

Geotech Sipper Pump & Skimmer Assembly

Installation and Operation Manual

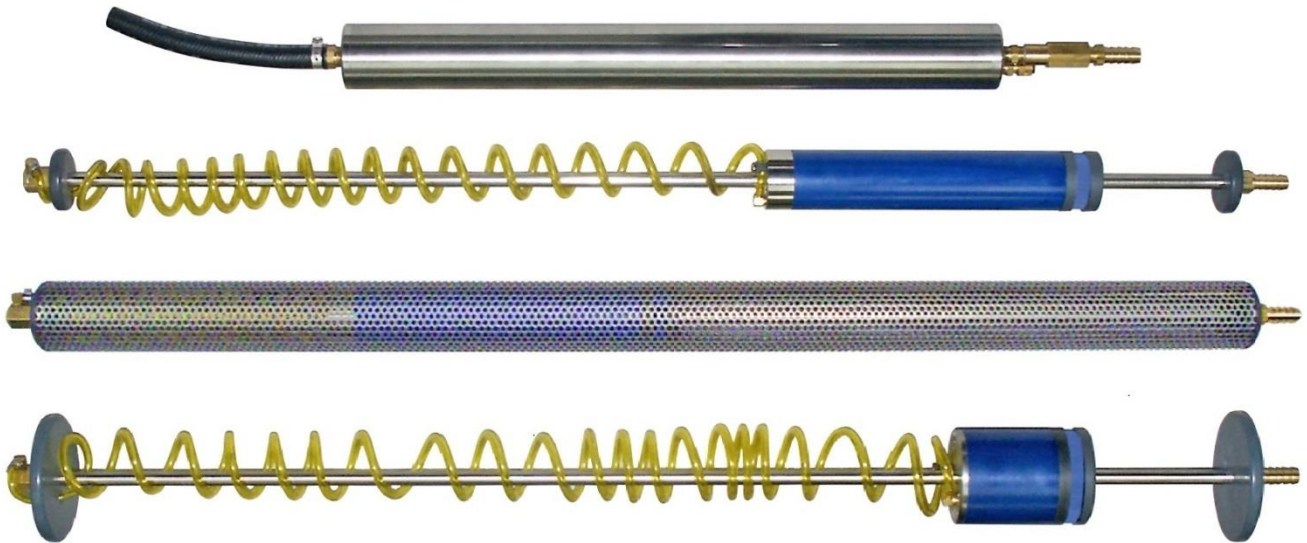


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DOCUMENTATION CONVENTIONS

This document uses the following conventions to present information:



WARNING

An exclamation point icon indicates a **WARNING** of a situation or condition that could lead to personal injury or death. You should not proceed until you read and thoroughly understand the **WARNING** message.



CAUTION

A raised hand icon indicates **CAUTION** information that relates to a situation or condition that could lead to equipment malfunction or damage. You should not proceed until you read and thoroughly understand the **CAUTION** message.



NOTE

A note icon indicates **NOTE** information. Notes provide additional or supplementary information about an activity or concept.

Section 1: System Description

Function and Theory

The Geotech Pump and Skimmer assembly (Skimmer), when used in conjunction with the Geotech Sipper Controller, is designed to efficiently collect free-floating hydrocarbons in 2" (5 cm) or larger recovery wells. The system consists of a Solar or AC Sipper controller, a stainless steel pump assembly, an attached Skimmer with floating intake cartridge (or buoy), and a Tankfull probe.

The Sipper controller regulates, or cycles, the pump and Skimmer assembly with three timer settings (vacuum, pressure, and delay) which vary the cycle time and recovery rate of the Skimmer. See the Geotech Sipper User Manual for more details on Sipper operation.

Timed vacuum and pressure is applied to the pump to draw product from the Skimmer attachment, which is then discharged into an optional above ground recovery tank. The standard Skimmer features a unique product intake assembly that incorporates both a density float and an oleophilic/hydrophobic membrane that differentiates between floating hydrocarbons and water.

The intake assembly follows the water table fluctuations and places the screen at the water/product interface, skimming LNAPL (light, non-aqueous phase liquid) down to a sheen within the range of the float travel. As the system cycles, product is drawn through the intake screen and is transferred to the pump through a coiled hose and the Skimmer's transfer shaft. Optional heavy oil and high temperature Skimmers, using intake buoys, are also available to recover product in 4" (10 cm) diameter and larger wells.

The stainless steel pump is primarily an air driven reservoir with upper and lower check valves. The pump is designed to provide a two-phase pumping cycle. During the first phase, or pump intake phase, vacuum is applied to the pump. This vacuum closes the top discharge check valve while opening the bottom, intake check valve, causing product to be drawn through the Skimmer intake screen and into the pump reservoir.

During the second phase, or pump discharge phase, the same air line is pressurized with air. This action closes the bottom, intake check valve on the pump and opens the discharge check valve, forcing the recovered product from the pump reservoir, into the product discharge line, up to the surface, and eventually into a recovery tank. See Figure 1-2 for an example of a typical stainless steel pump cycle.

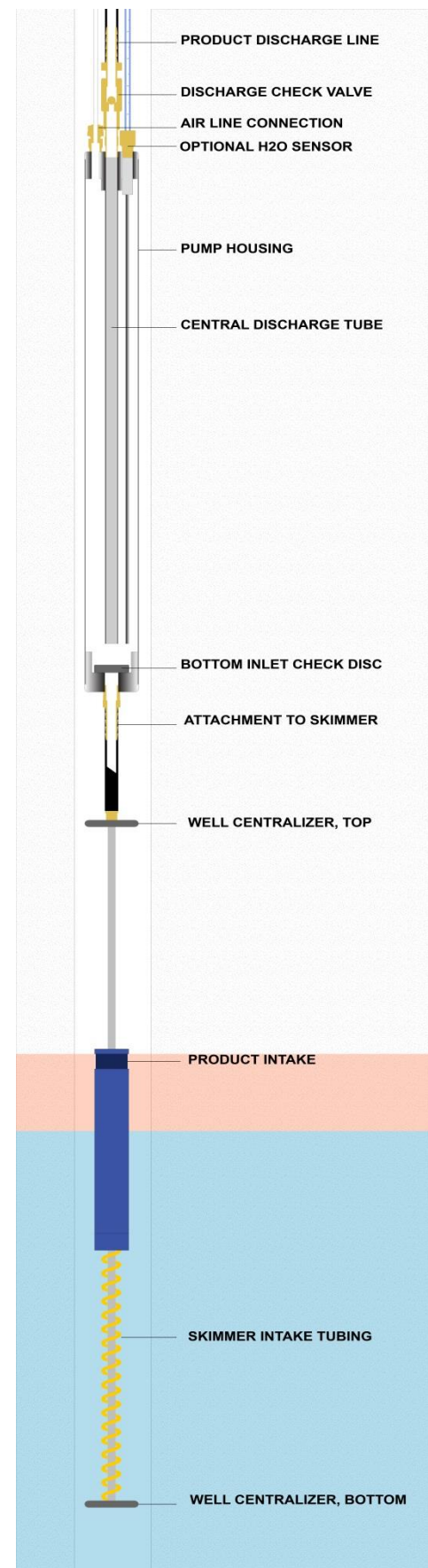


Figure 1-1: Example of a downwell pump assembly

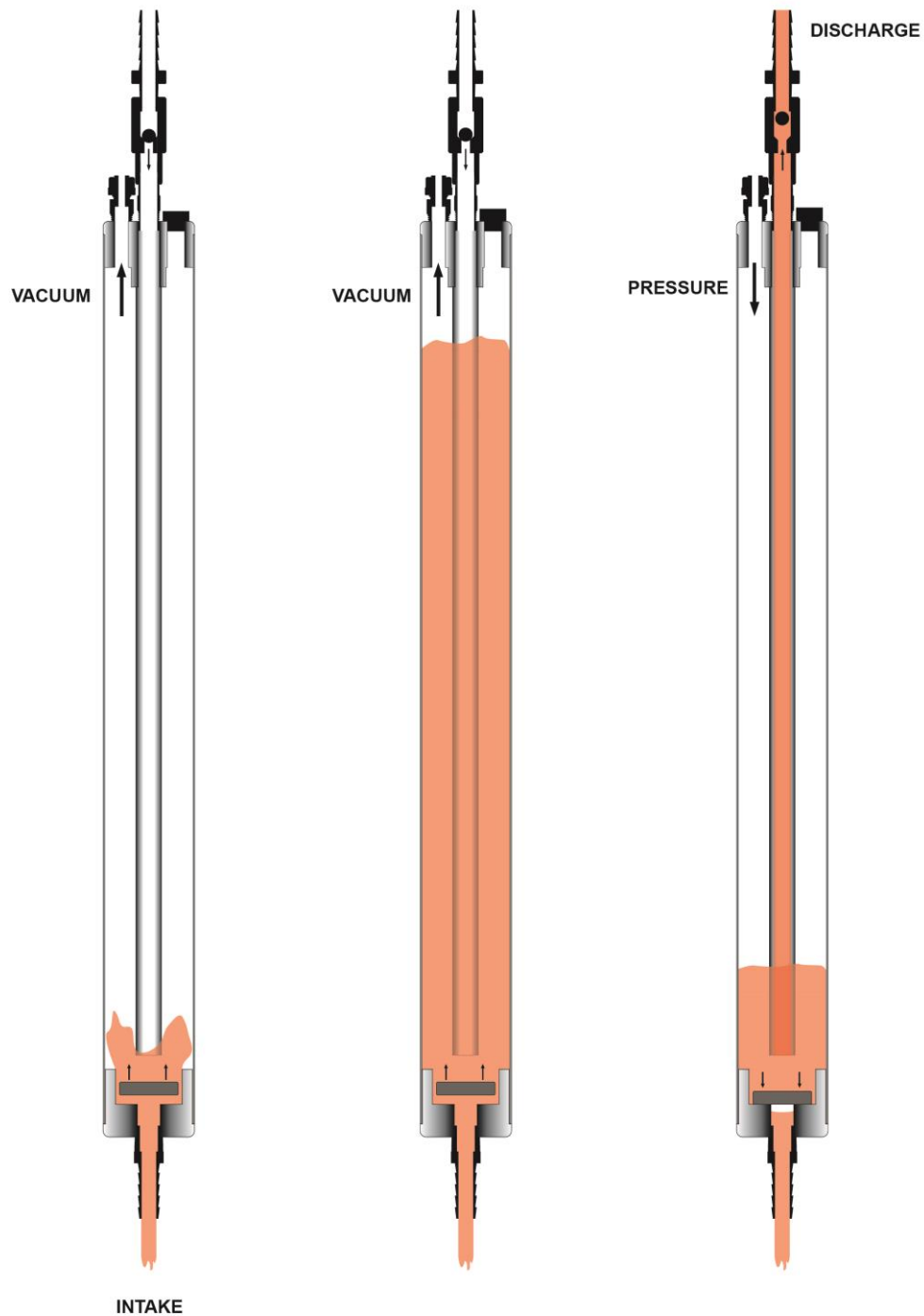


Figure 1-2: Typical Product Recovery Cycle in Stainless Steel pump

The stainless steel pump can be equipped with an optional Water (H₂O) Sensor, which minimizes water intake by immediately purging the pump when water is present in the stainless steel housing. See Section 3: System Operation for more details.

