



# MANUAL FOR VAKE DE-ICER SYSTEM

The VAKE De-Icer System guarantees high safety and operational reliability by having no machinery or electricity underwater. It features two pumps, each with its own power supply for optimal redundancy, that creates large amounts of bubbles to combat the formation of ice.

It operates without propellers, meaning there's no risk of debris being sucked up and blocking the system. A major advantage for usage in shallow water.

VAKE's air compressors are quality builds designed for continuous operation year in and year out. The housing and frame are made of aluminum. The pumps are IPX4 rated, which means they can be used outdoors under a roof. Multi-stage silencers and internal rubber suspensions as well as external rubber feet guarantee a very quiet operation of less than 40dB.

The system does not draw a high peak current when it's turned on, meaning you don't risk blowing a fuse at a start-up.

Due to the low power consumption, it's possible to use the system on multiple boats that are moored to the same jetty. For optimal redundancy, you can connect each pump to a different electrical outlet.

The high operational reliability and low power consumption, combined with low maintenance requirements make the VAKE De-Icer system the superior choice in the market.



# IN THE PACKAGE

2 x Air Compressors Model V-12 (80W, 220-240Volt,  
50/60Hz, <40dB, 7.15kg)

2 x Air hose

8 x Ropes for air hose suspension

2 x Hose clamps with quick-release screw

4 x Stainless steel hose holder

2 x Hose connection nipple with O-ring

4 x Cable ties



# PROTECTION BOAT

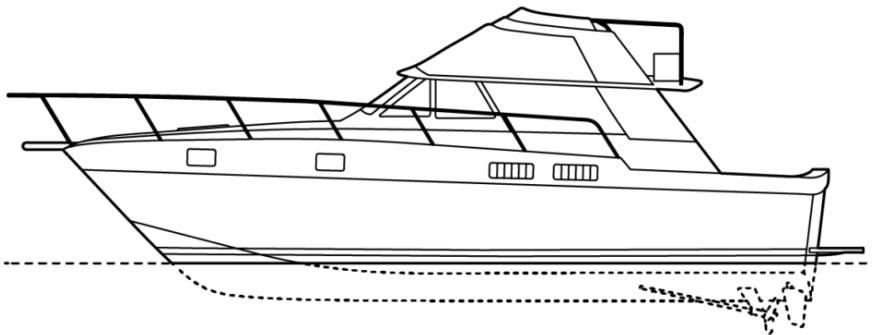
VAKE model V-12 is suitable for keeping a 12-13m boat with a waterline of approximately 12 meters ice-free.

The VAKE model V-12+ is suitable for 15-16m boats with a waterline of approximately 15 meters.

The system is safe to use with all types of sailboats, whether they feature saildrives, propeller shafts, or outboard engines. It is also safe for motorboats with propeller shafts or outboards. However, we do not recommend winter storage of motorboats with stern drives. The nozzle of the drive is often close to the water surface and can be exposed in case of a long-term system failure.

The size of the wake depends on the size of the boat – There will be a safety zone of a couple of meters outside the boat's hull.

VAKE MODEL V-12 IS SUITABLE FOR A MAX 12-13M BOAT (ABOUT 12M WATERLINE)  
VAKE MODEL V-12+ IS SUITABLE FOR 15-16M BOAT (ABOUT 15M WATERLINE)



## DOCK

VAKE is often used to protect a dock or other sensitive equipment. The length of the area that can be protected from freezing is a maximum of 24m for the V-12 model or 30m for the V-12+ version.

