

Universal CNC Adjustable Angle Head for CNC Milling Machine Centers

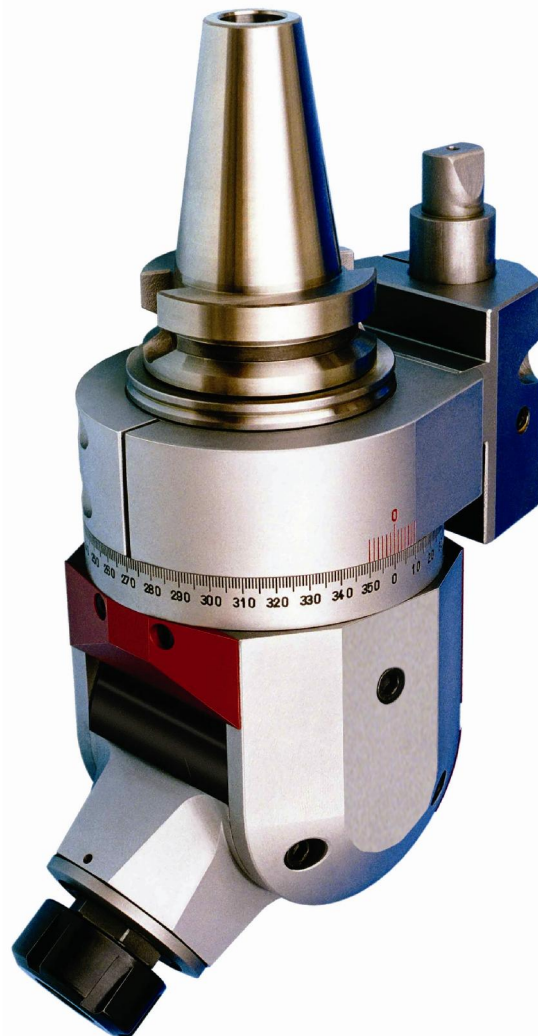
Model: PLCNC-AAH25

Instructions and Maintenance Manual

Thank you for the purchase of your new CNC Adjustable Angle Head from Dorian Tool International, your First Choice in Technology.

The CNC Adjustable Angle Head increases the versatility of your CNC Milling Machine Center by allowing you to mill, drill, and tap in the perpendicular plane to your machine's spindle, without moving the workpiece and therefore avoiding second operations.

This instructions manual explains how to install, use, and maintain of your CNC Adjustable Angle Head. Please read this manual prior to usage, and follow the guidelines explained herein.



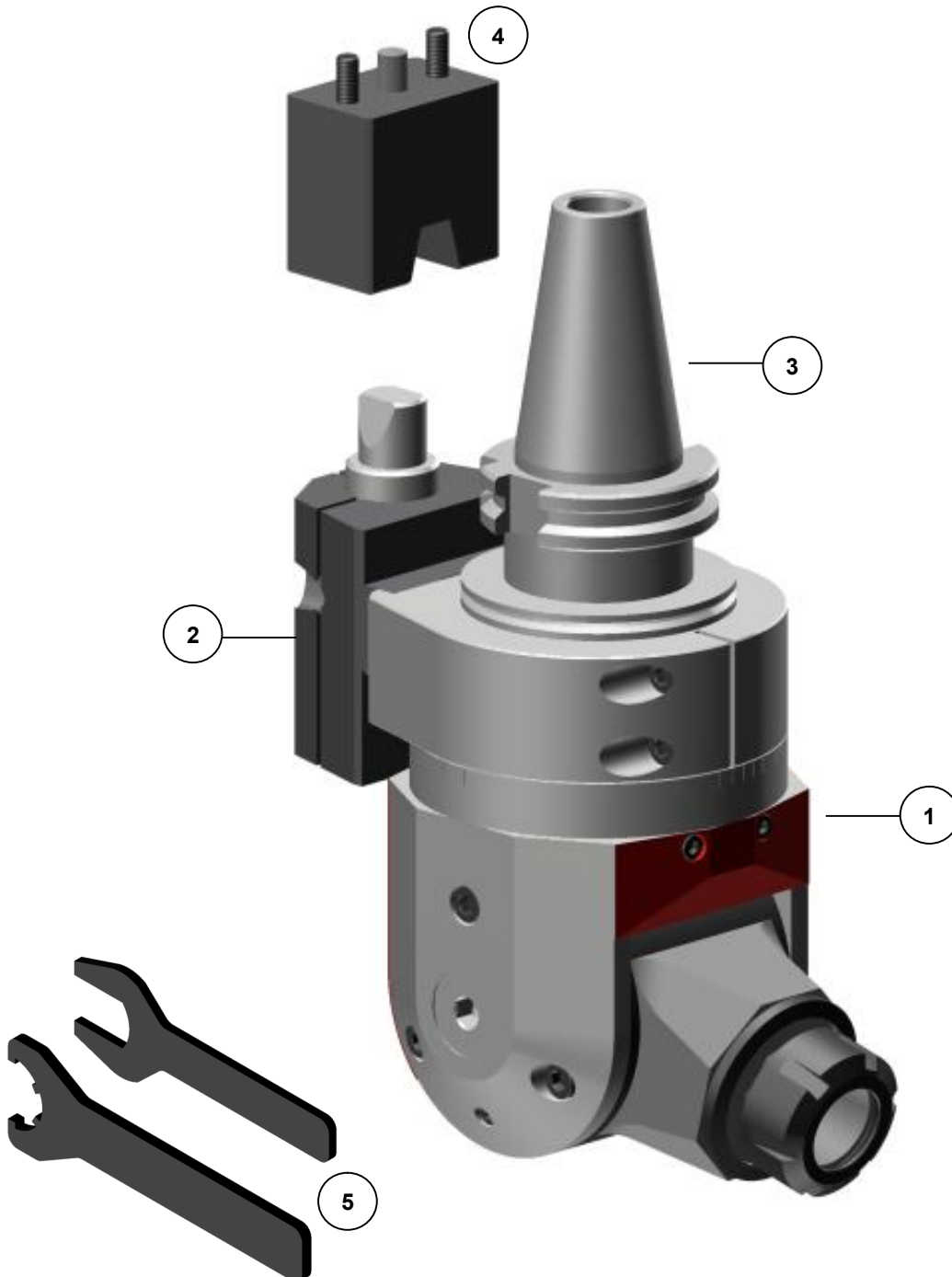
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Items Checklist

