



Operating manual SLUDGE BUOY
Type: SLB/SLB Mini

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Changes into this manual can be made without prior notice.

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1 GENERAL

Sludge Buoy (SB) is a new standard coming out to ships. It enables pumping out oil from the top of the tank rather from the bottom. The result is: 1) The water left in the tank is much cleaner and easier to process in the bilge water separator. 2) The oil that is being pumped out is not water whipped. The water content in the oil pumped out with SB is very low and does not need to be further treated for incineration.

1.1 Purpose of the manual

The purpose of this manual is to help the engineers to understand the philosophy of SB and the installation and operation of it. It is important that ship owners realize that big savings can be achieved if SB is installed from the beginning at the shipyard since big investments like sludge oil separator and water separating tanks will be surplus and not necessary with a SB onboard. If your intention is to burn sludge oil onboard the vessel, the SB should be mandatory. The savings should be huge with no extra water separating tanks close to the incinerator. The only tank needed is an incinerator day tank. There is always a sludge tank and a bilge water tank onboard every vessel, why not use these tanks smarter instead of building space demanding tank solutions? By installing a SB you separate at the source exactly as the book tells us to do.

1.2 Where to install SBS

Sludge Buoy TMS System (SBS) is typically installed onboard a ship or a rig, inside the sludge oil tank or bilge water tank. Inside the tank SB will always stay at the immediate surface. SB takes suction 15 – 20 mm from

the top liquid layer. SB will follow all motions of the ship and will always be at a 90° angle to the content inside the tank, thanks to the Cardan type fastening device. SB is easy to install and the installation is done by the ship's own crew while the tank is anyway open for normal inspection and cleaning. If it is not possible to weld inside the tank a special clamp is

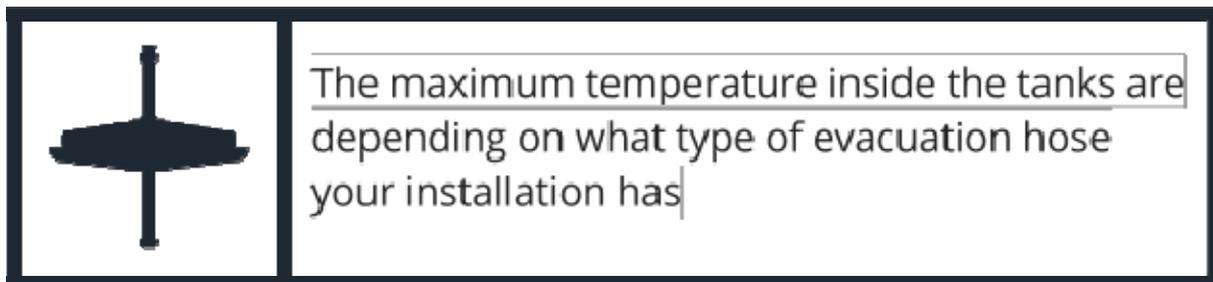
fitted without any welding inside the tank. Existing piping systems are recommended to be used as far as possible. There is no special maintenance on SB beyond cleaning it when regular tank cleaning is conducted.

1.3 Sludge tank and bilge water tank temperature management

Temperature management is depending on your installation. Generally a somewhat elevated temperature makes the oil and water to separate better. SB will work in cold tanks as well as hot tanks. Some bilge water separator manufacturers have their own working temperatures stated. Our recommendation is to keep under 50°C in order to protect the evacuation hose from early aging.

Some installations do not have any heating at all in the tanks and oil will still be skimmed off as long as it stays afloat. Normally, even in cold areas, the settling tank temperature is somewhat elevated thanks to the hotter surrounding areas in machinery spaces.

Do not exceed temperatures of 90 °C in any tank where SB is installed in order not to damage the suction hose.



It has to be remembered though, that even if the heat rises, the sludge oil temperature at the surface is lower than the liquid in the bottom of the tank where the heating coils normally are installed. The oil layer is working as an insulating blanket. You can therefore have 50°C in the bottom of the tank but only 30°C in the sludge oil layer.

1.4 Environmental management system ISO 14001

In order to make full use of your installation and value for money we recommend telling others about your SB installation. Most ships have an Environmental Management System to meet the requirements from ISO

14001, which stresses continual improvement. The goal with ISO 14001 is to continuously improve and audit the environmental management system, including telling others about it. SB is a perfect example how your ship has been innovative and separate out oil at its source. By doing this, less energy is wasted pumping around water and oil, and more efficient running of bilge water separators is possible. The engine crew has succeeded to be better in their work and that is worth telling the auditors when the next environmental audit or report is due.

1.5 Safety first

The following safety guidelines should be followed before and during the SBS installation.

- Always follow your company's Confined Space Entering Procedures.
- Make sure the tank is safe to enter by measuring oxygen content.
- Ensure the tank is clean enough to be able to work inside
- Sufficient lighting provided
- Sufficient ventilation provided
- Always use a respirator, or supplied air respirator if the tank has been in operation with waste oil.

1.6 Terminology

In the designing of SB great care has been taken to keep down the number of components. The moving parts have been cut down to absolute minimum in order to have a maintenance free system. If however some spare parts are needed or correspondence via mail is used, the terminology in Fig. 1 with the corresponding numbers is recommended to be used.

Part	Part name
15	Cardan upper/Fastening
14	Middle piece, Cardan
13	End screw/Damper
12	Guide rod 2,0 m, extendable 2 m
11	Circlip
10	Washer, upper
9	Receiving disc
8	Flotation body
7	Washer, lower
6	Distance sleeve
5	Integrated fitting for suction hose
4	Hose clamp, model: Pa-Ri,
3	Suction hose, HT, max 90 °C
2	Slide sleeve
1	End screw/Damper bracket

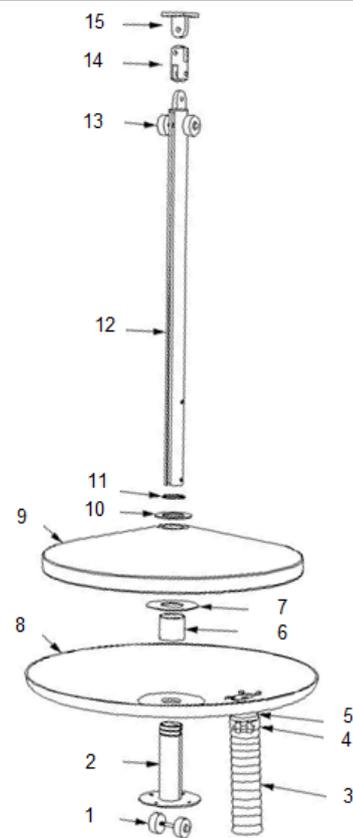


Fig. 1: Exploded view of the Sludge Buoy™.

