Floating Oil Collecting System

“Coolant Saver Portable”
TYPE-01

YD-200FS-16CSPN
YD-270FS-16CSPN

Instruction Manual
Version: 230425

World Chemical Co.,Ltd.

Preface

Thank you very much for purchasing our floating oil collecting system “Coolant Saver Portable”.
The floating oil collecting system is mainly constructed with our oil collecting skimmer “FLOAT SUCTION” and installed for oily waste water drained from factory and facility, at coolant tanks which sewage flows in, washing waste water tanks or various collecting tanks.
Before use, make sure to read this manual to use the system with fully understanding of function and features.
Moreover, store the manual for ready reference as necessary.

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Caution	**This instruction manual is intended for standard specification systems. For special specification systems, replace and read That apply as necessary.**

1. Safety Precautions

This document classifies safety precautions into "Danger" and "Caution" as follows.

Danger Wrong handling may result in a dangerous state which may cause death or severe injury.

Caution Wrong handling may result in a dangerous state which may cause medium or light injury or property damage.

Any item described as Caution ⚠ Caution may result in a serious result depending on the situation. Both of the above describe is important information and be observed.

I. Transport and install precautions

Danger (1) When carrying the system, be careful not to spill liquid out from a separater. After use, it becomes slippery due to accumulated oil. Take extra care of fall or slip.

Danger (2) Wrong handling of the system or accessories may **cause a serious accident.**
(Ex.) It is excessive air, use of inappropriate fluid or chemical.

⚠ Caution (3) When unpacking a wooden crate, be careful **not to get injured by nails or chips of wood.**

⚠ Caution (4) **Install the system horizontally on a firm place** and take measures to prevent unexpected movement during operation.

⚠ Caution (5) Use compressed air supplied from the air compressor to operate the pump. Do not use the air other than the compressed air. (Refer to the pump operation manual)

II. Prepare and operating precautions

Danger (1) **When transferring high-temperature liquid, the flow path temperature of the collecting skimmer, pump, separator and hose rises near to the liquid temperature. Handle it carefully to avoid burn.**
The maximum temperature of collecting liquid is **50C° or less.**

⚠ Caution (2) **Stop the operation at time of emergency such as an earthquake or fire.**

⚠ Caution (3) If **any abnormality occurs**, **stop the operation** immediately and take **appropriate measures**.

Danger (4) **Do not use the system in a place where a flammable gas enters in, because fire or explosion may happen.**

Danger (5) If opeing a cover and put hands or fingers into parts hard to see **during operation**, it causes injury. Keep them out.

III. Precautions at maintenance

⚠ Caution (1) **For repair,** contact your supplier or us. When returning the system back, clean the main body thoroughly not to adhere liquid and leak liquid, and wrap it with a plastic bag. Ater that, send back the packed one in a wooden crate or carton box.

IV. Other cautions

⚠ Caution (1) **Do not use the system with any specifications other than specified. Any use outside of the specifications is not covered by warranty.**

⚠ Caution (2) **Any modification by customer is not covered by warranty.**

⚠ Caution (3) **When disposing** the system, remove adhered oil and **dispose of it as industrial waste.**

⚠ Caution (4) **When collecting chemical substances** other than oil (mineral or animal/vegetalbe oil), consult with your supplier or us.
It is not possible to use the system for **solvents, organic acids, strong acids, or strong alkaline solutions** regardless of oil layer or water layer unless a special specification system. **Do not use it for flammable fluid.**
(Do not use it for any operation other than collecting of floating oil.)

