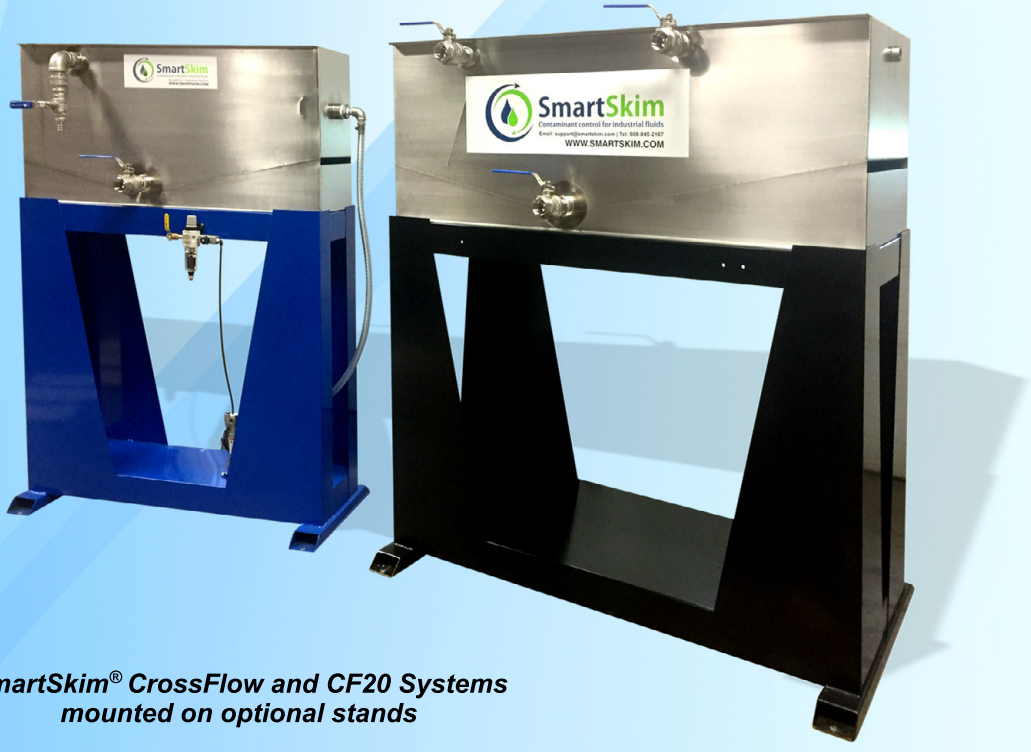
SmartSkim® CF Series System

Installation and Operations Manual

(Updated July 1, 2019)

SmartSkim® CF Series Separation System



SmartSkim® CrossFlow and CF20 Systems mounted on optional stands

1. Start-Up
2. Skimhead Adjustment
3. Transfer Pump
4. Air Service Assembly
5. Tramp Oil Discharge
6. Installation Drawings
7. Process Flow
8. Troubleshooting

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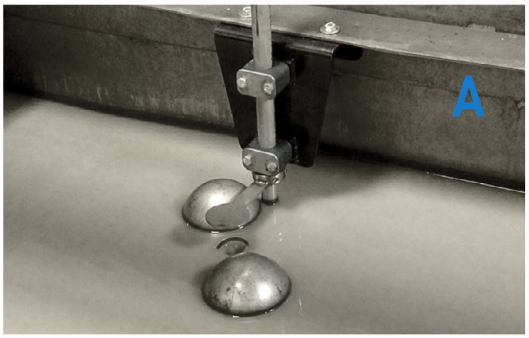
1- Start-up

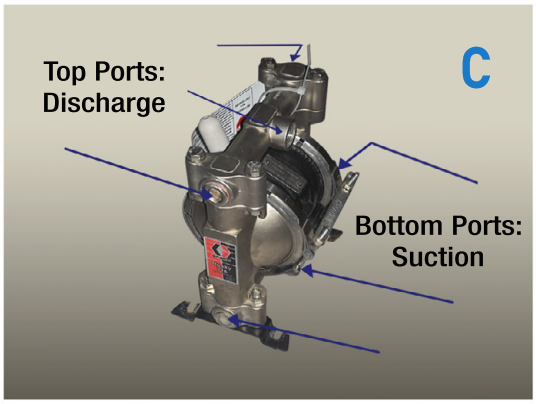
A. Install Suction Skimmer - It should be located in a position that sees floating oils. Identify in source tank a place where the natural flow of the tank causes oils to sit on the top surface and place the skimmer in this location.