Specific Gravity and Viscosity Limitations of Skimmer

The specific gravity of the product to be recovered with a Skimmer must be less than 1.0 and its viscosity less than 50 SSU for use with the “light” oil membrane, and 400 SSU for use with the “heavy” oil membrane cartridge. Geotech application engineers may be consulted for product recovery operations with viscosities outside that range. See Geotech Manual, “Hydrocarbon Viscosity Test Kit” for more information on choosing the correct intake membrane.

This type of membrane technology is designed to be used in wells with free product of at least 1/8” (3 mm) thickness.

The presence of surfactants or detergents in the product requires careful application. Surfactants and detergents may interfere with oil/water interface surface tension. This may interfere with pumping product layers of less than 1/8” as the oil water interface may become mixed. *The system will continue to operate and pump oil/water mixtures. When confronted with these contaminants please consult Geotech.

**If using water sensor in stainless steep pump, the sensor may need to be temporarily removed/disconnected to allow oil/water mix to be pumped.*

Other Applications for Stainless Steel Pump

The typical configuration of Stainless Steel Pump with attached Skimmer is implemented when floating hydrocarbons with density less than 1, or water, are pumped. Without the Skimmer, the stainless steel pump can be used either as a stand alone total fluids pump or a DNAPL recovery pump.

DNAPL or Dense Non Aqueous Liquids, are liquids that have a specific gravity greater than 1, or water. Sources of DNAPL contamination are typically chlorinated solvents leaked from industrial processing and storage. DNAPL is particularly difficult to find in free phase in ground water aquifers. Typically when free phase DNAPL is found it is at a solid rock barrier or a very low permeability material, such as tight clay. In either case the recharge rate of the free phase DNAPL layer at the bottom of a recovery well will typically be slow.

The stainless steel pump, when equipped with a Water Sensor and a screened intake is an effective way of pumping DNAPL. The water sensor will reduce the amount of non-DNAPL (water) pumped, and the screen intake will ensure proper operation of the pump’s check valves in a potentially gritting environment. See Figure 1-3 for a DNAPL pumping configuration.

The system can be easily changed in the field from DNAPL recovery to a total fluid system by simply disconnecting the water sensing system.

Follow Skimmer attachment guidelines when connecting the DNAPL intake, see Section 2: System Installation.

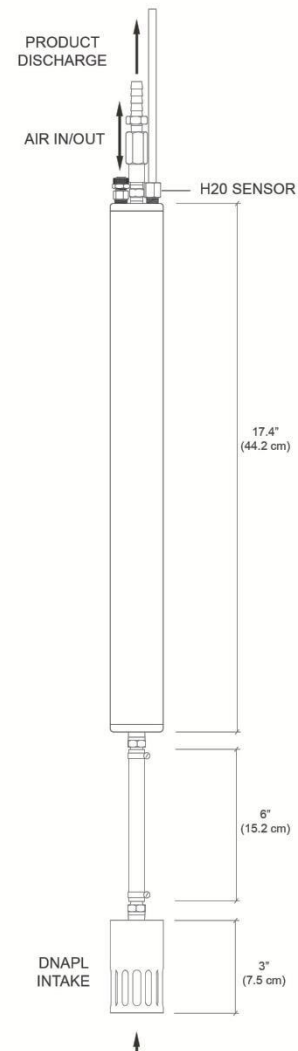


Figure 1-3: DNAPL recovery configuration for Stainless Steel Pump

System Components

Stainless Steel Pump Assembly

An air operated stainless steel pump is attached to the upper portion of the Skimmer. The pump consists of a stainless steel outer housing with top and bottom check valves.

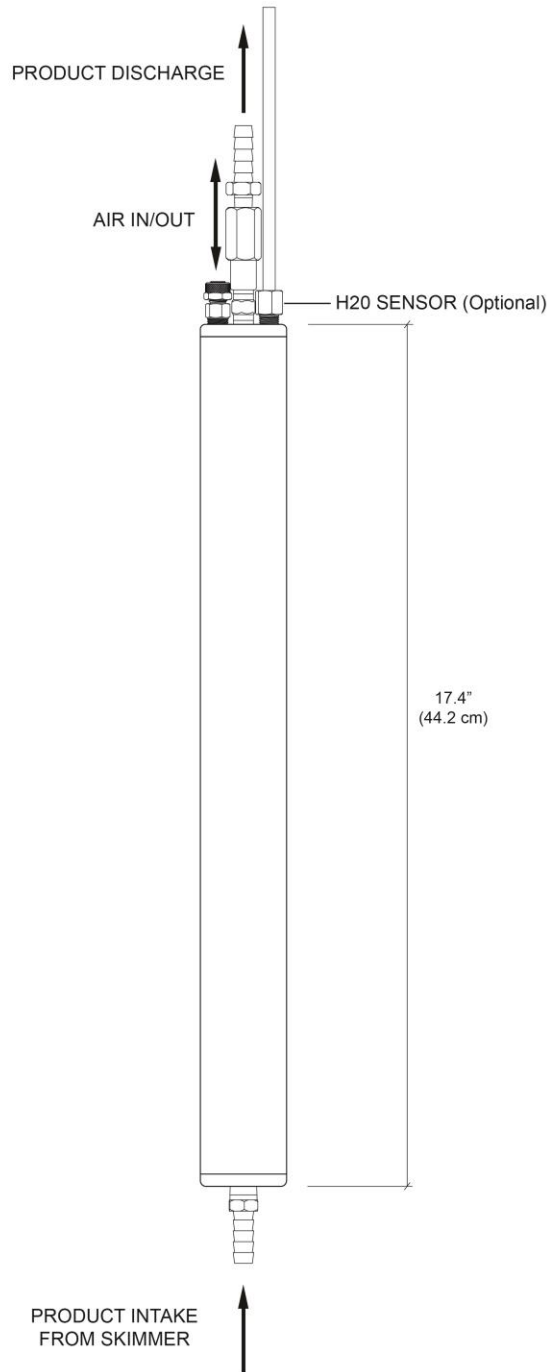


Figure 1-4: Stainless Steel Pump Assembly

Skimmer Attachments

A standard Skimmer attachment (when connected to the stainless steel pump assembly) is designed for use in either 2" (5 cm) diameter wells or 4" (10 cm) diameter and larger wells. Figure 1-5 shows an example of the two most common Geotech Skimmers. These Skimmers come with a standard 100 mesh intake screen. A 60 mesh intake screen is also available for use with higher viscosity fluids. See Geotech Manual "Hydrocarbon Viscosity Test Kit" for more information on choosing the correct intake cartridge.

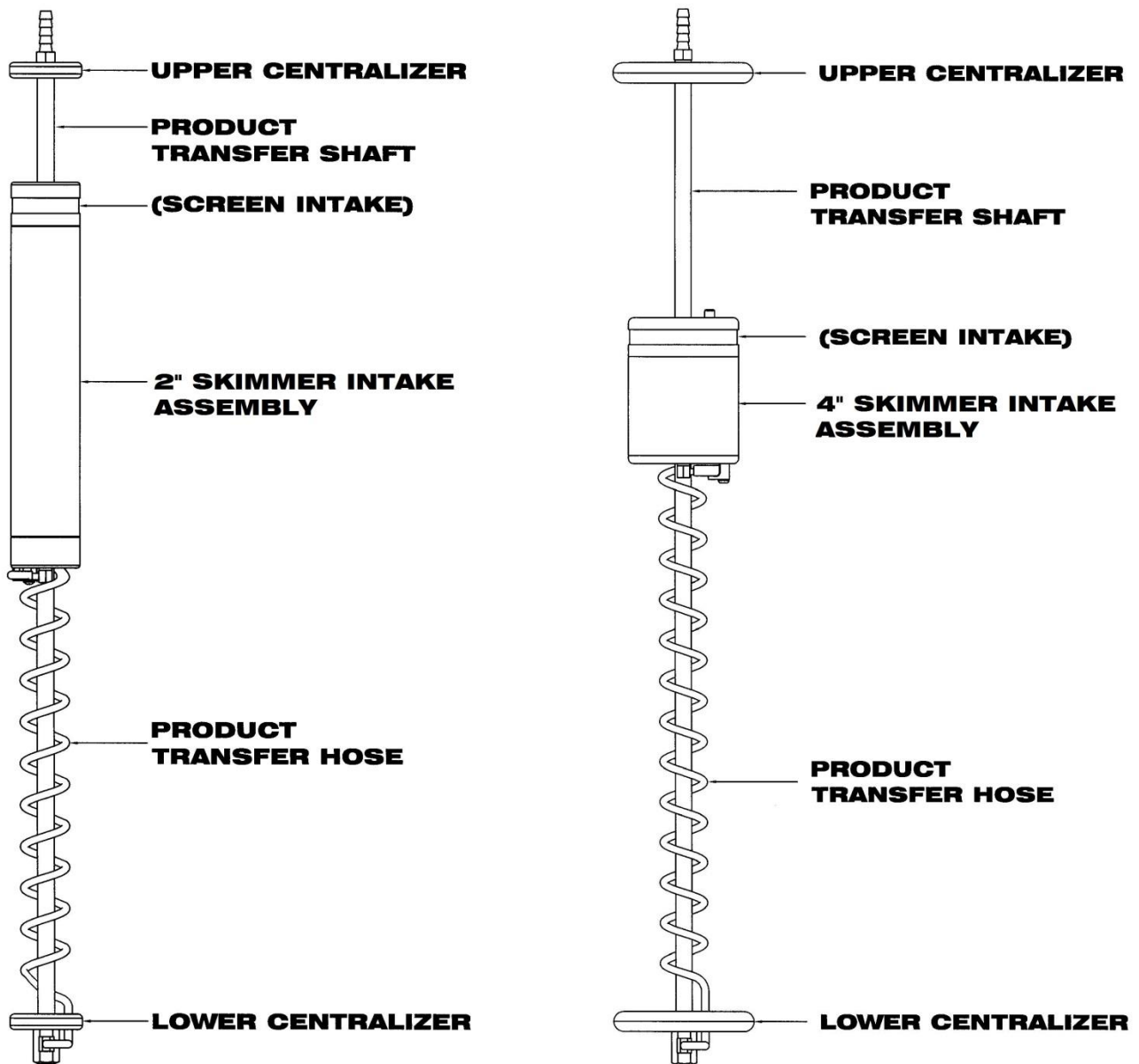


Figure 1-5: Standard 2" and 4" Skimmer Attachments

The Skimmer assembly is connected to the bottom of the stainless steel pump with a 6" piece of durable, fuel grade hose. The Skimmer consists of a product intake float, a coiled product transfer hose, and a transfer shaft. Well centralizers are placed at the top and bottom of the Skimmer shaft to protect the intake float and to allow unobstructed travel within the well. Standard Skimmers can provide 12" (30 cm) to 24" (61 cm) of intake travel. Geotech can provide up to 5' (1.5 m) of travel (4" Skimmers only) on a custom order basis.