Parts included with the CNC Adjustable Angle Head are the following:

1. Universal CNC Adjustable Angle Head
2. Positioning pin holder
3. V-Flange Toolholder (based on type requested i.e. CAT40, CAT50, etc.)
4. Stop Block with two cap screws and locator pin
5. ER Chuck collet nut and channel lock wrenches



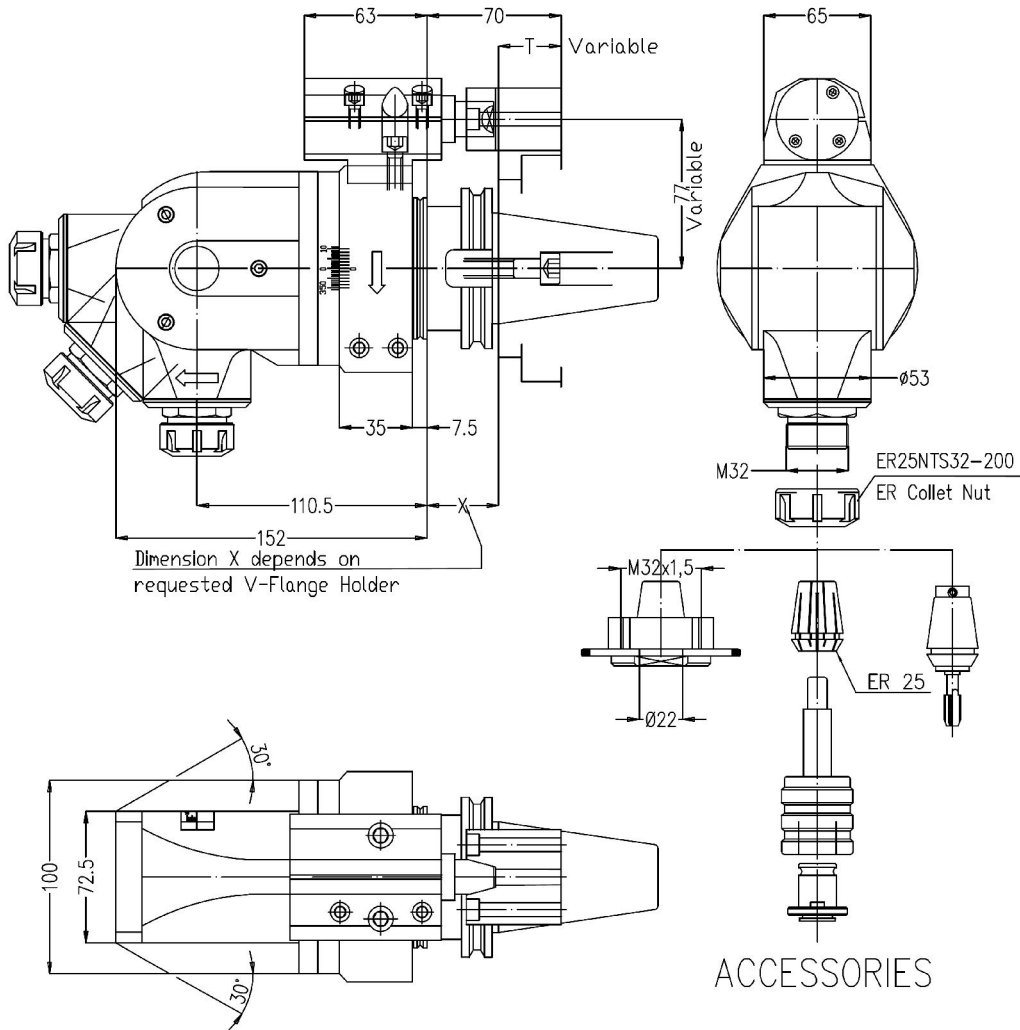
Safety Warnings

Please read this instructions manual prior to using your CNC Adjustable Angle Head, and follow the recommendations listed when using and handling the tool.

- *Understand the torque and speed limitations listed in the Technical Specifications page, so as not to overload or damage the CNC angle head. Exceeding these limits will void the warranty.*
- *Use industry standard ER25 collet holders only and no substitutions.*
- *Make sure all "Orientation-locking screws" are tightened properly after adjusting the head's position and prior to usage.*
- *Install the V-Flange Toolholder properly on the CNC angle head's shaft, making sure it is secured by the socket head cap screw.*
- *Always make sure the Positioning Pin is properly aligned to the Stop Block's tapered notch to ensure rigid machining, and minimize vibration and chattering.*
- *Be careful lifting the CNC Angle Head when loading it manually on the machine's spindle. Do not strain yourself and bring the spindle as close as possible to load the tool. If possible, a riser block can be installed to set the CNC Angle Head when not in use.*
- *When using the ATC Kit* for automatic change of the tool, make sure that the angle head's size and weight can be handled by your machine's toolchanger.*

*Automatic Tool Change Kit sold separately

Technical Specifications



Note: All dimensions in mm

Torque		Driving Ratio	Max. RPM	Collet Size	Tool Capacity (Ø)		Max. Tap Size		Weight*	
Nm	lbf-ft				in	mm	in	mm	kg	lbs
15	11	1:1	4000	ER25	0.625	16	0.500	12**	6.5	14.3

Notes:

* Weight of CNC Angle Head without V-Flange Toolholder.