Suction Skimmer

B. Locate and Level the CF Series tank - Level the CF Series tank. The unit needs to be level side to side and front to back. A tank that is not level may inhibit the removal of oil from the system. The CF Series tank needs to be installed high enough to gravity flow back into the source tank.

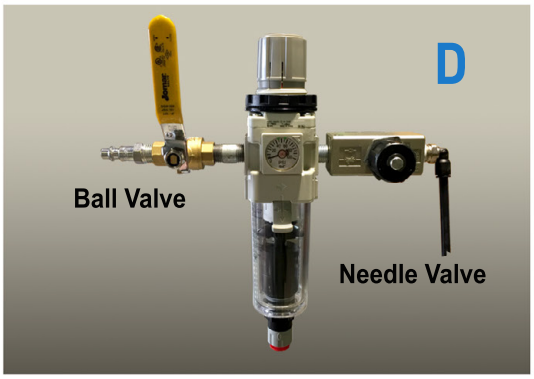
C. Install Separator Supply Pump - Place the pump as to where it can be accessible for suction and discharge piping. A CF Series unit with a stand will already have this step completed.



Separator Supply Pump

D. The air service assembly (ASA) needs to be connected to shop (compressed) air. The ASA will provide air to the separator supply pump. The ASA should be located in an accessible location to enable the ball valve to be turned on/off, to monitor air pressure (30 PSI) and to adjust airflow with the needle valve of the ASA. Once you are ready to operate the system, the flow rate of the fluids coming out of the separator should be in the range of:

- CrossFlow: 3-10 gallons per minute for most applications
- CF20: 8-15 gallons per minute for most applications



Air Service Assembly (ASA)

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1- Start-up (cont.)

E. Install Pump Suction Piping - This piping needs to go from the skimmer to the suction side (bottom ports) of the pump.

F. Install Tank Inlet Piping - The inlet piping runs from the pump discharge (top ports of the pump) to the inlet port connection of the separator tank.

G. Install Treated Fluid Return Piping - The treated fluid return piping is 2" NPT piping that returns the treated fluid from the separator tank to the source tank of the fluid being processed. The discharge of the treated fluid back into the source tank should be located at a point in the source tank away from the skimmer location. It is not recommended to reduce this pipe size.

H. Install Tramp Oil Discharge – Plumb the valve and piping from the tramp oil discharge port into a disposal drum/tote for the tramp oil that gets accumulated in the separator tank.

I. Fill Separator Tank - with the platepack installed in the tank, fill the tank with clean solution (coolant; cleaner; water). This preferential wetting of the surface allows oils to release from the coalescing plates. Prior to filling the separator tank, remove the zip ties that were used to secure the adjustable weir and platepack(s) during the shipping process.

J. Optional Connection Kits - Pictured below are the optional connection kits you may have purchased.

Inlet Port Connection

Treated Fluid Return to Source Tank

Tramp Oil Discharge to Disposal

Skimmer to Pump Kit (Optional)

Pump to Separator Kit (Optional)

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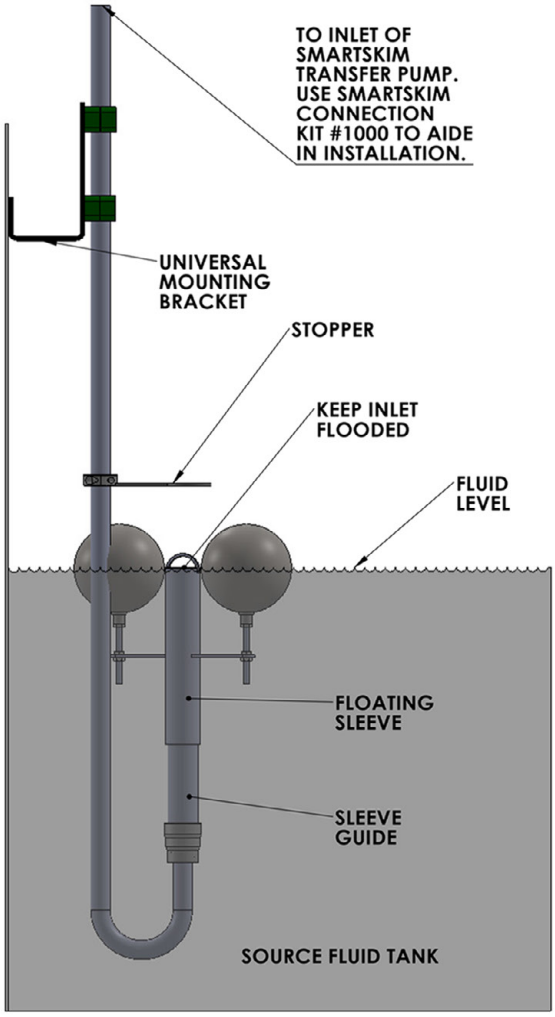