A Skimmer assembly will not draw water unless the intake cartridge is forcibly submerged, surfactants are present, or when the "conditioning" of the intake screen has been removed. See Section 4 for information on reconditioning the intake

Heavy Oil Skimmer Attachment

The optional heavy oil Skimmer attachment is designed to recover a range of fluids from gasoline to gear oil, skimming the product down to .01 feet (3 mm) in 4" (10 cm) diameter and larger wells. This option is best suited when the viscosity of the hydrocarbon is greater than the capability of the membrane screen technology (screen can no longer pass the hydrocarbon fluid).

The heavy oil Skimmer consists of a polypropylene intake buoy, a coiled product transfer hose, and a transfer shaft with well centralizers placed at the top and bottom. The intake buoy on the heavy oil Skimmer is designed to "ride" at the oil water interface and has a travel range of 24" (61 cm).

This assembly is ideal for use where the oil/water interface is broken down by detergents or is emulsified.

The intake buoy can also be "fine-tuned" by adjusting the intake fitting on the top of the buoy. Turning the fitting clockwise will lower the intake fitting relative to the product/water interface. Turning the fitting counter-clockwise will raise the intake fitting away from the interface. Figure 1-6 is an example of a heavy oil Skimmer assembly.

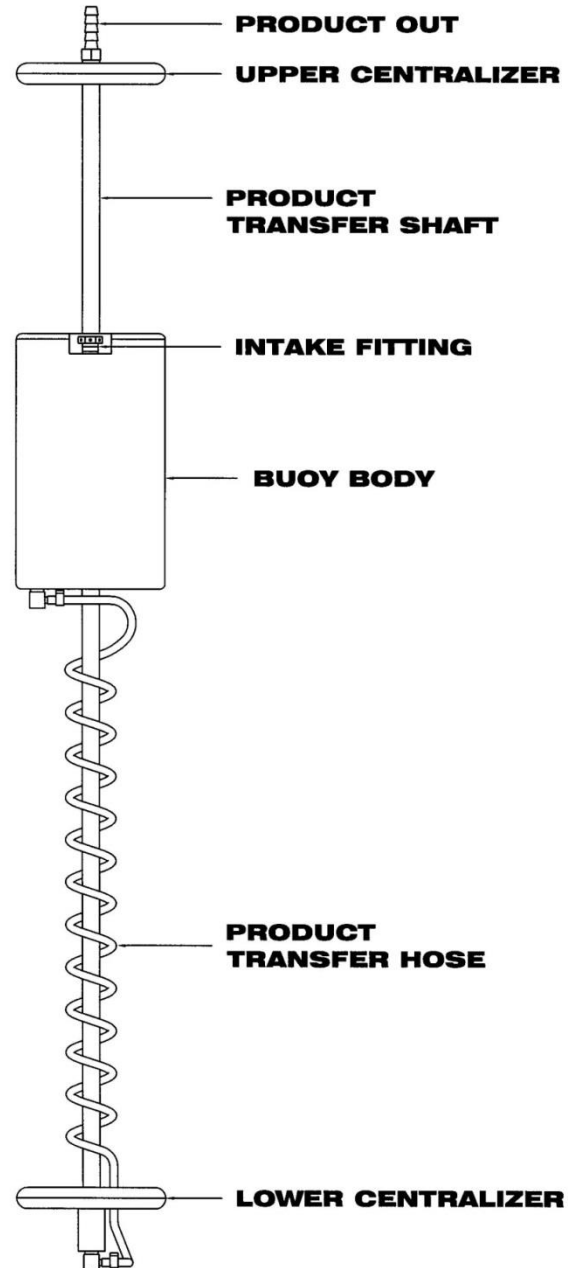


Figure 1-6: Heavy Oil Skimmer Attachment (optional)

High Temperature, Heavy Oil/Aggressive Chemical Skimmer Attachment

For high temperature well environments, Geotech provides a high temperature, heavy oil (HTHO) Skimmer that incorporates an ultra high molecular weight (UHMW) polyethylene intake buoy. The HTHO Skimmer has stainless steel end caps placed at the top and bottom of a stainless steel screen to keep out debris. The intake buoy of the HTHO Skimmer has a travel range of 26" (66 cm).

Like the heavy oil Skimmer, the intake buoy can be "fine tuned" by adjusting the intake fitting on the top of the buoy. Turning the fitting clockwise will lower the intake fitting relative to the product/water interface. Turning the fitting counter-clockwise will raise the intake fitting away from the interface. Figure 1-7 is an example of the high temperature, heavy oil Skimmer.

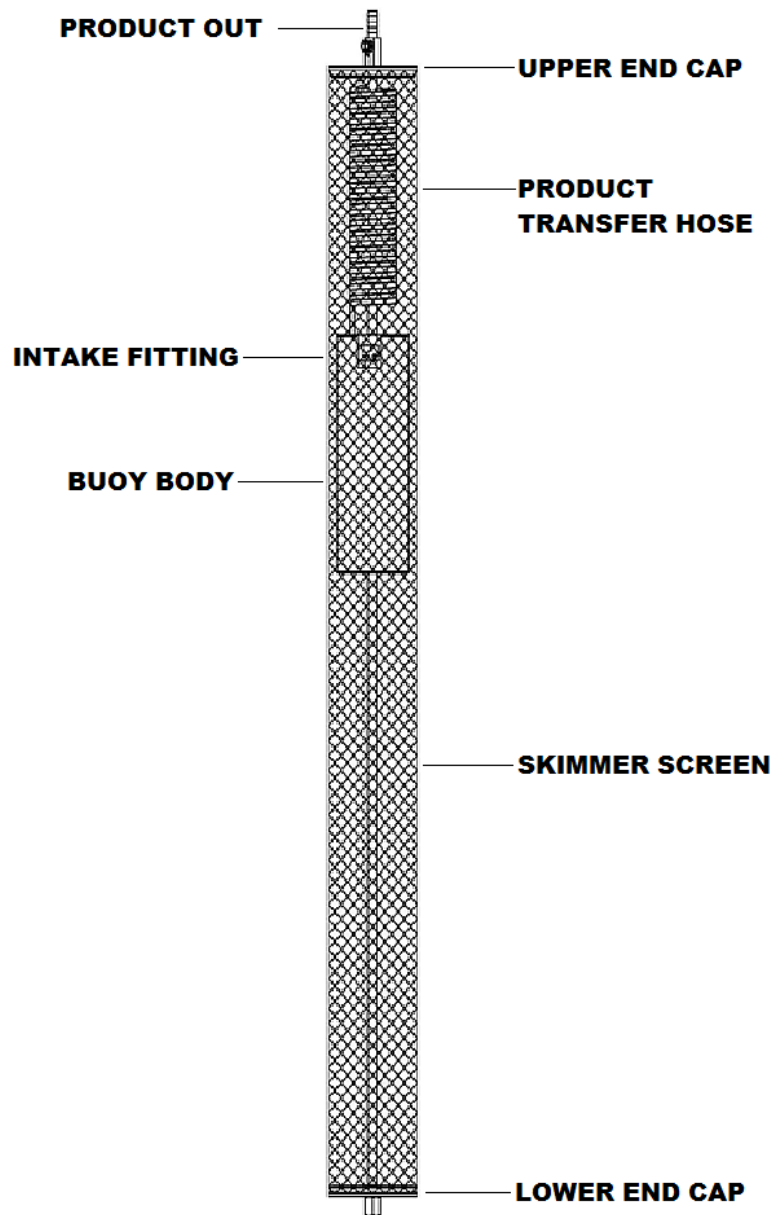


Figure 1-7: High Temp, Heavy Oil Skimmer Attachment (optional)

Section 2: System Installation



Prior to installation, ensure that the intake screen is “conditioned” (or primed, with diesel fuel or a similar hydrocarbon.) The optimum fluid would be to use the same downwell hydrocarbon to be recovered. Use a soft, bristle brush to avoid damaging the screen intake.

Install well cap as per manufacturers guidelines.

Calculate the tubing lengths required to install the Skimmer. Normal tubing lengths are around 180' (55 m) in well depth, suggested maximum is around 500' (152 m) total system length. Longer systems can be accommodated if care is taken to protect tubing and account for longer cycle timers.

To calculate the amount of air line and discharge hose required to suspend the pump and Skimmer in the well, first determine the following lengths:

- Measure the static water depth in the well using a Geotech Interface Probe.
- Measure the distance between the wellhead and the Sipper controller.
- Measure the distance between the wellhead and the product recovery tank.



See Figure 2-1 for a view of the Skimmer in relation to the well cap and static water level.

Do not make any cuts to the tubing until all measurements, between the controller and wellhead, and from the wellhead to recovery tank have been made.

If need be, attach the Skimmer or intake to the bottom of the stainless steel pump using the 6” (15 cm) piece of rubber fuel hose and hose clamps provided.

Ensure both ends of the hose are placed as far as they can go on each hose barb and then tighten the hose clamps in place.

Check connection by gently tugging at each hosebarb. The tubing should be secure.

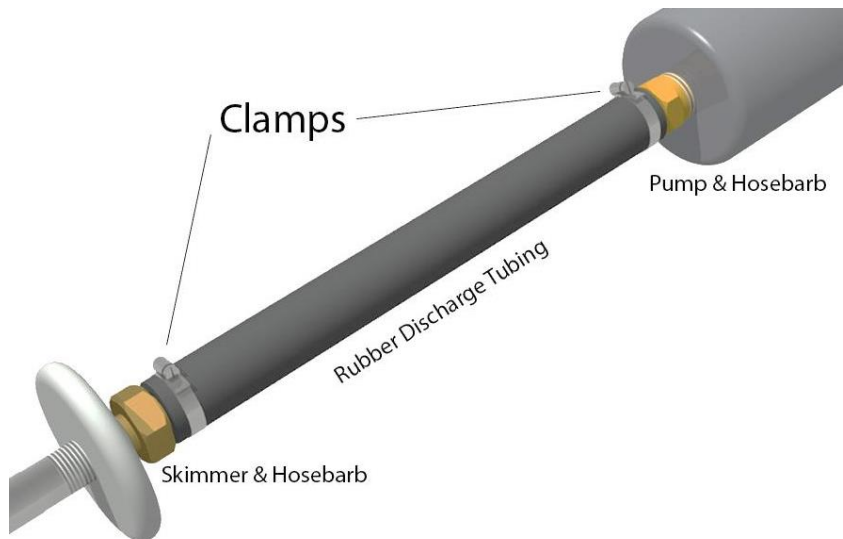


Figure 2-1: Connection between stainless steel pump and intake



This hose connection is important. An old or brittle piece of fuel hose or a loose hose clamp between the pump and Skimmer could eventually cause the Skimmer to detach and fall into the well. Always inspect this connection prior to use.