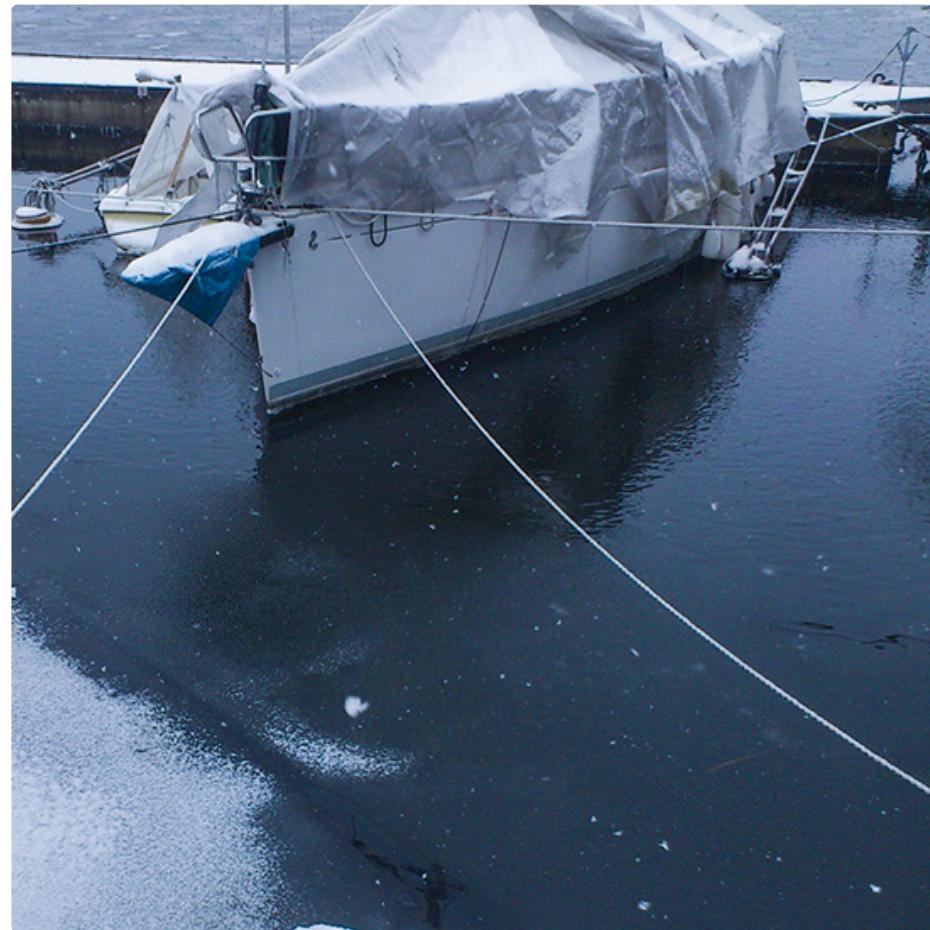
It takes about 1-2m in depth to get a good circulation of warm water. Proximity to deeper water gives a better effect in prolonged cold weather (below -15°).

# INSTRUCTION (BOAT AND DOCK)

This package is intended for one boat only. You should not split a single package to protect two boats.

The hoses must be hung on each side of the boat in order to create a water stream upwards which is then angled out to the side of the boat's shape. If despite the high operational reliability, a pump should stop working, the remaining one will maintain a reasonable wake while waiting for the broken pump to be repaired.