SKIMHEAD SET CORRECTLY

SKIMHEAD SET TOO HIGH

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2. Skimhead Adjustment

The ideal position for the floating sleeve (skimmer inlet) is one which aggressively skims the surface without drawing in excess air.

The position of inlet relative to surface will result from a combination of the position of the float balls and the pumping rate.

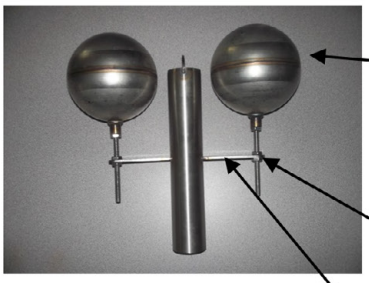
To raise the position of the suction skimmer inlet relative to the surface:

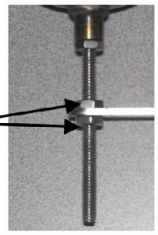
A. Loosen the jam nuts above and below the float brackets.

B. Rotate the float balls clockwise, toward the brackets.

C. This action has the effect of increasing the total buoyancy beneath the surface, driving the float position of the skim head up and closer to the surface.

D. Re-tighten jam nuts to lock in the new positions.





To lower the position of the suction skimmer inlet relative to the surface:

A. Loosen the jam nuts above and below the float brackets.

B. Rotate the float balls counter-clockwise, away from the brackets.

C. This action has the effect of decreasing the total buoyancy beneath the surface, driving the float position of the skim head deeper & increasing its relative distance from the surface.

D. Re-tighten jam nuts to lock in the new position.

Periodically the floats need to be wiped of debris and grease buildup.

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3. Transfer Pump

TO START THE PUMP

A. Open the ball valve on Air Service Assembly (ASA).

B. Using the knob on the top of the regulator, set the ASA to 30 PSI.

C. Open the needle valve on the ASA, this is done by turning the knob on the needle valve counter-clockwise to increase flow.

D. Adjust the flow rate of air to the pump by turning the needle valve clockwise to decrease airflow / pump speed and counter-clockwise to increase flow / speed.

F. To lock needle valve setting in place, turn the locking nut counter-clockwise so that it butts up against the rotating knob.

Transfer Pump

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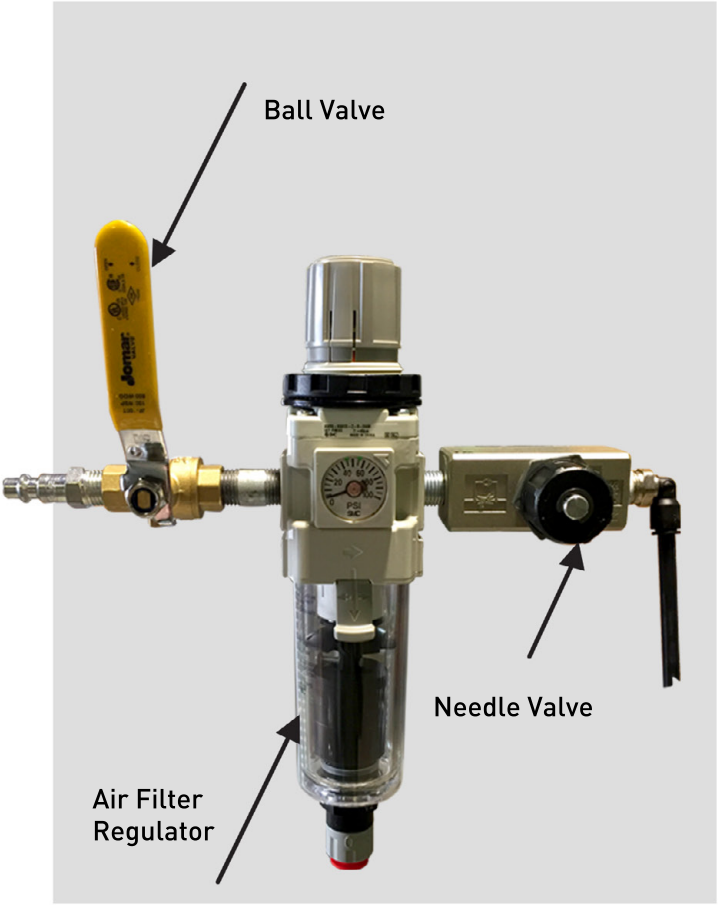
4. Air Service Assembly