2 NEW BUILDINGS

2.1 Sludge tank in double bottom

2.1.1 Welding of bracket to beam or ceiling inside the tank

In a sludge oil tank in the double bottom, Fig. 2, it is recommended for new buildings to simply weld the provided bracket, Fig. 3 directly on to a beam or inside the tank top on to the ceiling in a suitable location where SB is planned to be installed. The bracket is designed to fit together with the Cardan type fastening device, Fig. 4. The bracket is made of stainless steel.

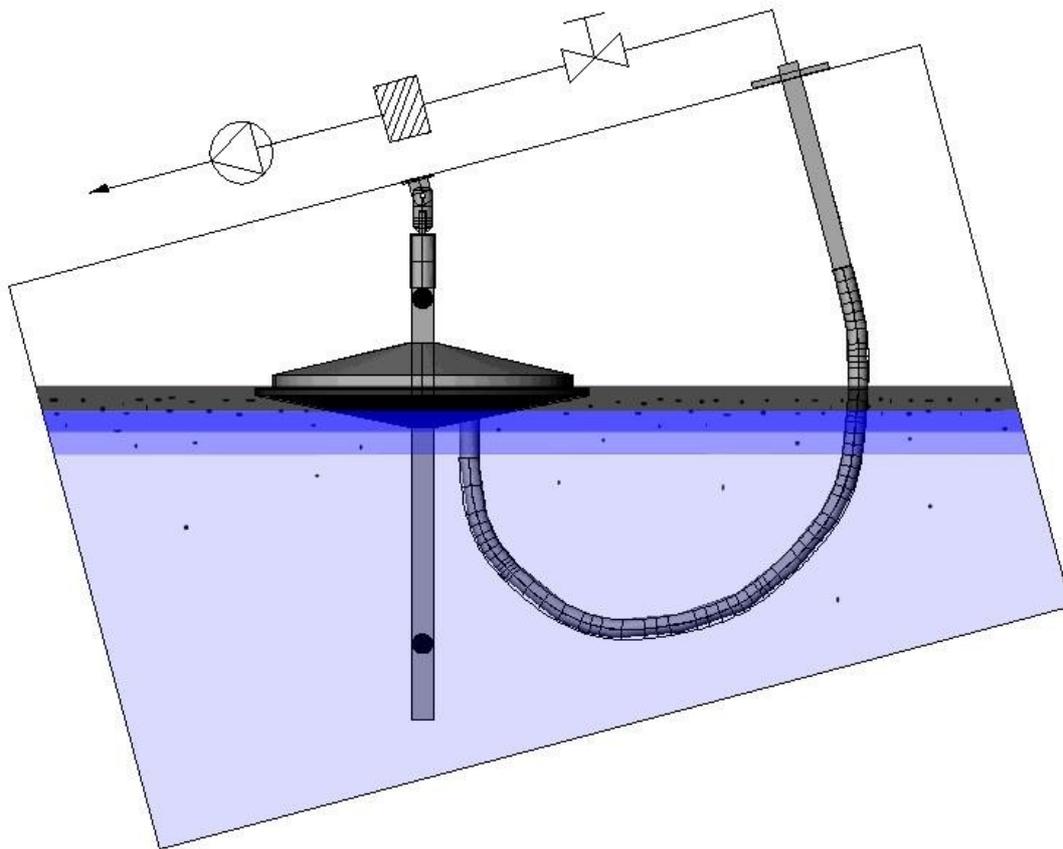


Fig. 2: Sludge oil tank in the double bottom.

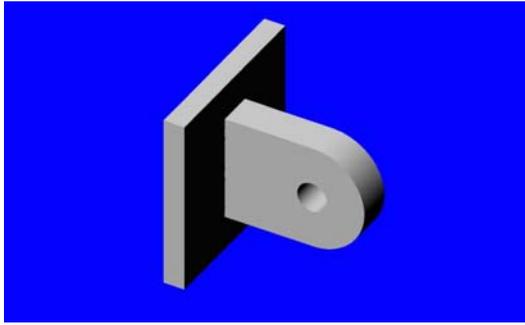


Fig. 3: Fastening bracket.

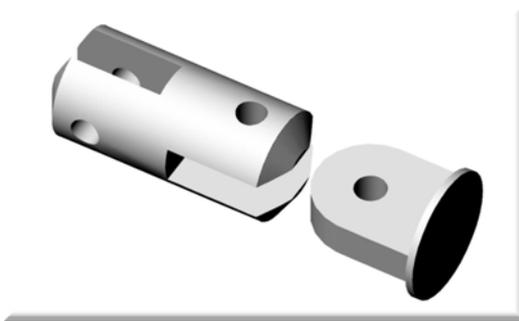


Fig. 4: Cardan type fastening device.

SB mini HT is not rotation locked in a certain position. Hence the only thing restricting the Buoy is the suction hose. A good rule of thumb is to have

the suction hose penetration about 1,5 meters from the centre of where the SB is attached in the ceiling of the tank. In this way the bend on the suction hose will be very soft and little force will affect the SB.

2.1.2 Fitting the SB on to the guide rod

The Cardan type fastening device is preassembled to the guide rod in our factory. Fit the Cardan type fastening device to the welded bracket inside the tank with the provided stainless steel screw. Cut the guide rod if necessary to have the correct height inside the tank. It is also good to just drill a new hole for the end screw (1) in case the guide rod fits into the tank but the height needs to be adjusted up due to heating coils or similar potential hazards on the bottom of the tank. In this case no cutting of the guide rod (12) is necessary.

