

GC TEK

Wakimizu Bakki Shower

Installation, Startup & Operating Manual

CORE PRINCIPLE Support the shower securely, send it mechanically prefiltered water, spread flow evenly across loosely packed media, and provide a bottom return that can never back up.

Owner / site

Model / serial

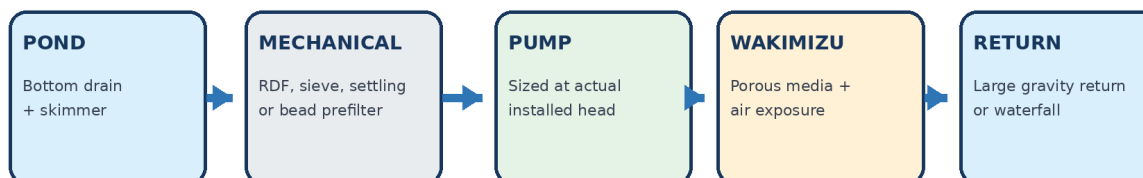
Installer / date

1. Purpose and filtration role

The GC Tek Wakimizu Bakki Shower is a high-performance trickle-shower biological filter for koi ponds and other heavily stocked aquatic systems. Pumped water is distributed over stacked trays of porous media. As it breaks into thin films and droplets, it repeatedly contacts fresh air before returning by gravity.

Recommended Wakimizu System Layout

Remove solids first. Pump clean water upward. Let the shower return by gravity without restriction.



Critical: bottom-tray discharge capacity must exceed incoming pump flow under every operating condition.

What it provides

- High oxygen transfer and vigorous gas exchange.
- A large, oxygen-rich surface for nitrifying bacteria.
- Ammonia and nitrite processing after the media has cycled.
- Degassing of carbon dioxide and other dissolved gases.
- Strong circulation and reduction of dissolved organic waste when paired with effective solids removal.

IMPORTANT The Wakimizu is primarily a biological and oxygenation filter. It should not be used as the first mechanical filter in the system.

2. Equipment and site preparation

Required equipment

- GC Tek Wakimizu trays, fittings and correct support frame or engineered stand.
- Bacteria House media or another approved, high-quality porous shower medium.
- Pump sized for the selected model at the actual installed head.
- Mechanical prefilter: sieve, RDF, settling chamber, or suitable bead filtration used as prefiltration.
- Correctly sized pipe, unions, valves, flexible couplings and supports.
- Top distribution pipe or removable spray bar.
- Ventilation if enclosed, and a weather-protected GFCI/RCD electrical supply.
- Pond-safe sealant only where the specific plumbing arrangement requires it.

Choose a safe location

- Level, structurally sound, accessible, and protected from impact.
- Close enough to limit unnecessary pipe loss.
- Above pond water level when using gravity return.
- Positioned so splashing, leakage, or overflow cannot damage structures.
- Outdoors or in a highly ventilated filter area.

WEIGHT WARNING Media, trays and retained water create a very heavy operating load. Do not install on soft soil, loose paving, thin decking, an unsupported shelf, or a pond edge not engineered for the full wet weight.

3. Build the support and stack the trays

Support requirements

- Use a concrete pad, masonry stand, corrosion-resistant steel frame, or properly engineered timber structure.
- Design for the full wet weight with an appropriate safety margin.
- Keep the shower level front-to-back and side-to-side.
- Leave the bottom discharge completely unobstructed.
- Provide enough height for the planned gravity pipe or waterfall return.
- Prevent settlement, vibration, rocking, twisting, and accidental movement.

