

GC TEK

NishikigoiUV

Installation, Startup, Operation & Maintenance Manual

READ BEFORE INSTALLATION This family manual covers common procedures for H80, H110, H165, H220, H400, H480, and HD160. The exact unit label and model-specific sheet control whenever values or instructions differ.

Owner / site

Model / serial

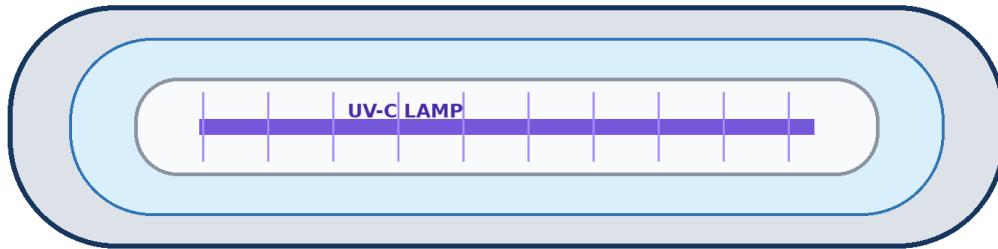
Installer / date

1. Purpose and model applicability

NishikigoiUV units clarify pond water by exposing flowing water to germicidal ultraviolet energy inside a closed stainless-steel vessel. Correct performance requires a matched unit, verified flow, clean quartz sleeve, effective lamp output, and mechanically prefiltered water.

How UV Clarification Works

Pond water passes around a quartz sleeve while UV-C energy acts on suspended microorganisms.



Quartz sleeve isolates the lamp from pond water

Clarification depends on correct flow • clean quartz • effective lamp output • adequate prefiltration

- Controls green-water algae by reducing suspended single-cell organisms when properly sized and operated.
- Supports clearer water; it does not remove settled solids, replace biological filtration, or correct water chemistry.
- Works best after effective mechanical filtration and with continuous circulation during the pond season.

UV-C SAFETY Never look at an energized UV lamp, expose skin or eyes to UV-C, or energize an open, empty, leaking, or partially assembled unit.

2. Model and installation record

Model	Lamp / watts	Connections	Verified flow range
H80	Confirm label	Confirm model sheet	Confirm dose/flow chart
H110	Confirm label	Confirm model sheet	Confirm dose/flow chart
H165	Confirm label	Confirm model sheet	Confirm dose/flow chart
H220	Confirm label	Confirm model sheet	Confirm dose/flow chart
H400	Confirm label	Confirm model sheet	Confirm dose/flow chart
H480	Confirm label	Confirm model sheet	Confirm dose/flow chart
HD160	Confirm label	Confirm model sheet	Confirm dose/flow chart

Record the controlling specifications

Unit model / serial number: _____

Lamp type and rated watts: _____

Voltage / frequency / current: _____

Maximum working pressure: _____

Connection size and type: _____

Target flow for this pond and dose objective: _____

HD160 NOTE GC Tek identifies HD160 as a 160-watt amalgam UV in a marine-grade 316 stainless-steel vessel. Confirm the nameplate and current model sheet before publication or installation.

PUBLICATION REVIEW GC Tek should replace the confirmation fields above with the final model chart, including dimensions, lamp count/type, electrical ratings, connection sizes, flow/dose ratings, pressure limits, and replacement part numbers.

3. Safety and site requirements

Electrical and UV exposure

- Installation and service must be performed by qualified personnel familiar with water systems and electrical safety.
- Provide correct voltage, grounding, disconnect, overcurrent protection, and GFCI/RCD protection as required by the unit label and local code.
- Keep ballast/control enclosures, plugs, junctions, and connectors dry and protected from condensation, flooding, and spray.
- Disconnect and lock out power before opening a lamp housing, unplugging a lamp, removing a quartz sleeve, draining the vessel, or servicing plumbing.
- Do not bypass interlocks, defeat covers, modify wiring, or test an exposed lamp.