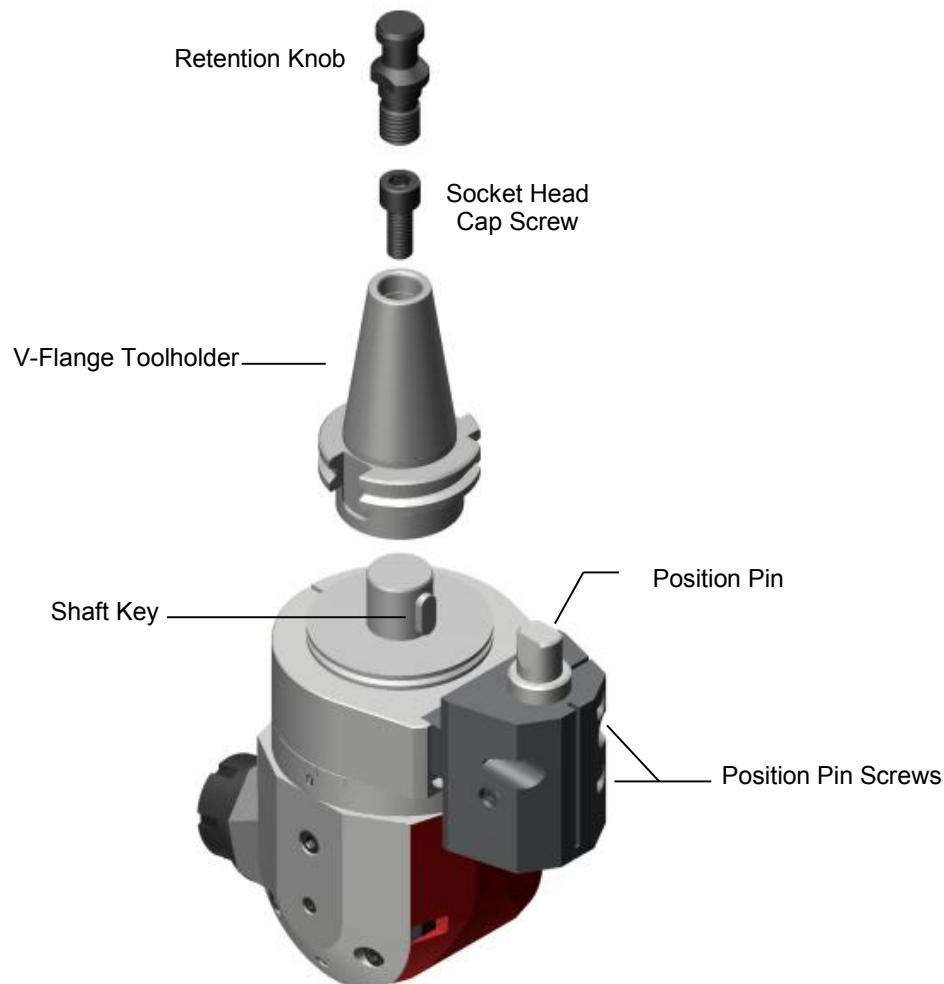
** Maximum tap size based on machinability of material. Use up to M10 for steels, and M12 for aluminum or light alloys.

CNC Angle Head Preparation

V-Flange Toolholder Installation

The steps listed on this page must be followed prior to installing the CNC Angle Head on the machine:

1. Slide the V-Flange Toolholder on the tool's shaft, by aligning the shaft key with its keyway. **Do not force** the holder against the tool. Once in place, fasten the socket head cap screw securely.
2. In order to install the retention knob or pull stud (not provided), you must hold the V-Flange Toolholder to prevent it from rotating. A tightening fixture can be used to lock the holder for this purpose. If not available, exercise caution when installing the pull stud, or it may result in possible damage to internal parts of the CNC Angle Head, as well as the machine's spindle.
3. Loosen the Position Pin Screws to allow the spring-loaded Position pin to slide freely in its housing. This pin is used to lock the CNC Angle Head in position when the spindle runs, so that it would not rotate along with the spindle.



CNC Angle Head Orientation Adjustment

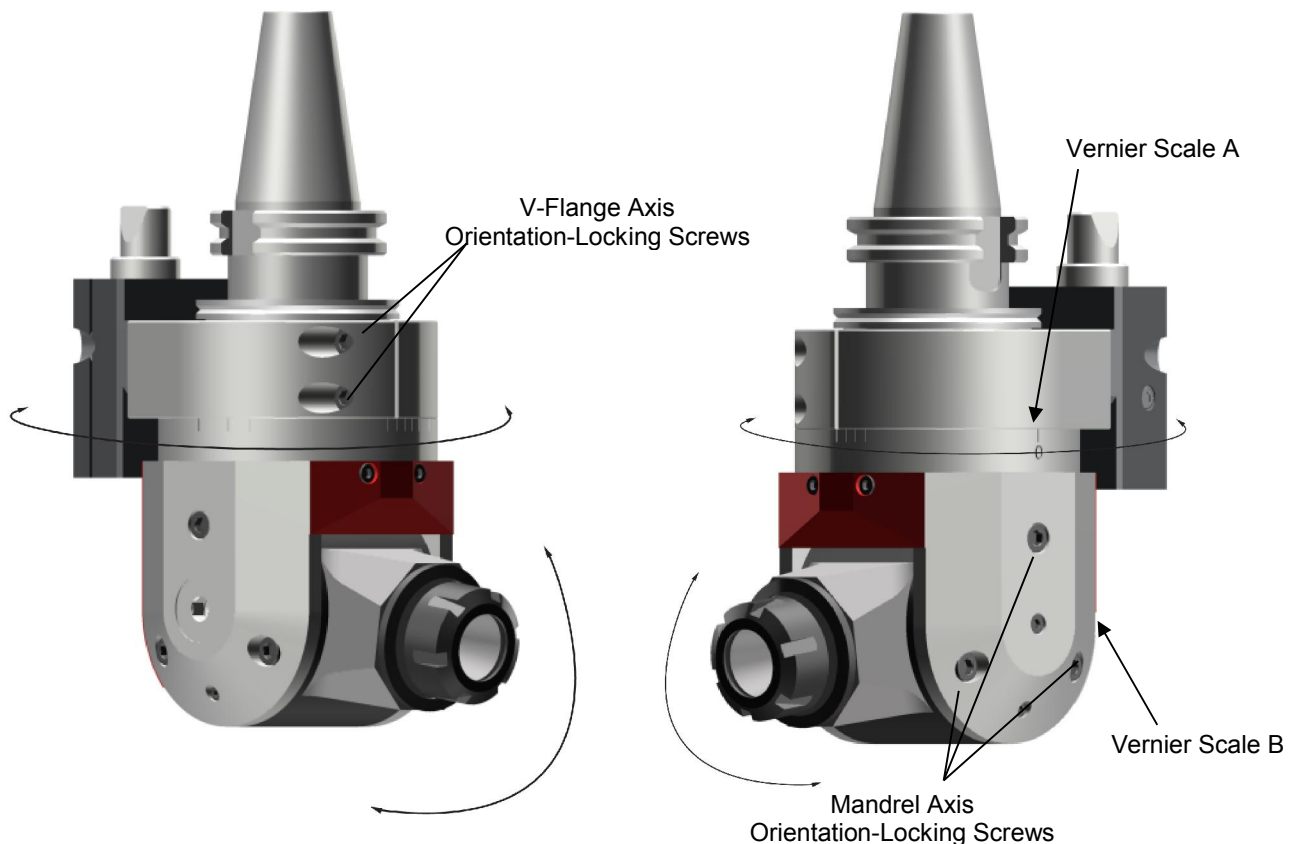
The PLCNC-AAH25 Adjustable Angle Head allows to rotate the tool's orientation about the V-Flange Tool holder's axis of rotation, as well as to position the CNC Angle Head's mandrel at virtually any angle between 0°-90° from the spindle's axis . Follow the steps below to adjust the head's orientation:

