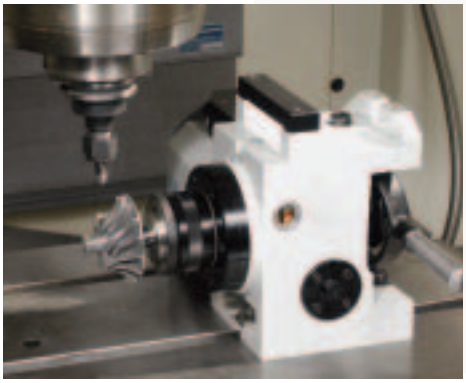
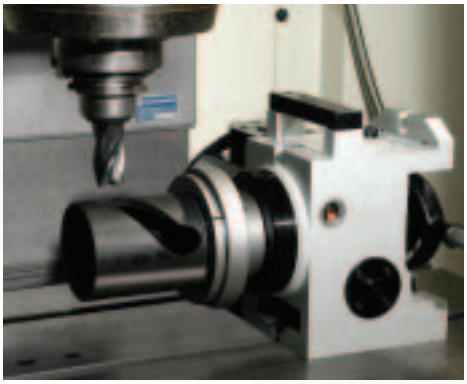
ROTARY INDEXING PRODUCTS

TURNING MILLING GRINDING WORKHOLDING

HARDINGE
EXPECT MORE

The Hardinge 5C Indexing System





Hardinge's 5C Indexing System is technologically advanced to increase your productivity. Over a century of experience in manufacturing 5C spindles and spindle tooling brings you the most accurate and reliable product on the market today. Both the All-Digital Servo Control and the 5C Indexing Unit are industry compatible to allow drop-in replacement of other brands.

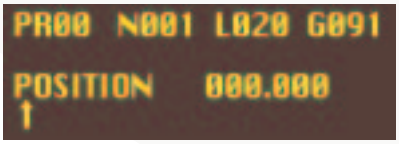
Increase your productivity by adding automation to your machining center or knee mill for rapid positioning of small parts in secondary operations such as milling, drilling, tapping, contouring and spiral milling.

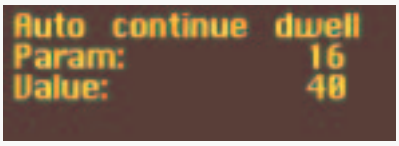
The Hardinge® 5C Indexing System is a fully automatic, programmable, rotary positioning device. The mechanical indexing head holds the workpiece and the all-digital servo control instructs the rotation of the spindle. Positioning of the workpiece is accomplished by programming the angular movements into the memory of the control. It can be used as a slave to your CNC machine or as a master control unit in dedicated drilling operations. It can be used in the horizontal position or mounted vertically for face and endwork.
The Hardinge All-Digital Servo Control is industry compatible and will drive some brands of brush or brushless motor indexing heads. The mechanical indexing head is also industry compatible for drop in replacement.

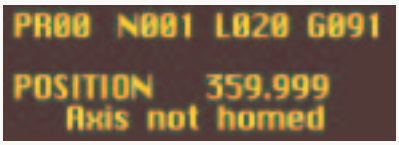
Quick Page Reference:

All-Digital Servo Control

- Intelligent power module for state-of-the-art performance
- Multi-line display reduces scrolling and user manual dependency
- Fast, and easy to use – industry compatible replacement
- High accuracy and repeatability
- RS-232 interface with fast 56K baud rate
- Infrared send/receive capability







Model #H-5CI-C All-Digital Servo Control supports brush or brushless motor indexers.

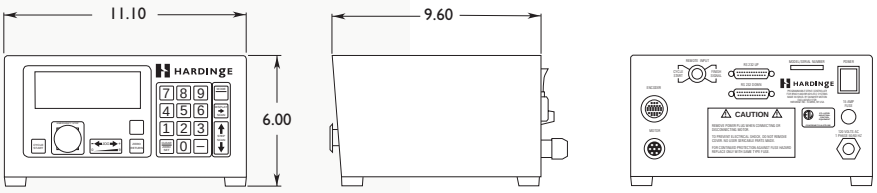
The Hardinge All-Digital Servo Control will support either brush or brushless motor indexers made by Hardinge or most other indexer manufacturers. This current generation digital control backed by Danaher Motion has an intelligent power module (drive electronics) to bring the best possible system to your machining center or knee mill.

Hardinge's Servo Control features a **multiple line LCD display** that lets you view the program number, step number, loop count and preparatory code without scrolling. You can store up to 50 programs with up to 1000 steps in each program. The parameter number as well as its definition can be viewed in logical English. The four line display means you'll be viewing all critical data, spending less time referring to the operator's manual and more time using the indexer. Error and fault messages can be displayed to help diagnose problems. Hardinge's Servo Control uses hardware rather than software to detect feedback faults, resulting in faster fault detection. The computer processing speed is six times faster than others on the market.

The Hardinge Servo Control has the ability to handle baud rates up to 56k supporting the latest speeds for sending and receiving data. The RS 232 interface allows data entry, upload, download, read position, start and stop motor operation – and allows remote diagnostics and troubleshooting. The communication parameters can be adjusted to support stop bits, data bits and different baud rates to work with different machine tool brands. Infrared sensor capability allows you to send/receive programs from a Pocket PC. Dell Pocket PC Computer Axim X30 available from Hardinge – model #CI-3279-PPC .

The Hardinge Servo Control can be used as a direct replacement for the current benchmark control in conjunction with either brush or brushless motor indexers. It has common parameters for ease of integration from one brand to the other. The memory is nonvolatile so that the program content is fully captured and will be maintained after power off conditions.

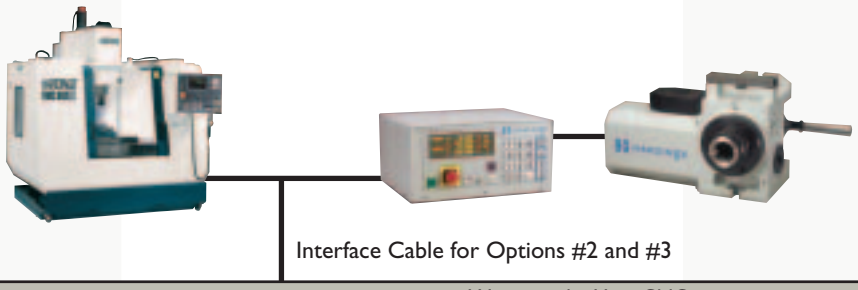
The Hardinge Servo Control can be easily applied to your machining application or manufacturing setup. Refer to the interface arrangements on the following page.



All dimensions shown in inches.

4th Axis Integration – Interfacing to a Host Machine

The Hardinge 5C Rotary Indexing System can be used as a manual system or it can be integrated into your CNC manufacturing application as a 4th-Axis* using one of the three interface configurations as shown.