Pull the measured lengths of air line and discharge hose through the fittings on the well cap (when applicable). Fully tighten the compression fittings around the hose and tubing at the well cap. The well cap is designed to suspend the pump and Skimmer assembly by the sturdier discharge hose.

For system over 50' in well depth, a safety cable is highly suggested.

Attach the air line and discharge hose to the pump and Skimmer assembly with hose clamps. After attaching the needed lengths of tubing, place the pump and Skimmer assembly into the well so that the midpoint of the intake float travel lies on the static water level measured.

Connect the air line from the pump to the Sipper controller. Connect the product discharge hose from the pump to the product recovery tank. Ensure that both lines are kept level and that there are no kinks or sags in the lines. When possible, enclose the lines within a secondary pipe or conduit to protect them from damage.

Install the Tankfull probe in the recovery tank and connect the probe connector to the Sipper controller.

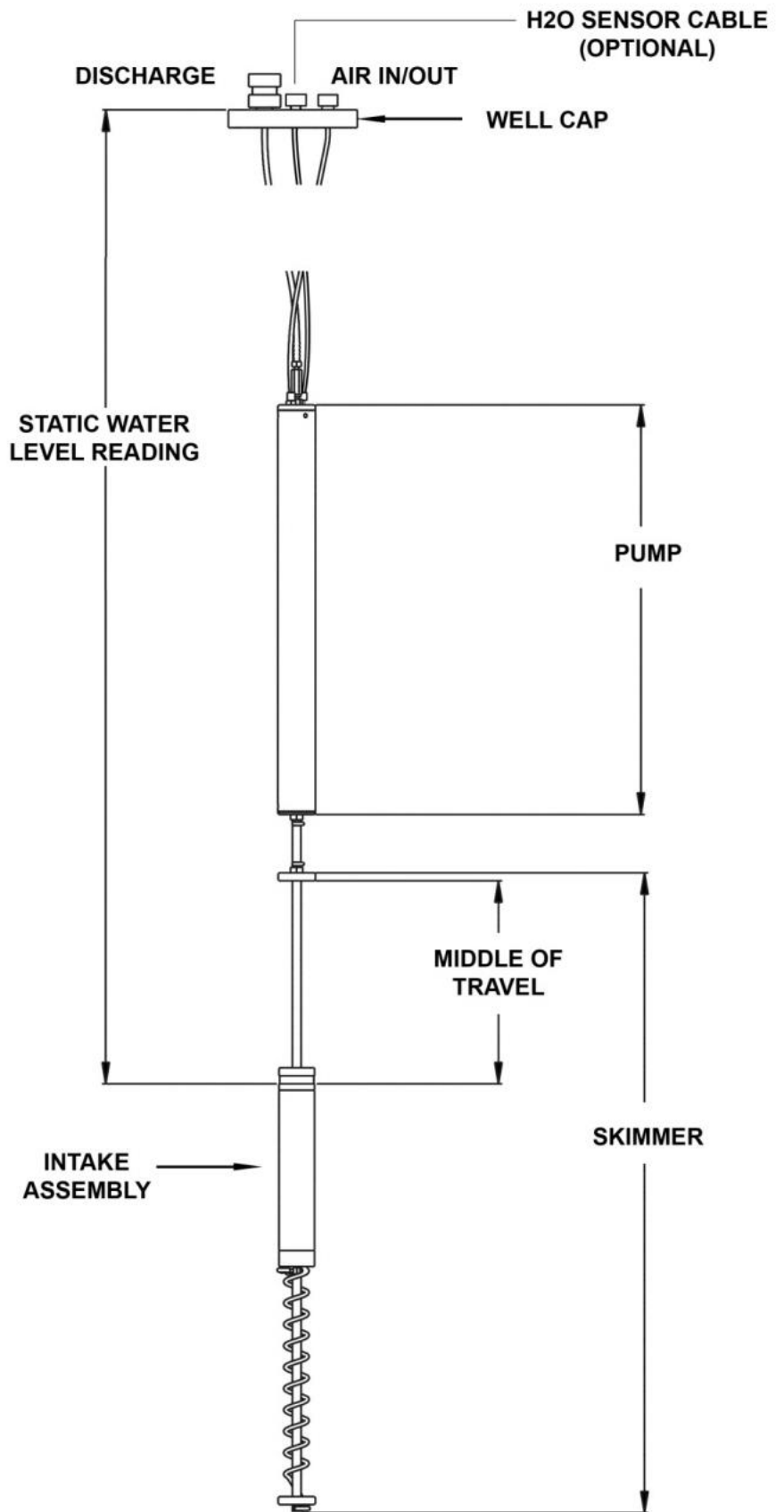


Figure 2-2: Pump and Skimmer Assembly with generalized Well Cap

Section 3: System Operation

The stainless steel pump assembly with Skimmer is designed to operate with the Geotech Sipper Controller. After all connections have been made, set the vacuum, pressure, and delay times for the pump and allow the unit to run. Make any needed adjustments to the timing before leaving the system. Read the Geotech Sipper User Manual (P/N 16550176) in conjunction with this manual to establish the operational requirements of your Sipper system.

The stainless steel pump can be equipped with an optional H₂O sensor. Figure 3-1 is an example of a typical stainless steel pump cycle when water is sensed and then purged:

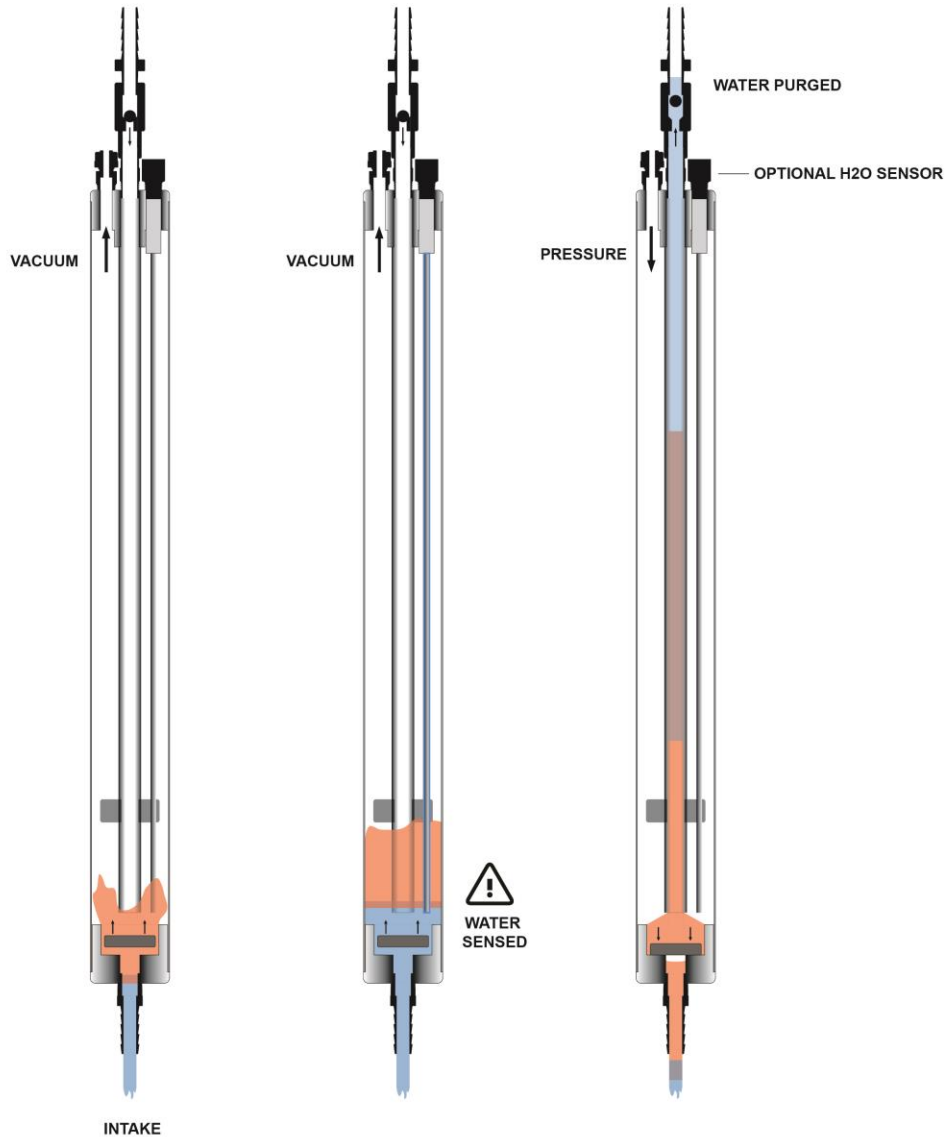


Figure 3-1: Active H₂O Sensor Cycle in Stainless Steel Pump

The amount of water purged/pumped is minimal, <10mL, relative to the stainless steel pump's internal volume, which is around 200mL.

Section 4: System Maintenance



Always ensure all hose and tubing fittings at the pump and between the pump and Skimmer are tight prior to deploying the unit into the well.

Monthly (or per Site Visit, at minimum) Maintenance

- Pull the pump and Skimmer from the well.
- Inspect all tubing for cracks, kinks and damage. Replace any old and brittle tubing.
- Inspect the coiled tubing for physical damage or obstructions. Verify the intake assembly moves freely over its travel range.
- Inspect the float (buoy) and intake screen. Clean the intake screen and float using the method described in this section.
- Inspect the Skimmer assembly for signs of physical damage. Scrapes or dents in the screen intake may cause the Skimmer to take on water. If such damage is found, a new 2" or 4" intake assembly may be necessary.
- Clear away any debris collected in the well vault (or above ground casement).
- Measure the well and record product layer thickness and depth to water from top of well casing.
- Verify pump vacuum, pressure, and delay settings are adjusted for the recharge rate of the well.
- Place a pump positioning mark or zip tie on the discharge hose (usually black) even with the top of well casing.
- Re-deploy pump, aligning new depth to water mark on discharge hose with top of well casing.
- Check the Tankfull probe for proper operation.

Quarterly Maintenance

- Pull pump and Skimmer.
- Clean the well screen (site specific, primarily to clear bio growth and keep thick degraded product from impeding conductivity to the well at the product layer. Frequency to be determined by user.)
- Place float assembly in water to verify the screen stays out of the water at the top of the traverse range. If it does not, replace the coiled tubing and retest. If it still does not, replace the float assembly.