V-Flange axis adjustment:

1. Loosen both V-Flange Axis Orientation-Locking Screws in order to free and move the head.
2. Rotate the head to the desired angle using the scale on the tool's body. The markings on the body are in increments of 1°, and the Vernier (A) scale measures in half degree increments. The head can be rotated at any angle between 0 to 360 degrees. Use a precision pin installed on the collet to check for perpendicularity.
3. Tighten the Orientation-Locking Screws once the head's angle is adjusted.

Mandrel axis adjustment:

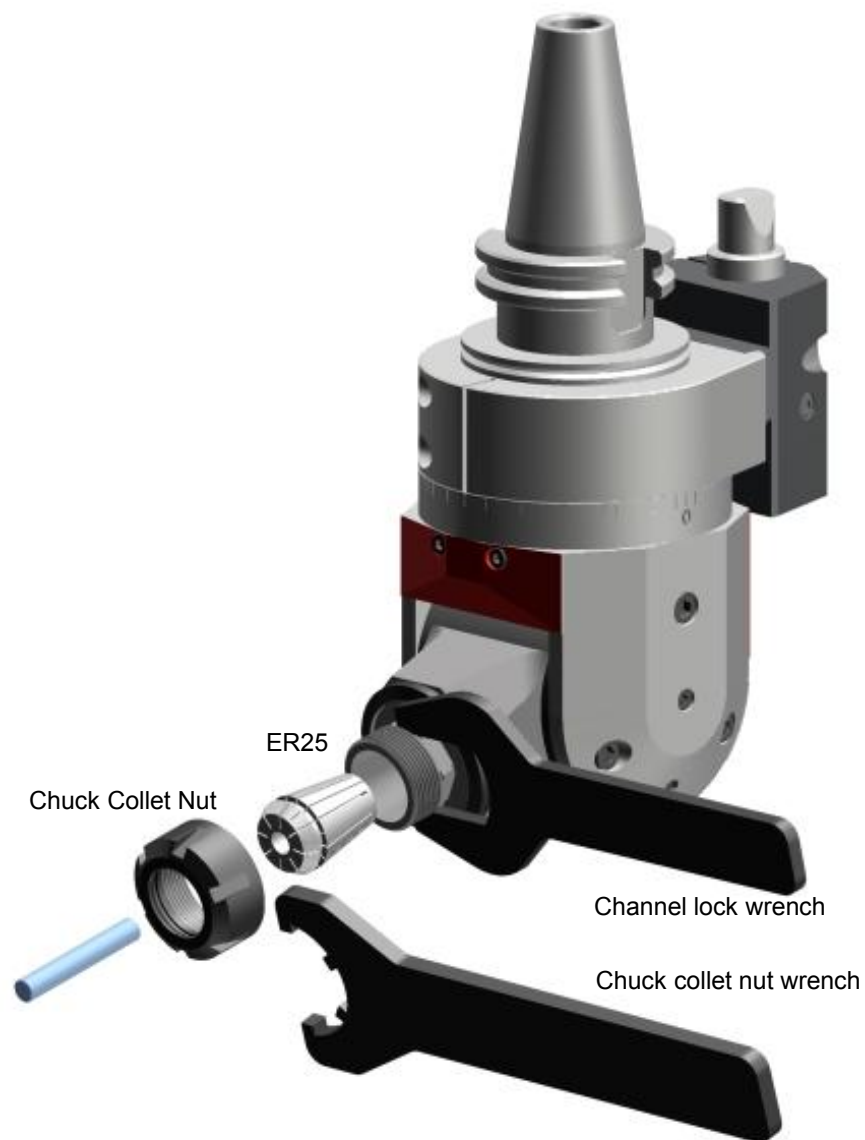
1. Loosen the three Mandrel Axis Orientation-Locking screws to free and rotate the mandrel.
2. Set the desired angle by referring to the Vernier (B) scale on the back of the CNC Angle Head. Use a precision pin installed on the collet and a sine plate to accurately set the desired angle.
3. Tighten the Orientation-Locking Screws one the mandrel is adjusted.



Tool Installation

The CNC Angle Head is equipped with a mandrel to hold an ER25 collet which holds drills, taps, reamers, etc. In order to install a tool into the collet housing, please do the following:

1. Use the provided channel lock wrench to prevent the mandrel from turning.
2. Remove the chuck collet nut using the provided wrench.
3. Insert the ER25 collet, followed by the chuck collet nut and tighten the latter until you feel the collet starts to close.
4. Install the tool to be used, and tighten the Chuck Collet Nut.
5. Follow the tool manufacturer's recommendation for tool overhang.