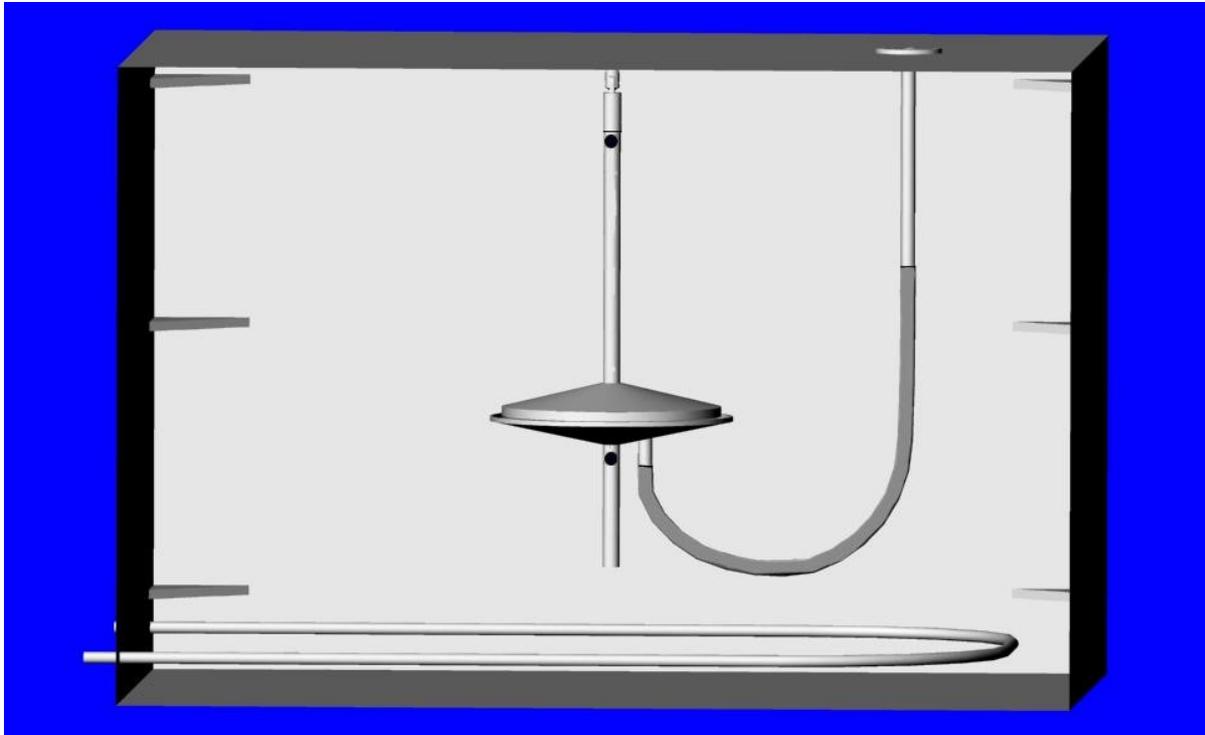


Fig. 5: Double bottom tank with steam coil inside.

Fig. 6. Drill the new hole about 20 mm from the free end of the guide rod. The guide rod or suction hose must not touch anything inside the tank. Enter the tank and attach the Cardan type fastening device to the fastening bracket. Now you have the guide rod hanging freely and it is then easy to slip on the SB on to the guide rod and fit the end screw (1) in the end of the guide rod. The end screw is fitted with some rubber material in order to dampen the possible hits of the SB if the tank is almost empty. Remember to position the guide rod in such a way that the suction hose is towards the direction of the penetration of the tank. See fig. 5.

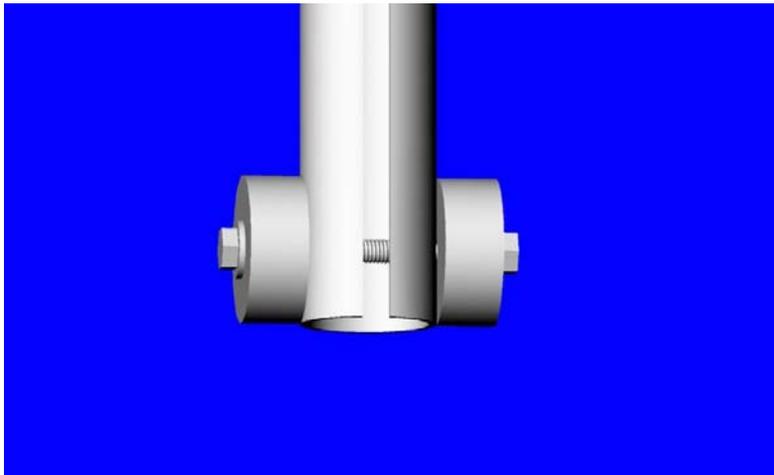


Fig. 6: End screw/Damper.

2.1.3 Planning of evacuation hose

Plan carefully where the hose is going to be led out of the tank so no obstructions like bulkheads heating coils or similar is restricting the SB to move freely. Most of the times there are beams or longitudinals welded on to the bottom of the tank. If possible, it is always the best if the hose can be led along with the beams rather than crossing them. If there is a heating coil close to the hose and there is a risk of the hose being damaged due to extensive heating, the easiest way is to take some gasket material and roll around the steam coil locally and lock it with hose clamps on each side of the gasket. Pipe clamps can also be sharp inside the tank and can be covered in the same way with gasket material if necessary.

The suction hose is to be kept in a suitable length in order to have as little influence on the SB as possible. The hose that is provided might very well be in excess length for your installation and might therefore need to be cut. It is recommended to have a 50 mm black steel evacuation pipe going down to 1/3 of the depth of the tank, see Fig. 2 & Fig. 10, in order to have as small forces on the hose as possible. In this way most of the hose will always be in liquid and therefore have little or no influence on the movements.