The air service assembly (ASA) consists of a ball valve, combination air filter / regulator and a needle valve.

The ball valve allows you to quickly start and stop the pump without changing any of the air flow settings on the regulator.
(Shop air connection is required at this valve).

The needle valve allows fine-tune adjustments for the flow rate of the pump without needing to adjust the regulator settings at all.

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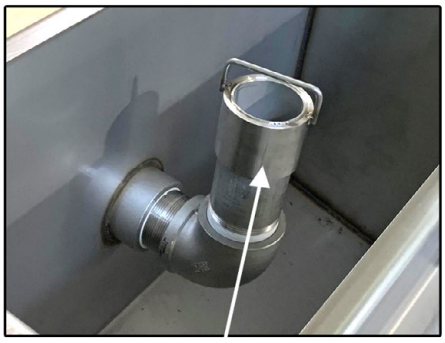
5. Tramp Oil Discharge

When beginning operation of the CF Series Separator, make sure the tramp oil discharge valve is in the closed position. Also, the adjustable weir should be in the lowered position until a significant buildup of tramp oil in the Separator has occurred. To lower the weir, turn the weir knob clockwise. When shipped, the Separator is usually in a lowered position.

Once there is a sufficient buildup of tramp oil in the separator, raise the adjustable weir (turn counter-clockwise to raise) so that the tramp oil buildup can spill over the half-moon opening that allows for the tramp oil to exit the separator.

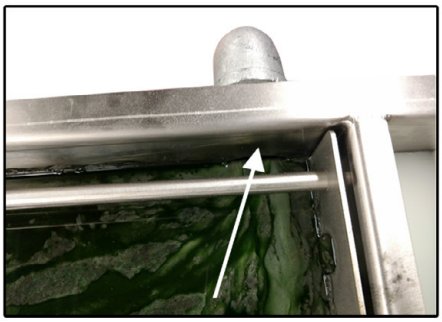
The tramp oil discharge valve will need to be opened to allow the accumulated tramp oil to flow into your disposal container. Remove tramp oil from the system on an as-needed basis.

Allowing for too much tramp oil to build up inside of the separator can cause large amounts of tramp oils to flow back into your sump.

