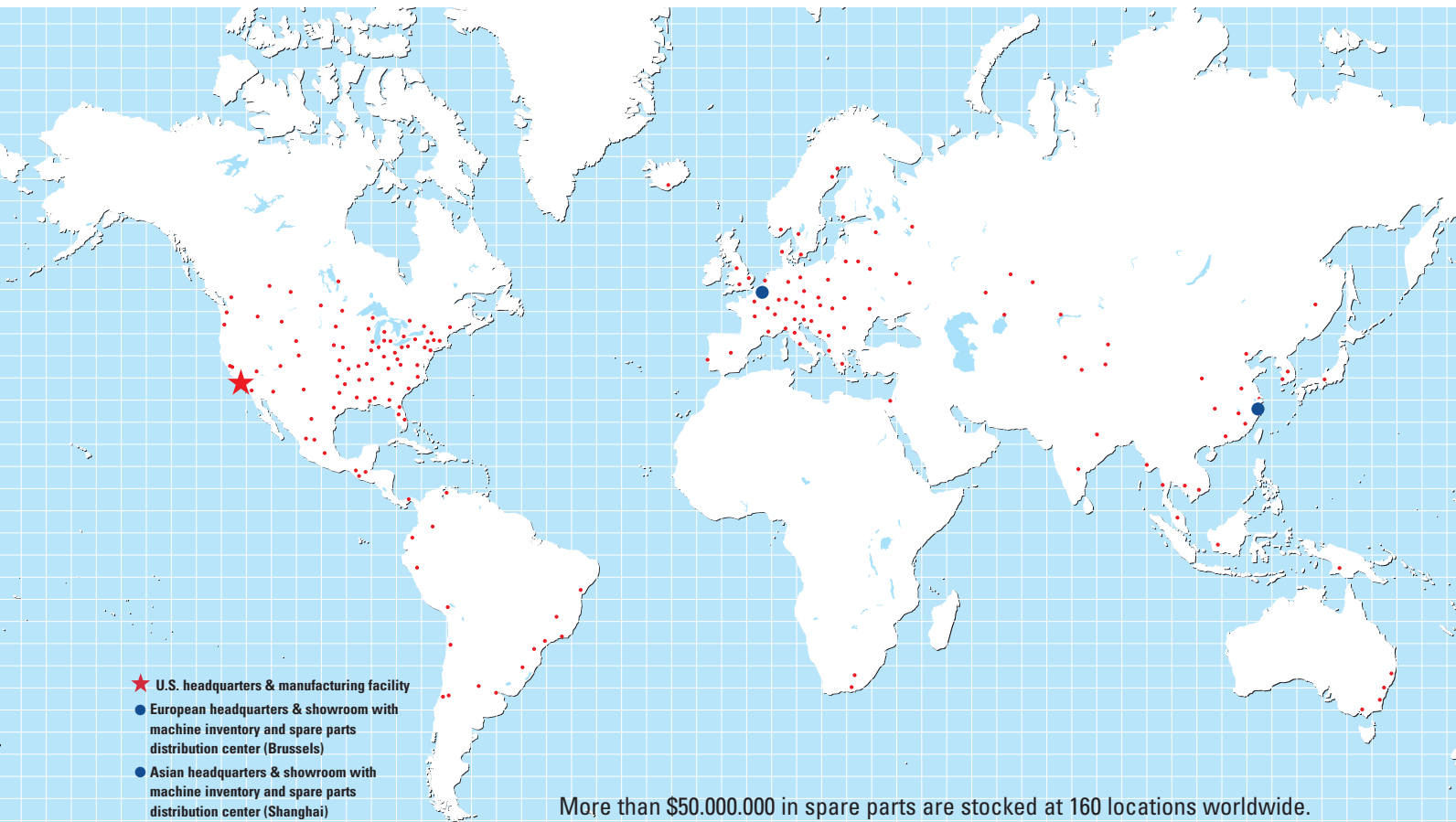
The Haas Website

Wouldn't it be great to have a salesman available 24 hours a day? To have your most detailed questions answered instantly? To get an accurate price quote that includes the latest promotions?

At HaasCNC.com you can have all this and more. Our new website provides all the information that is important to YOU. What you need, when you want it – all online.



Worldwide Support



More than \$50,000,000 in spare parts are stocked at 160 locations worldwide.

Head Office, California, USA



European Headquarters, Brussels, Belgium



Asian Headquarters, Shanghai, China



Our network of dedicated Haas Factory Outlets provides local attention to detail, fully stocked service vans, and the training and backing of an international organization. In total, more than \$50,000,000 in spare parts are stocked at 160 locations worldwide. Local parts inventories are supported by overnight availability from main headquarters.



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