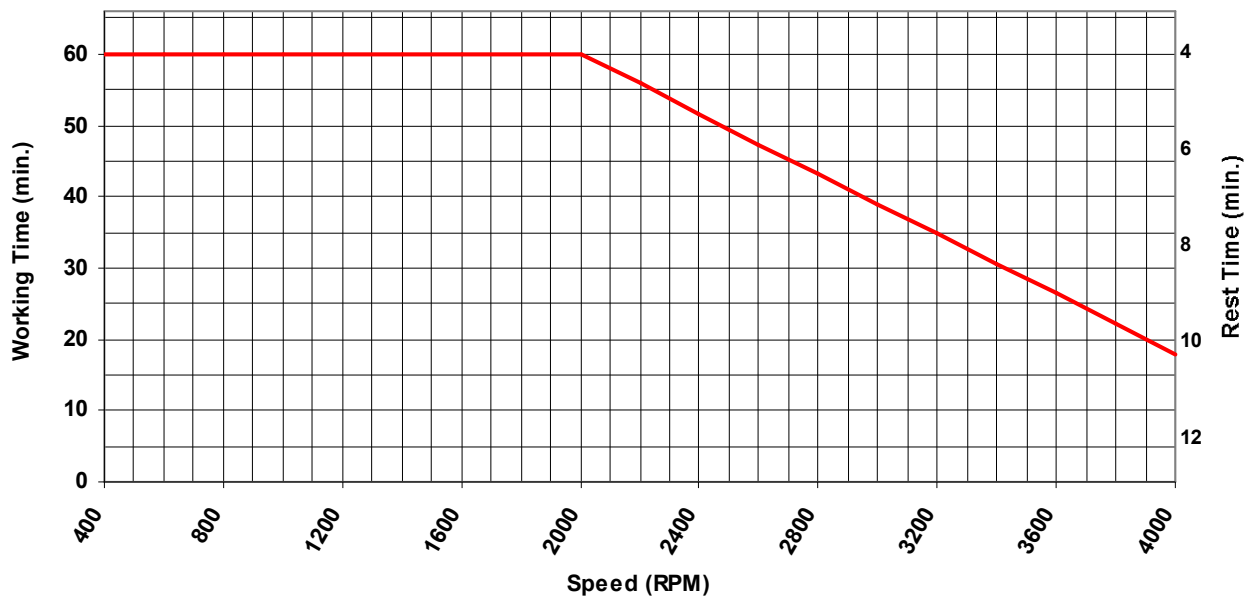
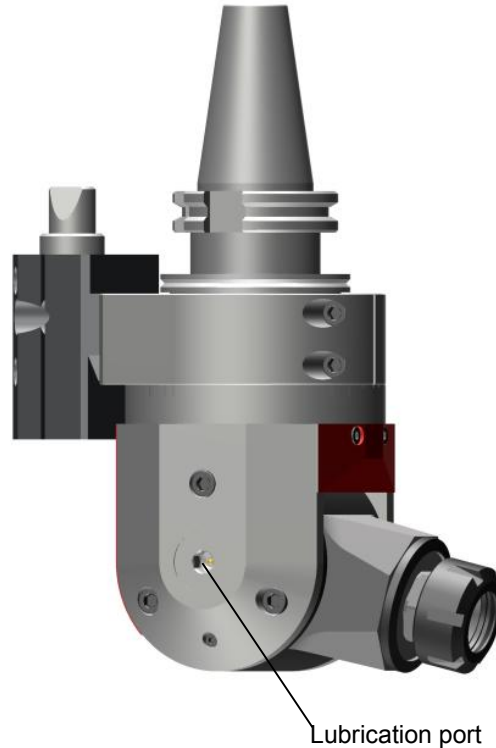
Maintenance and First Use

The CNC Angle Head is inspected and tested to ensure maximum functionality. However, it is recommended to perform a first-run test prior to usage, or after extended periods of not using the tool. We recommend the following procedure:

1. Mount the CNC Angle Head on the machine's spindle (following page).
2. Run the machine's spindle at 1000 RPM for a period of 10 minutes, then stopping for a lapse of 3-4 minutes.
3. Increase the speed to 2000 RPM and run again for 10 min. followed by a 4 min. stop. Increase speed by 1000 RPM until the maximum speed is reached, and follow the Rest time as indicated on the chart below.

A working temperature of 50-70 °C (120-160 °F) is normal on a first-run test.

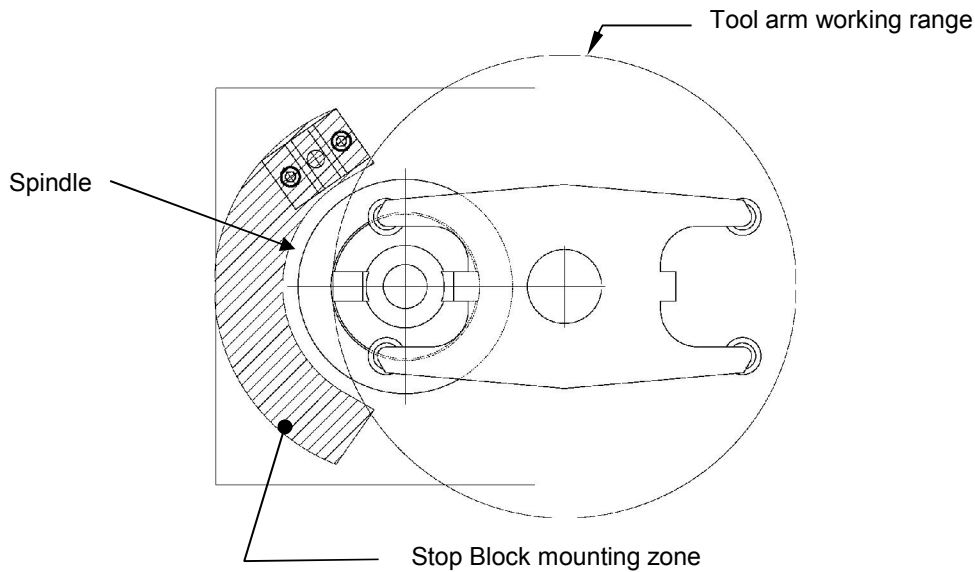
Tool lubrication is recommended every **300 working hours**, using high-speed bearing grease (ester based). Perform the above mentioned test after lubricating the tool, to allow for complete coverage of the lubricant. Do not overload the head with grease.