Use oil to fit the hose easily. Finally, just attach the suction hose to the SB using the provided stainless steel hose clamp. It is recommended to fit the hose and the hose clamp to the SB in the workshop where good working conditions are provided, at least outside the tank. Do not tighten the hose clamp finally until inside the tank and care has been taken that there are

no tensions in the hose. Remember to fit the hose in such a way that the natural coiling form is utilized as much as possible. Then tighten the hose clamp and make sure the hose is attached securely. Simulate the motion of the SB by lifting it up and down and see in what way the hose have least impact on the movement of the SB. In this way the suction hose will affect the SB movements as little as possible. Fitting the hose correctly is essential to the result SB is going to provide. The hose will be even softer, lighter and more flexible in operation when the tank is in operation and the temperature is higher.

Do not exceed temperatures of 90 °C in any tank where SB Mini, HT is installed in order to not damage the suction hose.

2.1.4 Slipping the SB with the attached hose on to the hanging guide rod inside the tank

When all of the above explained has been carried out it is just to go inside the tank again and slip the SB on to the hanging guide rod. It is good to be two persons when this job is performed. One person can then lift up the SB and the other person can fit the end screw (1) with the damping rubber

material. Do not tighten the end screw too hard so the groove in the guide rod will be reduced. Then attach the other end of the suction hose to the

50 mm metal pipe with the other provided stainless steel hose clamp. This metal pipe should go down to 1/3 of the depth of the tank. See Fig. 5 or Fig. 7 for an example.

2.1.5 Testing the movements of the hanging SB

To test the SB simply lift it up and down and around by hand and feel that it slides easily on the guide rod. Check that the suction hose is following up and down nicely. When the SB is not touched at all, it should be hanging vertically down. When there is liquid in the tank the lifting forces of the flotation body will force the SB to be in a 90° angle to the top liquid layer. The SB will be naturally lubricated so there is no need for additional lubrication. Make sure that it is enough hose so the SB can move freely up, down and around. It is better to have a hose slightly too long then slightly too short.

2.1.6 Suction pump for SB in a double bottom sludge oil tank

It is recommended to have a dedicated 1 inch or 1,5 inch diaphragm pump, or as they are also called membrane pump, in order to have higher redundancy in case something would happen to the existing sludge pump. By installing a dedicated air driven pump connected to SB the availability and flexibility will be higher and it is after all a small investment (The membrane pump will need service air, 7 bar) Use two inch suction pipes all the way from the SB to the pump, and connect to the pump with a reducer. It will make your pumping very effective. If however a dedicated pump is not wanted the SB can be connected to the existing sludge oil pump via a shut-off valve.

2.2 Bilge water tank in double bottom

2.2.1 Installation of the SB in the bilge water double bottom tank

It is exactly the same installation instructions as 2.1 Sludge tank in double bottom. Follow the instructions there and read further down in this section regarding the pump installation.

2.2.2 Suction pump for SB in a double bottom bilge water holding tank

It is strongly recommended to have a dedicated 1 inch or 1,5 inch diaphragm pump, or as they are also called membrane pump, in order to have higher redundancy in case something would happen to the existing bilge water pump. In addition to this it is recommended, since it is oil that is skimmed off, to have dedicated piping as well in order to not contaminate the bilge water piping system with pure sludge oil. Usually it is not necessary to have so much new pipes made since the SB can be connected to the existing sludge oil piping system. The membrane pump will need service air, 7 bar. Use two inch suction pipes all the way from the SB to the pump, and connect to the pump with a reducer. It will make your pumping very effective.

2.3 Bilge water settling tank “high tank” SB installation

2.3.1 Installing a SB inside a bilge water settling tank 2-stage- or 3-stage tank

SB will skim off a layer of free oil that will otherwise always be inside the tank and contaminate the water and make it harder to process in the bilge water separator. By installing SB you will make sure the skimming effect will be at the correct place. When the level fluctuates inside the tank fixed installations like funnels and penetrations at different levels will not work as well as SB. SB will always stay at the immediate surface following the level and the motions of the ship.

If it is a tank with several stages like 2- or 3- stages it is recommended to install the SB in the first stage or in the stage where most of the oil will be accumulated, see Fig. 7. In a tank like this the level will be almost constant and SB will always be quite high up in the tank.