2. Configuration and Structure

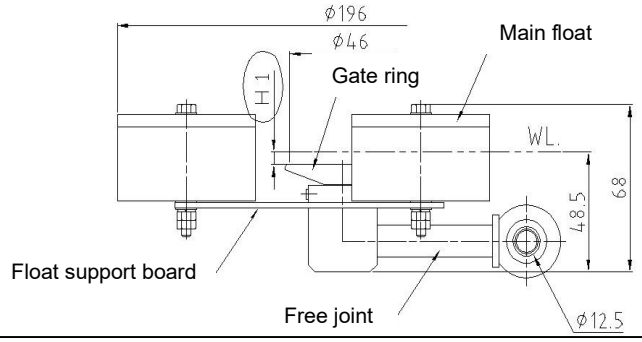
"COOLANT SAVER PORTABLE" is mainly consists of a collecting skimmer, separator, collecting pump and strainer unit. The weight is depending on the model, but the standard one is approx. 60kg in a dry state.

(1) Collecting skimmer 200FS / 270FS

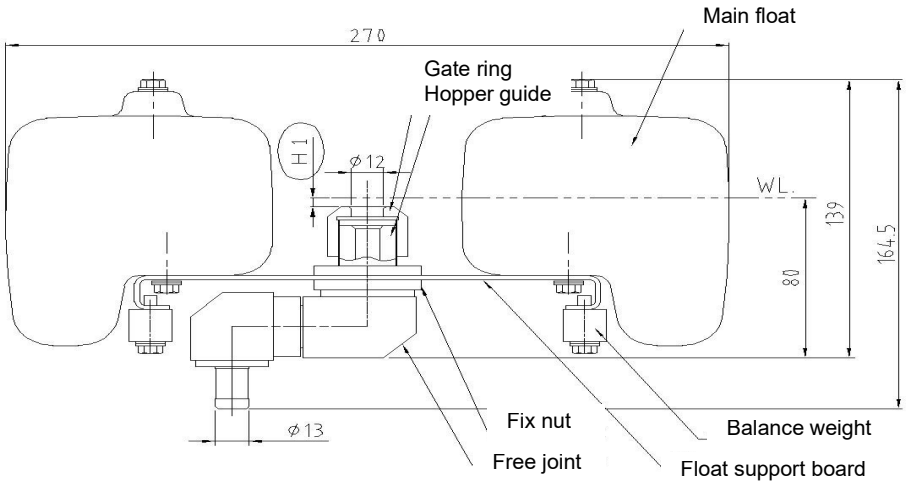
The collecting skimmer is used to collect floating oil by putting on a tank and consisted with the parts as below picture.

When ordering, it is selectable from two types, 200FS or 270FS depending on the collecting flow rate or installation site.

It is possible to adjust the flow rate by turning a gate ring. When turning it clockwise, the flow drop (Picture: H1) increases. On the other hand, when turning it anti-clockwise, it decreases.



<YD-200FS Collecting skimmer>



<YD-270FS Collecting skimmer>

Flow drop H1 (mm)	200FS Flow rate to Gate ring (L/min)	270FS Flow rate to Gate ring (L/min)
3	3	1
4	5	3
5	8	5

<Flow drop & Flow rate>

The list is based on theoretical calculation with clear water and not assured the actual capacity. The capacity is depending on the condition of oil, water quality, floating solid particles and ambient environment.

<Handling procedure of a collecting skimmer>

1. Connect a suction hose to a hose joint (Tip of Free joint: Φ13) at the bottom of the main body and put the skimmer in a tank where oil is floating.

2. The free joint is possible to move from side to side & up and down. Set the hose and collecting skimmer at the place which is not affected by the tilt of the float by the connected hose.

3. Check that the gate ring is submerged.

4. Adjust the flow drop of the gate ring (Picture: H1) for oily water to flow into. (It is approx. 3mm when shipping out from our factory.)
   If liquid in the tank is not water, oil layer is thick, the viscosity of the floating oil is high or the specific gravity is small, the flow drop may be changed by the alteration of the float buoyancy or oil flow speed. At that time, adjust it as necessary.

5. When adjusting the flow drop, turn the gate ring with holding a hand. Turning it clockwise makes the flow drop bigger and the flow rate increase. On the other hand, turning it makes the flow drop smaller and the flow rate decrease.