Interface Cable for Options #2 and #3

Function	Wiring to the Host CNC
Cycle Start Command to indexer via M-code output, relay (pins 3 and 4 of Hardinge connector)	Spare M-Code output and associated relay
24 Volt supply (pin 1 of Hardinge connector)	To power supply
M-code finish signal (pin 2 of Hardinge connector)	Spare M-code input

option #1

True 4th-Axis* via the host machine

The Hardinge Indexing Head may be connected directly to the host machining center and it's CNC control. Configured in this way, the Hardinge indexer operates in a fully interpolated fashion with the other axes of the host machine. This arrangement does not use the Hardinge Servo Control but relies on the capabilities of the machining center's CNC control and it's motor amplifier. The programming requirements for the indexer become fully integrated into the main CNC program and the indexer is treated as a 4th axis* of the machining center. The system effectively becomes an integral part of the host machine.

All currently produced Hardinge VMC's are configurable in this way with either the GE Fanuc or Siemens control options. Custom motors may be fitted to accommodate other brand CNC controls. (The indexing motor must be compatible to the machining center / CNC control.)Please notify the factory of your specific machine integration before placing your order.

*4th Axis is a generalized term referring to an additional axis that can be integrated into the current X, Y and Z axes machining center configuration.

Y-cable available for connecting a Haas brush motor Indexing Head to a Hardinge all-digital Servo Control. Part No. #CI-3011-Y.

option #2

4th-Axis* via RS-232 port and interface cable (program resides in the host machine)

The Hardinge 5C Indexing System (Indexer and Servo Control) may be connected to the host machine via the RS-232 port. Using this method, the program commands will be resident in the machine's CNC control and sent directly to the Hardinge Servo Control. After sending the program information, the host CNC relay signals that the motion should begin and when complete, it returns a finished signal to the CNC. Subsequent machine tool movements occur after the indexer motion is completed. This interfacing technique requires that the host CNC be capable of communicating programming information over an RS-232 communications port.

After passing the command information to the indexer control, the host CNC will trigger movement to occur via the four wire interconnecting cable as described in the chart. The cable is provided with a connector for the Hardinge Control side and wire terminations for the CNC side. Additional information is provided in the user manual.

Configuring to the GE Fanuc control is fully supported. Other control types may be considered upon request. Please note that control systems that do not directly provide the ability to write information to the RS-232 port may require special software by the control builder in order to operate in this fashion. RS-232 cable to be provided by the customer.

A total of three control units can be daisy-chained together for program transfer - each with a distinct identifier.

option #3

4th-Axis* via CNC interface cable (program resides in the Servo Control)

In this interface arrangement, the communication that occurs between the Hardinge All Digital Servo Control and the host CNC is in the simplest form. Logically the host CNC requests that the indexer control process it's next programmed commands and then advise when completed. This requires that the program be stored internally within the Hardinge Servo Control, which is then asked to execute the commands sequentially as a signal is received from the host CNC control. Typically the START indexer command is prompted by a spare and programmable M-Code. At the completion of the indexer-commanded movement, the unit sends the host CNC a finished signal so that the VMC can proceed with the remainder of its program. The interface cable is provided to connect the host machine to the Hardinge Servo Control.

Programming Features and System Specifications

AUTOMATIC CIRCLE DIVISION
You can program a step that automatically divides a circle into any number of equal parts between 2 and 999

EMERGENCY STOP/FEED-HOLD
You can use the EMERGENCY STOP to feed-hold spindle movement without losing position on restart

FAST SET-UPS
All connectors are "quick-disconnect", ensuring fast and easy set-ups

INTERFACING
Most CNC mills can be interfaced quickly and easily by using a spare M function which provides a switch-closer as a signal between your mill and the control

LINEAR & SPIRAL MILLING
For semi fourth-axis capability

MEMORY
A nonvolatile memory retains your program even when power is turned off – and remembers the current spindle position and step number

PROGRAM STORAGE
Store and recall from up to fifty different programs

PROGRAMMABLE PARAMETERS
You can alter many of the basic features by performing your own basic programming

PROGRAMMING
Program to rotate the spindle clockwise or counter-clockwise with step sizes from .001 to 999.999 degrees

ABSOLUTE OR INCREMENTAL PROGRAMMING
Up to 1000 different steps can be stored in memory and each step can be repeated (looped) 999 times

RS-232 INTERFACE
For computer control of sending and receiving programs

RESOLUTION
Standard resolution of .001 degrees

SIMPLE EDITING
Edit a program by simply writing over existing steps, or inserting or deleting a line (or several lines) between steps, with automatic program line renumbering

SUBROUTINES
Allows you to repeat sequences up to 999 times saving programming time and memory space

VARIABLE FEED RATES
Variable from .001 deg./sec. to 360 deg./sec.

ZERO RETURN
An "automatic home" position can be programmed to return the spindle to its original starting position from any point

12-MONTH WARRANTY
Against any defects in materials or workmanship

System Specifications

SERVO CONTROL	
Interchangeable between Brush and Brushless Motors	Yes
Baud Rate Capacity	up to 56K
PROGRAMMING	
Storage - No. of programs	up to 50
Storage - No. of steps/program	up to 1000
RS-232 Interface	Yes
Text Display	multiple lines
Infrared Upload/Download	Yes
SPINDLE	
Torque (ft-lb/Nm)	45/61 Brush Motor 82/108 Brushless Motor
Runout Max. (TIR)	0.0004"
Backlash (arc/sec)	40
Speed (degrees/sec)	0.001 to 360
Nose Thread (True Hardinge manufactured 5C threaded-nose spindle)	$2^{3}/_{16}$ – 10
Collets	Standard 5C
Spindle center to base (inch)	4.000" ± 0.001
INDEXING	
Accuracy (arc/sec)	+/- 30
Repeatability (arc/sec)	10
Resolution (degree)	0.001
Max Rotation/Step (degree)	999.99
Work Gear Dia. (inch/mm)	2.8/71.1
MOTOR	
Type (hp/kW DC servo)	0.5/0.4 Brush Motor 0.78/0.58 Brushless Motor
Gear Ratio (worm & gear)	60:1
OPERATING SPECS	
Duty Cycle	90% at full speed*
Operating Temp. (max ambient)	104°F/40°C
Power Requirements (VAC)	115 +/- 5% @ 10 amps
Max Air Pressure (psi/bar)	120/8.3
WEIGHT	
Rotary Indexer (lb/kg)	48/22.1
Control (lb/kg) Brush/Brushless	9.54/4.34

* Without Tailstock. Brushless motor 90% at full speed, Brush motor 75% at full speed.

5C Indexing Head

Manufactured by Hardinge U.S.A.

World renowned hardened and ground 5C spindle

Fast indexing speed up to 360 degrees per second

Industry compatible right down to the replacement parts

Uses standard 5C collets, step chucks, ID expanding collets and manual jaw chucks

The 5C indexing head is based on a long history of Hardinge 5C spindle and manual indexer designs. Over 60 years of Hardinge-engineered and proven mechanical elements guarantee an accurate, repeatable, reliable and flexible product. This unit is offered in a brushless or brush motor configuration and is industry compatible. It carries the same spindle centerline (4.00"), foot print and tool clearance as previous Hardinge products and other US-made brands for direct replacement.