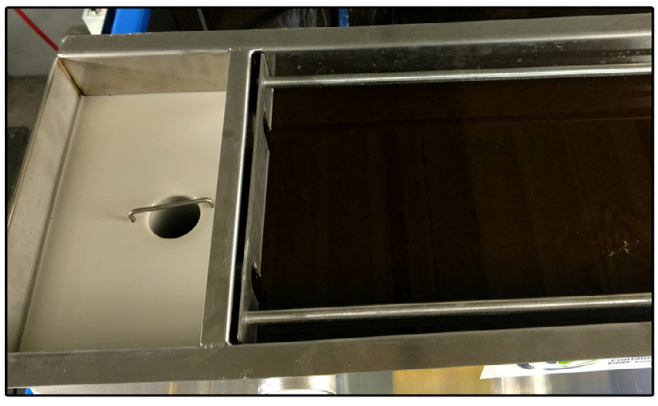


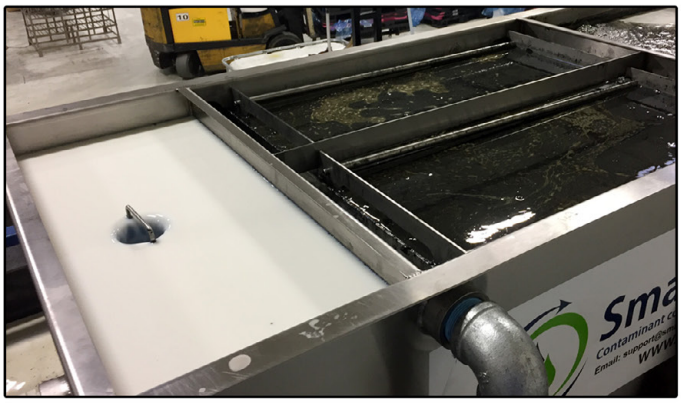
Adjustable Weir

Fluid below the half-moon tramp oil discharge prior to fluid level being raised



Fluid level in raised position in order for tramp oil to exit the separator





Buildup of Tramp Oil in CrossFlow and CF20 Separators

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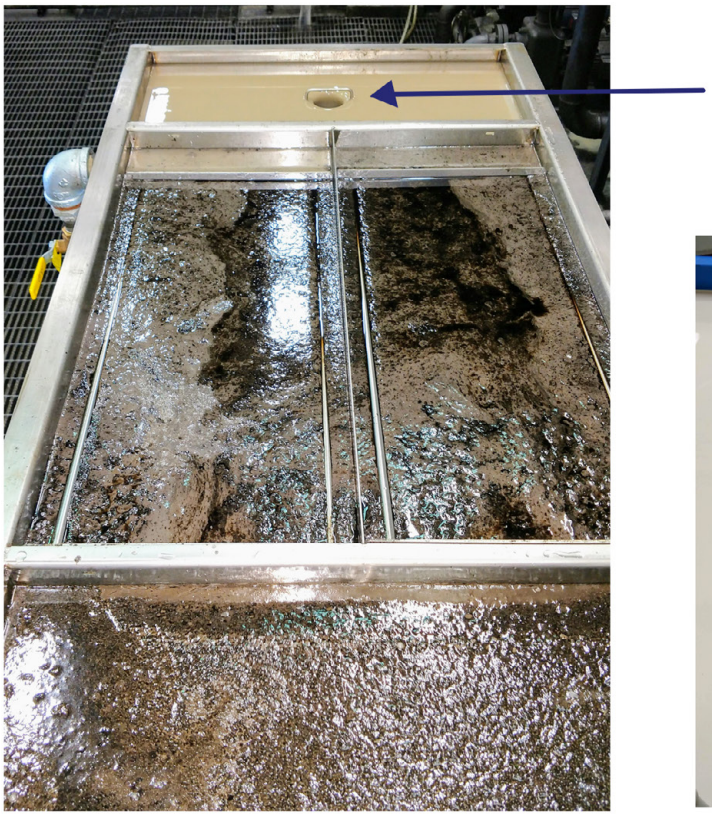
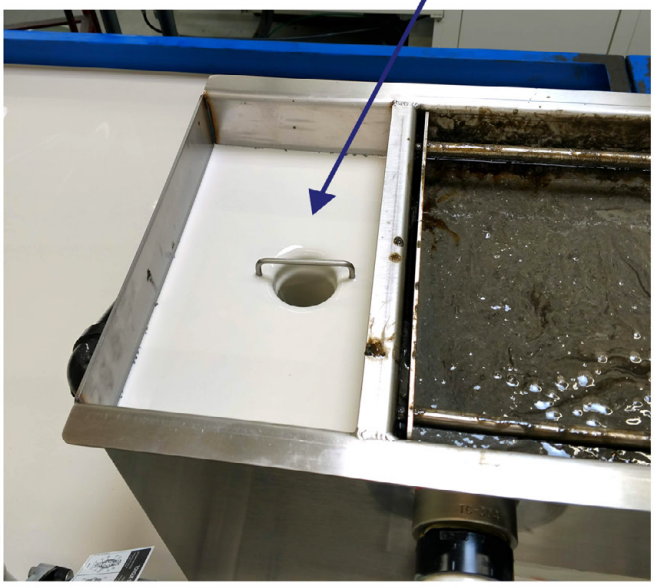
5. Tramp Oil Discharge (cont.)

If you like, you can keep the level raised, and just occasionally open the ball valve on the discharge port to remove the layer of oil as it accumulates. Operations where tramp oils are excessive may have the port constantly opened to continually remove the tramp oils from the system.



