STOP!

BEFORE USING, READ THE INSTRUCTIONS!

Really, It's important

NQALHA

Not Quite A Lathe, Handwork Assistant

Personal Safety

Glassworking is inherently dangerous

You can be killed or seriously injured by hot glass and glassworking torches. Before using the NQALHA, you must be experienced in dealing safely with hot glass and glassworking torches. If you are new to glasswork, you must start by learning how to safely perform the basics by hand. It's highly recommended to take lessons from a competent teacher. If a teacher isn't available, there are books and videos available from many sources that demonstrate safe glassworking techniques

Once you are familiar with safe hand work, you can transition to using the NQALHA

YOU MUST TAKE FULL RESPONSIBILITY FOR YOUR SAFETY WHEN USING THE NQALHA!

YOU MUST RELEASE MPM&E AND MIKE PETERSON FROM ALL LIABILITY ASSOCIATED WITH USE OF THE NQALHA!

IF YOU DON'T AGREE TO THESE CONDITIONS, YOU MUST RETURN THE NQALHA FOR A REFUND!

You must be aware of these safety related issues before using the NQALHA

Electromagnetic locks

The locking mechanism is based on electromagnets. If power is lost, they will release and the NQALHA will no longer hold position. If an object is held in the rollers, and power is lost, the object will fall

This behavior can be mitigated by the use of an Uninterruptable Power Supply, available at most electronic/computer stores for very low cost. A UPS is not provided with the NQALHA, but the APC Back UPS 6, model number BE425M, at www.apc.com, $50, is a good choice

Rapid rotation

The NQALHA is capable of rapid rotation. This can be a desirable feature for some types of glasswork when the glassworker has the skill to manage centrifugal force. It can also cause a piece of hot glass to rotate dangerously fast, possibly causing hot glass to fly toward the glassworker

When the on/off button is pressed for the first time after power is applied, the NQALHA starts at a slow rotation speed. It's necessary to rotate the thumbwheel speed control to enable high speed motion.

Workpiece holding

The workpiece is held by a lever operated clamp mechanism. Whenever a workpiece is loaded and clamped in place, the glassworker must verify that the workpiece is securely fastened before starting work

Balance and Tipping

The steel base is an effective counterweight, but it does NOT balance the NQALHA in all extreme arm positions and for all workpiece weights. The ball bearings on the horizontal arm allow very free motion when the magnets are de-energized. If the work surface is not level, and power is removed. The arm can possibly swing into an unbalanced position and the NQALHA can tip over

When placing the NQALHA on the workbench for the first time, leave the travel lock in place as you locate a suitable spot for the base. Then, carefully unscrew the travel lock and extend the arm. Very carefully release the head and watch to see if the arm moves, being very careful to catch it if it starts to tip.

Before using the NQALHA, carefully move the head through the full range of motion needed for the work being done. If you see signs of tipping, use a clamp, counterweight or screw to secure the NQALHA to the workbench

To avoid breaking the NQALHA

Wiring

Even though the wire routing was carefully designed, and the wires are protected by flexible steel conduit and mesh, the wiring can still be damaged by abuse. Before using the NQALHA, look at all of the conduits and wires as the head is moved and understand where they move and how they flex. If anything looks like it's being pinched, stretched or excessively flexed, contact MPM&E for assistance. Also, be aware of anything on your bench that might snag or break the wires

While working, be careful to keep the conduit out of the direct torch flame. In testing, the wiring proved to be durable and able to withstand a lot of radiant heat, but it cannot withstand the full heat of a glassworking torch for more than a very short time

Don’t break the clamp

NEVER tighten the clamp when there is no workpiece inserted and the clamp is at the bottom of its travel. Doing this will damage the clamp. The clamp lever motion should feel smooth and light. If it feels tight, don’t force it. Contact MPM&E for assistance

Be extra careful and observant

If anything appears dangerous or unexpected, immediately stop using the NQALHA and contact MPM&E for assistance

Operation

The NQALHA has several controls. On the wood handle, at the bottom left, is a lever used to release the magnetic locks. To the right of the wood handle is an aluminum piece with two buttons and a thumbwheel. The button facing the glassworker is the front button, the other one is the back button. Below the front button is a thumbwheel. A footpedal is also provided, connected by a cable and 1/4 inch plug. Before using the NQALHA, hold the handle, press the lever, move the head through its range of motion and use all of the controls until you are comfortable that you understand their function

Electromagnetic locks

The NQALHA is locked into position by electromagnets. The locking is not strong, the glassworker can overpower it at any time, but it locks securely enough for most normal glasswork

The NQALHA has three independent sets of locking electromagnets, horizontal, vertical and twist. They can be controlled separately or in combination, depending on the mode selected

User Interface Evolution

When I first designed the user interface, it was trivially simple and had few options. As I used it and got reports from testers, it evolved. Now, after many hours of use, I have made some changes. They are motivated by two factors, the problems associated with the twist axis and the desire to reduce the number of control inputs necessary to efficiently do work.