The spindle is hardened and ground for accuracy and has a rigid design with large bearing surfaces to support heavy cutting forces. Positioning of the spindle is accomplished through a self-locking worm and worm gear.

A manual collet closer is provided with the indexer. Opening and closing of the collet requires a simple movement of the lever arm which in turn advances the collet forward or backward within the spindle. This is the proven closer design that has been used on time proven Hardinge manual indexers. The closer features a toggle system that will snap over center to assure a positive and self-locking arrangement. The manual closer has a total stroke of .030" and provides complete adjustability to position the collet stroke as required. Pneumatic closers are available for higher gripping forces, automation processes, and for grouping multiple indexing heads.

Set-up reduction is crucial to every manufacturing operation and particularly so for those organizations moving towards the lean approach. This unit can be connected to a wide variety of host machines to enable a rapid set-up of your individual applications. Indexing heads are available in single, dual, triple and quad units.

Brushless Motor Models:

H-5CIBL-1	Single Unit
H-5CIBL-2	Dual Unit
H-5CIBL-3	Triple Unit
H-5CIBL-4	Quad Unit

Choose from manual or pneumatic collet closers to complete this model.

Hardinge offers the most complete workholding portfolio and custom manufacturing capability in the industry.

Brushless Motor and other Options

Brushless Servo Motor

Hardinge brushless Servo Motor technology from Danaher Motion incorporates the latest generation, highly efficient Intelligent Power Module (IPM) for improved overall system reliability. The duty cycle is rated conservatively at 90% at full speed with a high torque rating for heavy operation. There are no brushes to wear, no dust generated from brushes, and it offers more efficient heat dissipation as compared to a brush motor. Brushless motors yield higher acceleration and deceleration which can reduce cycle times.

Preset Tailstock and Indexer Combinations

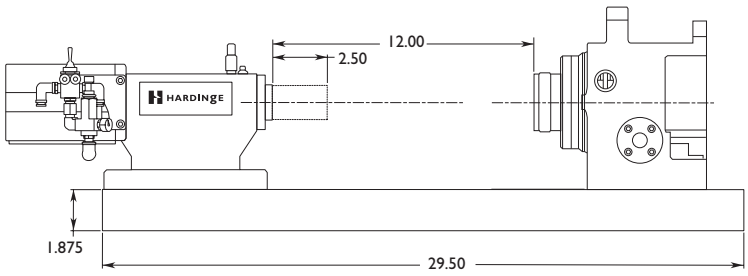
Self-contained units are available with a pneumatic indexer and pneumatic tailstock mounted on a subplate for easy placement on and off the machine table. The plate measures 29 1/2" long by 10 1/4" wide to accommodate up to two indexers and two tailstocks. Units are set up to maintain factory tolerances. Tailstock is adjustable to accommodate a range of part lengths.

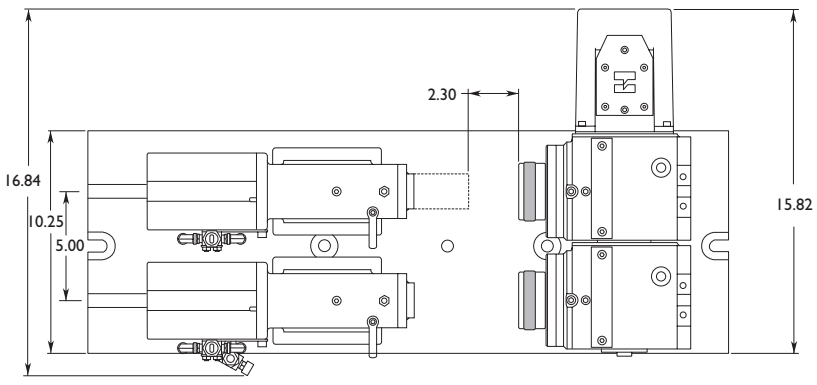
Single Unit: Pneumatic Tailstock, Pneumatic Indexer and Double Mounting Plate

Pneumatic Standard Force (brushless)
HTABL-SF
Pneumatic High Force (brushless)
HTABL-HF

Dual Units: Two Pneumatic Tailstocks, Dual-unit Pneumatic Indexer and Double Mounting Plate

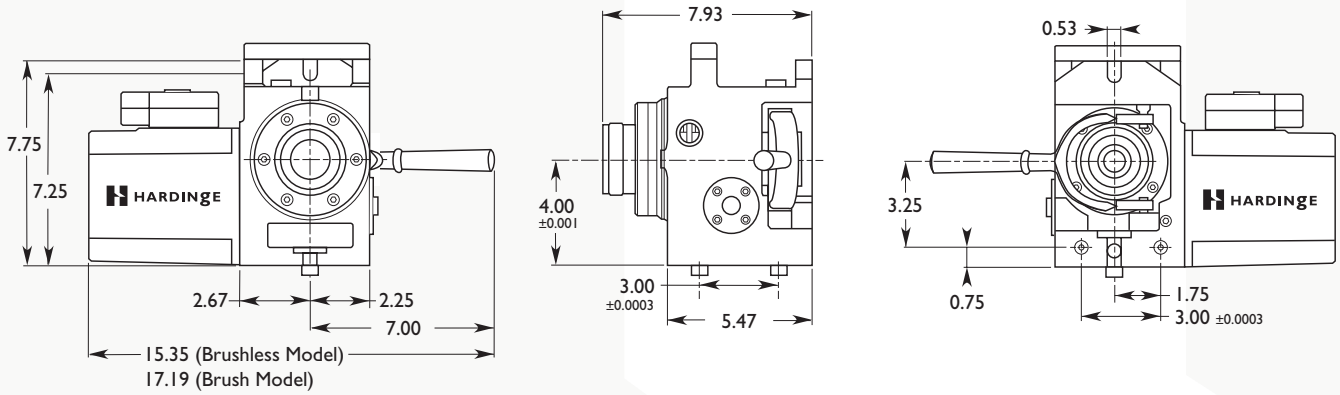
Pneumatic Standard Force (brushless)
HTA2BL-SF
Pneumatic High Force (brushless)
HTA2BL-HF