Yearly Maintenance

- Pull the pump and Skimmer from the well.
- Open pump and clean interior and parts with soapy water.
- Degrease the check disk and check ball seats. Spray with WD40 or kerosene.
- Clean and prime intake screen using the method described in this section.

Cleaning the Skimmer and Intake Screen

Standard 2" and 4" Skimmers will usually come with a float containing a 100 or 60 mesh intake screen. When required, gently clean the screen with WD40 or kerosene, using a soft, bristle brush, to remove emulsified product, bio growth or other debris. Take care to avoid damaging the screen intake. Rinse the product intake assembly with clean water and make sure it is completely dry before reconditioning the intake screen.

For heavy oil Skimmers, use warm soapy water first, followed by WD40 or kerosene to remove debris or bio growth from the buoy body, then rinse and let dry.

Using warm soapy water, clean all debris and bio growth from the Skimmer shaft and coiled tubing.

Conditioning the Skimmer Intake Screen

Prior to initial deployment, and after every cleaning, the intake screen must be conditioned (or primed) with diesel fuel or other similar hydrocarbon. Use a soft, bristle brush to saturate the screen portion of the intake thoroughly. The optimum fluid would be to use the downwell hydrocarbons being recovered. Take care to avoid damaging the screen intake.

Section 5: System Troubleshooting



Additional troubleshooting measures can be found in the Solar Sipper User Manual.

Problem:

The pump is only discharging water, not product.

Solutions:

The water level has risen above the travel range of the Skimmer.

- Pull the pump and Skimmer out of the well. Purge the water out of the intake and pump by allowing the system to cycle for several minutes, prime the intake cartridge screen, then reset the Sipper controller.

The pump position has slipped, or the pump was installed below the water level in the well.

- Prime the intake cartridge screen , re-position the pump and Skimmer, then reset the Sipper controller.

The intake assembly will not slide freely, or the coiled hose is tangled.

- Inspect the Skimmer assembly and repair as necessary.

Loose hose or tubing on fittings below intake level.

- Check all fitting connections.

Problem:

The pump discharges air only, no product.

Solutions:

Product has been removed.

- Recalculate and reduce the pumping rate at the Sipper controller.

The Product layer is below the bottom of the Skimmer's travel range.

- Adjust the position of the Skimmer assembly within the well and then reset the Sipper controller.

The Skimmer assembly has detached from the pump (due to a cut hose or loose hose clamp.)

- If the Skimmer assembly cannot be "fished" from the well then a new Skimmer will be needed.

Problem:

The pump cycles but does not discharge product.

Solutions:

One or both of the pump check valves are malfunctioning.

- Remove and clean pump assembly from particulates, or replace check valve components.

The viscosity of the product is too thick for the Skimmer.

- Contact Geotech to discuss other Skimmer options for the type of product in the well.

The intake screen is obstructed or the coiled hose is kinked.

- Verify that the intake is clean of debris and bio growth
- Check the condition of the coiled hose.

Problem:

The pump does not operate.

Solutions:

The product recovery tank is full.

- Empty the recovery tank, inspect the Tankfull probe float and then restart the Sipper controller.

The intake float switch is high.

- Drain the intake float switch assembly (on the side of the controller) and inspect all lines and solenoids for fluid vacuumed into the controller. Blow out all lines and parts, adjust vacuum timing and then restart the Sipper controller.

Problem:

Applicable if pump is equipped with optional H2O Sensor: pump is having to purge water with every cycle.

Solutions:

The skimmer is submerged in water.

- The product layer has been fully recovered or the water table has raised beyond the skimmer's travel capabilities. Reset the pump position so that the intake screen and top of the hydrocarbon layer is in the middle of the skimmer's travel distance.

Section 6: System Specifications

Application:	2" (5 cm) or larger recovery wells
Recovery Rate:	.2 gallons (.76 liters) per cycle
Maximum Depth	180 feet (54.9 m)
Maximum Pressure:	100 PSIG (6.9 bar)
Oil/Water Separation:	Oleophilic/hydrophobic mesh screen

Stainless Steel Pump

Size:	23.5"L x 1.75" OD (59.7 cm L x 4.5 cm OD)
Weight:	4.5 lbs. (2 kg)
Materials:	303 and 304 SS, flexible tubing, PVC, and Brass
Air Line:	.170" ID x .25" OD (Polyethylene)
Discharge Line:	.375" ID x .5" OD (Polyethylene or fuel grade Synthetic Rubber)

Stainless Steel Pump with H2O Sensor

Size:	23.5"L x 1.75" OD (59.7 cm L x 4.5 cm OD)
Weight:	5 lbs. (2 kg)
Materials:	303 and 304 SS, flexible tubing, PVC, and Brass
Air Line:	.170" ID x .25" OD (Polyethylene)
Discharge Line:	.375" ID x .5" OD (Polyethylene or fuel grade Synthetic Rubber)
H2O Sensor cable:	Polyurethane insulated cable (28AWG), Acetal Resin

2" Skimmer Assembly

Size:	35.5" L x 1.75" OD (90 cm L x 4.5 cm OD)
Weight:	1.75 lbs. (0.8 kg)
Materials:	304 SS, Polyethylene, PVC, Polypropylene, and Brass Fittings
Effective Travel:	12" (30.5 cm) Standard Travel
Operating Temperature:	32° to 100° F (0° to 38° C)

Minimum fluid level to activate Skimmer = 15" (38 cm)

4" Skimmer Assembly

Size:	35.5" L x 3.75" OD (90 cm L x 9.5 cm OD)
Weight:	2.25 lbs. (1 kg)
Materials:	304 SS, Polyethylene, PVC, Polypropylene, and Brass Fittings
Effective Travel:	24" (61 cm) Standard Travel, up to 5 feet (1.5 m) available
Operating Temperature:	32° to 100° F (0° to 38° C)

Minimum fluid level to activate Skimmer = 9" (23 cm)

4" Heavy Oil Skimmer Assembly

Size: 40" L x 3.75" OD (102 cm L x 9.5 cm OD)
Weight: 2.5 lbs. (1.1 kg)
Materials: 304 SS, PP, and Brass Fittings
Effective Travel: 24" (61 cm) Standard Travel
Operating Temperature: 32° to 100° F (0° to 38° C)

Minimum fluid level to activate Skimmer = 15" (38 cm)

4" High Temperature, Heavy Oil Skimmer Assembly

Size: 40" L x 3.75" OD (102 cm L x 9.5 cm OD)
Weight: 2.5 lbs. (1.1 kg)
Materials: 304 SS, HDPE, and Brass Fittings
Effective Travel: 24" (61 cm) Standard Travel
Operating Temperature: 32° to 212° F (0° to 100° C)

Minimum fluid level to activate Skimmer = 15" (38 cm)

Section 7: System Schematics

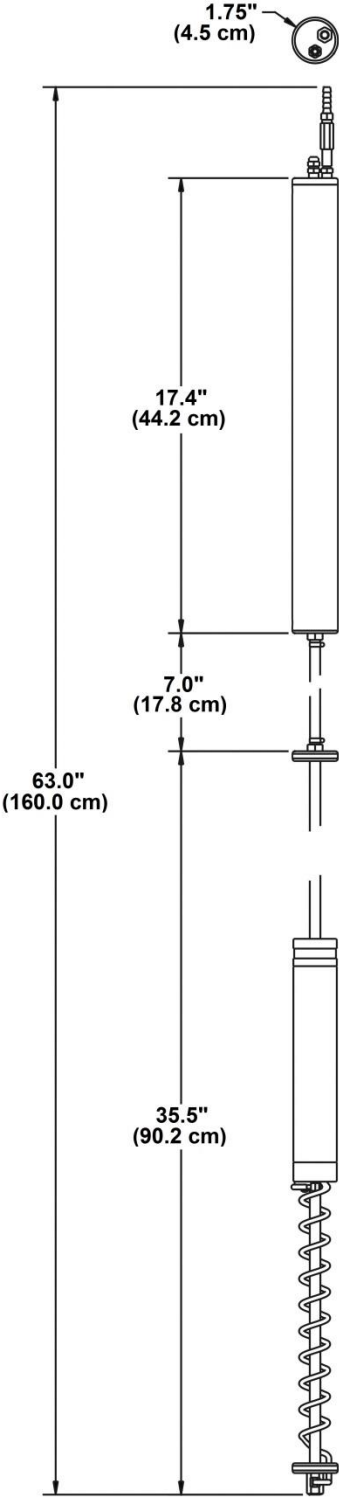
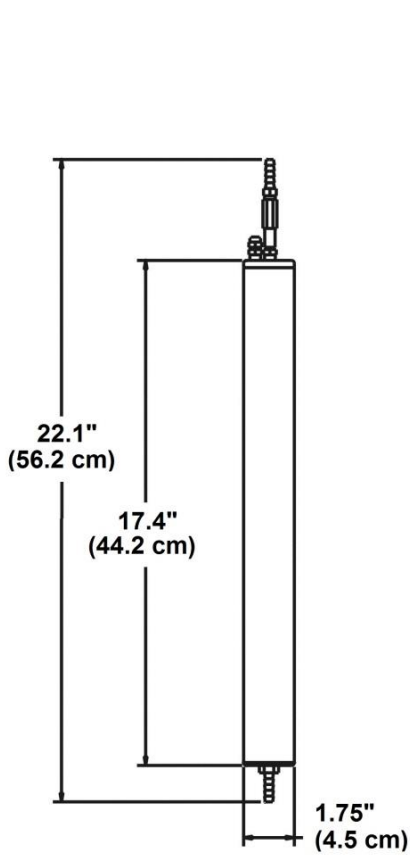
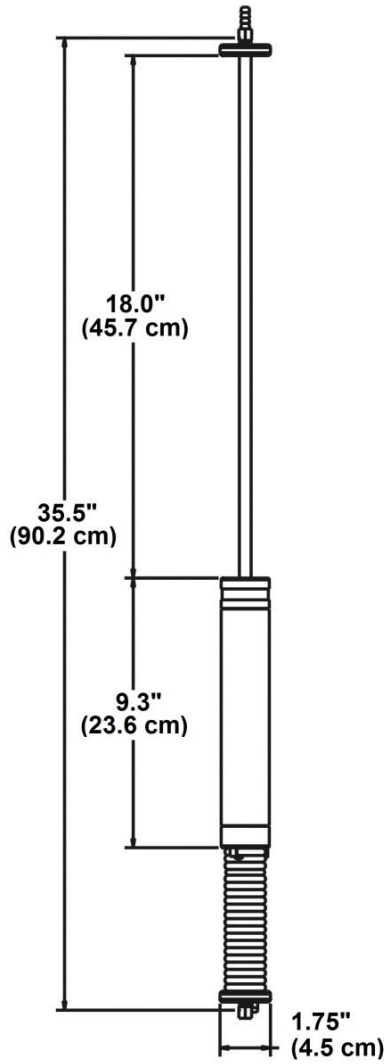