The twist axis is inherently problematic. It’s unbalanced because of the weight of the motors. When working with a lightweight workpiece, the head can rotate quickly when the twist magnet is released. If the user is expecting this, they can prepare by strongly gripping the handle and preparing to take control. If the user is unprepared, it can be surprising, possibly in a bad way. In the old standard configuration, the rear button enabled or disabled the twist magnet function. This is troublesome because there is no visible indication that the magnet is enabled. The only ways to know if the magnet is enabled or disabled are to remember pushing the button or try using the lever. The new operating configuration consistently uses the footpedal to release the twist magnet.

When I first started experimenting with adding a jog function, it was activated by a tricky combination of control actions. As the function improved, I experimented with different methods of selecting it and finally decided that the best control was no control. In positioning mode, the jog function is enabled by default and the footpedal control of motion and twist are automatically selected.

In the old configuration, every control had exactly one function and combinations weren't used. As a result, it was more beginner friendly. The new configuration uses combinations that may seem confusing at first, but after a bit of practice, the new functions make the unit work more predictably and efficiently.

User Interface Options

Config Name	Function	Power on with
New Standard	Lever controls Horizontal and Vertical Magnets Pedal controls Twist Magnet, when lever applied Pedal controls Pause/Reverse when lever is not pressed Front button toggles Start/Stop Back button reverses motion New jog function in positioning mode	**Front Button**
Old Standard	Back button selects one of two options 1 Lever controls All magnets 2 Lever controls Horizontal and Vertical Magnets, Twist locked Front button toggles Start/Stop Pedal controls Pause/Reverse	**Back Button**

UI Configurations can be selected by powering off the NQALHA. Be careful to have control of the head when removing power. Using the chart above, press a button and hold it while restoring power. The new configuration will remain selected even if power is removed

In early releases, there were many more User Interface configurations. Some were good, some kinda useless. Early on, I just threw in everything I could think of. After many hours of use, I have refined the interface. The Old Standard is still available for anyone who prefers the old behavior

Modes of Operation

The NQALHA has two modes of operation, Rotation and Positioning. They are selected by the toggle switch, located on the aluminum box at the left side of the handle. When the switch is up, Rotation mode is selected. When the switch is down, Positioning mode is selected

Rotation Mode

The front button is the on/off button that starts and stops rotation

When the button is first pressed, rotation starts at low speed. After stopping and restarting, rotation resumes at the previously selected speed unless the button was pressed during high speed rotation. If the front button

is pressed to stop rotation during high speed operation, the rotation will resume at low speed when the button is pressed again. This is an important safety feature that ensures that high speed rotation will never start unintentionally

The footpedal controls pause and reverse

When the pedal is pressed, rotation is paused. When it's released, rotation resumes in the reversed direction. The pedal can be pressed and released quickly to reverse without pausing.

In the New Standard, the footpedal has two functions, depending on the state of the lever. When the lever is pressed. The pedal controls the twist magnet. When the lever is not pressed, the pedal controls pause and reverse

The thumbwheel controls rotation speed

Moving your thumb toward the heat shield increases speed while moving your thumb toward the handle decreases speed

When rotation is stopped

The motors are free to rotate by hand. Since they are stepper motors, there is a bit of resistance even when they are de-energized.

Positioning Mode

Positioning Mode is selected when the toggle switch is down. The New Standard positioning mode adds a jog function

In the New Standard Configuration

The footpedal, lever and thumbwheel controls depend on combinations and order of use

Order is important. If the lever is pressed first and held, followed by the footpedal being pressed, the footpedal controls the twist magnet.

If the pedal is pressed first, it starts rotation and the lever only controls horizontal and vertical magnets

This can seem confusing at first, but after a bit of practice, it allows efficient selection of functions with fewer control inputs

The thumbwheel controls rotation speed or jog

If the footpedal is pressed, the thumbwheel controls rotation speed, moving your thumb toward the heat shield increases speed while moving your thumb toward the handle decreases speed

If the footpedal is not pressed, moving the thumbwheel rotates the workpiece

Pressing the front button reverses direction if the footpedal is pressed

Otherwise, it does nothing

The back button does nothing

In the Old Standard Configuration

Pressing the footpedal starts rotation, releasing the pedal stops it

The thumbwheel controls rotation

Moving your thumb toward the heat shield increases speed while moving your thumb toward the handle decreases speed