5C Indexer

Dimensions

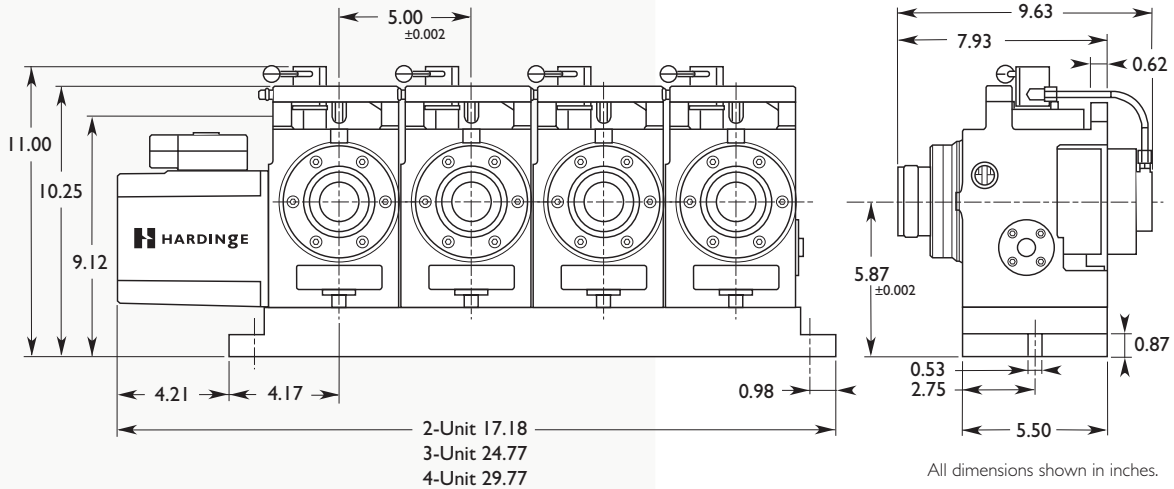


H-5CIBL-1 Single Unit (brushless)

Replacement Compatibility

The Hardinge Indexer is fully compatible with other common brands in the market, using the same spindle centerline, foot print and tool clearance for drop-in replacement.

Hardinge replacement parts are compatible to select U.S. rotary indexer manufacturers.



All dimensions shown in inches.

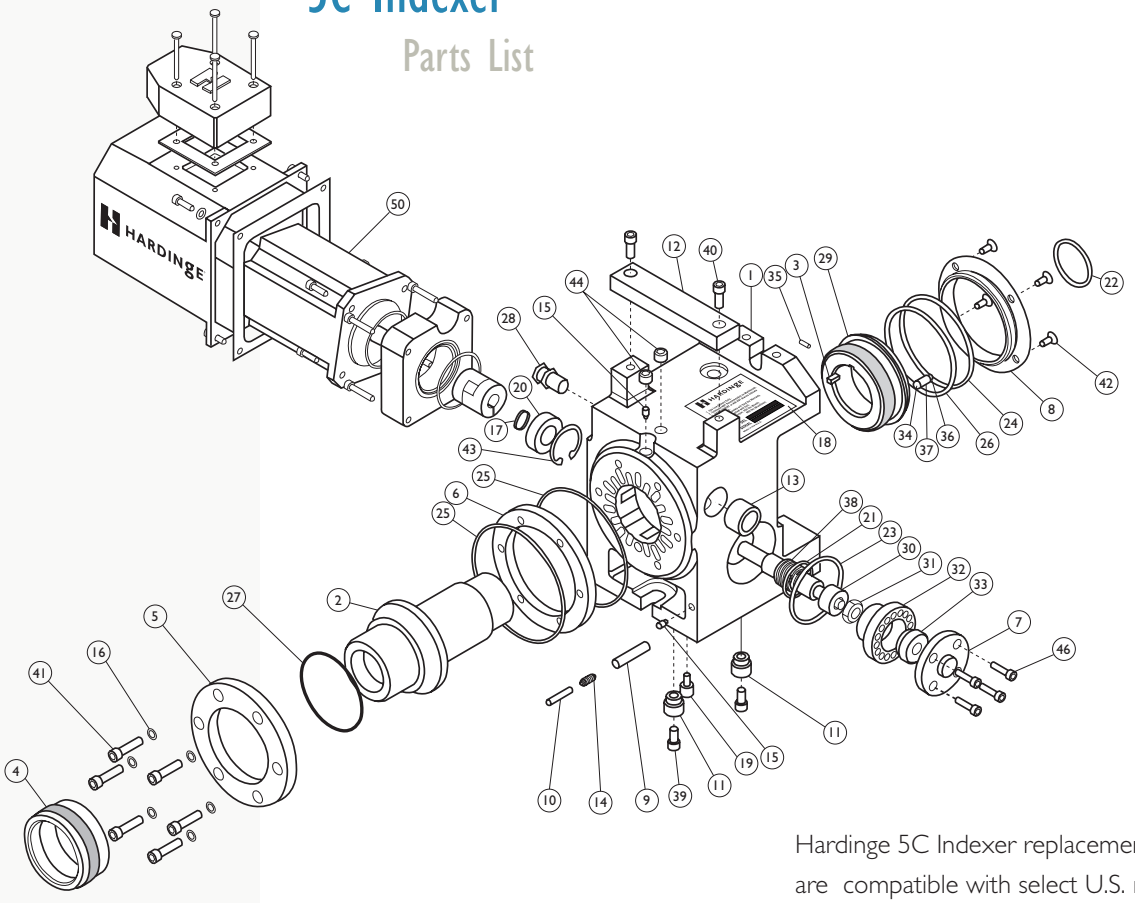
H-5CIBL-2 Dual Unit (brushless)
H-5CIBL-3 Triple Unit (brushless)
H-5CIBL-4 Quad Unit (brushless)

Multi-Spindle Units

Two, three and four units available mounted on a single sub plate for increased productivity for higher volume applications. Pneumatic closers and valve assemblies are required for multi-spindle units and are ordered separately.

5C Indexer

Parts List



Hardinge 5C Indexer replacement parts are compatible with select U.S. rotary indexer manufacturers.

5C Indexer Parts List

Item	Part Number	Qty	Description
1	CI 0000264	1	Housing
2	CI 0000283	1	Spindle 5C
3	CI 0000283K	1	Key, Spindle
4	CI 0000534	1	Spindle Cap
5	CI 000199001	1	Spindle Lock
6	CI 000199002	1	Spindle Spacer
7	CI 000199003	1	Bearing End Cap
8	CI 000199005	1	Rear Oil Shield 5CV
9	CI 000199006	1	Tube, Wick Oiler
10	CI 000199007	1	Wick, 3/16" dia. Round
11	CI 000199011	2	Locating Pin
12	CI 000199012	1	Handle
13	CI 000199013	1	Sight Gage
14	CI 000199014	1	Spring, Wick Oiler
15	CI 000199016	2	5C Collet Key
16	CI 0002384	6	1/4" Copper Washer
17	CI 0009912	1	Wave Washer
18	CI 0010366	1	ID Tag
19	CI 0010998	2	Magnetic Oil Plug
20	CI 001128101	1	Bearing Radial
21	OR 0001820V	1	O-Ring
22	OR 0002623	1	O-Ring
23	OR 0003337	1	O-Ring
24	OR 0004851	1	O-Ring
25	OR 0006466	2	O-Ring
26	CI 001115103	1	Quad Ring