6. Adjust the flow drop in a fine balance with the condition of the floating oil (S.G. and viscosity), thickness or the pump's flow rate.

7. If the flow drop is extremely deep, the low-level water enters much more than the surficial oil. At the time, if it is more than the pump suction ability, the gate ring is submerged and the floating oil is flooded around the inlet and the skimmer hardly collects oil smoothly. On the other hand, if the flow drop is very shallow to collect only surficial oil when oil layer is thin, oil adheres on the top of the gate ring and the viscosity makes the flow rate decrease excessively.

8. The best flow drop is the state that collected oil through the gate ring becomes thin layer with going along the inner wall of the hopper.
   When the oil is normal mineral oil, the best flow drop of the gate ring is approx. 3-5mm.

9. For smooth operation, take a skimmer out from the tank, clean and maintain such as re-tighten nuts as the situation demands.

10. When the surface gets dirty, solid materials like sludge easily adhere. The following ability of the float becomes worse with the growth of the excrescence. It is recommended to clean it periodically.

11. Mind the dirty on the gate ring and free joint. The free joint moves with the action of the hose and float. If they get dirty or caught foreign objects, it is not possible to move smoothly. Refer to the list in the page 5 about the relationship between the flow drop (H1) and flow rate.

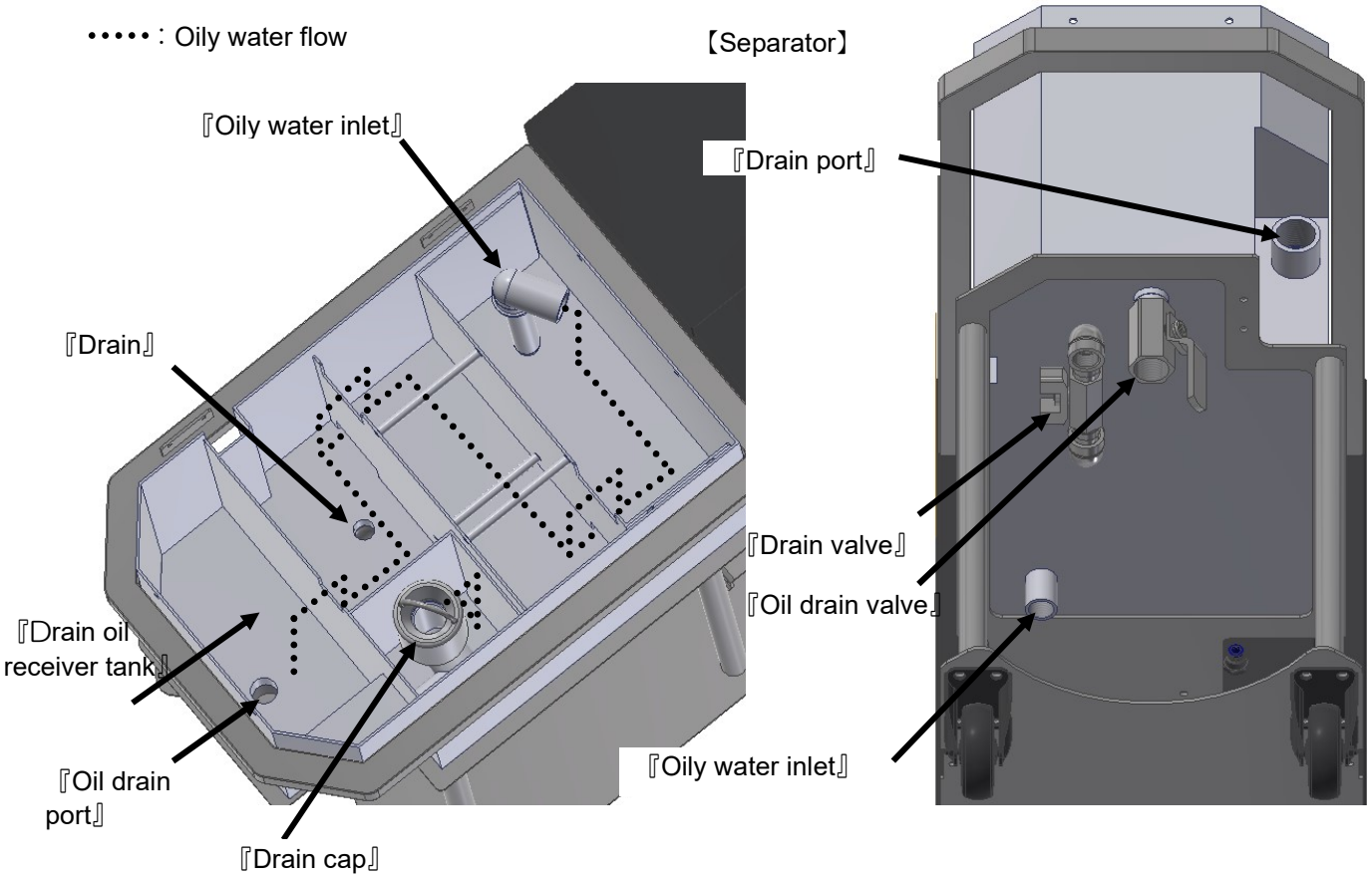
(2) Separator

The capacity of the separator is approx. 17 liter and the capacity of the drain oil receiver tank is approx. 4 liter.

Oily water from “Collecting skimmer” to “Collecting pump” through “Strainer unit” goes into through “Oily water inlet” on the bottom of the separator, and the liquid level rises. Oily water into the separator moves the form of an S-shape along the inner wall and floating oil is discharged to “Drain oil receiver tank” by separation by the difference of specific gravity.

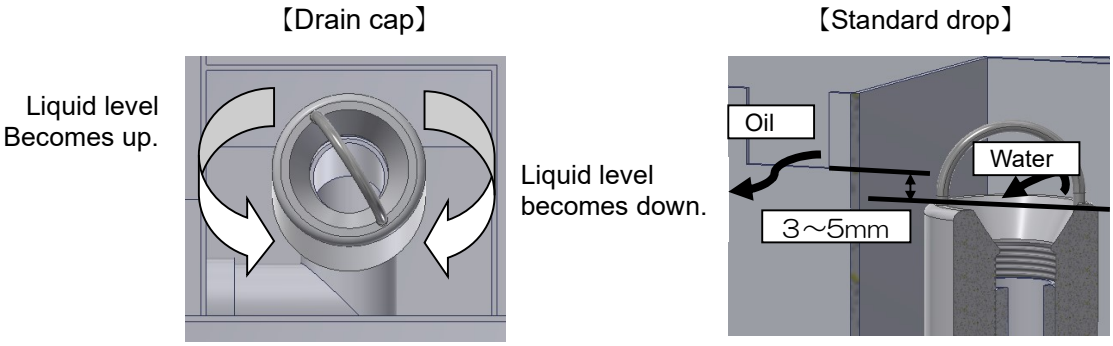
On the other hand, the drainage water overflows at “Drain cap” of the separator and is discharged from “Drain port”. Usually, flexible hose is used as the drain hose and set it that the drainage water goes back to the tank.

The drain valve and oil drain valve are installed on the separator.



The liquid level of the separator is designed to fit with the upper end position of the drain cap and it is possible to adjust the liquid level of the separator by up and down of the drain cap. Turning the cap clockwise makes it down and anti-clockwise makes it up.

When the oil is normal low viscosity mineral oil, the difference between the upper end of the oil drain port and the liquid level (oil drain drop) is approx. 3 – 5 mm.