Pressing the front button reverses direction

The magnet function is identical to rotation mode

The back button selects the way the lever works. Initially, the lever controls the horizontal and vertical axis magnets with the twist axis magnet locked. When the back button is pressed and released, the lever controls all axis magnets

Manual control

When the pedal is released, the motors lock in place. If speed is set to zero and the pedal is pressed, the motors release to allow manual control

Saved speeds and rotation direction

Each mode maintains its own values for speed and direction. When the mode is changed, speed and direction resume at the values selected before the mode was changed

Shutdown

The NQALHA does not have a power switch. To turn off the magnets and motors, press and hold the front button and back button for several seconds. After shutdown, pressing the lever resumes normal operation

Drift and lock collars

Even though the drive rollers are manufactured to very tight tolerances, they aren't perfect. Neither are the o-rings, the clamp or the workpiece. As a result, the workpiece will drift slowly along its axis when rotating

For short duration use, like flaring a tube, drift will not be a problem

For longer duration work, drift can be managed using multiple strategies:

Mark the workpiece to allow you to see the drift. As it drifts, reverse rotation to reverse the drift

Push a maria on the workpiece, and locate it between the two right side drive rollers

Use a lock collar. Three custom lock collars, 10, 12 and 25.4mm are included. MPM&E sells other sizes of custom made plastic lock collars. They work well, but many other options are available. Lock collars are a common, off the shelf item at industrial suppliers (In the industrial world, they're called Shaft Collars). Some are even available at local hardware stores. The best source is www.ruland.com/shaft-collars.html

I have found that lock collars are almost never needed and I rarely use them

Springs

The NQALHA comes with two sets of springs, regular and strong. This allows for 3 combinations of spring force, depending on workpiece weight and user preference

Don't get discouraged

Like learning to play a new musical instrument, the NQALHA takes time to learn. Many experienced glassworkers struggle the first time they use it. Think of it like a guitar player learning to play the saxophone. If you find that your handwork technique doesn't translate to the NQALHA, experiment with alternate techniques. The NQALHA master technique has not been invented yet. All of the users are refining and inventing techniques as they gain experience. Many of the users have speculated that the NQALHA could change how glass is worked

Maintenance

Now that NQALHAs have been out in the field for many years, I have observed that very little maintenance is required and I have had almost no requests for repairs. They seem to just work reliably for years. It's highly recommended to have a set of ball-end, T-handle hex drivers. Periodically, check all screws to make sure they are tight. Pay particular attention to the screws at the pivot points. Also, check the flex conduit to make sure it is flexing smoothly with no kinks or breaks.

The silicone o-rings are standard, off the shelf parts. If they are damaged, they can be easily replaced

Warranty, Support and Parts

The NQALHA has a "lifetime" warranty, my lifetime, I'm 72. As long as I'm able, I'll do whatever I reasonably can to support users of the NQALHA. I love glass. I love art. I look forward to working closely with artists as they make amazing creations with my invention

Any part that's defective in design or fabrication will be replaced for free. As the design evolves, upgrades will be available, either free or at a low cost, depending on the details

If you damage or destroy anything, parts will be available at a reasonable cost

Since the NQALHA is large and heavy, and shipping is expensive and potentially damaging, most maintenance and repair should be done on-site. The NQALHA is a modular design. All complex parts can be replaced at the module level

The buyer needs to have a set of basic hand tools (hex drivers, wrenches, wire cutters .. etc), and the ability to work with screws, cable ties and connectors

This is not a product from a faceless corporation. It's a tool for artists, handmade by an artist. All comments, good or bad, are welcome and valuable. Please send feedback or requests for assistance to support@nqalha.com

Please save the shipping box and packing material in case the NQALHA needs to be returned to MPM&E

Training Videos

Training and demo videos are available on my YouTube channel.
https://www.youtube.com/c/MikePetersonManufacturingandEngineering

They are also linked from my website, nqalha.com

Version History

This is Version 11

V11 2/6/2026 Added New Standard UI config. Added jog function

V10 5/19/2023 Small changes to positioning and pedal twist mode behavior

V9 11/8/2022 Removed MpExperimental documentation since it was deactivated. Added more detail for Pedal Twist mode

V8 9/16/2021 Added MpExperimental documentation and changed shutdown sequence

V7 11/30/2019 Minor operation refinements

V6 9/10/2019 Fixed some small errors

V5 5/22/2019 Added new software functions

V4 1/31/2019 Added new software functions

V3 7/8/2018 Added warranty info

V2 7/3/2018 Added Positioning Mode and renamed Continuous Rotation Mode to Rotation Mode

V1 6/14/2018 Initial release