

Pontoon Assembly and Connector System (Jetfloat/Duwe Style)

Pontoon Modules and Connecting Lugs

Modular **pontoon floats** (single modules ~50×50×40 cm, and larger double modules ~100×50×40 cm) are designed with integrated **connecting lugs** at their corners. Each standard float has four lugs (often marked with 1–4 raised dots) on its top surface – one at each corner ¹. These lugs overlap with lugs of adjacent floats when building a platform. By aligning all floats with the manufacturer's logo or vent plug facing the same direction (e.g. **flut plug to the right**), the lug numbering (dot markers) automatically lines up in the correct counter-clockwise sequence ¹ ². When properly oriented, **four lugs will meet at each interior connection point**, forming a stack of aligned holes through which a connector can pass. Along edges or when mixing different module sizes, fewer than four lugs might meet (see **Spacer Discs** below for how those gaps are handled). The assembly principle is similar to “Lego blocks on water” – floats slide together so that their corner lug holes line up, ready for pinning ¹.

Standard Connecting Pin (Short)



Standard Jetfloat connecting pin (short version) used to lock adjacent pontoon modules. The large circular head sits on top of the lug stack, and internal locking tabs engage with a 45° twist.

The **standard connecting pin** is the primary fastener for joining pontoon modules on a single level. It's a stout HDPE pin (~0.6 kg) with a broad, slightly conical head and a shaft that fits through the aligned lug holes of up to four floats ³ ⁴. To install, the pin is inserted downward through the overlapping lugs at a connection point. A **45° rotation** (using a special assembly key that fits into the pin's top holes) locks the pin in place, anchoring the floats together ³. The pin's design typically has locking tabs or flanges that, when rotated, grip under the bottom-most lug – **securing all layers by form-fit**. Once

turned to the locked position, the pin **cannot be removed without the key**, preventing accidental disassembly ³ ⁸ ⁹. The head of the pin should sit flush against the top of the lug stack (the conical underside of the head ensures a tight fit on the float surface ⁵). If the assembly surface is uneven or debris is between lugs, the pin may not seat fully, making locking difficult ⁶ – it's critical that floats are on a flat surface and lugs properly aligned. In practice, builders often pour a bit of water on the pin/lug interface before twisting to reduce friction and ease locking ⁷. Each standard pin has two small holes in its head; when these holes are aligned diagonally (45° to the float edges), it indicates the pin is in the locked position ⁸ ⁹. (For visual verification, Jetfloat recommends orienting the pin so the two holes end up horizontal, which confirms a full 45° turn ¹⁰.) After locking, a plastic **cap or plug** (Lamellenstopfen) is usually pressed into the open top of the pin's shaft to seal it and allow any trapped water to drain out slowly ¹¹. The standard pins are **sufficient for most one-layer assemblies**, placed in a grid throughout the platform (typically in every lug intersection). They are **UV-stable, corrosion-proof** HDPE and very rugged ¹², ensuring a durable yet flexible connection that lets the entire floating dock absorb waves and loads without rigid joints.

Long Connecting Pin (Extended)

The **long connecting pin** is an extended version of the standard pin (weighing ~1.0–1.2 kg, roughly double the length) designed for **multi-layer or thick connections** ¹³ ¹⁴. It is used when stacking pontoon modules vertically (e.g. a two-story dock or adding secondary flotation layers) or when joining floats of different heights. In a multi-layer build, assembly follows a specific pattern: first, each layer of floats is connected internally using the short pins (placed in a staggered checkerboard pattern, with every second lug intersection pinned in one layer) ¹⁵. Then the **long pins** are inserted through the remaining **open lug positions**, spanning **through both the top and bottom layer** of floats, and locked to clamp the layers together ¹⁶ ¹⁷. This ensures a form-fitted, unified structure across layers. The long pin has the same diameter and locking mechanism (45° twist to lock) as the standard pin, but its shaft length can accommodate the height of two stacked modules (or one tall module). For example, Jetfloat's long pin secures multi-layer applications by reaching through the upper float's lugs into the lower float ¹⁴. In practice, when creating a double-height platform or adding a secondary buoyant layer, you would **prepare the base layer** with some pins omitted (left as pass-through channels), place the second layer on top (aligned lugs), then drive the long pins through those channels to lock everything together ¹⁸ ¹⁹. Long pins may also be used to integrate special taller components or bridge differing module heights (Jetfloat offers, for instance, 40 cm to 25 cm height connectors using long pins). Aside from length, **the main difference is usage** – standard pins for one-layer horizontal connections, long pins for vertical stacking connections. Both types are made from high-molecular HDPE and have similar properties (UV, saltwater resistance, etc.), and both use the same assembly key system.