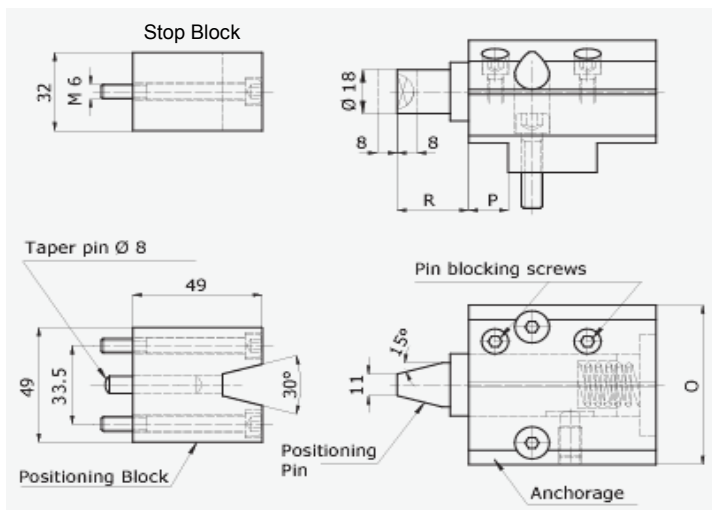
Stop Block Positioning and Mounting

The Stop Block holds the head's body, while allowing the spindle to rotate freely and turn the head's mandrel. Proper installation and positioning of the Stop Block is crucial to the performance of the CNC Angle Head.

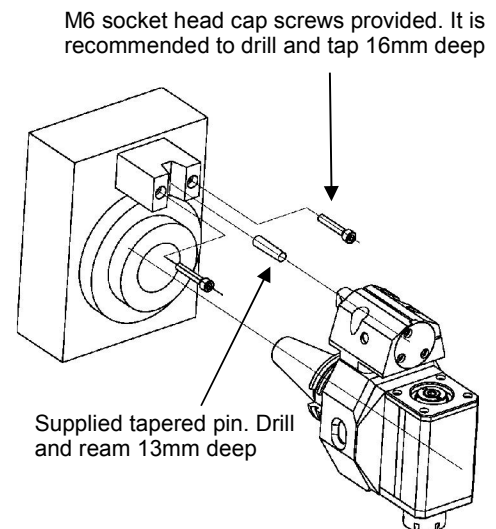
Prior to mounting the Stop Block, pay careful attention to the machine's tool change arm range, and how the Stop Block can interfere if not installed properly. The schematic below shows the tool arm working range, and where the Stop Block can be mounted.



In order to mount the Stop Block, you need to drill and tap the spindle's frame, using the schematic below as a guide to position these features. Once this location is determined, the Stop Block can be attached and a hole needs to be reamed to insert the provided tapered pin, which serves to quickly re-position the Stop Block if it needs to be removed.



Dimensions in mm unless noted
O: 65mm; P: 15mm; R: 26mm



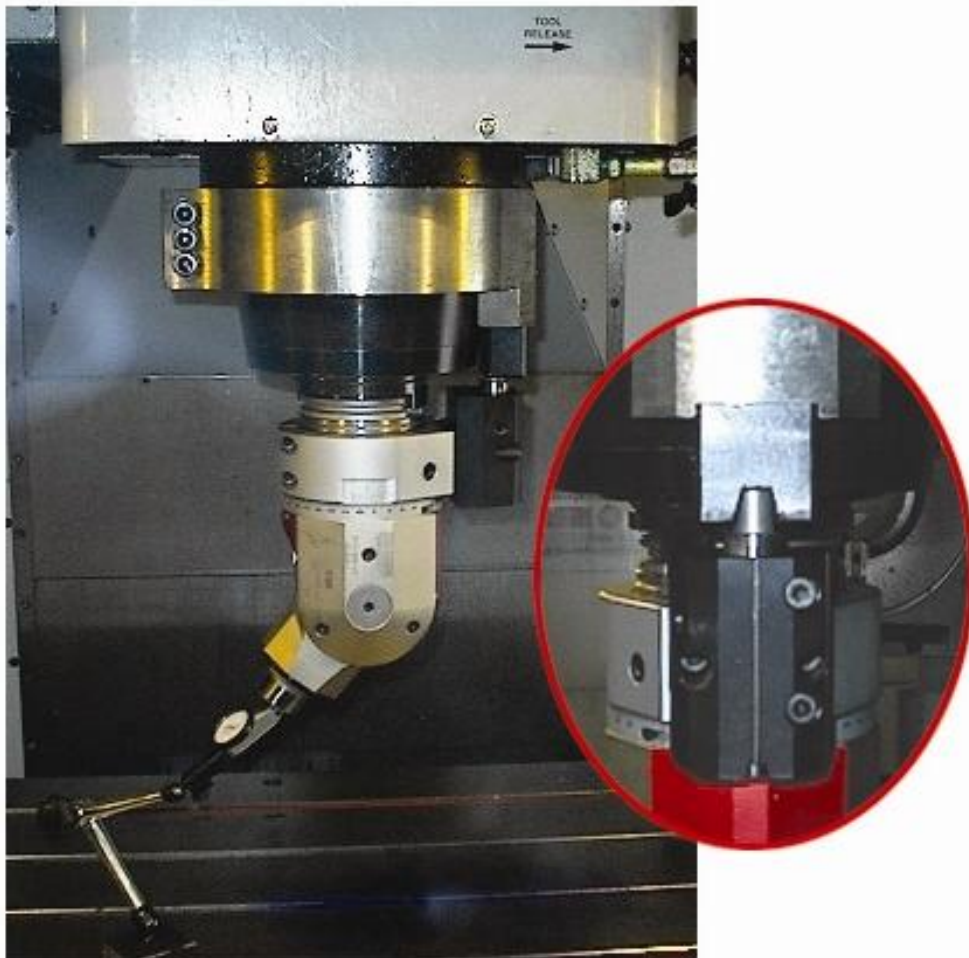
Stop Block Positioning and Mounting(continued)

If space is limited on the spindle's frame, or in case the latter cannot be altered to fit the Stop Block, there are two options that can be followed in regard to your situation:

1. If there is an existent hole pattern on the spindle's frame, an adapter plate can be machined with the Stop Block and frame's pattern. You can proceed to mount your machined plate, and securely fasten the Stop Block.