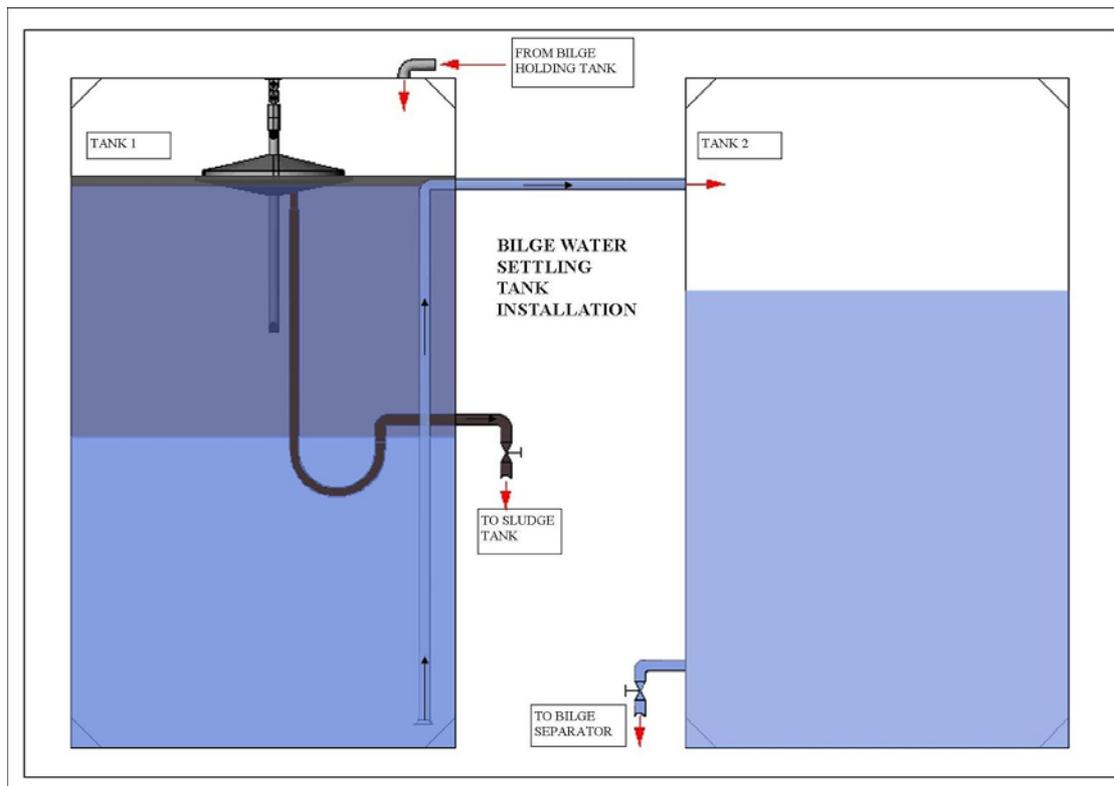


Fig. 7: Bilge settling tank, 2-stages, operated by gravity.

Since it is a high tank there will not be any need of a pump. The oil can be drained out by gravity. It is recommended to have a distance of about two (2m) meters between the designed working level inside the tank and where the oil is drained out. Usually the oil is drained out to the sludge oil tank. The oil is drained out by a normal two inch ball valve. The size of the piping is recommended to be two inch on the entire pipeline from the SB to the ball valve.

See fig. 11 for a practical example of manhole cover penetration.

SB will save money at the shipyard when the ship is built. The reason for this is there will be no need of multiple penetrations into the bilge water settling tank as traditional skimming methods call for. Only one penetration in order to skim off the free oil with SB is needed.

2.3.2 Welding of bracket to beam or ceiling inside the tank

It is recommended for new buildings to simply weld the provided bracket, Fig. 3, directly on to a beam or inside the tank top on to the ceiling in a suitable location where SB is planned to be installed. The provided bracket is designed to fit together with the Cardan type fastening device. The bracket contains of a stainless steel flat bar welded on to a black steel flat bar with a special welding method granting maximum strength and corrosion properties. Thanks to this arrangement a normal welding rod can be used to attach the black steel flat bar base to the beam or ceiling inside the tank. Be careful so no welding slag is soiling the stainless steel fastening bracket when welding the black steel base to the ceiling of the tank.

Remember that SB will be rotation locked in a certain position according to the cut out groove in the guide rod hence the suction hose will be in a certain direction as well. A good rule of thumb is to have the suction hose penetration 1,5 meters from the centre of where the SB is attached in the ceiling of the tank. In this way the bend on the suction hose will be very soft and little force will affect the SB.

2.3.3 Fitting the SB to the guide rod

The Cardan type fastening device is preassembled to the guide rod in our factory. Fit the Cardan type fastening device to the welded bracket inside the tank with the provided stainless steel screw. Cut the guide rod if necessary to have the correct height inside the tank. It is recommended to

do this work outside the tank. Then enter the tank and attach the Cardan type fastening device to the fastening bracket. Now you have the guide rod hanging freely and it is then easy to slip on the SB on to the guide rod and fit the end screw in the end of the guide rod. The end screw is fitted, on each side of the guide rod, with two Nitrile rubber circular elements in order to dampen the possible hits of the SB if the tank is almost empty, Fig. 6. This is however never likely to happen in a high tank. Remember to position the guide rod or SB in such a way that the fitting for suction hose (part number 5) is towards the direction of the hose penetration of the tank.

2.3.4 Planning of evacuation hose

Check the fit of the hose to the 50mm black steel suction pipe inside the tank that it is exact to slip on. The hose is recommended to be fitted like a U-shape. This means that the hose is attached to the SB almost in a vertical position and then is hanging down to be attached about two meters lower down to the evacuation pipe at the same vertical position. This means the 50mm black steel pipe must have a soft 90° angle towards the bottom of the tank.

Attach the suction hose to the SB using the provided stainless steel hose clamp. Use mounting paste to fit the hose. It is recommended to fit the hose and the hose clamp to the SB in the workshop where good working conditions are provided, at least outside the tank. Do not tighten the hose clamp finally until inside the tank and care has been taken that there are no tensions in the hose. Remember to fit the hose in such a way that the natural coiling form is utilized as much as possible. Make sure the hose is attached securely. In this way the suction hose will affect the SB movements as little as possible. Fitting the hose correctly is essential to the result SB is going to provide. The hose will be even softer, lighter and more flexible in operation when the temperature is higher. In this case the hose of five meters (5m) is most of the time just right and no cutting of hose is necessary.

2.3.5 Slipping the SB with the attached hose on to the hanging guide rod inside the tank

When all of the above explained has been carried out it is just to go inside the tank and slip the SB on to the hanging guide rod. It is good to be two persons when this job is performed. One person can then lift up the SB and the other person can fit the end screw with the damping rubber material. Do not tighten the screw too hard so the groove in the guide rod will be reduced. Then attach the other end of the suction hose to the 50 mm metal pipe with the other provided stainless steel hose clamp. This metal pipe should be about two meters lower down than the normal working level inside the tank, in order to be able to drain out the oil by gravity.

2.4 Testing the movements of the hanging SB

To test the SB simply lift it up and down and around by hand and feel that it slides easily on the guide rod. Check that the suction hose is following up and down nicely. When the SB is not touched at all, it should be hanging vertically down. The SB will be naturally lubricated so there is no need for additional lubrication. Make sure that it is enough hose so the SB can move freely up, down and around. Excess hose length is not a good

idea so make sure it is enough but not too much. Always strive to keep the suction line as short as possible for more effective suction. When the SB is moved up and down in an empty tank, and the suction hose is attached, the weight of the hose can be felt. When SB is in operation and the tank is filled with water and there is oil in the hose the weight of the hose is almost zero.