Figure 7-1: Stainless Steel Pump with Skimmer Dimensions

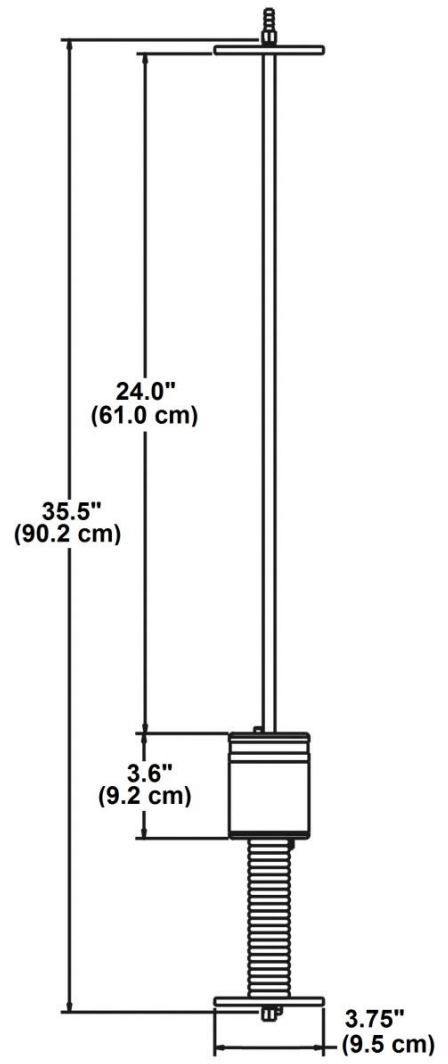


SIPPER PUMP ASSEMBLY

*Note:
Optional H2O Sensor
on Stainless Steel
Sipper Pump does
not affect overall
dimensions*



2" SKIMMER ASSEMBLY



4" SKIMMER ASSEMBLY

Figure 7-2 – Standard Pump and Skimmer Dimensions

Section 8: Parts and Accessories

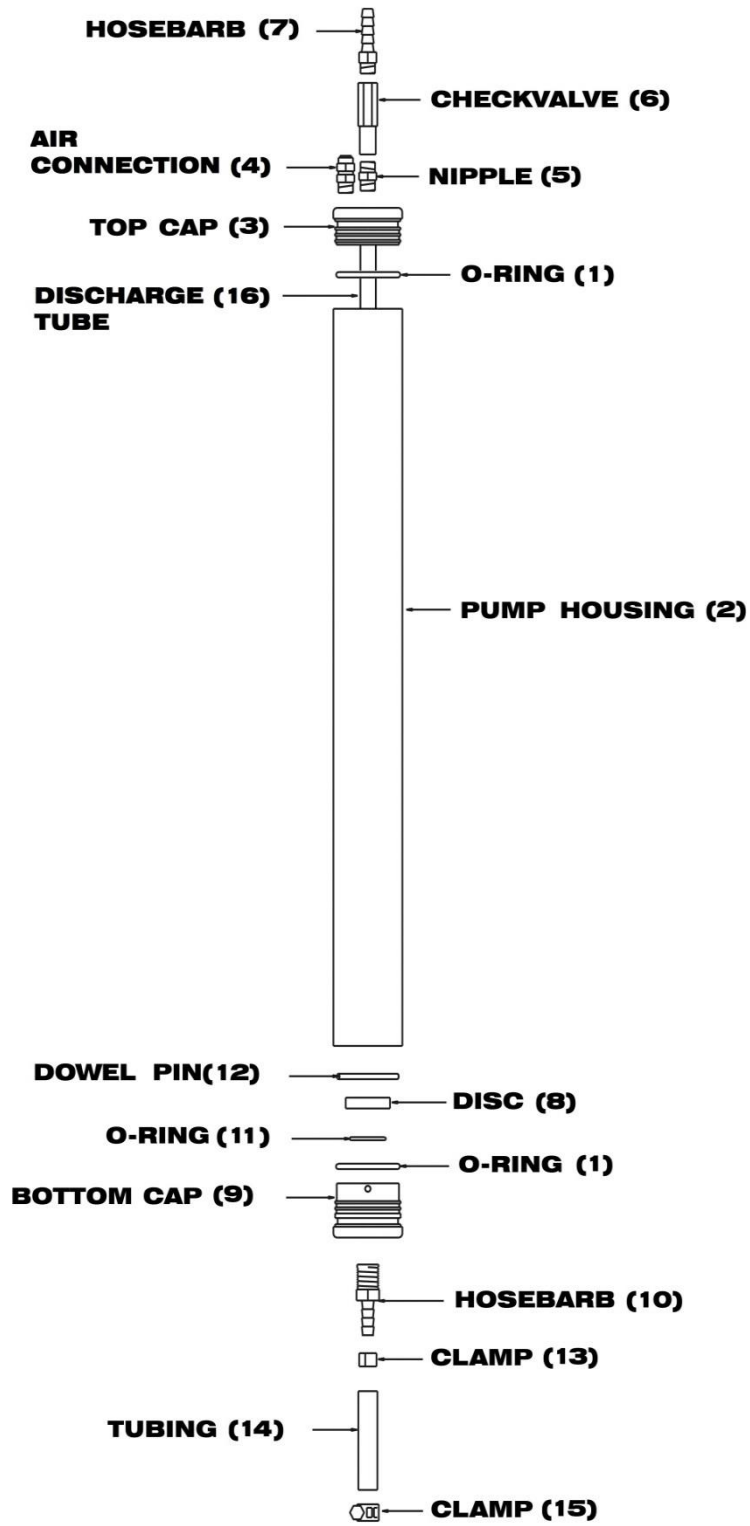


Figure 8-1: Stainless Steel Pump Assembly

Sipper Stainless Steel Pump Assembly (56600050)

Item #	Parts Description	Parts List
1	O-RING,VITON,#128	16600030
2	HOUSING,SS,PUMP,CRS/PRS	26600013
3	CAP, TOP, SS, CRS	26600019
4	TUBE,CONN,1/4X1/8MPT,POLYTITE PUMP	16600037
5	NIPPLE,BRS,HEX,1/8NPT	17500151
6	VALVE,CHECK,PRODUCT DISCHARGE CRS/PRS PUMP	26600157
7	HOSEBARB,BRS,3/8"X1/8MPT	16650310
8	DISC,PVC,CHECK	26600017
9	CAP,SS,BOTTOM,CRS/PRS	26600018
10	HOSEBARB,BRS,3/8"X1/4MPT	16650323
11	O-RING,VITON,#208	16600023
12	PIN,SS,DOWEL,CHK DISK CRS/PRS	26600162
13	CLAMP,SS,STEPLESS EAR,17MM	16600004
14	TUBING,RBR,3/8x5/8,FT PRODUCT DISHCARGE	16600019
15	CLAMP,SS6,WORM,7/32-5/8"	16600063
16	TUBE,INTERNAL,SIPPER PUMP	26600170

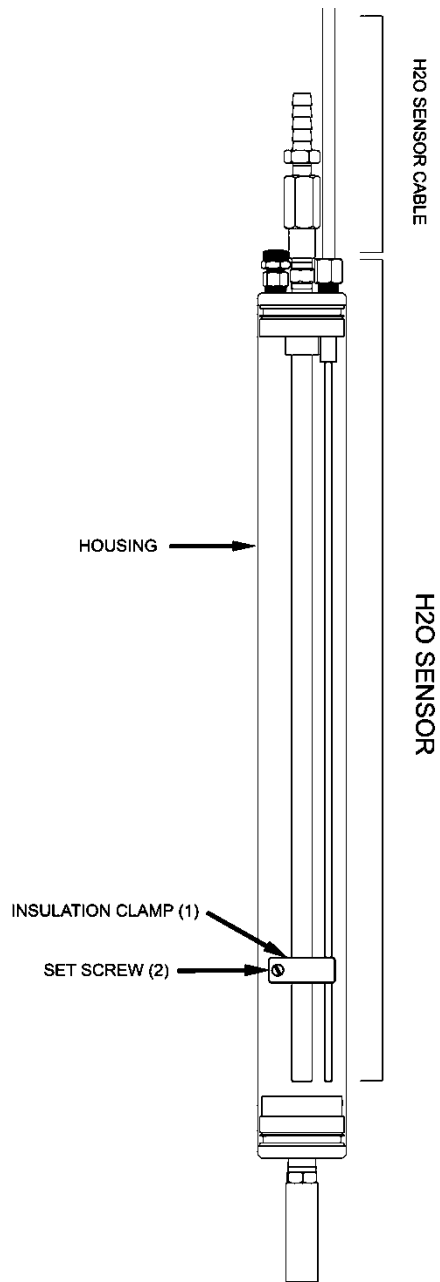


Figure 8-2: Stainless Steel Pump Assembly with optional H2O Sensor

Sipper Stainless Steel Pump with optional H2O Sensor Assembly* (56600059)

In addition to previously listed parts for Sipper Stainless Steel Pump Assembly (56600050):

- *SENSOR, H2O, REPLACEMENT 56600085
- CABLE, 28AWG, 8COND, URETH ORS418005
- CLAMP,INSULATOR,PRS, W/H2O SENSOR 26600270
- SCREW,SS6,6-32x.75",PNH PPF013012