Pay careful attention to how much the Position pin can travel once installed on the machine. Make sure that when in position, the compression spring allows the pin to fully align with the Stop Block. If not, the CNC Angle Head will experience chattering and vibrations that will affect the quality of machining. In case the Position pin is too high to fit on the Stop Block, you may have to remove material from the base of the latter until you get a good fit.

2. A sleeve or collar-style clamp can be machined and installed around the spindle's body as shown in the picture below. This method is feasible if there are no holes on the spindle's frame, or if drilling is not possible.



CNC Angle Head mounting

Once the Stop Block has been installed, and the head's adjustments have been done according to instructions, the CNC Angle Head is ready to be mounted and used. To mount the tool, you need to do the following:

1. Carefully load the CNC Angle Head on the spindle by activating the Clamp/Unclamp function of the machine. Due to the weight of the head, it may require two people to perform this operation safely. Never run the machine's spindle prior to engaging the head with the Stop Block.
2. Make sure the spindle is not locked so that the head can be turned to align the Position pin and the Stop Block.
3. Loosen the Position pin screws so that the latter can travel freely. You must be able to compress the Position pin by hand in order to align it with the Stop Block.
4. Adjust the Position pin in the Stop Block's housing until it is fully engaged. The best fit will prevent the CNC Angle Head from vibrating.
5. Tighten the Position pin screws to lock in the spring-loaded pin.
6. The CNC Angle Head is ready to be used. If the working angle needs to be re-adjusted, follow the guideline mentioned before on how to orient the head.

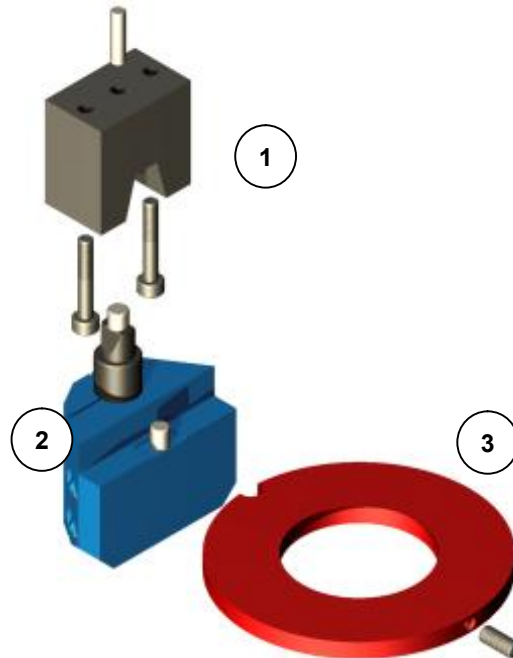
CAUTION: To remove the CNC Angle Head from the spindle, an operator needs to hold the tool while a second operator activates the Unclamping function. The tool can be easily dropped due to its weight, and this can result in damage of the head, tool, workpiece, and can even hurt the operator.

Automatic Tool Change Kit

The PLCNC-AAH25 CNC Angle Head can be used in conjunction with the automatic tool changer of the CNC milling machine. For this purpose, an Automatic Tool Change kit is necessary and quoted upon request. The ATC kit includes the following:

1. Stop Block (identical to the standard change version)
2. ATC Position pin holder
3. Position Locking Plate

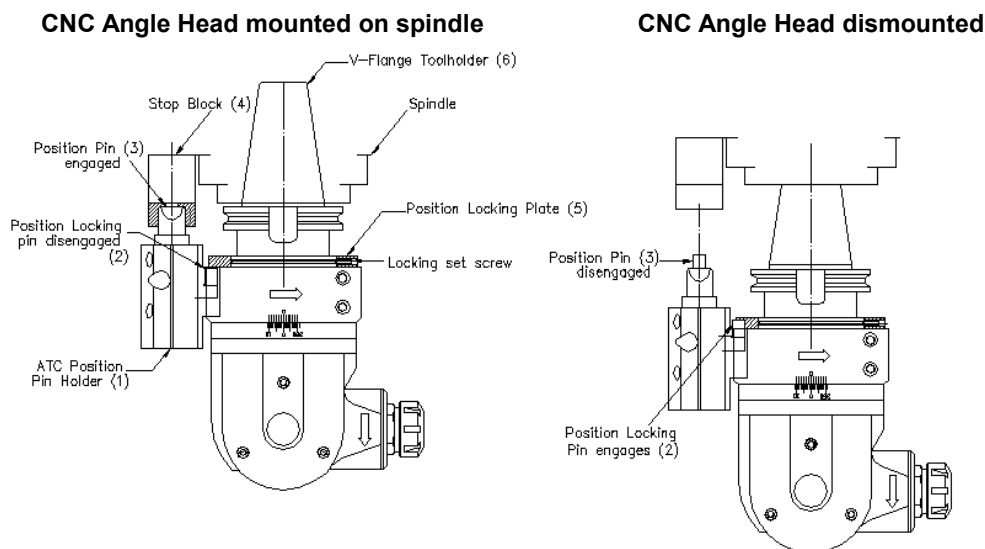
Note: It is solely the customer's responsibility to make sure that his or her machining center's automatic tool changer can safely store, index and change the CNC Angle Head without any clearance or weight issues. Any damage to any machine component during the installation and/or use of the CNC Angle Head with ATC kit is the customer's responsibility.