2.5 Incinerator installation

2.5.1 Incinerator waste oil handling and water separation tanks

If you are in the process of planning a new building and your task is to solve the sludge oil handling to the incinerator, SB is something you may want to consider. By installing a SB in the double bottom sludge oil tank there will be no need for expensive sludge water separation tank units. These are normally sold by the incinerator manufacturer and are expensive and will become surplus when you have a SB in the sludge tank. These units are often installed close to the incinerator and is said to separate out the water and heat up the oil. Since the oil pumped up from the double bottom sludge oil tank with SB is having a very low water content these separation tanks are just unnecessary and very expensive. The only tank needed is for heating the oil, a so called incinerator day tank. Some incinerator manufacturers even call for "dual water separation tanks".

Your ship will save a lot of money and space by installing a SB in the double bottom and have the separation there at the source, instead of pumping water around to settle and drain out again.

2.5.2 Sludge separator installation

It has been proven that no sludge oil separator is necessary in order to burn sludge oil that has been pumped with the SB. In other words, there is no need to have a sludge separator running in order to burn sludge. This saves a lot of money, spares and work hours for ship owners.

Since SB is taking suction from the top of the tank where the lightest oils are, the quality of the oil will also be the best. The oil will not be water whipped and contains very little sediment.

Some ship owners have found out that their existing sludge oil separators actually work if their suction is connected to the SB. It is a well known problem that the sludge separators with traditional bottom suction does not work as designed. It is simply too much water. SB can change this!

3 EXISTING SHIPS IN OPERATION

3.1 General

We recommend planning the installation for after the tank has been cleaned. There is no need for welding inside the tank in order to install the SB. It will be secured to a beam inside the tank by a clamp, Fig. 8 and Fig. 9, made by the crew onboard. A part from making a clamp where the provided bracket is welded on to, the same installation recommendations applies as for a new building. One important factor is that existing ships already know about the problems different areas and systems have. New buildings rarely have any problems at the time but they will come. This is why we believe existing ships are very important to care for and that is also where SB was tested out. There is a need to be better in handling sludge oil and bilge water.

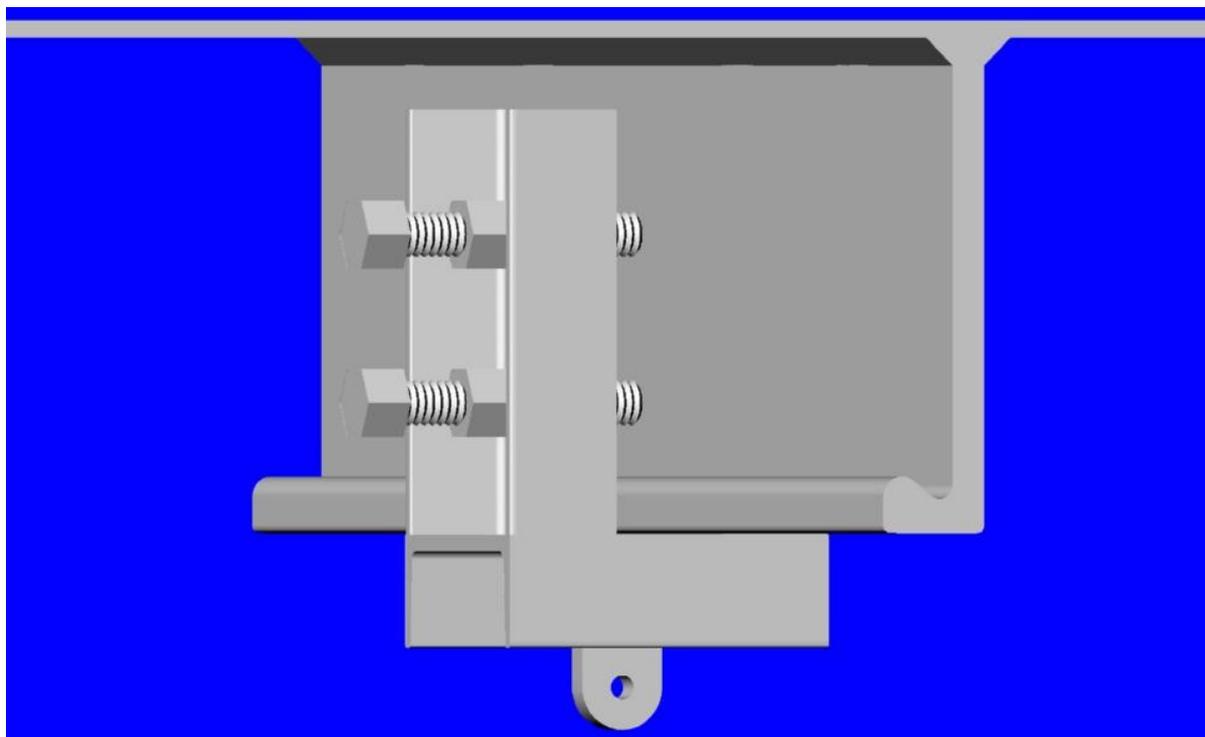


Fig. 8: Clamp, when welding is not possible.