*Requires specified cable length, maximum 500ft

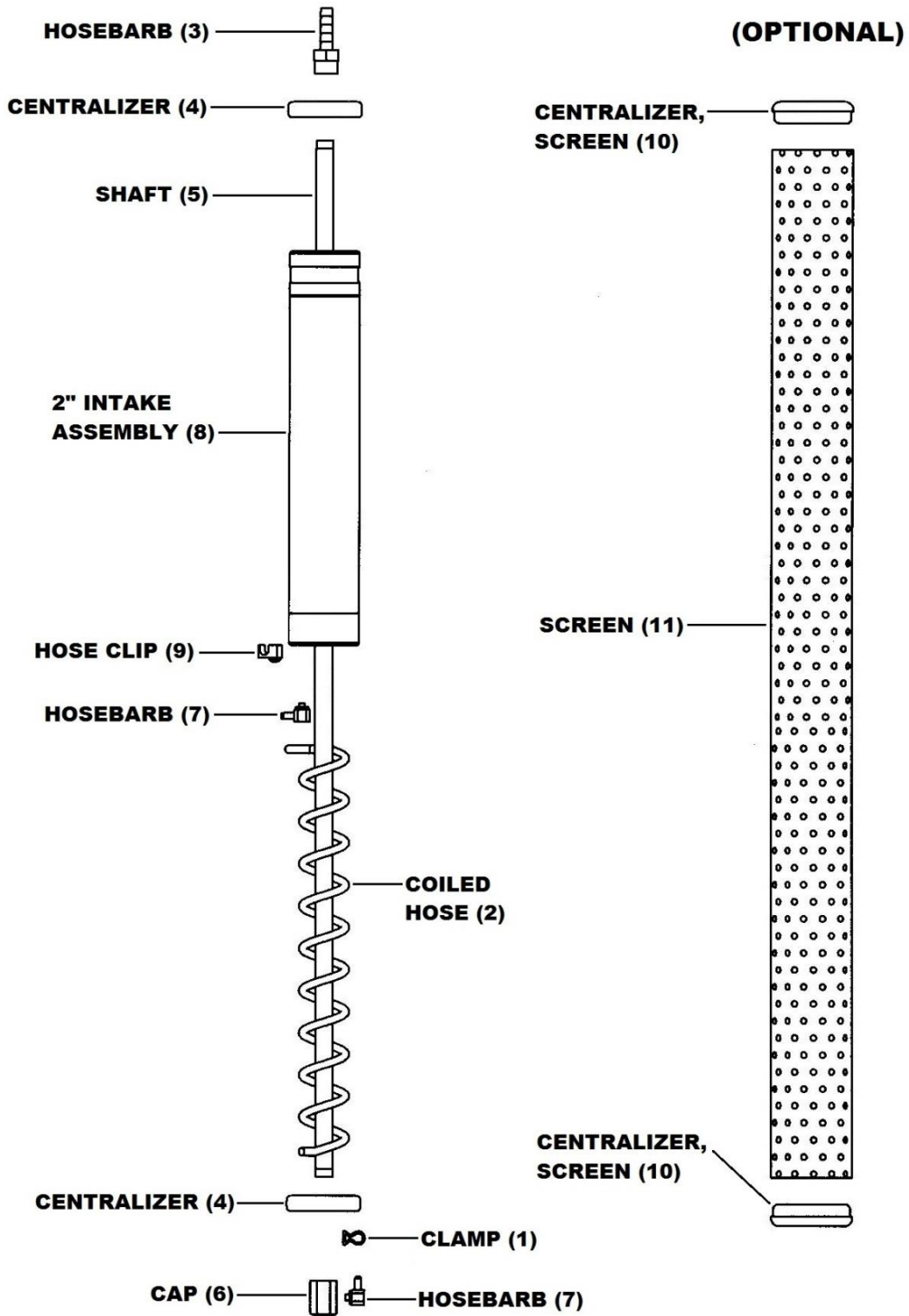


Figure 8-3: Standard 2" Skimmer Assembly

2" Skimmer Assembly – 100 mesh (56600003)

Item #	Parts Description	Parts List
1	CLAMP,SS,STEPLESS EAR,7MM	16600005
2	HOSE,COILED,PR2	26650304
3	HOSEBARB,BRS,3/8"X1/8FPT	16650308
4	CENTRALIZER,PVC,SKIMMER,2"	26650306
5	SHAFT,SS,SKIMMER,33.5",PRC	26600002
6	CAP,BRS,1/8FPTx10-32 90 DEG	16600064
7	HOSEBARB,BRS,1/8"X10-32,90DEG	17500149
8	ASSY,BUOY,SKIMMER,2"100MESH	56650309
9	HOSE CLIP,SKIMMER FLOAT	26650028

2" Skimmer Options

8	ASSY,BUOY,SKIMMER,2" 60 MESH	56650312
10	CENTRALIZER,PVC,SCREENED PR2	26600186
11	SCREEN,SS,1.88"ODX32.7" STRAIGHT WELD	26600188

Additional 2" Skimmers

	HOUSING,RECLAIMER,1.66,SS4,36"	56600064
	ASSY,SKIMMER,2",60 MESH	56600069
	ASSY,SKIMMER,2",60M,W/SCREEN	56600071

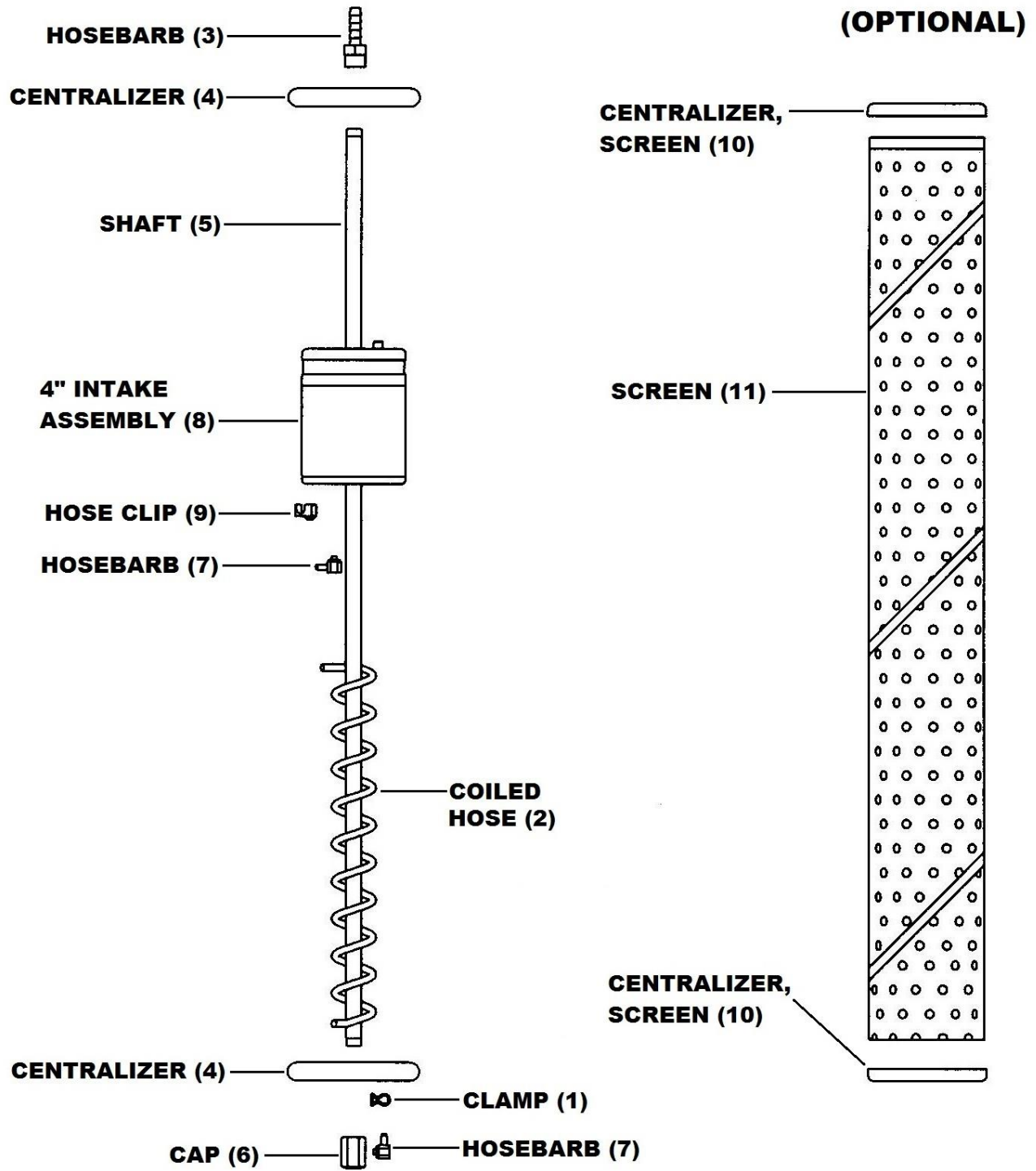


Figure 8-4: Standard 4" Skimmer Assembly

4" Skimmer Assembly – 100 mesh (56600004)

Item #	Parts Description	Parts List
1	CLAMP,SS,STEPLESS EAR,7MM	16600005
2	HOSE,COILED,PR4	16650312
3	HOSEBARB,BRS,3/8"X1/8FPT	16650308
4	CENTRALIZER,SKIMMER,PR4	16600048
5	SHAFT,SS,SKIMMER,33.5",PRC	26600002
6	CAP,BRS,1/8FPTx10-32 90 DEG	16600064
7	HOSEBARB,BRS,1/8"X10-32,90DEG	17500149
8	ASSY,BUOY,SKIMMER,4"100 MESH	56650310
9	HOSE CLIP,SKIMMER FLOAT	26650028

4" Skimmer Options

8	ASSY,BUOY,SKIMMER,4" 60 MESH	56650313
10	CENTRALIZER,PVC,SCREENED PR4	26600187
11	SCREEN,SS,3.67" DIAM X32.7"	26600189

Additional 4" Skimmers

	ASSY,SKIMMER,4",100M,W/SCREEN	56600055
	ASSY,SKIMMER,4",100 MESH,5 FT EXTENDED TRAVEL	56600008
	ASSY,SKIMMER,4",60 MESH	56600070
	ASSY,SKIMMER,4",60M,W/SCREEN	56600072
	ASSY,SKIMMER,4",60 MESH,5 FT EXTENDED TRAVEL	56600073