Tray assembly

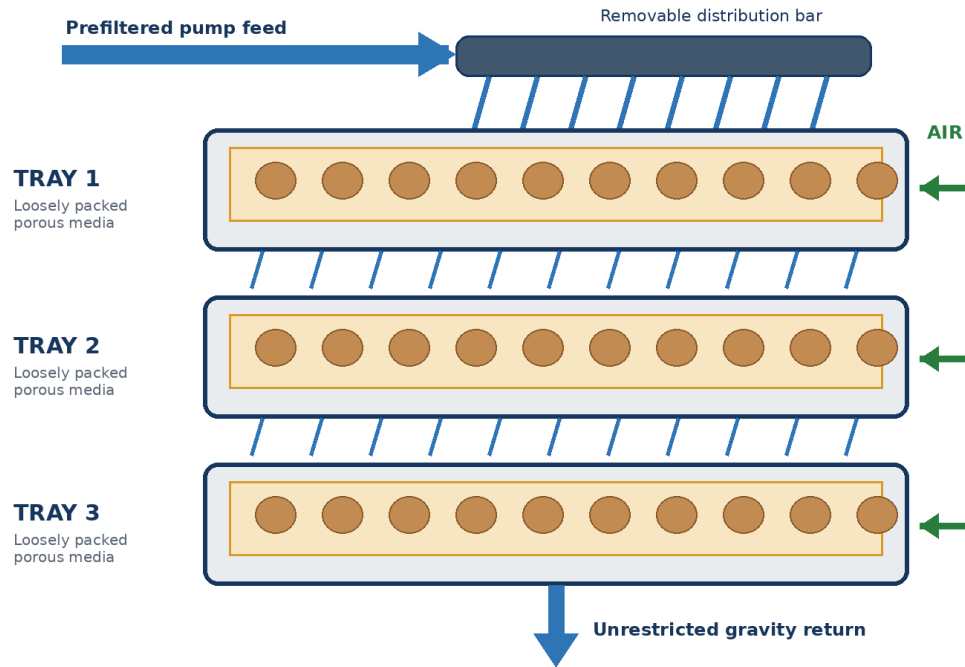
1. **Place the bottom tray:** Align its discharge with the return route and verify clear access.
2. **Seat each upper tray:** Confirm every lip, edge and support is fully engaged.
3. **Check the stack:** There must be no rocking, twist, uneven loading or forced alignment.
4. **Position the top tray:** Leave room for the removable distribution bar and service access.
5. **Recheck the return:** The bottom outlet must remain open and capable of passing the full pump flow.

DO NOT FORCE TRAYS Misalignment can create leaks, uneven flow, tray stress, overflow, or collapse risk. Correct the support or alignment before adding media.

4. Load media for water and air movement

How the Bakki Shower Works

Even distribution + open media + free air + unrestricted discharge



1. **Confirm stability:** Load media only after the complete empty stack is stable and level.
2. **Distribute evenly:** Spread media across each tray without creating heavy spots.
3. **Keep it open:** Pack loosely enough for water and air to move freely.
4. **Protect flow paths:** Do not block tray outlets, drip slots, edges or lower-tray discharge.
5. **Leave distribution space:** Keep the top surface open enough for water to reach the full tray width.

AVOID CHANNELING Tightly compressed or uneven media reduces oxygen transfer and allows water to bypass large portions of the biological surface.

5. Install the distribution bar

- Feed the top through a distribution pipe, manifold, or spray bar that wets the full tray area.
- Aim all openings into the tray; prevent water from spraying beyond its edges.
- Make the bar removable so holes and biofilm can be cleaned.
- Avoid a few strong streams that bypass most of the media.
- Use evenly spaced holes sized for the intended flow and available pressure. Start conservatively; holes can be enlarged later, but oversize holes cannot be reversed easily.

Connect the pump and plumbing

- Use adequately sized pipe to reduce head loss and preserve pump output.
- Install a service union near the pump and useful isolation valves.
- Use a check valve only when the layout requires one.
- Support heavy plumbing independently; use flexible couplings where vibration or movement must be isolated.
- Never restrict pump suction. Adjust flow on the discharge side or with a controllable pump.
- Pressure-test and inspect all joints before continuous operation.

USE THE PUMP CURVE Select flow from the pump's performance curve at the installed lift and friction loss - not from the advertised maximum at zero head.

6. Set flow and configure the return

Correct operating flow

- Wet the full width of the top tray.
- Maintain energetic cascading through every media layer.
- Avoid flow that spills over tray edges or overwhelms the bottom return.
- Account for lift, pipe length, fittings, valves and dirty-filter resistance.
- Use the model-specific recommended flow as the final limit.