**Remember to deploy VAKE hoses before the ice settles!**



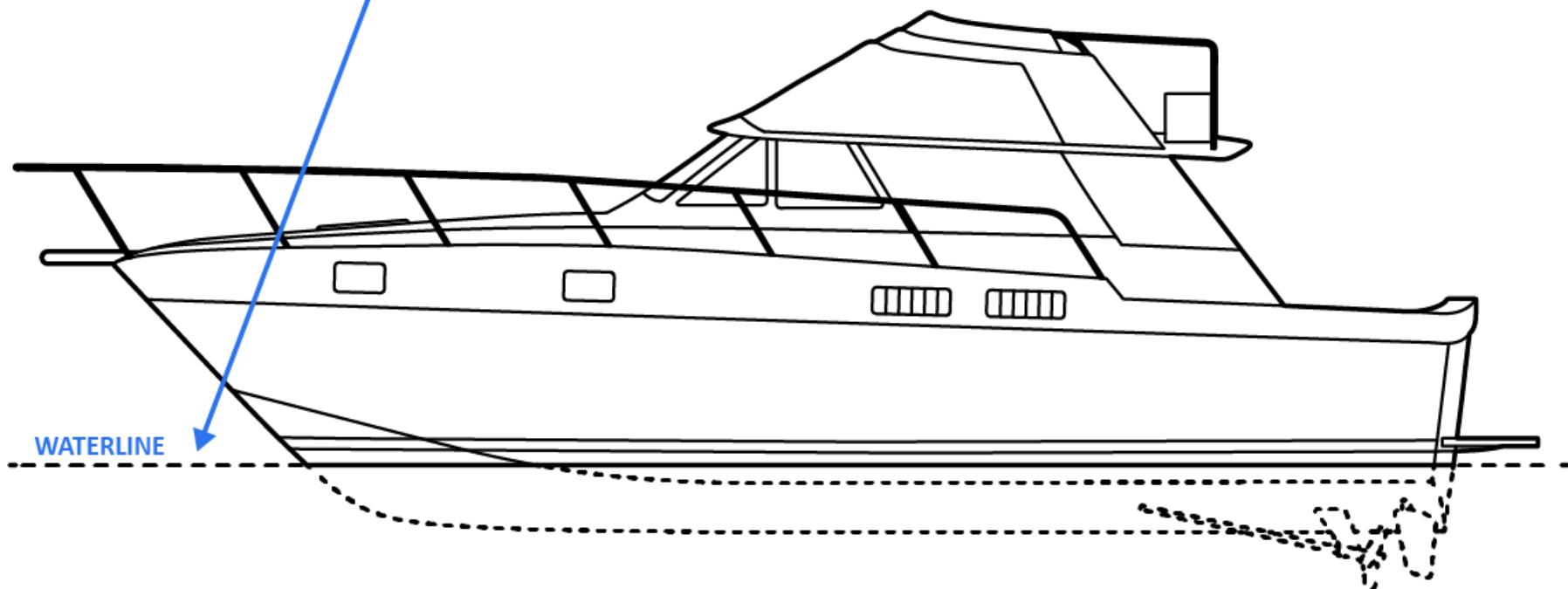
# IMPORTANT BEFORE STARTING

The compressors must be positioned so that the part of the hose above water does not experience sharp bends.

**The hose may only have ONE highest point.** This is to ensure that condensed water inside the hose will either flow into the ocean (preferred direction) or back into the compressor. Avoid the situation where condensed water can get trapped inside a part of the hose.

# 1. PLACE THE COMPRESSORS

ATTENTION! HOSES AND PUMPS MUST UNDER NO CIRCUMSTANCES  
BE PLACED BELOW THE WATERLINE INSIDE THE BOAT!



## BOAT DOCK

Find a suitable place where you can run air hoses and where the compressors can stand all winter. You can advantageously place the compressors inside the boat and then take advantage of the fact that the excess energy provides a little heat in the boat. The compressors are IPX4 rated and can therefore also be placed outdoors under a roof/tarpaulin. Regardless of the choice of location, care must be taken to ensure that the air supply is not cut off in the event of large amounts of snow.

**ATTENTION! Hoses and pumps must under no circumstances be placed below the waterline inside the boat!**

When placed inside a boat, air hoses can be led in through a ventilation valve. An alternative option is to create a plate with two holes that fit inside of an openable window. Avoid bending or pinching the hose, this blocks the air.

The compressors are IPX4 rated and can therefore be placed outdoors under a roof or tarpaulin. If no other roof is available, a "dog house" shelter can be manufactured. Always ensure that the compressor's supply of air is not suffocated by large amounts of snow.

## 2. PREPARE AIR HOSE

Unroll the hose and attach two stainless holders per hose. One holder is pulled all the way to the end of the hose and

Each hose requires four ropes. One rope each is attached to the ring in the middle of the chain on the holder. In addition,

the other just past the red mark, 8m from the air connection.



Suspension at the end of bubble hose.

two ropes must also be attached directly to the hose with an even distance between them.

Secure the position of the stainless steel hanger in the vicinity of the red marking (according to the picture) with one of the included cable ties.



Suspension at red marking on bubble hose.