Item	Part Number	Qty	Description
27	OR 0003638	1	O-Ring
28	NC 0010224	1	Home Switch
29	CI 013206401	1	Worm Gear
30	CI 0011281	1	Angular Contact Bearing
31	CI 000199010	1	Bearing Locknut
32	CI 000199008	1	Bearing Housing
33	CI 000199009	1	Bearing Nut
34	CI 0006698	1	Adjusting Pawl Spring
35	CI 013206402	1	Home Switch Magnet
36	CI 013206403	1	Detent Pin
37	CI 013206404	1	Detent Plug
38	CI 013206405	1	Worm Shaft
39	0100608	2	SHCS, 1/4-20 x 1/2
40	0100610	2	SHCS, 1/4-20 x 5/8
41	0100616	6	SHCS, 1/4-20 x 1
42	0310306	4	FHCS, 10-32 x 3/8
43	125000823101	1	Retaining Ring
44	5 0001467	2	1/8-27 Pipe Plug
46	0100312	4	SHCS, 10-32 x 3/4
47	CI 0003011C	1	Home Switch Connector
48	CI 0003011P	6	Connector Pins
49	CI 0008044	4	Pin
50	CI 0001111	1	Brushless Motor Assembly

Collet Closer Options

The Hardinge 5C Indexing Head is provided with a manual collet closer as standard. Additionally Hardinge offers two pneumatic collet closers, the PSF (Pneumatic Standard Force) and the PHF (Pneumatic High Force). Both of these closers offer operational improvements by reducing operator fatigue and allowing for possible automation arrangements. Both closers utilize an original Hardinge concept of force amplification that has been historically proven to provide long life and effective operation even under demanding applications. The Hardinge force amplifier which is an integral part of the design is a simple approach that allows high actuation forces with normal shop air pressure. In both cases, air pressure is applied for gripping and is spring returned for releasing.

Both pneumatic closer designs can be set for a large number of gripping force levels by simply varying the incoming air pressure within the specified operating range. These closers will accommodate the complete range of Hardinge 5C tooling including step chucks and internal gripping systems.

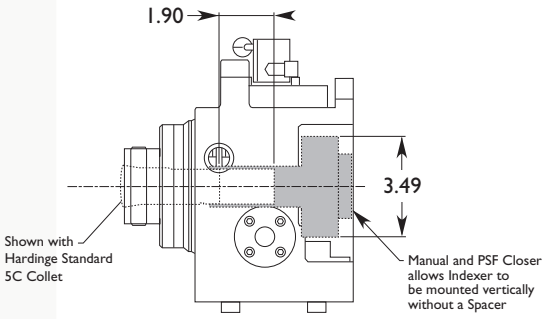
Pneumatic Standard Force Collet Closer

The -PSF Pneumatic Standard Force Collet Closer is designed to provide all of the actuating force necessary for gripping with any of the 5C components in the workholding family. This means that the part held in the Hardinge indexer will be gripped as securely as in any lathe application. The .030" of travel will permit a load clearance or part diameter variation of up to .007" without the need to perform readjustments. The PSF, given it's compact size, cannot support a through-hole capability and as such the collets are tightened by an Allen wrench through the collet order hole. When a collet stop is used, the system must be equipped with a through hole in order to access the tightening screw. **-PSF**

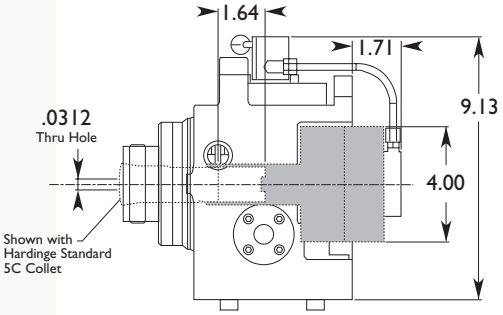
Pneumatic High Force Collet Closer

The -PHF Pneumatic High Force Collet Closer is designed with the same force amplification system as found on the PSF, but is equipped with a dual cylinder for greater resulting force. Once again this force can be regulated downward and needs to be set according to levels which are below the maximum allowed for the workholding system. In addition to the applied force, where the PHF closer has an advantage over the PSF unit is in the length of travel and the through hole capacity. The total travel of this unit is double that of the PSF at .060" and the through hole is .312". This means that the diameter variation or loading clearance of .015" can be realized without adjustment and that the collet can be secured from the rear. **-PHF**

-PSF



-PHF



A vertical mounting plate is required to mount an indexer with a high force collet closer on end to machine the face of the workpiece. **-PHF-MP**

All dimensions shown in inches.

Tailstock Options

Manual Tailstock

Tailstock model -MTS is a manual operated quill-type tailstock that is advanced into the workpiece with a convenient hand wheel. The unit is configured with base locating pins to reference and configure with a Hardinge indexer. To secure the position of the quill during machining operations, an easy 1/4 turn quill lock is provided. **H-MTS**

Pneumatic Tailstock

Tailstock model -PTS is a pneumatically operated unit that allows a greater level of cell automation and reduces operator fatigue. It has many of the features of the MTS and can be operated from a host CNC machine tool via M-code or by the operation of a convenient hand valve.

H-PTS

Control Valve Assemblies

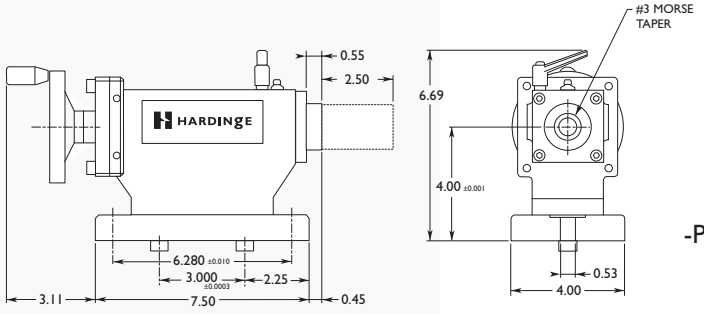
In many cases Control Valves for Pneumatic Tailstocks and Collet Closers are bypassed when the system connects directly to a host machine. For this reason Hardinge offers them separately to maintain the lowest possible cost to the customer.

H-PTS-V Valve Assembly for Pneumatic Tailstock

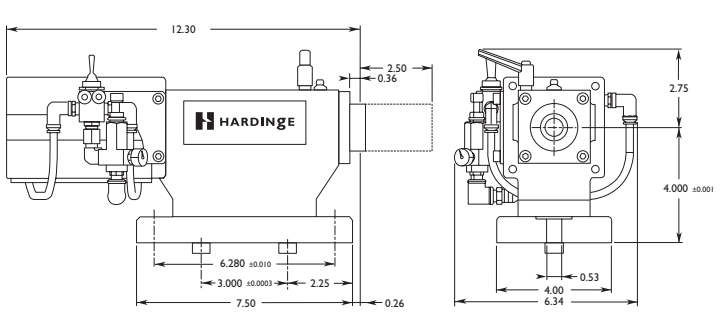
H-PSF-V Valve Assembly for Pneumatic Collet Closer

Hardinge tailstocks are designed to be used where extra support is needed for either workpiece or fixturing holding. Workpieces that have a length to diameter ratio of greater then 3-to-1 may be candidates for tailstock support. This is especially true when attempting to achieve high accuracy levels. Choose from Manual or Pneumatic operation.