Return choices

Return method	Description	Key requirement
Gravity waterfall	Lower tray falls directly into pond	Shower above water level; splash contained
Gravity pipe return	Bottom tray feeds large pipe to pond	Capacity exceeds pump flow; continuous fall
Filter-bay return	Discharge enters a return chamber	Chamber and outlet pass full flow
Waterfall box	Discharge feeds basin or weir	Overflow capacity exceeds shower flow

NEVER RESTRICT THE BOTTOM OUTLET A small, uphill, blocked, submerged, frozen, or poorly vented return can back water through the trays and cause overflow. Return capacity must exceed pump flow.

7. Pre-start checklist

- ☐ Support is rigid, level, non-settling, and rated for full wet weight.
- ☐ Every tray is fully seated with no rocking or twist.
- ☐ Media is evenly distributed, loosely packed, and clear of outlets.
- ☐ Mechanical prefilter is operating and clean.
- ☐ Pump, pipe size and expected flow match the Wakimizu model and installed head.
- ☐ Spray bar is secure, removable, aimed inward, and free of debris.
- ☐ Pump suction is open and flooded; discharge valves are in start position.
- ☐ Bottom return and overflow path can pass full flow without backing up.
- ☐ Electrical equipment is grounded, weather protected and GFCI/RCD protected.
- ☐ Work area is clear; no tools, children, pets, or unsecured parts are near the shower.

STOP IF The stand moves, any tray is misaligned, the return is uncertain, the pump can outrun the discharge, plumbing leaks, or electrical protection is incomplete.

8. Initial startup procedure

1. **Confirm pond level:** Bring the pond to its normal level and verify that the gravity return route is clear.
2. **Inspect the complete assembly:** Check support, tray seating, media, pipe supports and all joints.
3. **Open valves:** Place every suction, discharge and isolation valve in the correct startup position.
4. **Start at low flow:** Energize the pump at the lowest practical speed or discharge setting.
5. **Observe the top tray:** Confirm distribution reaches the full tray width without spraying outside.
6. **Watch every tray:** Water must cascade freely through each level without pooling or overflowing.
7. **Verify the return:** Confirm the bottom tray discharges faster than water enters and cannot back up.
8. **Inspect the system:** Look for leakage, vibration, unusual pump noise, cavitation, air entry, or movement.
9. **Adjust gradually:** After several minutes, fine-tune pump speed, discharge valve or distribution bar.
10. **Recheck:** Inspect after one hour and again the next day. New media may release harmless fine dust at first.

FIRST-DAY NOTE Mechanical filtration may need more frequent cleaning while media dust and remaining construction debris are removed.

9. Commissioning record

Measurement / check	Acceptance target	Recorded result
Stand and tray level	Level both directions; no movement	
Installed pump / speed	Model and setting recorded	
Vertical lift	Pump water level to distribution bar	
Estimated actual flow	Within Wakimizu model rating	
Top distribution	Full width; no external spray	
Tray cascade	Even; no pooling/overflow	
Bottom return	Free discharge; ample reserve capacity	
Leaks / vibration / noise	None abnormal	
Pond water level after 1 h	Stable	

Handoff

Installer / company: _____

Installer signature: _____

Owner acceptance: _____

Startup date: _____

10. Biological cycling and water quality

New media does not provide full biological filtration immediately. Beneficial nitrifying bacteria must colonize the porous surfaces. Cycling speed depends on temperature, fish load, feeding, pH/alkalinity, oxygen, and water chemistry.

- Monitor ammonia and nitrite frequently during startup.
- Avoid rapid increases in fish load or feeding.
- Maintain continuous water flow and oxygenation.
- Keep established media wet and flowing whenever possible.
- Use dechlorinated water for top-ups and water changes.
- Do not aggressively wash or disinfect biological media.

RESPOND TO TOXIC READINGS If ammonia or nitrite rises, reduce or stop feeding as appropriate, verify flow and aeration, perform suitable dechlorinated water changes, and follow qualified koi-health guidance.