### 3. HANG UP AIR HOSE BOAT

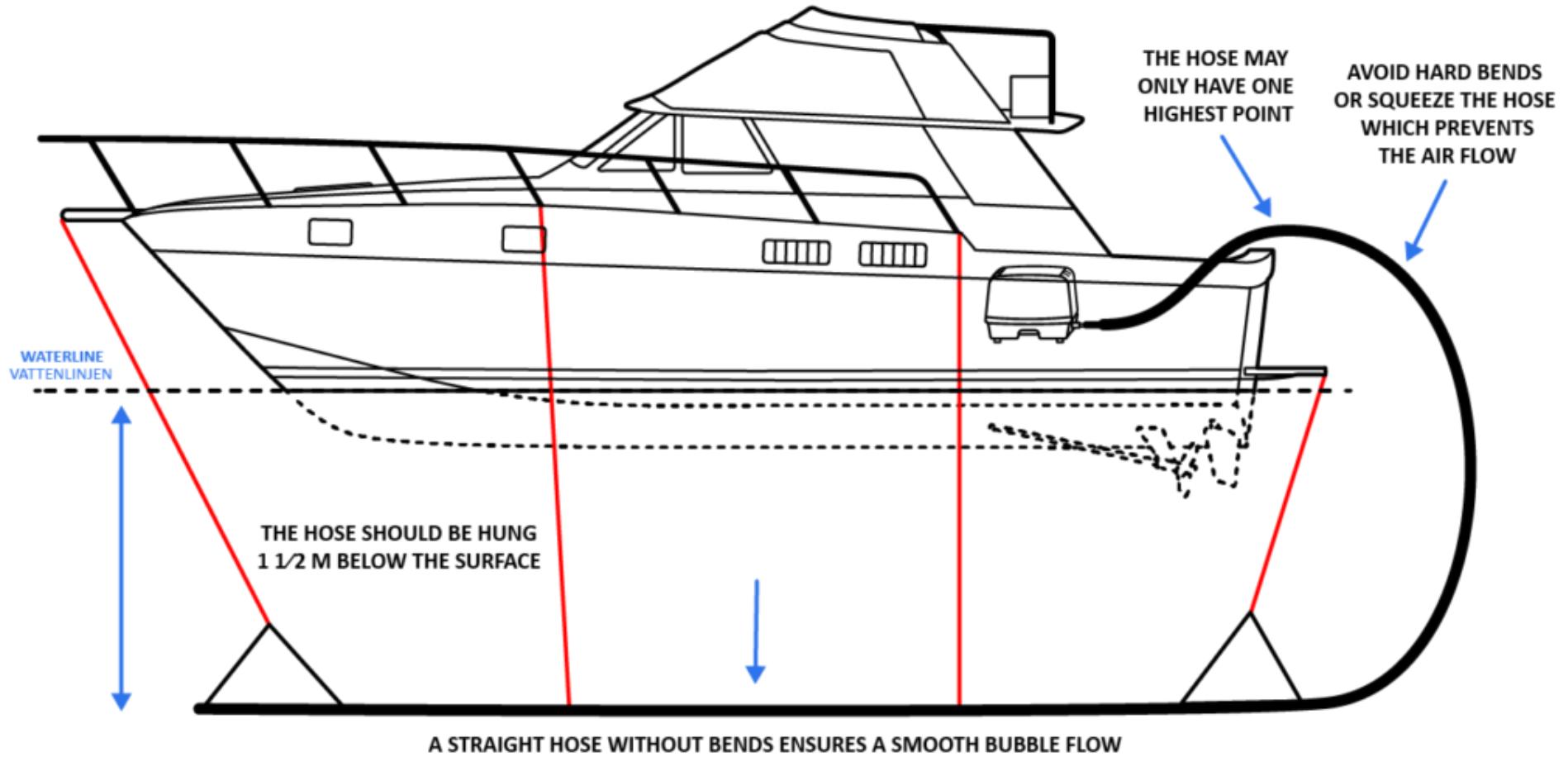


Illustration of successful suspension seen from side

Remember: the hose may only have ONE highest point.

Avoid kinks or pinching of the hose. Following these

instructions will ensure that no ice blockades will form inside of the hose.

Cut hoses to the correct length if they are too long. Roll out the hoses along the sides of the boat. If the water is dark, you can start by hanging the hose a few centimeters below the surface to easily check that the hose runs straight.

The hose must be hung 1½ m below the surface. Hang the end of the hose a bit shallower than the pump side of the hose. It is an advantage if the line hangs towards the center line or keel of the boat since the wake will become larger when the bubbles hit the hull before reaching the surface. To achieve this, hang the front and back ropes close to the middle of the boat. It might help to cross these ropes (i.e. attach the left rope to the right side of the boat, and vice versa).

If your boat has heavy chines (motor boat) underwater that stops this flow along the hull, it's better to position the hoses a bit further away from the hull.



Suspension. Angle of tamp illustrates how it should hang underwater. This is to stretch the hose.

If you want to use the entire length of the hose on a boat that's shorter than 12 meters, you can create a pole construction that stretches the hose away from the boat. Utilizing an additional anchor point (e.g. the dock) is also an option.