Hydraulic and mechanical safety

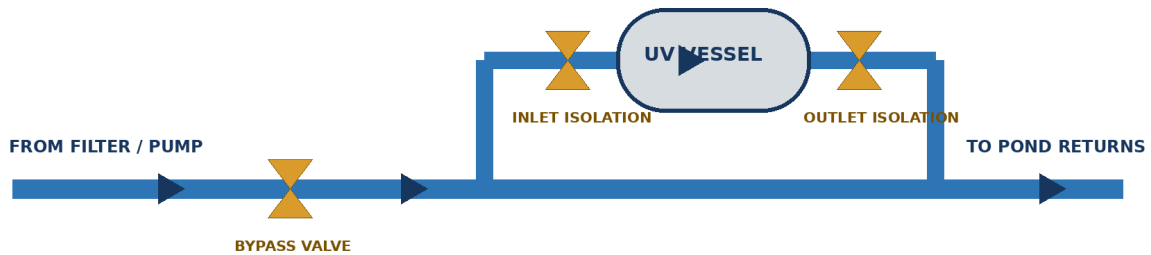
- Mount on a rigid, level support and independently support all connected pipe.
- Never exceed the vessel's labeled pressure or temperature limits.
- Install isolation and pressure-relief/drain provisions appropriate to the system.
- Relieve all pressure and allow the lamp to cool before service. Hot lamps and quartz can cause burns or fracture.
- Do not lift or support the unit by the electrical cable, lamp connector, ballast, unions, or quartz components.

MERCURY / GLASS CAUTION Many UV lamps contain mercury and fragile quartz. Handle as directed, prevent breakage, and dispose of spent or broken lamps under applicable regulations.

4. Recommended system placement

Recommended Bypass Installation

Install after mechanical and biological filtration where practical. Use the bypass to isolate and set UV flow.



Normal UV operation: UV isolation valves OPEN; bypass valve adjusted to send the verified flow through the UV.

UV service: Lamp OFF, pump OFF, pressure relieved; UV valves CLOSED; bypass OPEN for circulation if desired.

Preferred sequence

- Pond → mechanical filtration → biological filtration as designed → pump → NishikigoiUV bypass loop → pond returns.
- Install where the UV receives relatively clean water to reduce quartz fouling.
- Keep service access at the lamp end, quartz-sleeve end, unions, drain, and electrical connections.
- Position the vessel so trapped air can be purged and the chamber stays completely flooded whenever the lamp is energized.
- Protect from freezing, standing water, excessive heat, and direct spray.

DO NOT DEAD-HEAD Valve placement must never allow a running pump to be trapped between closed valves. Label the normal-operating and service positions.

5. Mounting and plumbing

1. **Confirm orientation:** Use only an orientation approved for the exact model. Do not assume every vessel may be mounted horizontally or vertically.
2. **Prepare support:** Use manufacturer-approved brackets or a rigid cradle that does not distort the vessel.
3. **Plan service clearance:** Allow enough straight clearance to remove the longest lamp and quartz sleeve without bending them.
4. **Install unions:** Place accessible unions at both water connections so the vessel can be removed without cutting pipe.
5. **Build the bypass:** Use full-port isolation valves on the UV branch and a controllable bypass valve on the main line.
6. **Support plumbing:** Prevent pipe weight, expansion, and misalignment from loading the UV ports.
7. **Provide drain and purge:** Allow safe depressurization, draining, and air removal where required.
8. **Leak-test cold:** With electrical power disconnected, fill and pressure-test the plumbing within the labeled limit.

FLOW DIRECTION If the unit has a required inlet and outlet, follow the vessel labels. Arrange flow to keep the chamber full and carry air out of the unit.

6. Electrical installation

- Compare the supply with the unit nameplate before connection. Never assume voltage from the plug shape or model name.
- Mount the ballast/controller in its approved orientation, within its cable limits, and where heat can dissipate.
- Use drip loops and weatherproof entries. Keep connectors off the floor and away from plumbing joints.
- Bond and ground metallic components when required by the product design and electrical code.
- Use a disconnect that can be locked out for service. Label the UV circuit and bypass valves.
- Do not share or modify lamp leads, splice proprietary connectors, or use an unapproved extension cord.

Flow interlock

Where an approved flow switch, pump interlock, or controller input is provided, wire it according to the exact model diagram so the lamp cannot remain energized without adequate water flow. An interlock supplements - but does not replace - proper startup and shutdown procedures.

NO DRY OPERATION An energized lamp in an empty or stagnant vessel can overheat the lamp, quartz sleeve, seals, and vessel, creating equipment damage and safety hazards.