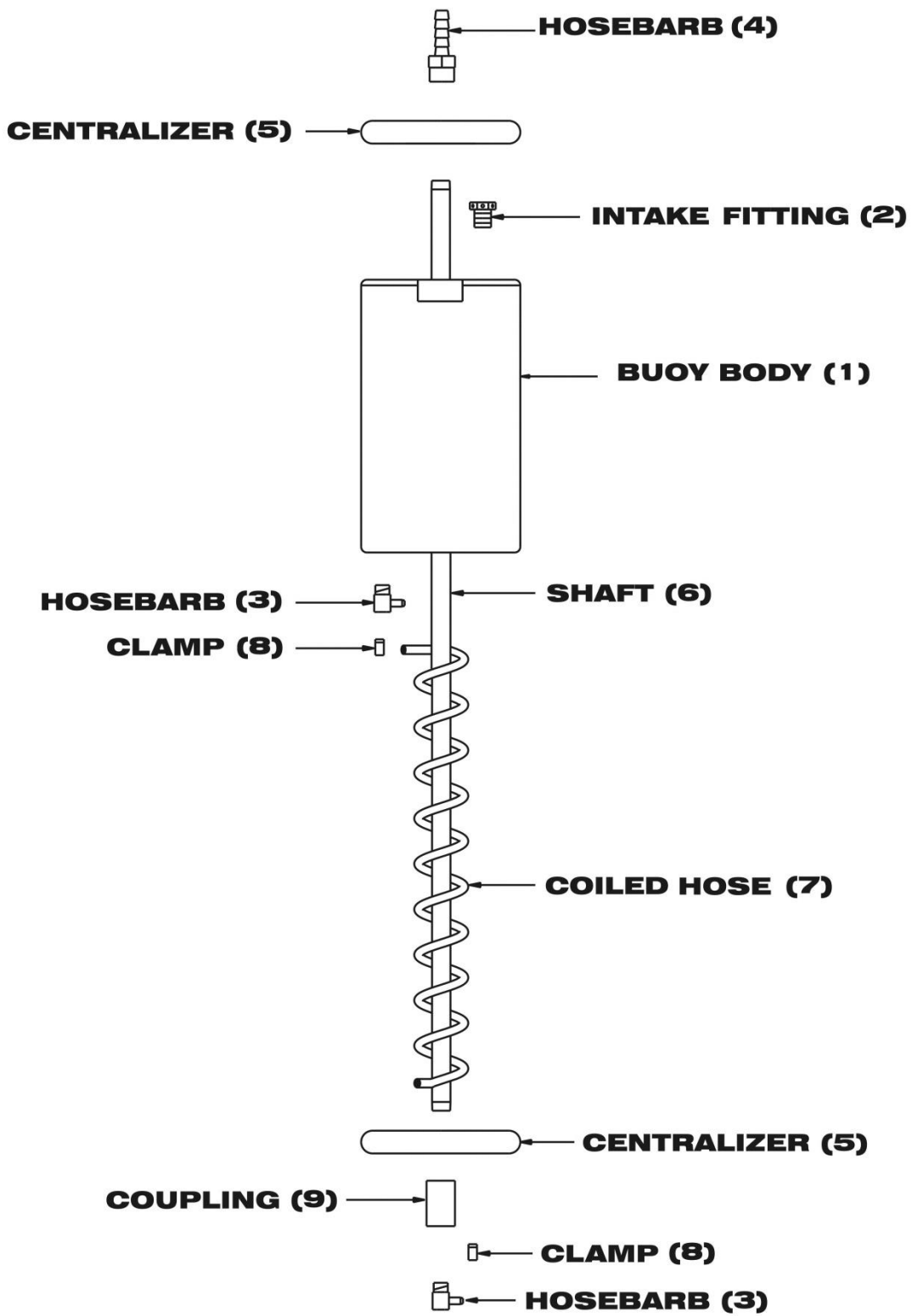


Figure 8-5: 4" Heavy Oil Skimmer Assembly

4" Heavy Oil Skimmer (56600005)

Item #	Parts Description	Parts List
1	BUOY,PP,HEAVY OIL	26600004
2	FTG,INTAKE,OIL BOUY	26600005
3	HOSEBARB,BRS,.170"X1/8MPT,90D	17500148
4	HOSEBARB,BRS,3/8"X1/8FPT	16650308
5	CENTRALIZER,SKIMMER,PR4	16600048
6	SHAFT,SS,OIL SKIMMER,38"	26600006
7	HOSE,COILED,OIL SKIMMER	26600007
8	CLAMP,SS,DBL PINCH,9/32-23/64"	11200273
9	COUPLING,SS4,.125"	16600006

4" Heavy Oil Skimmer Options

ASSY,BUOY,OIL SKIMMER,4"	56600060
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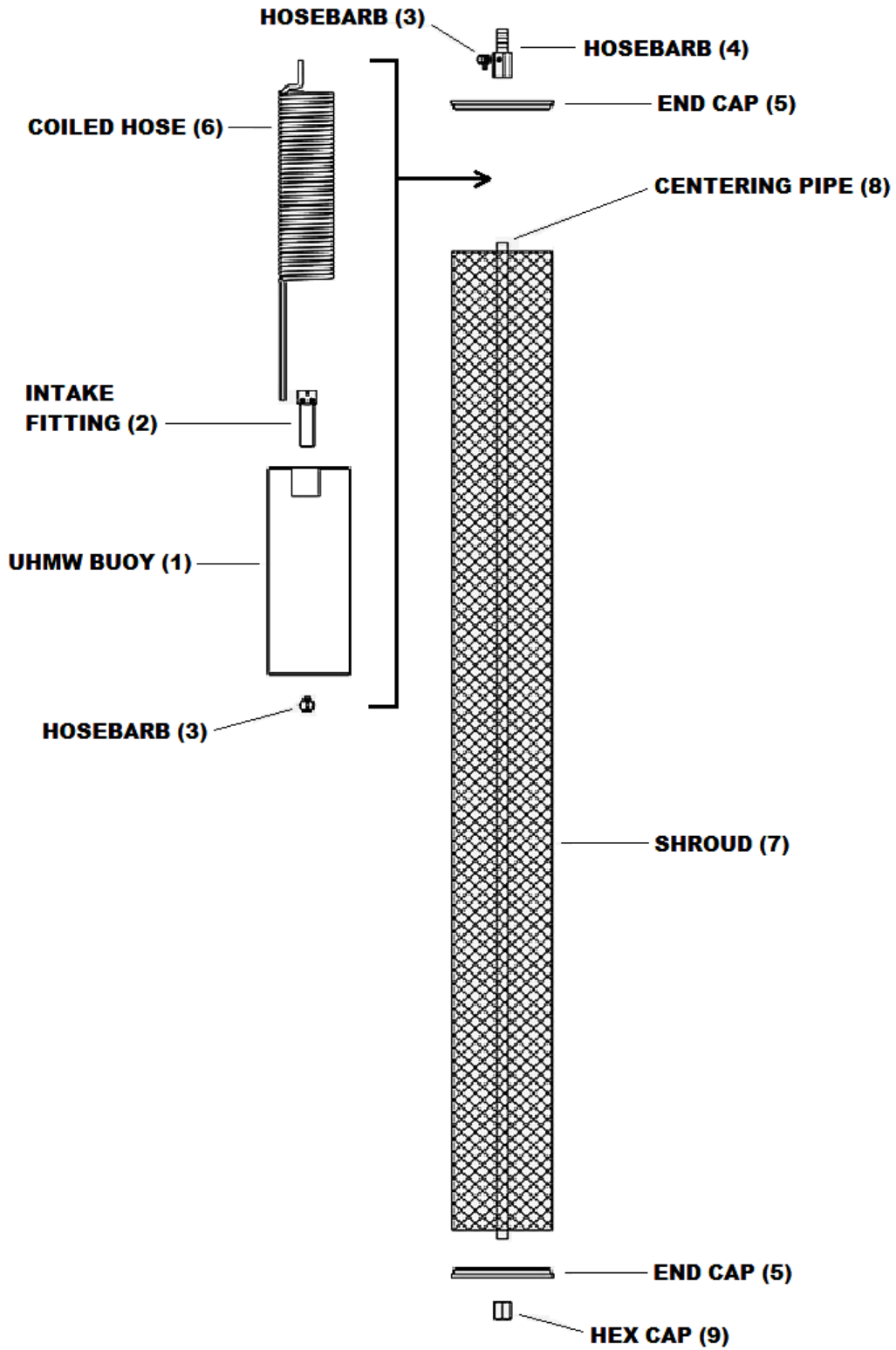


Figure 8-6: 4" High Temperature, Heavy Oil Skimmer Assembly

4", High Temp, Heavy Oil Skimmer (56600012)

Item #	Parts Description	Parts List
1	BUOY,UHMW,HEAVY OIL,HI-TEMP	26600206
2	FITTING,BUOY INTAKE,HTHO	26600207
3	HOSEBARB,BRS,1/8"X10-32,90DEG	17500149
4	HOSEBARB,EXT,1/8M/F NPT,10-32	27200012
5	END CAP,BUOY INTAKE,HTHO	26600209
6	TUBING, COILED, PTFE, HTHO	56600074
7	SKIMMER,SHROUD,4",HTHO	26600210
8	PIPE,CENTERING,SCH80,1/8",HTHO	27500005
9	FITTING,HEX CAP,1/8FPT,HTHO	27200013

Sipper and Skimmer Accessories

Parts Description	Parts List
MANUAL, SIPPER PUMP & SKIMMER ASSEMBLY	16550181
MANUAL, SOLAR SIPPER	16550176
MANUAL,TEST KIT,HYDROCARBON VISCOSITY	26030001
TEST KIT,HYDROCARBON VISCOSITY	86020001
WELL CAP,2",SLIP W/ CMPRSN FTG SIPPER	86600061
WELL CAP,4",SLIP W/ CMPRSN FTG SIPPER	86600062
TUBING,PE,.170x1/4,FT POLYETHYLENE	87050501
TUBING,TLPE,.170x1/4,FT FEP LINED POLYETHYLENE	87050529
TUBING,FEP,.170x1/4,FT FEP	87050509
TUBING,RBR,3/8x5/8,FT PRODUCT DISHCARGE	16600019
TUBING,TLPE,3/8x1/2,FT FEP LINED POLYETHYLENE	87050506
TUBING,FEP,3/8x1/2,FT FEP	87050511
CLAMP,NYL,1/4" SNAPPER	11150259
CLAMP,SS,STEPLESS EAR,17MM	16600004
CLAMP,SS6,WORM,7/32-5/8"	16600063

DOCUMENT REVISIONS		
EDCF#	DESCRIPTION	REV/DATE
-	Previous Release	06/05/2012
-	Updated manual to include PRS with H2O Sensor option – SP	6/12/2014
-	Clarify H2O Sensor as optional – SP	9/2/2014
-	General updates and clarifications, included DNAPL information – SP, JL	01/05/15

The Warranty

For a period of one (1) year from date of first sale, product is warranted to be free from defects in materials and workmanship. Geotech agrees to repair or replace, at Geotech's option, the portion proving defective, or at our option to refund the purchase price thereof. Geotech will have no warranty obligation if the product is subjected to abnormal operating conditions, accident, abuse, misuse, unauthorized modification, alteration, repair, or replacement of wear parts. User assumes all other risk, if any, including the risk of injury, loss, or damage, direct or consequential, arising out of the use, misuse, or inability to use this product. User agrees to use, maintain and install product in accordance with recommendations and instructions. User is responsible for transportation charges connected to the repair or replacement of product under this warranty.

Equipment Return Policy

A Return Material Authorization number (RMA #) is required prior to return of any equipment to our facilities, please call our 800 number for appropriate location. An RMA # will be issued upon receipt of your request to return equipment, which should include reasons for the return. Your return shipment to us must have this RMA # clearly marked on the outside of the package. Proof of date of purchase is required for processing of all warranty requests.

This policy applies to both equipment sales and repair orders.

FOR A RETURN MATERIAL AUTHORIZATION, PLEASE CALL OUR
SERVICE DEPARTMENT AT 1-800-833-7958.

Model Number: _____

Serial Number: _____

Date of Purchase: _____

Equipment Decontamination

Prior to return, all equipment must be thoroughly cleaned and decontaminated. Please make note on RMA form, the use of equipment, contaminants equipment was exposed to, and decontamination solutions/methods used. Geotech reserves the right to refuse any equipment not properly decontaminated. Geotech may also choose to decontaminate the equipment for a fee, which will be applied to the repair order invoice.

Geotech Environmental Equipment, Inc
2650 East 40th Avenue Denver, Colorado 80205
(303) 320-4764 • **(800) 833-7958** • FAX (303) 322-7242
email: sales@geotechenv.com website: www.geotechenv.com