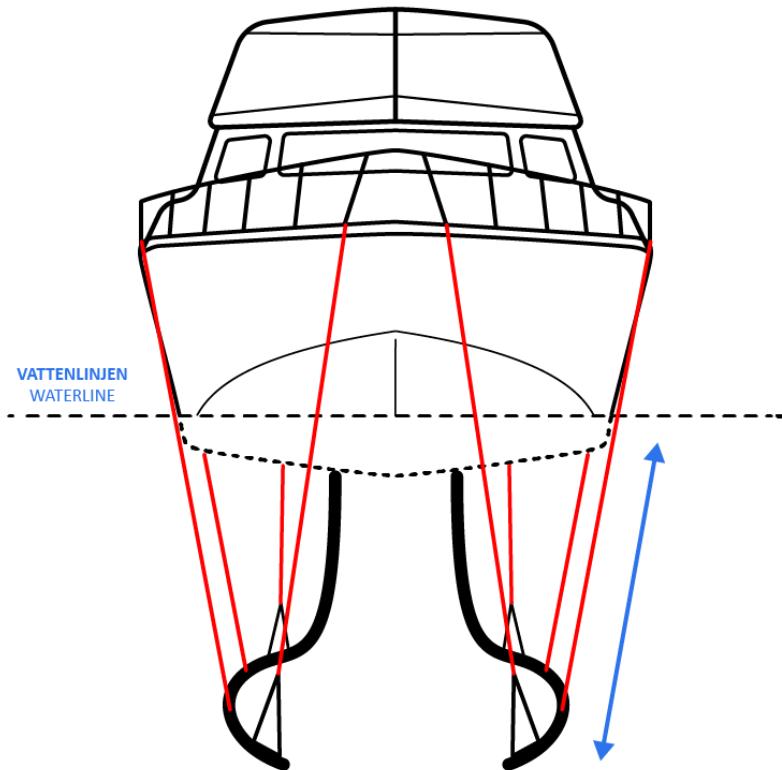
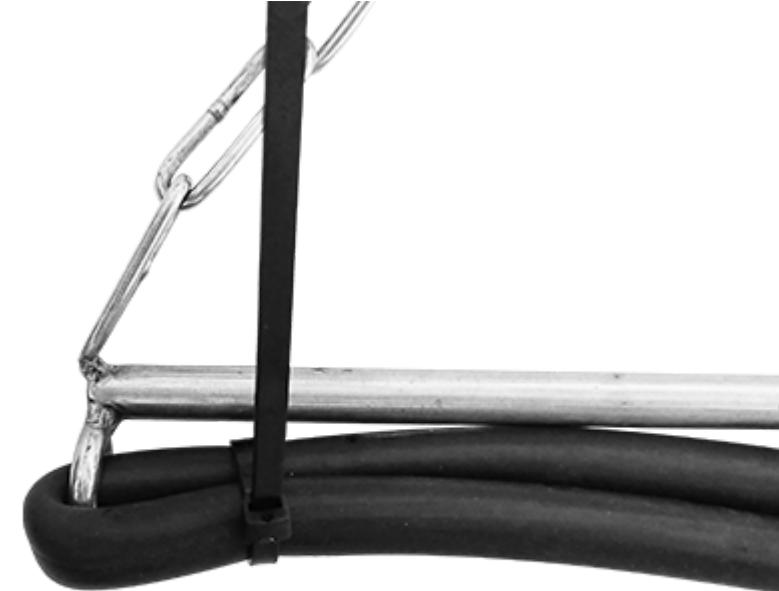


Illustration of suspension seen from front

If your boat has heavy chines (motor boat) underwater that stops this flow along the hull, it's better to position the hoses a bit further away from the hull.

It's important that the hose is stretched by the stainless steel holders. To achieve this you can angle the front and back ropes (attached to the two holders) up to 45 degrees to create some tension on the hose in between.



Shorter boat than 12-13m, then adjust the length of the hose. Surplus hose is strangled by cable ties.

If the boat is shorter than 12-13 meters and it is difficult to achieve the desired angle on the end clamps, you should move the last holder a little further onto the hose. This way you get a better angle on the rope. The remaining tube stump is "closed" by folding it double before using a cable tie.

Remember that the warmer bottom water is heavier than the surface water, which means that if you stop the momentum of the current, the warm water will immediately turn downwards again. This happens when the current reaches a

neighboring boat, which explains why your wake can never extend further than the nearest neighboring boat or dock.