Cycling log

Date	Ammonia	Nitrite	Temp.	Action / observation

11. Routine and seasonal maintenance

Daily or frequent

- Confirm even top-tray distribution and free bottom return.
- Listen for pump cavitation, air ingestion, or changed operating noise.
- Inspect for overflow, excessive splashing, leakage, or unexpected pond-level loss.

Weekly

- Clean the upstream RDF, sieve, settling unit, or other prefilter as required.
- Inspect spray-bar holes for debris or biofilm.
- Remove leaves, string algae, and debris from tray edges and outlet areas.
- Confirm media has not shifted into a flow path.

Seasonal

- Inspect pipe, unions, valves, stand, fasteners and supports for corrosion, settlement, cracking, or movement.
- Clean the distribution manifold if flow becomes uneven.
- Review actual pump output and clean the impeller when performance declines.

PROTECT THE BIOFILM Do not routinely remove and wash media. If genuine blockage occurs, rinse gently with pond water. Chlorinated tap water and aggressive cleaning can damage the bacterial colony.

12. Winter and cold-weather operation

An exposed shower transfers heat as well as oxygen. Cold-climate operation requires a deliberate decision based on pond temperature, koi management and freeze risk.

- Keep water moving continuously when operating.
- Ensure every outlet and return remains open and cannot freeze.
- Prevent ice from obstructing tray edges, drains, or waterfall return.
- Use a ventilated cover or windbreak if heat loss must be reduced; never create an airtight enclosure.
- Plan an overflow route that remains safe if ice partially restricts normal discharge.
- If shutting down for an extended freeze, drain and protect exposed plumbing as appropriate.

FREEZE HAZARD Ice restriction can cause overflow and rapid pond-water loss. Never leave a cold-weather installation unattended until its return and overflow behavior have been proven.

Shutdown caution

Do not leave established biological media warm, wet and stagnant for long periods. If operation is interrupted, follow GC Tek guidance for preserving or safely restarting the biofilter.

13. Troubleshooting

Problem	Likely cause	Corrective action
Trays overflow	Restricted return, excessive flow, poor tray alignment	Stop or reduce flow; clear return; level and reseal trays.
Uneven top flow	Blocked holes, poor manifold position, low pressure	Clean/reposition bar; verify pump and plumbing.
Weak shower flow	Dirty prefilter, pump blockage, small pipe, excessive head	Clean system and impeller; reduce loss; review pump sizing.
Dry media areas	Channeling, uneven loading, poor distribution	Redistribute media and adjust manifold.
Cloudy water	Mechanical stage inadequate or overloaded	Improve solids removal before the shower.
High ammonia/nitrite	New/damaged biofilm, excess feed/load, low flow	Reduce feed/load; restore flow/oxygen; monitor and manage water.
Noise or splashing	Excessive fall, exposed outlet, misaligned bar	Adjust return, add splash control, reposition distribution.
Pump surges/draws air	Low pond level, blocked intake, suction leak	Restore level; clean intake; inspect suction fittings.

SHUT DOWN WHEN UNSAFE Stop the pump for structural movement, uncontrolled overflow, electrical hazard, rapid pond-level loss, dry running, or unexplained severe noise. Correct the cause before restart.

14. Safety and owner handoff

- Use a dedicated, weather-protected electrical installation with GFCI/RCD protection and proper grounding.
- Keep connections above ground and protected from spray.
- Never lean on trays, climb the frame, or permit children or pets near an unsecured installation.
- Prevent discharge from undermining soil, decking, stonework, pond liner, or the equipment pad.
- Support all plumbing independently and keep the maintenance path dry and unobstructed.
- Follow model-specific flow, weight, connection, warranty and service instructions.

PUBLICATION REVIEW Before release, GC Tek should add the exact Wakimizu model table: tray dimensions, media capacity, wet weight, recommended/minimum/maximum flow, inlet and outlet sizes, permitted configurations, and support contact.

Support record

Dealer / installer: _____

Phone / email: _____

GC Tek technical support: _____

Warranty / registration reference: _____