-MTS

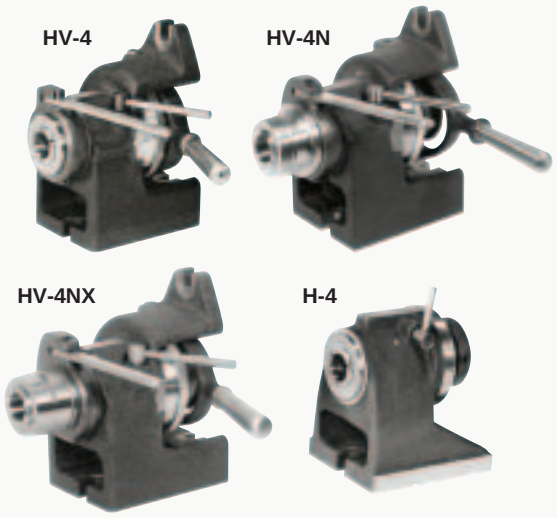


-PTS



All dimensions shown in inches.

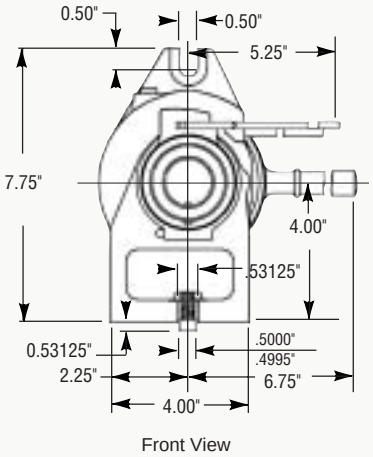
Manual Index Fixtures



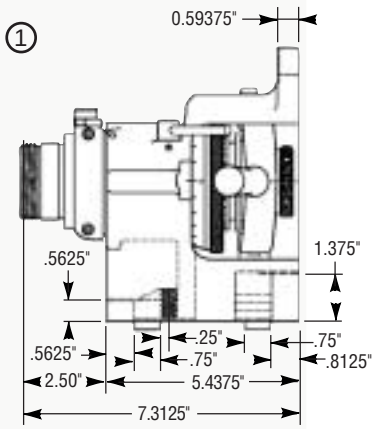
Manual Index Fixtures are used in both production and toolroom environments as a low cost, quick and accurate means of holding a workpiece and performing indexing operations. The tapered or threaded nose spindles are hardened and ground. They accept all standard 5C collets, step chucks with closers, expanding collets, Dead-Length® collets and manual jaw chucks.

Description	Part Number	Figure	Model
Manual Collet Index Fixture	–	–	–
– With Plain Spindle and 24-Hole Index Plate	HV-0000002-P4	1	HV-4[A]
– With Threaded-Nose Spindle and 24-Hole Index Plate	HV-0000002-D4	1	HV-4N[A]
– With Taper-Nose Spindle and 24-Hole Index Plate	HV-0000002-T4	1	HV-4NX[A]
– With 24-Hole Index Plate	HF-0000002-24	2	H-4[B]
Blank Index Plate for HV Model	HV-9004138	3	HV
20-Hole Index Plate for HV Model	HV-0004138-2A	4	HV
24-Hole Index Plate for HV Model	HV-0004138-4A	5	HV
Blank Index Plate for H-4 Model	HF-9004138	6	H-4
20-Hole Index Plate for H-4 Model	HF-0004138-20	7	H-4
24-Hole Index Plate for H-4 Model	HF-0004138-4A	8	H-4

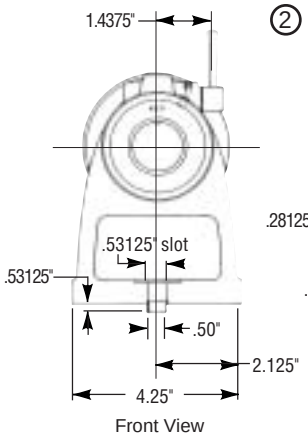
A - Used in horizontal or vertical positions.
B - Used in horizontal position only.