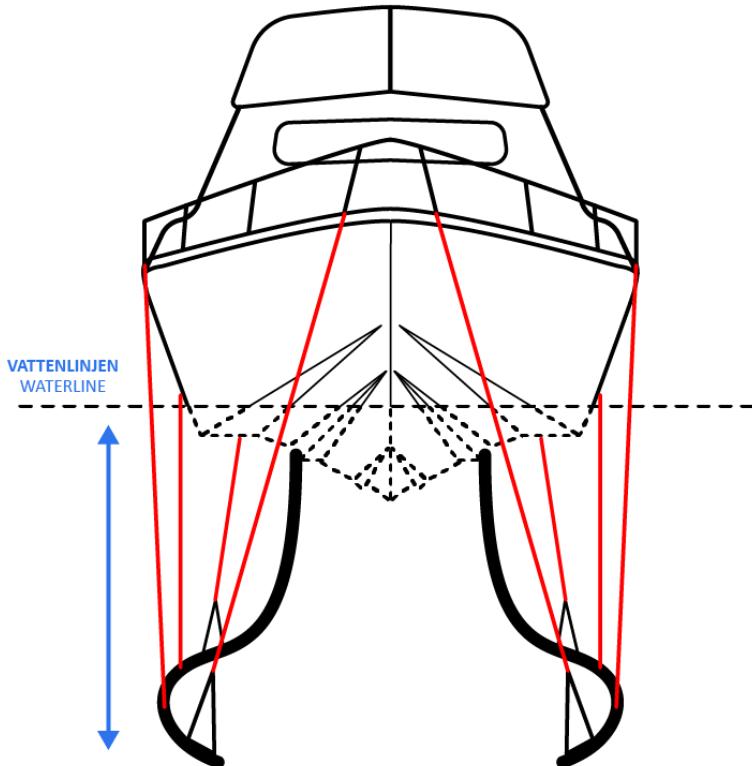


Illustration of suspension seen from front

## DOCK

Remember: **the hose may only have ONE highest point**. Avoid kinks or pinching of the hose. Following these instructions will ensure that no ice blockades will form.

To keep a dock or jetty ice-free, hoses are placed 1.5 m below the water surface along the outer edge of the jetty. For proper circulation of warm bottom water, it is necessary that the inflow is not obstructed. In a shallow bay, the availability of warmer water can become worse during longer periods of cold weather.

Unroll the hose on the bridge and make sure it is not twisted. Attach the stoppers in the appropriate places. Then slowly lower the hose into the water.

You can advantageously start by placing the hose shallow in order to visually check that it hangs horizontally. To then drop it down to the correct depth with the ropes

It is important that the stainless steel holders at each end put some tension on the hose to stretch it out. This can be achieved by angling the outer ropes to 45 degrees (see images section 3 (Boat)). If the hose is longer than the bridge, you can fold and close off part of the hose using cable ties (see the picture in the previous section).

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## 4. CONNECT HOSE IN AIR COMPRESSOR

Screw in the hose attachment (brass) in the air compressor by hand so that the rubber bushing seals properly. Tools are not needed for this step and might lead to crushing the bushing. **Hand power is enough!** Connect the hose and tighten the supplied hose clamp. Test the connection by turning on the pump and listen for any leakage at the hose connection.

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## 5. TEST DRIVE AND TRIM

The hose must hang as horizontally and straight as possible for an even distribution of the air bubbles.

## **BOAT**

When testing in calm weather, you should be able to see how the bubbles cause water to flow up and be reflected outwards by the boat's hull (clearly visible when the air bubbles settle on the surface and go with the current). It is this current of warmer bottom water that keeps the ice away when it gets cold.

## **DOCK**

If there is a different amount of bubbles along a hose, it may have twisted or is not hanging horizontally. Pull up and try to sort this out. A certain unevenness in the amount of bubbles is harmless. If part of the hose hangs deeper, it can result in smaller bubbles in this place. Correct by lifting the nearest rope slightly and observe the increase in the number of bubbles.

The hose should hang as horizontally and straight as possible for an even distribution of the air bubbles.

## 6. READY FOR THE WINTER

When the above steps are complete, you can turn off the power to VAKE and wait for the cold. BEFORE the ice threatens to settle, you can start up the VAKE de-icer and enjoy a carefree winter without ice. At a first start, it may take a few minutes before the water is blown out of the hose and a steady flow of bubbles has been achieved.

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# SERVICE

Check the air filter and clean it if necessary at the end of the season. Find the small lip and use a flathead screwdriver to pry off the plastic cap on the pump 'roof'. Vacuum the filter and reassemble.

Every 5-6 seasons the membrane must be replaced.