CF20 Separator

Adjustable overflow weir
Turn counter-clockwise to raise
Turn clock-wise to lower



CrossFlow Separator

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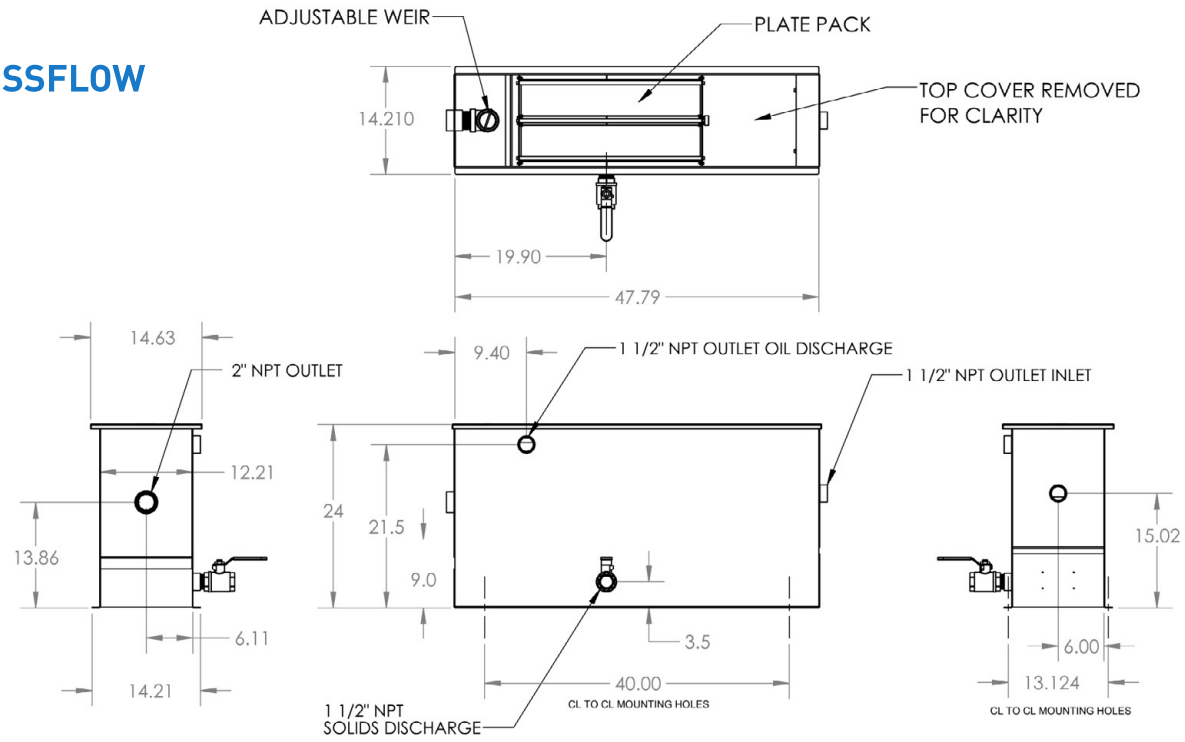
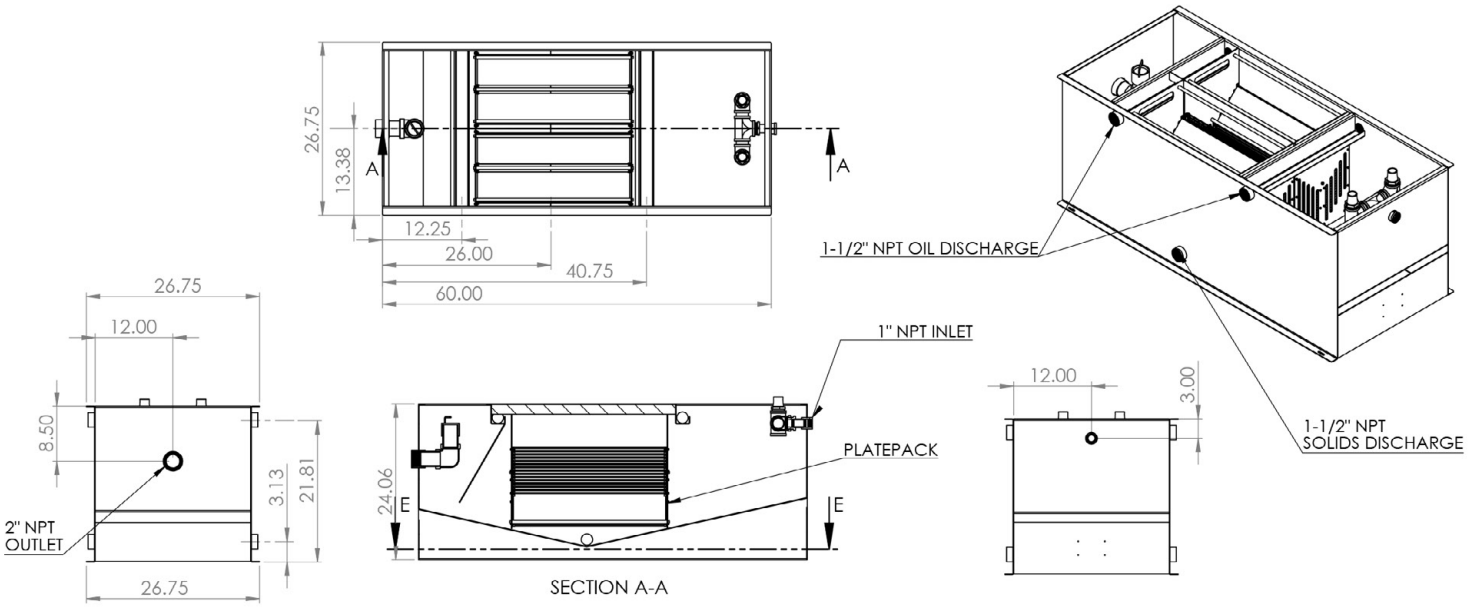
6. Installation Drawings