Edge Connectors (Randverbinder with Nut)



Example of a plastic edge connector assembly (bolt with coarse threads and a large nut). This “Randverbinder” secures two or three lugs at the perimeter by clamping them together with a threaded nut, stabilizing the dock’s outer edge ²⁰.

While standard pins lock interior lug groups, **edge connectors** (German: *Randverbinder*) are used to reinforce and finish the **outer edges** of a pontoon platform. At the perimeter of the assembly, some lug holes are not paired with a neighboring float’s lug (e.g. the outside corners or edges where only 2–3 lugs come together instead of 4). In these cases a normal pin can sometimes be inserted, but it won’t be fully supported on all sides. The edge connector is a specialized **bolt-and-nut system** that secures these edge lugs tightly. It consists of a heavy-duty plastic threaded **bolt** that is inserted through the overlapping edge lugs, and a large **plastic nut** (plus washers/spacers as needed) that screws down on the bolt’s shaft to clamp the lugs together. Unlike the quarter-turn pins, **edge fasteners rely on threading tension** – you tighten the nut to lock the connection (Jetfloat provides a custom wrench tool for this plastic nut) ²⁰. Once tightened, the edge lugs are held firmly, preventing any flapping or separation at the boundaries of the platform. These connectors “**firm up the outer edges**” of the system ²⁰, adding rigidity and preventing excessive movement where floats meet open space. They are also used for **attaching accessories** or special structures at the edge: for example, mounting cleats, guard rails, mooring points, or ladders often involves replacing a standard pin with an edge connector that can accept additional hardware ²⁰. Edge connectors come in different lengths and configurations: a **short version** (with one nut) for a single-layer edge (clamping ~40 cm height), and **longer versions** with multiple nuts for multi-layer edges or connecting different height modules ²¹ ²². For instance, Jetfloat offers a 290 mm **long edge connector** (with 4 nut positions) to join a 40 cm-high float to a 25 cm-high float ²¹, and an even longer 560 mm version (also with 4 nuts) for securing **double-stack layers** (two full-sized layers) at the edges ²². In usage, you insert the bolt through the edge lug holes, thread on the nut from the opposite side of the assembly, and tighten it until the lugs are compressed against the bolt’s head and nut flange. **Spacer discs** (below) are often inserted along with the edge connector if some lug positions are empty, ensuring the nut tightens against something solid ²³. It’s advised to **periodically check and re-tighten** all edge connector nuts (e.g. monthly inspections) because vibration and wave action can loosen them over time ²⁴. In very rough conditions (**heavy wave action**), the manufacturer even recommends adding a **safety screw** through the side of the nut and bolt (drilling through the plastic) to lock them together and prevent the nut backing off ²⁵. Overall,

edge connectors are crucial for a finished, stable dock: they ensure the perimeter is secure and also serve as anchor points for many attachments not possible with the twist-lock pins.

Spacer Discs (Einzel- & Doppeldistanzscheiben)

Because not every connection point will have a perfect set of four lugs, **spacer discs** are used to fill any gaps and maintain even pressure. These are flat, circular **HDPE washers** of defined thickness (approximately the thickness of one lug or two lugs) that drop into the lug stack before locking the connector. Jetfloat provides two types: the **single spacer** (*Einzeldistanzscheibe*, ~16 mm thick) and the **double spacer** (*Doppeldistanzscheibe*, ~32 mm thick) ²⁶ ²⁷. The rule of thumb is: **insert spacers to replace any “missing” lug in a connection**. For example: - If a particular pin position has only **3 lugs meeting** (instead of 4), you add **one single spacer disc** to make up for the fourth missing lug ²⁸. This often occurs in certain layout patterns or when using a mix of single and double-size pontoons (some intersections might naturally only have 3 overlapping lugs).

- If only **2 lugs meet** at a connection (a common case at the **outer edge** where one float's lug #1 overlaps with a neighboring float's lug #4, but the other two sides are open), then a **double spacer disc** is inserted to compensate for the two absent lugs ²⁹ ²³. The 32 mm double-disc fills the gap perfectly so that a connector (edge bolt or pin) can still be tightened without deforming the lugs.