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## SOME WORDS ON SAFETY (BOAT)

Modern fiberglass (plastic) boats can theoretically be stored completely frozen in still ice. However, a wake is required to protect the hull since ice will move due to waves and wind. This is far from the most serious threat. The absolute biggest danger is that seacock freeze and crack.

A current generator works by lifting up warmer water. This also warms the inside of the boat to a certain extent. Water in bushings can still freeze if the air is very cold.

Winter conservation of the seacock in any way is a must for winter storage in water and should never be neglected.

There are different schools of thought when it comes to protecting your boat. You should check with your insurance company what their instructions are.

Some prefer to leave ball valves open to protect them from freezing.

Others recommend closing the seacock while trapping antifreeze inside the “ball”. This method requires the use of excessive amounts of antifreeze to ensure you do not trap seawater inside.

Whichever method you choose, we recommend wrapping insulation around the base of all grommets and the bottom of the connected tubing. You can advantageously use hose insulation in foam from the nearest construction company. With insulation in this way, the penetrations are heated from below by the warmer water.

Never pour toxic glycol antifreeze into nature! Glycol can be dangerous: one cup is enough to kill a grown man. Pets are a big risk group since glycol tastes sweet. Even so-called “environmental” glycol is a petrochemical product with debated dangerousness.

For worry-free winter preservation, we recommend VAKE organic antifreeze liquid which is completely non-toxic!

Remember that some insurance companies require you to report year-round storage in the water.

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## Shore power (boat)

Keep in mind that anodes wear out unnecessarily if you connect shore power to the charger and the boat's system. There are various methods to reduce this problem. But the most effective is to only connect power cables directly to VAKE without connecting the boat to shore power.

If you have lead-acid batteries in the boat, they are preserved for the winter if they are fully charged and only when it is cold! Meaning a trickle charge is needed at least during the autumn AND the spring because lead-acid batteries have a notorious self-discharge resulting in a

## MOORINGS (BOATS)

The increased wind resistance from the cover on your boat means that you have to review your moorings for upcoming autumn storms. It is recommended to supplement the usual moorings with extras that, as far as possible, are allowed to go to other attachment points on the boat and pier. A rule of thumb is that when you have a ridiculous amount of moorings, you will also be able to sleep soundly.

dangerously low state of charge after only a month at room temperature. For maintenance charging, we recommend

SUNBEAMsystem solar panels that work well through a transparent tarpaulin.

Lithium batteries do not require maintenance charging.

Never leave any part of the mooring hanging near the water as it can get stuck in the ice.

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## MOISTURE IN THE BOAT

A common prejudice is that winter storage in water makes the indoor environment more humid compared to storage on land. This is not correct!

The most humid season in a boat is September-October. Then the majority of us all have our boats still in the water. During this time, there are surprisingly many people who get tired of their otherwise well-cared-for boat and leave it without proper dehumidification. This period lays the foundation for mold formation, “boat smell”, and oxide on cables and electronics. A dehumidifier is therefore recommended for ALL boat owners. An electric dehumidifier designed for cold spaces is superior. Many people use old-fashioned salt dehumidifiers, we instead recommend GOBI DRY Brick, which is a more modern, cleaner, and 100% reusable option. [www.gobidry.se](http://www.gobidry.se)

From November onwards, the water is warmer than the surroundings and therefore heats the boat from below.

During the winter, this effect becomes even more evident. With VAKE on, your boat heats up compared to the surrounding air temperature.

# DIESEL TANK

Another moisture problem is the water that forms in a diesel tank and comes from the humidity of the air. The water in combination with Diesel causes bacteria to thrive and a dangerous slurry to form.

This is a problem all year round and regardless of the type of winter storage.

But it is a good habit to leave the tank completely filled when storing for a long time to help prevent condensation. There is a solution that completely stops condensation and it is the GOBI DRY Tank that we highly recommend.

[www.gobidry.se](http://www.gobidry.se)

# VEGETATION

Vegetation gradually stops during the autumn and then drops to a minimum. In the spring when the days get longer you can notice that slime begins to flourish. It is time to brush it away with suitable tools.

# INSURANCE

Use an insurance company that allows winter storage in water. Remember to report this if required. Check with

# OSMOSIS

A fiberglass boat normally absorbs water, which means that after perhaps 20-30 years blisters can occur. When stored on land, the plastic dries out, which delays this process. By

your insurance company what they require regarding open or closed seacocks. epoxy-treating the boat, you prevent water ingress, which is always a good idea.