CROSSFLOW



CF20



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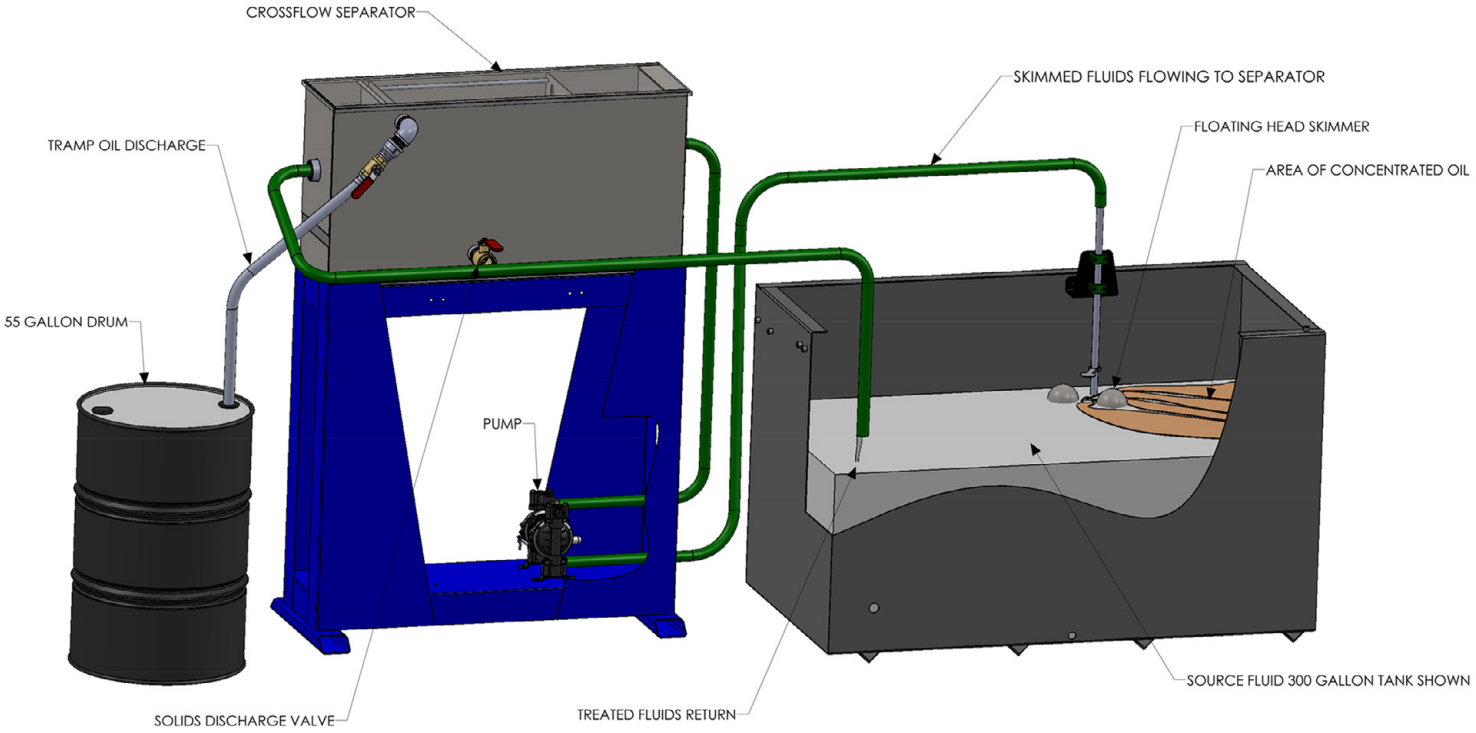
7. Process Flow