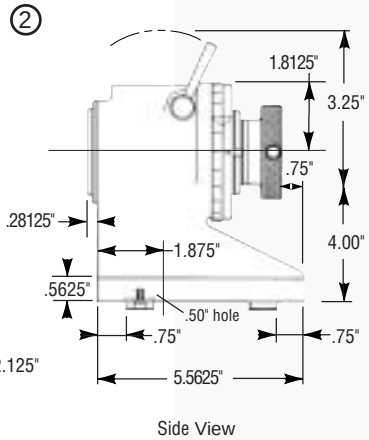
Front View



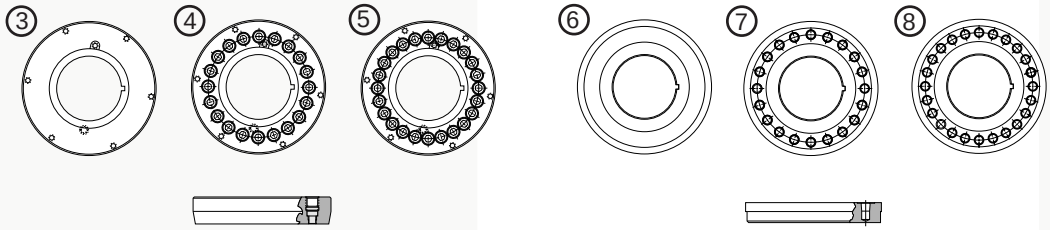
Side View



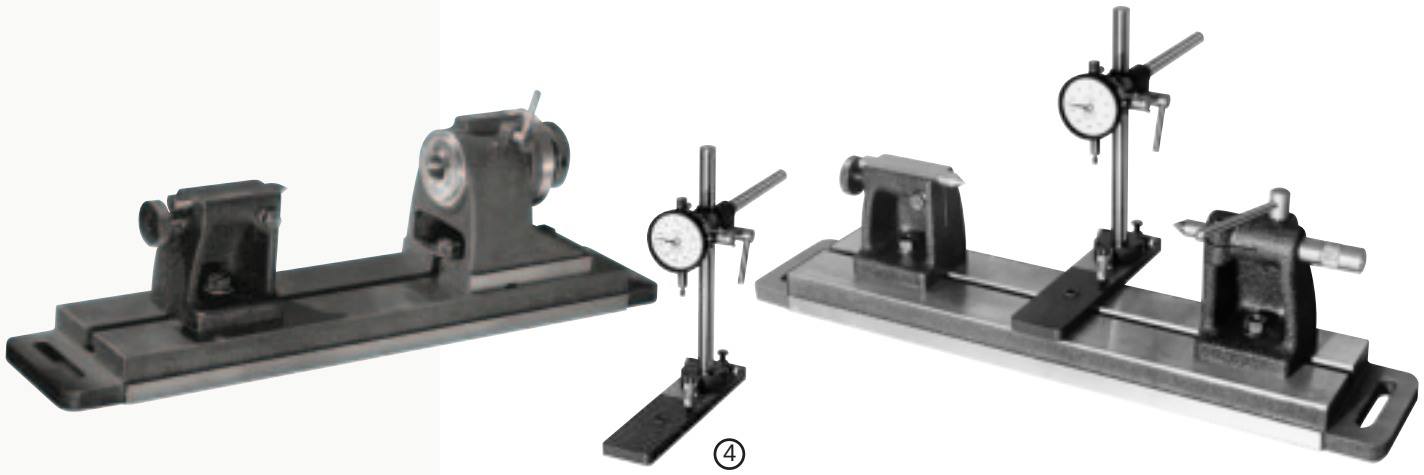
Front View



Side View



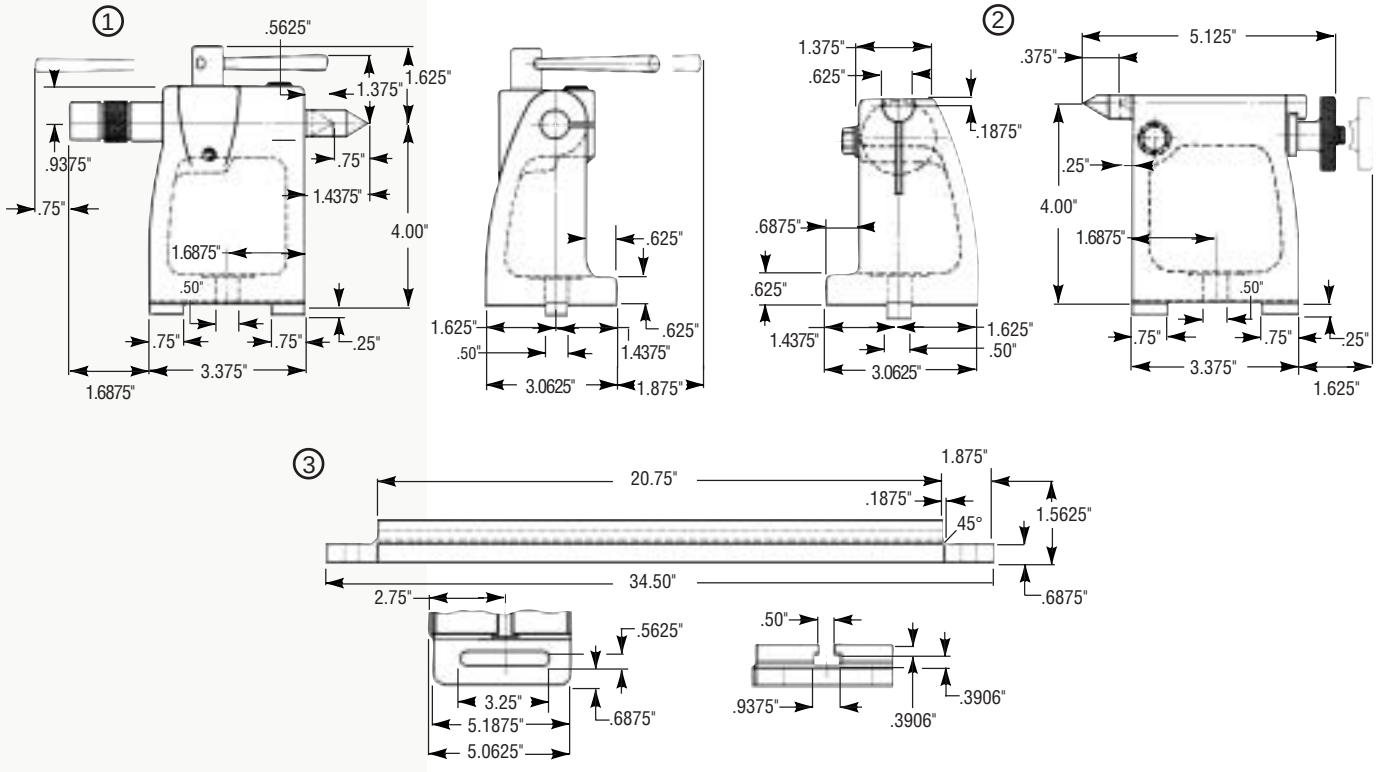
Inspection Fixtures



The SB-4 Sub-Base with the tailstocks can be used as a bench center. The L-4 Tailstock has a hardened and ground spindle which is lever-operated with a rack and pinion. The spindle is spring loaded to hold the center against the workpiece. A position lock is also provided. The hardened and ground spindle on the T-4 Tailstock is screw fed and can be locked in any position with a hexagon clamp bolt. The removable keys permit the tailstocks to be applied directly to any machine table. The SB-4 Sub-Base also accepts various combinations of fixtures such as the HV and H-4 series of indexing fixtures.

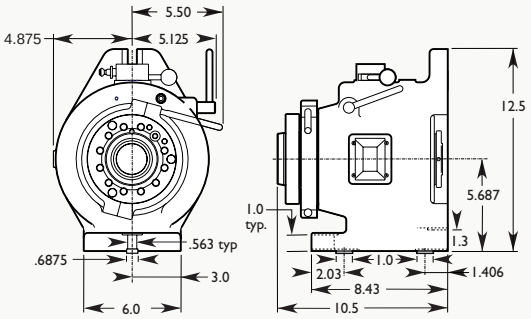
Description	Part Number	Figure	Model
Tailstock — With Rapid Movement Lever	HV-0000056	1	L-4
Tailstock — With Screw Adjustment	HF-0000056	2	T-4
Sub-Base	HV-0001996-A	3	SB-4
Indicator With Stand	HV-0010037-A	4	CH-4

Drawing dimensions in inches.



A2-5 16C Pneumatic Indexing Fixture

Face & Fixture Plates and Manual Chucks



Dimensions shown in inches.

Hardinge **16C Indexing Fixtures** are pneumatically operated and manually indexed. Choose from a 15° or 18° indexing increment model. The fixtures can be mounted either horizontally or vertically. They accept all 16C spindle tooling – collets, step chucks, Dead-Length® collets, Dead-Length spider-stop step chucks, Dead-Length work stops, Sure-Grip® expanding collets, jaw chucks, fixture plates and face plates.

16C Indexing Fixtures have angular contact bearings for optimum rigidity and a maximum spindle runout of .0001", with spindle accuracy of ± 30 seconds and indexing repeatability of ± 30 seconds. There is a check valve in the collet closer actuator which maintains the closer in "closed" position in the event of lost air pressure.