7. Pre-start inspection

- ☐ Model, voltage, lamp type, connection size, pressure limit, and target flow have been verified.
- ☐ Vessel orientation and mounting are approved for the exact model.
- ☐ Pipe is independently supported; unions and valves are accessible.
- ☐ UV branch and bypass are labeled; valve positions cannot dead-head the pump.
- ☐ Quartz sleeve, seals, lamp, end caps, and connectors are correctly installed.
- ☐ Vessel has been filled and leak-tested with electrical power disconnected.
- ☐ Air has been purged; the vessel remains completely flooded at operating flow.
- ☐ Pump and filter are operating normally; verified flow is within the selected UV dose range.
- ☐ Ballast/controller is dry, ventilated, grounded, protected, and matches the supply.
- ☐ All covers and guards are fitted; no person can see or contact an energized lamp.

STOP IF The quartz is cracked, seals leak, air remains trapped, flow is uncertain, the vessel is empty, wiring differs from the diagram, or any safety cover is missing.

8. First startup procedure

1. **Keep UV power OFF:** Start with the lamp and ballast/controller de-energized.
2. **Set the water path:** Open the UV isolation valves and set the bypass so water can enter without dead-heading the pump.
3. **Start circulation:** Run the pump at low flow and slowly fill the UV vessel.
4. **Purge air:** Use the approved venting method until the chamber is completely flooded and bubble-free.
5. **Inspect for leaks:** Check unions, end seals, drains, ports, and the quartz-seal area under operating pressure.
6. **Set verified flow:** Adjust the discharge/bypass arrangement to the model-specific flow for the desired UV dose.
7. **Energize the UV:** Only after full, stable flow and leak-free operation, turn on the UV circuit.
8. **Verify indirectly:** Use only the controller indicator, approved sight feature, current monitor, or other specified status method. Never view the lamp directly.
9. **Observe:** Remain with the system for at least 15 minutes. Recheck temperature, noise, leaks, flow, and controller status after one hour and the next day.

SAFE SHUTDOWN ORDER Lamp OFF first. Allow cooling water to flow if specified. Then stop the pump, isolate the vessel, relieve pressure, and drain only when service requires it.

9. Flow, dose, and commissioning

UV performance is controlled by UV dose, which depends on effective lamp output, exposure time, water clarity/transmittance, vessel geometry, and actual flow. A higher flow generally reduces exposure time. Select flow from the GC Tek model chart for the intended objective; do not rely only on pump nameplate flow.

Measurement / check	Acceptance target	Recorded result
Pond volume / application	Verified design value	
UV model / lamp	Matches selected duty	
Actual UV branch flow	Within GC Tek dose chart	
Vessel pressure	Below labeled maximum	
Chamber condition	Full; air purged	
Quartz condition	Clean and undamaged	
Controller / lamp indication	Normal approved status	
Leaks / heat / noise	None abnormal	
Bypass valve position	Marked and secured	

Handoff

Installer / company: _____

Installer signature: _____

Owner acceptance: _____

Startup date: _____

10. Routine operation and maintenance

Frequent checks

- Confirm circulation and approved lamp/controller status.
- Inspect for leaks, condensation, unusual heat, noise, or electrical alarms.
- Verify the pond level and pump operation remain stable.

Monthly or as conditions require

- Inspect the quartz sleeve indirectly during safe, de-energized service. Mineral film and biofilm reduce UV transmission.
- Check unions, brackets, cable strain reliefs, seals, and bypass valve markings.
- Confirm actual flow has not changed because of dirty filters, altered valves, or pump service.

Lamp service

- Replace lamps according to the model-specific rated service interval or verified output-monitor recommendation, even if the lamp still appears lit.
- Use only the exact approved replacement lamp and seals. Record installation date and operating hours.
- Never touch lamp or quartz glass with bare fingers; use clean gloves and remove contamination using the approved method.

NO ABRASIVES Do not scrape quartz, use steel wool, or apply unapproved acids or solvents. Damage and chemical residue can weaken the sleeve, harm seals, and reduce performance.