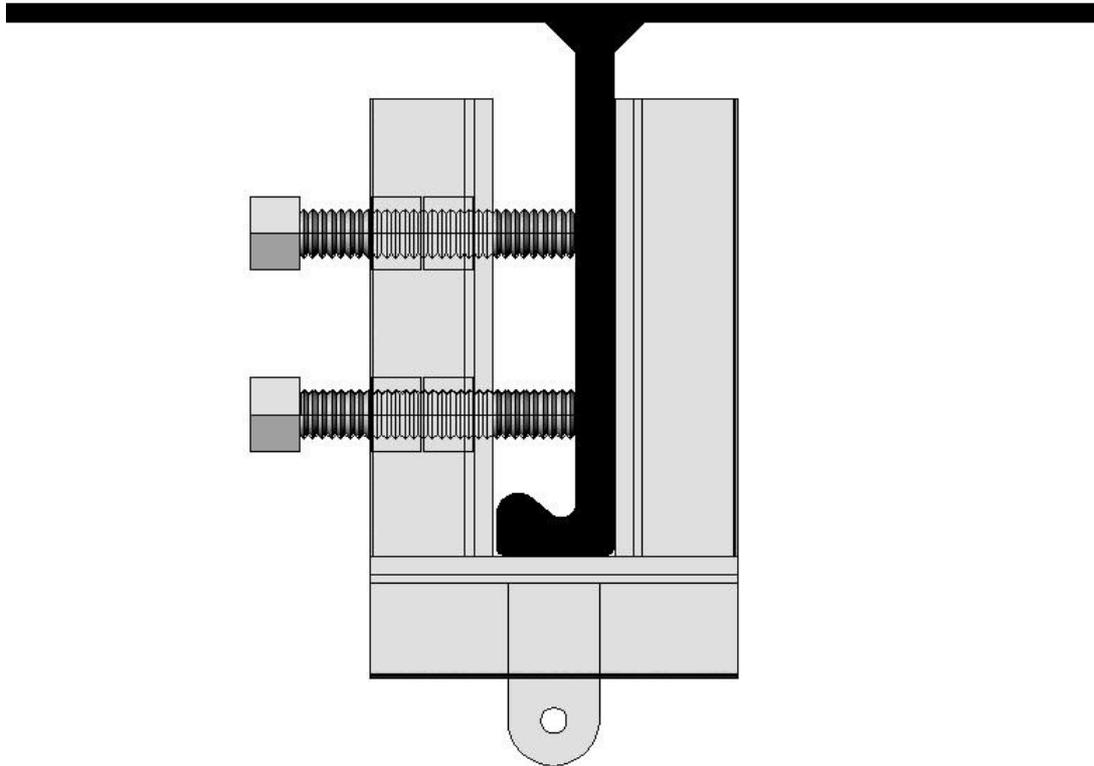


Fig. 9: Clamp.

When the tank is opened for cleaning the first thing to do is to go inside the tank and plan and measure where the SB is going to be placed. It is generally recommended to put the SB in the middle of the tank and if the tank is consisting of several compartments, in the middle one, or where most of the sludge oil will accumulate. Avoid installing SB underneath where water or oil enters the tank. This is to avoid directly hitting or soiling the SB causing unnecessary weight increase. The oil will not settle very well in such a place in any case.

It is also best to use existing penetrations to the tank but if that is not possible penetration can be made through the manhole, Fig. 10. This can be done without approval from classification societies as long as a shut-off valve is installed after the penetration outside the tank.

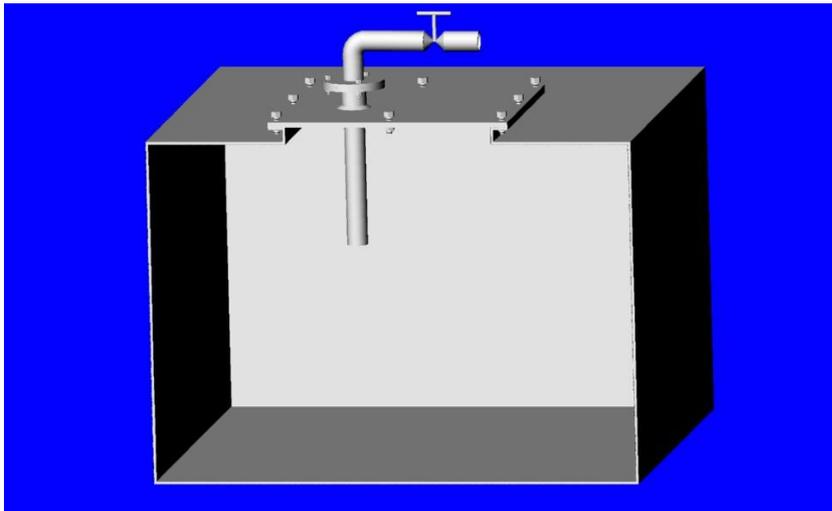


Fig. 10: Penetration through a manhole covers to a double bottom tank.



Fig. 11: Penetration through a manhole covers to a high tank.

3.2 Sludge tank in double bottom

It is recommended for existing ships that have had the sludge tank in operation to fasten the SB installation by means of a clamp, Fig.8 , Fig. 9 that is made by the crew onboard. It is recommended to weld the provided bracket on to the clamp and in this way fasten the Cardan type fastening device and the guide rod. The bracket contains of a stainless steel flat bar welded on to a black steel flat bar with a special welding method granting maximum strength. Thanks to this arrangement a normal welding rod can be used to attach the black steel flat bar base to the beam or ceiling inside the tank. Be careful so no welding slag is soiling the stainless steel fastening bracket when welding the black steel base to the ceiling of the tank.

The clamp is recommended to be made of a U-beam of normal black steel. It has shown unnecessary to use stainless steel for the clamps. Depending on how big the beam is going to be clamped to, different dimensions can be used. Generally, a 100 x 40 mm U-beam is suggested and will firmly secure a SB installation. The U-beam is to be welded together in such a

way that the flat sides are to be in towards the beam. Good engineering practices can be used here. The locking screws that are used can be made of stainless steel M20 – 100 mm. It is good to have these big screws since it can be hard sometimes to screw inside a dark and oily tank. It is also easier to weld the nuts onto the U-beam the bigger they are. Four Pcs of nuts will be needed, two to be welded on to the U-beam and two to be working as lock nuts on the screws.

Remember that SB will be rotation locked in a certain position according to the cut out groove in the guide rod hence the suction hose will be in a certain direction as well. A good rule of thumb is to have the suction hose penetration 1,5 meters from the centre of where the SB is attached in the ceiling of the tank. In this way the bend on the suction hose will be very soft and little force will affect the SB. See Fig. 5.

After the clamp has been manufactured and fitted the same instructions can be followed under the NEW BUILDING section: 2.1.2 – 2.3.2.

3.3 Bilge water tank in double bottom

3.3.1 Installation of the SB in the bilge water double bottom tank

It is exactly the same as 3.2 Sludge tank in double bottom. Follow the instructions there and read further down in this section regarding the pump installation.