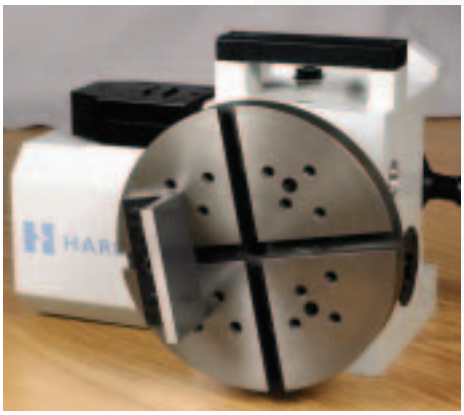
ANSI A2-5 Pneumatic Collet Index Fixtures
– with 20-Hole Index Plate, 15° increments
Part No. HV -0000002-1620
– with 24-Hole Index Plate, 18° increments
Part No. HV -0000002-1624
A2-5 Face Plate – 8.875" diameter
Part No. A2-0000692-09
A2-5 Fixture Plate – 8.875" diameter
Part No. A2-00008750-08
16C Collet-Style Fixture Plate 6.370" dia.
Part No. 1785-00-00-000000

5C Face Plate

5C threaded-nose face plate measures 7" diameter and is drilled and tapped for $^{5}/_{16}$" x 18 TPI bolts.

Part No. 57A-0000692-D

Optional Angle Plate
Part No. 37-0000016

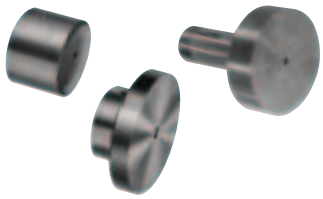


5C Manual Jaw Chucks

3- and 4-jaw Chucks are engineered for Hardinge® 5C threaded-nose spindles.

5" 3-Jaw Universal (shown)
Part No. 53A-5405-THDN

5" 4-Jaw Independent
Part No. 54-5405-HB D



5C Fixture Plates

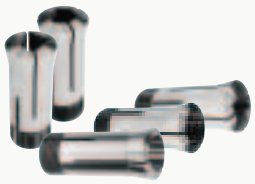
Fixture plates are used to mount parts which cannot be held with a collets or jaw chuck. The clamping method is designed, manufactured and balanced by the customer. Collet and spindle-mount styles are available.

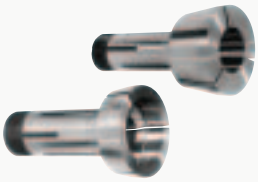
5C Spindle-Mount Style:
3" Part No. 53A-0008750-D; 5" Part No. 55A-0008750-D

5C Collet-Style:
3⅜" Part No. 1397-00-00-000000; 4⅜" Part No. 1399-00-00-000000

5C Workholding

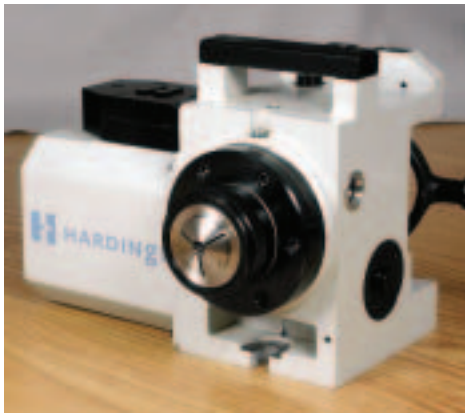
Collets, Sure-Grip Expanding Collets and Step Chucks





5C Hardened & Ground Collets

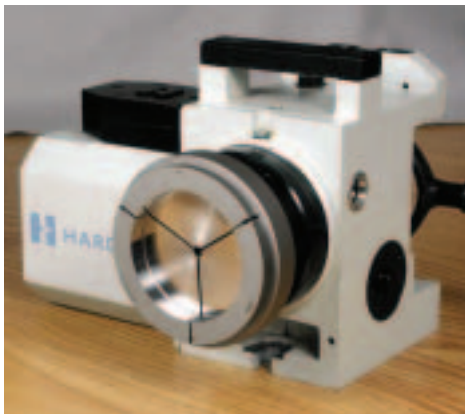
The Hardinge Collet is manufactured to exacting standards from special alloy steel. Threads are heat treated and the body is spring tempered to assure accuracy and durability at low cost. A wide range of standard sizes and shapes (and some not so standard) are available for off-the-shelf delivery. Choose from round, hex, rectangular and square. Emergency collets (ready to bore) are available for just-in-time machining.



5C Step Chucks

Step Chucks are used for accurately holding work up to, or larger than, 6" in diameter. Castings, moldings, stampings and machined parts are held rigidly and accurately. Tubing can be held without crushing or distorting. Maintain accurate gripping, the same as with collets, when using regular- and extra-depth capacity step chucks for holding larger diameters.

Regular-Depth Step Chucks are ⅜" larger in diameter than the rated size so the full capacity may be readily applied to a depth of ½". **Extra-Depth Step Chucks** are made so the full rated capacity may be applied to a depth of 1¼". Small closing angles are available on step chucks for non-rotating use. A 5C threaded-nose **Step Chuck Closer** is required for each rated size step chuck. The closer mounts directly on the spindle nose. An inside taper corresponding to that on the step chuck places the closing pressure over the stepped area of the chuck, resulting in greater gripping power and accuracy. **Emergency Step Chucks** are supplied with pin holes and pins in place for precision just-in-time machining.



5C Sure-Grip® Expanding Collet Systems

Hardinge Sure-Grip Expanding Collet Systems mount directly into the collet angle of the spindle. It is a solid, one-piece body and arbor combination with a minimum of parts required to expand the collet. The expanding arbor instantly locates on center, unlike other designs. Benefits include a quick collet changeover along with a wide gripping range for each collet. The Hardinge design offers true parallel gripping with a high gripping force.

HARDINGE
EXPECT MORE

Spindle Tooling for Manual & CNC Lathes

Collets for Automatics, Turret Lathes & Rotary Transfer Machines

Swiss-Type Collets, Guide Bushings & Barloader Collets

HQC® Quick-Change Collet Systems

Sure-Grip® Expanding Collet Systems

HCAC® Collet Adaptation Chucks

Sure-Grip® 3-Jaw Power Chucks

Chuck Jaws

Toolholder Collets, Bushings & Tool Holders

Precision CNC Tooling for Mills

Collet Blocks

Rotary Indexing Products

Custom Workholding

Industrial Products

Machine Tools

Hardinge is everything you need in workholding for all brands of lathes, mills, grinding machines, automatic screw machines, rotary transfer machines, turret lathes, automation and assembly. Expect more from your workholding. Choose Hardinge precision and reliability for increased productivity and value!

Call us today, we've got your answer.

Hardinge Inc. One Hardinge Drive | P.O. Box 1507 | Elmira, New York 14902-1507 USA
USA: 800-843-8801 | Canada: 800-468-5946 | Fax: 607-734-3886
To Order Online: www.hardingetooling.com | Corporate Homepage: www.hardinge.com | E-mail: info@hardingetooling.com