In practice, during assembly you would place the appropriate spacer disk on top of the lug stack (or between lugs) at those partial connections before inserting the pin or edge connector. The spacer then gets sandwiched in and ensures **equal distribution of clamping force** ³⁰. Without spacers, tightening a pin or bolt where lugs are missing could lead to a loose connection or damage (the connector would tighten against nothing on one side). The assembly manual explicitly instructs to fill these gaps: *“The gap must be filled with a double spacer disc”* where only lugs #1 and #4 meet ³¹ ³², and *“in each connection point with only 3 lugs, insert a single spacer”* ²⁸. By using the **16 mm and 32 mm spacers** as needed, you maintain a solid, wobble-free dock surface even at the edges and transitions. The spacers also act as **washers**, preventing the plastic lugs from rubbing directly under the connector head or nut, thus increasing the longevity of the connection by spreading out the load ³⁰. (In the provided 3D models, likely `Einzel-Scheibe.obj` represents the single spacer and `Scheibe.obj` the double spacer.)

Flutverschraubung (Drain/Vent Plug)

Each pontoon module comes equipped with one or more **drain/vent plugs** (German: *Flutverschraubungen*) on its side wall. These are **screw-in caps** – in the Duwe/Jetfloat design they are gray plastic plugs with an O-ring – that serve two important purposes: **sealing the pontoon's air chamber watertight**, and allowing it to be **opened for air pressure equalization or filling**. During transport and storage, Jetfloat floats are shipped with the flut plugs slightly open to prevent pressure build-up (from temperature changes) inside the airtight pontoon ³³. **Before assembly**, it is critical to **tighten all these plugs firmly (airtight) using the special Flut-Schlüssel (plug wrench)** ³⁴. This ensures each float is fully sealed and buoyant when placed in water. The assembly guidelines note to double-check that *“the flutverschraubungen on the sides of single and double elements are tightly closed”* prior to connecting the modules ³⁴ – failing to do so could cause a float to take on water.

Uniform orientation of the floats (as mentioned, usually with all plugs facing the same direction) not only standardizes lug alignment but also makes the **plugs accessible** from the perimeter of the finished platform for maintenance ². Once the platform is in use, these plugs normally remain closed and watertight. However, they can be opened when needed to **drain water or relieve air pressure**. For instance, if over time a pontoon has accumulated some water inside, one would unscrew the plug to

drain it. Likewise, if a floating dock (sealed floats) is left in hot sun **on land**, the internal air can expand significantly – **never leave a fully sealed float under intense sun** without venting, or the pressure could deform or damage it ³⁵. The manual explicitly warns to open the plugs (or disassemble some connectors to break the seal) if a system is sitting in high heat out of water ³⁵. In normal water operation this is less an issue, as water cools the floats.

Another use of the flut plug is to **partially flood or sink modules on purpose** during certain installations. For example, to install a Jetfloat swimming pool floor or to facilitate connecting large sections, one might momentarily open plugs or even drill a small 7 mm hole in some floats to let them fill with water and submerge slightly ³⁶ ³⁷. Later, the holes can be sealed and the floats pumped out or refloated. In summary, the **flutverschraubung** is not a connector between modules but rather a component of each module that ensures internal air-tightness and provides a maintenance/installation access point. Always **close these plugs before/during use** (using the proper tool to get a tight seal), and open them if necessary for **pressure relief or draining**. The provided `Flutschraube.obj` corresponds to this vent-screw – typically it would be positioned in a threaded socket on the pontoon's side, flush with the surface when tightened.