3.3.2 Suction pump for SB in a double bottom bilge water holding tank

It is strongly recommended to have a dedicated 1 inch or 1,5 inch diaphragm pump or as they are also called membrane pump in order to have higher redundancy in case something would happen to the existing bilge water pump. The membrane pump will need service air, 7 bar. Use two inch suction pipes all the way from the SB to the pump, and connect to the pump with a reducer. It will make your pumping very effective. In addition to this it is recommended, since it is oil that is skimmed off, to have dedicated piping as well in order to not contaminate the bilge water piping system with pure sludge oil. Usually it is not necessary to have so much new pipes made since the SB can be connected to the existing sludge oil piping system.

3.4 Bilge water settling tank “high tank” SB installation

3.4.1 Installing a SB inside a bilge water settling tank, 2 or 3- stages

SB will skim off a layer of free oil that will otherwise always be inside the tank and contaminate the water and make it harder to process in the bilge water separator. By installing SB you will make sure the skimming effect will be at the correct place. When the level fluctuates inside the tank fixed installations like funnels and penetrations at different levels will not work as well as SB. SB will always stay at the immediate surface following the level and the motions of the ship.

If it is a tank with several stages like 2- or 3- stages it is recommended to install the SB in the first stage or in the stage where most of the oil will be accumulated. In a tank like this the level will be almost constant and SB will always be quite high up in the tank.

Since it is a high tank there will not be any need of a pump. The oil can be drained out by gravity. It is recommended to have a distance of about two (2) meters between the designed working level inside the tank and where the oil is drained out. Usually the oil is drained out to the sludge oil tank. The oil is drained out by a normal two inch ball

valve. The size of the piping is recommended to be two inch on the entire pipeline from the SB to the ball valve. If the size can not be achieved easily with existing piping inside the tank good engineering practices can be used and lower dimensions have to due. In this case the hose of five meters (5m) is most of the time just right and no cutting of hose is necessary.

4 OPERATION

4.1 Daily operation of the SBS in a sludge tank

The Sludge Buoy (SB) with suction hose needs to be filled with water the very first time it is taken into operation. This is depending on that the suction hose most probably is filled with air. Fill water via the sample valve or install a special priming valve. This operation is normally just needed once, however if the Sludge Buoy is sucked dry this procedure might need to be repeated. Be sure therefore to not empty the tank that much that the SB will always be emptied in order not to have to fill water each time. The amount of water to fill up the system is 10 litres approximately.

All ships are different and the operation pattern will vary among different ships. Usually it is enough to operate the SB three to four times per week if it is installed inside a double bottom sludge oil tank. SB is then started and is in operation as long as there is a rich sample of sludge oil coming out from the sample valve, Fig. 12. It is recommended to have the sample

valve somewhere near the pressure side of the pump. Try to place the sample valve about five meters after the pump so the sample is representative of what the pump is delivering. Switch off the pump when the sample is getting thinner and water can be seen coming out from the sample valve.



Fig. 12: Sample valve.

Depending on the layout of the tank and temperature of the oil it might take a few hours until the free oil has travelled inside the tank from one compartment to another. It might therefore be good to pump for one hour and then switch off the pump, go and have lunch, and then pump again

for an hour. In this way most of the free oil will be skimmed off the surface if there are many different compartments. Experience will tell which way that is most effective and the operator will soon realize that.

4.2 Daily operations of the SBS in a bilge water settling tank high tank

A good working procedure is to skim the free oil off the bilge water settling tank as often as possible. In reality the motorman can pass twice per watch to check if oil is present. Surely a routine is soon established and very little time is needed to evacuate the free oil from the tank.

After the installation is finished do not forget to properly label, Fig. 13, the SB installation, otherwise there is a risk of forgetting it since it almost takes no space at all in the engine room.

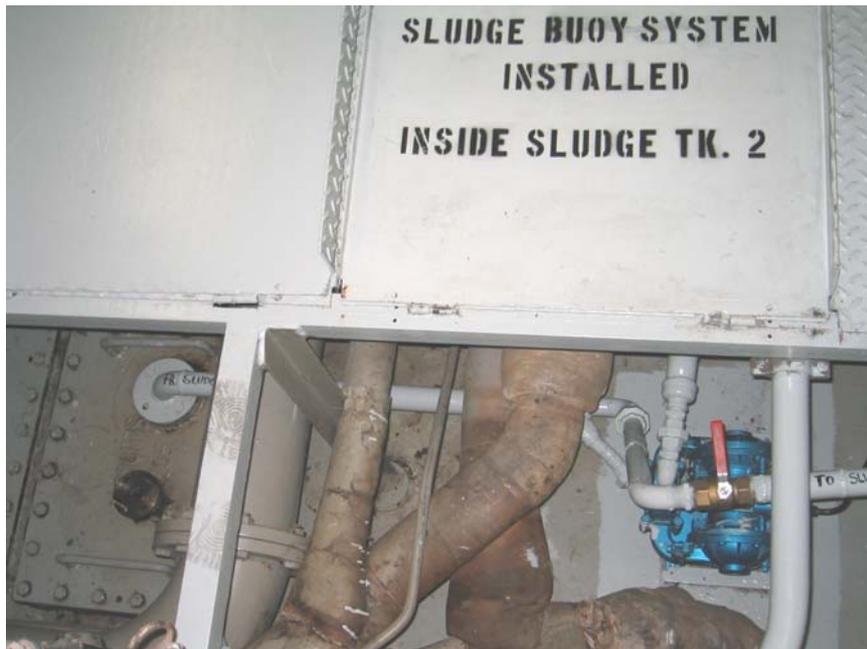


Fig. 13: Label the Sludge Buoy installation properly.

5 MAINTENANCE

5.1 Update SB in your maintenance system

SB is in no need of maintenance that is beyond regular tank cleaning. When the tank is opened annually or semi annually the only need for maintenance is cleaning. Make sure the SB is sliding freely up and down and around. Check the suction hose for wear and screws and fittings are still properly secured. Change the suction hose if it has signs of wear. Put some lubrication oil on the Cardan type fastening device if necessary. In case a new suction hose is needed it is of outmost importance that the new hose is very flexible. If you are not sure where to get one, contact us and we will help you. All parts can be purchased separately.

It is recommended that this maintenance instruction is written in to the maintenance system like STAR, AMOS or similar.

6 CONTACT

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