11. Lamp and quartz-sleeve service

1. **Shut down safely:** Turn the lamp off, disconnect/lock out power, keep cooling flow if required, then stop the pump.
2. **Isolate:** Open the bypass for circulation if desired, close both UV isolation valves, relieve pressure, and drain the vessel.
3. **Allow cooling:** Wait until the lamp, quartz, and vessel are cool enough to handle safely.
4. **Remove the lamp:** Follow the exact end-cap and connector procedure. Support the lamp along its length; do not flex or strike it.
5. **Remove the quartz sleeve if needed:** Release only the specified seal hardware. Withdraw the sleeve straight and support it fully.
6. **Inspect and clean:** Replace cracked, chipped, clouded, or deeply scratched quartz. Clean only by the approved method.
7. **Renew seals:** Replace O-rings/gaskets at the specified interval or whenever damaged, flattened, swollen, or chemically attacked. Use only approved lubricant if specified.
8. **Reassemble:** Seat the sleeve and seals evenly; tighten in the stated sequence and torque. Do not overtighten glass components.
9. **Cold leak-test:** Reopen valves slowly, fill, purge air, and inspect with UV power disconnected.
10. **Restart:** Only after the chamber is full and leak-free, restore power and verify operation indirectly.

BROKEN LAMP Keep people away, ventilate the area as appropriate, do not vacuum mercury-containing debris, and follow the lamp manufacturer's cleanup and local disposal requirements.

12. Winterization and extended shutdown

- Do not allow water to freeze inside the vessel, quartz sleeve, unions, drains, or connected pipe. Freeze expansion can rupture components.
- For shutdown, turn the lamp off before stopping flow. Disconnect power and follow the model procedure for isolation and draining.
- Drain completely when freeze exposure is possible. Protect open ports from dirt, insects, and moisture without sealing trapped water inside.
- Store removed lamps and quartz sleeves clean, dry, protected from impact, and in their original packaging when possible.
- At recommissioning, inspect seals and quartz, reassemble, cold leak-test, purge air, establish flow, and energize last.

DO NOT USE AUTOMOTIVE ANTIFREEZE Use only a winterization method explicitly approved for pond equipment and the exact UV model.

Extended outage

If water circulation continues while UV is unavailable, open the bypass and isolate the UV vessel. Mark the unit out of service and monitor pond clarity until repaired.

13. Troubleshooting

Symptom	Likely causes	Check first
No status / no lamp	No power, GFCI trip, controller fault, loose connector, failed lamp	Disconnect power; verify supply and protections; inspect only by approved procedure.
Green water persists	Wrong flow/dose, old lamp, dirty quartz, undersized unit, poor circulation	Verify actual branch flow, lamp hours, quartz condition, pond volume, and system turnover.
Frequent lamp failure	Wrong voltage/lamp, overheating, cycling, moisture, handling contamination	Stop operation; verify nameplate, flow, ballast, installation, connectors, and lamp part.
Water leak	Seal damage, misassembly, cracked quartz, loose union, excessive pressure	Lamp OFF; pump OFF; isolate and relieve pressure before inspection.
Air in vessel	Poor orientation, suction air leak, low pond level, inadequate purge	Lamp OFF; restore flooded, bubble-free flow before re-energizing.
High temperature	Low/no flow, fouling, blocked bypass, enclosed ballast	Lamp OFF; restore verified flow and ventilation; inspect for damage.
GFCI/RCD trips	Moisture, damaged cable, ground fault, ballast/lamp fault	Leave de-energized and have qualified personnel test the circuit and unit.
Cloudy water, not green	Suspended solids, bacterial bloom, chemistry or filtration issue	Test water and inspect mechanical/biological filtration; UV is not a solids filter.

SERVICE INFORMATION Record model, serial, lamp part/age, controller indication, voltage, actual flow, vessel pressure, quartz condition, pond volume, water appearance, and clear installation photos before contacting support.

14. Service and lamp-replacement record

Date	Lamp / part	Quartz / seals	Hours / flow	Technician / notes

Support record

Dealer / installer: _____

Phone / email: _____

GC Tek technical support: _____

Warranty / registration reference: _____

FINAL TECHNICAL REVIEW Before release, GC Tek should verify every model-specific instruction and insert the approved specification, dose/flow, orientation, wiring, parts, torque, cleaning, disposal, warranty, and contact information.