Summary of Connector Types and Their Usage

To correlate with the available 3D elements and provide a clear reference:

- **Standard Connector Pin** (`Verbinder.obj`) – Blue plastic pin used for regular connections between pontoon blocks (one-layer). Insert from top through 4 aligned corner lugs and **twist 45° to lock** ³. Provides quick, tool-assisted locking; used ubiquitously across the platform grid for assembly.
- **Extended Connector Pin** (`Verbinderlang.obj`) – Blue plastic **long pin** for extended reach (e.g. two layers). Used when connecting multiple vertical layers or taller components; same twist-lock mechanism, but spans greater depth ¹⁴. Often deployed in **multi-tier builds** to tie upper and lower floats together (inserted after short pins have secured individual layers).
- **Edge Connector Bolt/Nut** (`Randverbinder1.obj`, `Randverbinder2.obj`) – Specialized threaded connector (often white/gray) consisting of a **coarse-thread bolt** and a large **nut**. Used at **edges and corners** of the assembly to clamp together lugs that don't have a full 4-way neighbor. One of the `.obj` files likely represents the bolt piece and the other the nut (or possibly two sizes of edge connector). Employed especially for **outer frame stability** and for attaching accessories (cleats, railings, etc.) ²⁰. Unlike pins, these require **manual tightening** (using a wrench) rather than a twist-lock key, and may be used in combination with spacer washers.
- **Spacer Washer – Single** (`Einzel-Scheibe.obj`) – A black (or sometimes colored) **16 mm thick disc** that equals the thickness of one lug. Placed into connections where **3 lugs** are present to fill the void of a missing 4th lug ²⁸. Ensures tight, even pressure when a pin or bolt is tightened.
- **Spacer Washer – Double** (`Scheibe.obj`) – A **32 mm thick disc** (twice the single) used where **2 opposing lugs** are present (2 lugs missing) ²⁹ – e.g. at an edge connection of just two floats. Fills the gap of those two missing lugs so a connector can be firmly locked without bending anything.
- **Drain/Vent Plug** (`Flutschraube.obj`) – Gray screw-cap that goes into the pontoon's side. Not a structural connector between floats, but a **seal for the pontoon's internal cavity**. Must be closed watertight before assembly/use ³⁴. Used for maintenance (open to relieve pressure or drain water). Always orient floats consistently with these plugs for easy access and assembly alignment ².

By understanding the role of each of these components, one can **assemble the modular pontoon system correctly** and also position each 3D model in the virtual configurator at the proper location. For instance, when generating the 3D assembly: insert **blue pins** at every inter-module junction inside the platform (with heads flush on top surface), use **edge bolts/nuts** at the perimeter holes, put **washers** in any gap where a bolt spans an incomplete lug set, and ensure each pontoon model has a **flush-**

mounted vent plug on its side. Following the guidelines from Jetfloat/Duwe, this will result in a structurally sound and realistic pontoon configuration ³ ²⁰. All connections should be tight and level, with pin heads and bolt heads properly seated – enabling the virtual (and real) platform to distribute loads evenly across its connectors, just as designed.

Sources: The above information was compiled and inferred from Jetfloat's official assembly instructions and product details, which align closely with Duwe's pontoon system. Key references include Jetfloat International manuals (on lug alignment, pin locking, multi-layer assembly) ¹ ³ ³⁸, Jetfloat product specs for pins and connectors ¹⁴ ²⁰, and specific notes on spacers and edge connections from the Jetfloat documentation ²⁸ ²³. The **Flutverschraubung** usage and precautions are drawn from Jetfloat's German assembly guidelines ³⁴ ³⁵. These combined sources provide a precise picture of how to build and connect the modular pontoon elements.

¹ ³ Assembly - Floating Docks - Jetfloat

<https://www.jetfloat.com/support/assembly/>

² ⁵ ⁶ ⁷ ⁸ ⁹ ¹⁰ ¹¹ ²³ ²⁴ ²⁵ ²⁸ ²⁹ ³⁰ ³¹ ³² ³³ ³⁴ ³⁵ ³⁶ ³⁷

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<https://www.jetfloat-international.com/wp-content/uploads/2023/12/MONTAGEANLEITUNG-2024-DE.pdf>

⁴ ¹² ¹³ ²¹ ²² ²⁶ ²⁷ Standardzubehör - Jetfloat International

<https://www.jetfloat-international.com/standardzubehoer-2/>

¹⁴ Long Connecting Pin - Floating Docks - Jetfloat

<https://www.jetfloat.com/product/long-connecting-pin/>

¹⁵ ¹⁶ ¹⁷ ¹⁸ ¹⁹ ³⁸ JETFLOATinternationalAUSTRIA

<https://www.jetfloat-international.com/wp-content/uploads/2023/12/Assembly-instruction-2024-EN.pdf>

²⁰ Edge Fastener Assembly - Floating Docks - Jetfloat

<https://www.jetfloat.com/product/edge-fastener-assembly/>