CNC Angle Head Loading with ATC Kit

The operation principle of the ATC kit is to lock the V-Flange Toolholder once the CNC head is dismantled from the machine's spindle. By locking the holder, it restricts any rotation that can cause the head to lose its engaging position or home position with the Stop Block.

The ATC Position Pin Holder (1) features a Position-Locking Pin (2) that locks the position locking plate. Whenever the ATC Position Pin (3) is pressed against the Stop Block (4), it mechanically disengages the Position-Locking pin that unlocks the Locking Plate (5), thus allowing the spindle to rotate the V-Flange Toolholder (6) freely. After use, the home position for the holder must be called, returning the Locking Plate (5) to its initial position, and dismantling the CNC head from the Stop Block engages the Position-Locking Pin to lock the holder in position. The tool can then be stored automatically and called when needed.



Mounting the CNC Angle Head for automatic tool change

In order to mount and set the CNC Angle Head to allow for automatic tool change, you must do the following:

1. Replace the Position pin holder that comes standard with all CNC Angle Heads with the ATC Position pin holder.
2. Follow the procedure on how to install the Stop Block explained earlier in this instructions manual.
3. Install the Position Locking Plate around the CNC head's flange, and insert the locking set screw but do not tighten yet.
4. Mount the Angle head on the machine's spindle with the assistance of a second operator as mentioned previously. Once mounted, call for the machine's Spindle Orientation code and lock the spindle.
5. Once in position, rotate the Position Locking Plate and align the groove with the Position-Locking Pin (2) on the Position Pin Holder (1)
6. Tighten the set screw on the Position Locking Plate.

The Angle head is ready to be used with the machine's automatic tool changer. Every time the head is to be changed, the same code used to set its initial position will align and engage the locking plate, and obstruct any rotation that may occur when storing the tool in the machine's tool magazine.



Dorian Tool CNC Right Angle Head



6 MONTHS LIMITED WARRANTY PROGRAM

This limited warranty program is the only one that applies to this product, and it sets forth all the responsibilities of Dorian Tool, regarding this product. There is no other warranty, other than those described herein. This Dorian Tool product is warranted, to the original purchaser only, to be free of defects in materials and workmanship for 6 months from the date of purchase without additional charge. The warranty does not extend to subsequent purchasers or users.

Dorian Tool will not be responsible for any amount of damage in excess of the retail purchase price of the product under any circumstances. Incidental and consequential damages are specifically excluded from coverage under this warranty. This warranty does not apply to accessories or damage to units from misuse or incorrect installation. Misuse includes incorrect programming, crashing, exceeding maximum RPM and torque, excessive coolant, modifications to any component, damage to the V-flange holder, and improper maintenance.

RETURN/REPAIR POLICY: Defective products, other than accessories, may be returned freight prepaid to Dorian Tool. Any defective product that is returned to Dorian Tool within 6 months of the date of purchase will be replaced or repaired to Dorian Tool decision. If the unit is repaired or replaced with a new unit, the repaired or replaced unit will then be warranted under the terms of the remainder of the warranty period. The customer is responsible for the shipping charges on all returned items. During the warranty period, Dorian Tool will be responsible for the return shipping charges.

LIMITATIONS: This warranty covers all spare parts for 6 months. The warranty becomes null and void if someone other than a Dorian-Authorized technician repairs or attempts to repair the product. The warranty becomes null and void if the product is modified in any way.

Defects resulting from normal wear and tear (including scratches, abrasions, due to usage or exposure), accidents, damage during shipping to our service facility, alterations, unauthorized use or repair, neglect, misuse, abuse, failure to follow instructions for care and maintenance are not covered under this warranty. If your problem is not covered by this warranty, call our Technical Support Department at 979-282-2861 for general repair information and charges, if applicable. You may also contact us through our website at www.doriantool.com or email sales@doriantool.com.

TO REQUEST WARRANTY SERVICE FOR THIS PRODUCT: Contact Dorian Tool Technical Support by telephone, fax or email. We suggest that you keep the original packaging in case you need to ship the unit. When returning a product, include your name, address, phone number, dated sales receipt (or copy), and a detailed description of the reason for return and product serial number.

WARRANTY ACTIVATION: Please complete Warranty Activation Card and mail to Dorian Tool. Dorian Tool products must be registered within 15 days of product ship date to activate this warranty. If not activated within 15 days, the warranty becomes null and void. Mail the completed registration card, along with a copy of the original sales receipt to:

ATTN: WARRANTY REGISTRATION – DORIAN TOOL
615 COUNTY ROAD 219, EAST BERNARD, TEXAS 77435
PH: 979-282-2861 TOLL FREE: 800-627-0266 FAX 979-282-2951
YOU MAY ALSO CONTACT US VIA E-MAIL AT SALES@DORIAN TOOL.COM
WARRANTY IS NON-TRANSFERABLE AND NON-REFUNDABLE.

Mail or Scan the Below Portion Back To Dorian Tool



DORIAN TOOL CNC RIGHT ANGLE HEAD LIMITED WARRANTY

Date: _____

This limited warranty program is the only one that applies to this product, and it sets forth all the responsibilities of Dorian Tool, regarding this product. There is no other warranty, other than described herein. All Dorian Tool products must be registered within 15 days of purchase to activate this warranty. Mail the completed registration form, along with a copy of the original sales receipt to:

WARRANTY REGISTRATION DORIAN TOOL
615 County Road 219, East Bernard, Texas 77435

I have enclosed a copy of the original sales receipt.

Company _____

Address _____

City _____ State _____ Zip Code _____

Phone _____ Fax _____ E-Mail _____

Type of Business _____ No. of Employees _____

Authorized Dorian Distributor and Location Where Product Was Purchased _____

Date of Purchase _____ P.O. No. _____ Date Received _____

Dorian UPC Number _____ Serial No. _____ Description _____

Signature _____ Title _____ Date _____