COMMON SPARE PARTS

Part #	Description
1757	Air Service Assembly (1/4" connection)
1823	Air Service Assembly (1/2" connection)
2035	Repair Kit for Husky 515 Pump (buna)
1871	Husky 515 Pump (poly body with buna internals)
1151	Repair Kit for Husky 716 Pump (santoprene)
1150	Husky 716 Pump (stainless steel body with santoprene internals)
3230	Repair Kit for Husky 1050 Pump (buna)
1931	Husky 1050 Pump (aluminum body with buna internals)
3312	Repair Kit for Husky 1050 Pump (santoprene)
3131	Husky 1050 Pump (stainless steel body with santoprene internals)
2040	Tramp Oil Discharge Connection Kit
1000	CrossFlow Connection Kit – Skimmer to Pump (rated to 150F)
1001	CrossFlow Connection Kit – Pump to Separator (rated to 150F)
2197	CF-20 Connection Kit – Skimmer to Pump (rated to 150F)
2198	CF-20 Connection Kit – Pump to Separator (rated to 150F)

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8. Troubleshooting

PROBLEM	CAUSE	SOLUTION
Oil escaping from the separator back to the wash / coolant tank.	There is too much flow through the separator.	Slow pump flow using needle valve.
	There is too much oil accumulating inside the separator.	Raise the level of the variable weir to purge the topmost layers of oil out of the separator into the oil capture barrel or central treatment.
	The volume of solids captured inside the separator is blocking the bottom portions of the oil separating plates.	Shut down separator. Remove plate pack. Discharge solids through the bottom solids port. Spray off any debris on plates.
Poor skimming inside the source tank.	Skimhead inlet set too low.	Reset skimhead to a position closer to the surface by threading float balls downward. (See: Skimhead Adjustment)
	Suction from pump is impaired.	Make sure suction hose between skimmer and pump is not blocked. Check that pump is operating correctly. If debris and solids continue to block the check valve, install a debris strainer to protect pump inlet.
Clean fluids being discharged along with captured oil.	Water level inside separator is too close to overflow line of the oil discharge port.	Adjust the vaiable height discharge weir to lower the fluid level inside the separator.
	Pump flow rate is too high.	Increasing the flow through the separator causes a higher fluid level inside the separator. Turn down flow rate by slowing down the pump by using the needle valve on the air service assembly.
	There is too much turbulence on the surface of the separator due to too much air in the skimmed fluids.	Reset the pump flow rate and skimhead position to eliminate high levels of air entering the skimmer and pump.

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8. Troubleshooting (cont.)

PROBLEM	CAUSE	SOLUTION
Pump running slowly or stopping.	Insufficient air pressure.	We recommend keeping 30 PSI feeding the pump. Flow control can be adjusted with the needle valve on the air service assembly serving the pump.
	Pump needs lubrication.	The Graco pumps shipped with the unit do not typically need lubrication. However in applications where there is a high moisture content in the plant air, the moisture can strip out the factory lubrication. You can test this by dripping a few drops of lightweight oil into the air line feeding the pump to see if additional lubrication is needed. See Graco Pump Manual. Open the face plate of the Graco pump and apply a white lithium grease to the air valve.
Pump running too fast with no discharge flow.	Suction blockage.	Check for blockage in hoses, skimhead inlet or pump inlet ports.
Fluids are being discharged through the air muffler.	Ruptured pump diaphragm.	Replace diaphragms.
Pump not cycling. Air discharging from air muffler continuously.	Debris in the air valve.	Disassemble air valve and remove any visible debris.