(3) Collecting pump

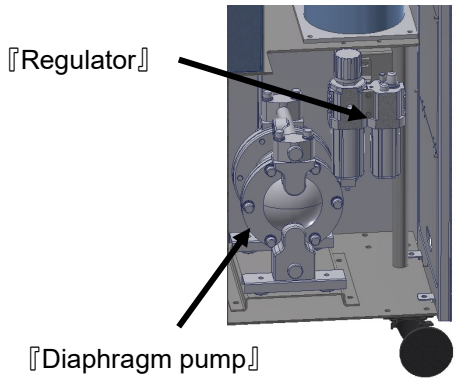
Air-driven diaphragm pump is used for the collecting pump. Switch ON/OFF to operate the pump.

Basically, the collected flow rate is adjusted by the flow drop of the gate ring (Picture: H1) and adjust the pump for liquid viscosity and suction head by the adjustment dial. The regulator air is set 0.2MPa as the delivery and do not change it basically.

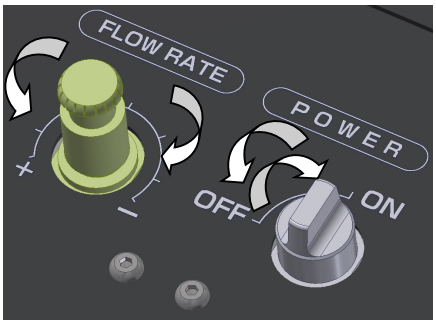
Adjust the pump depending on the flow rate of the collecting skimmer or separating condition of the separator.

Normally, adjust it with the collecting flow rate from 1 to 3 L/min depending on the oily water condition.

【Air drive】



【Adjustment dial / ON • OFF switch】



It is possible to increase the collecting flow rate by adjusting the flow drop and air volume, but if the collecting flow increases, oil not be separated may mix in the drain water.

Regarding the handling way of the pump about the air drive, specification and operating precautions, follow the pump manual to be included.

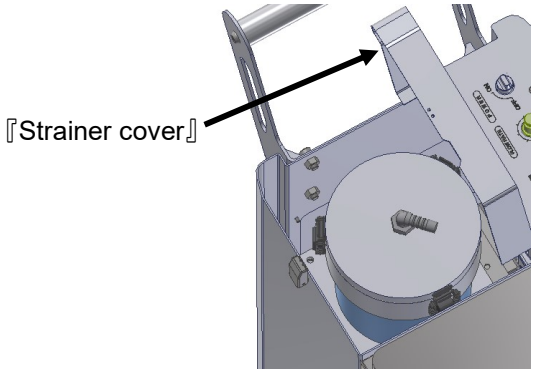
(4) Strainer unit

The strainer unit is between the collecting skimmer and pump (Diaphragm pump), and possible to confirm it by opening “Strainer cover”. Solid particles in collected oily water (sludge) are separated and collected in “Basket”. It is installed to prevent problems such as the pump damage by solid particles or solid deposit in the separator.

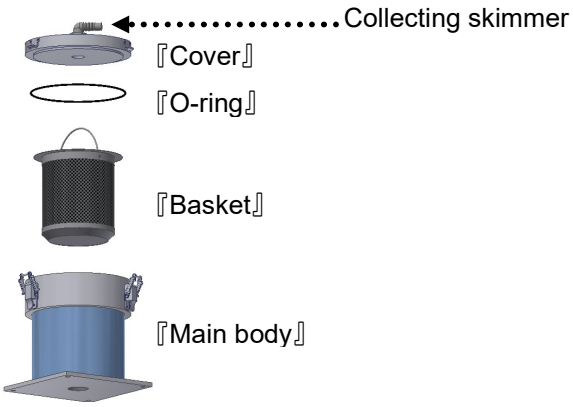
The unit is made of PVC (Chloroethene) and the basket is made of stainless.

The mesh of the basket is approx. 1mm and the capacity is max. 1,200cc.

【Strainer unit set position】



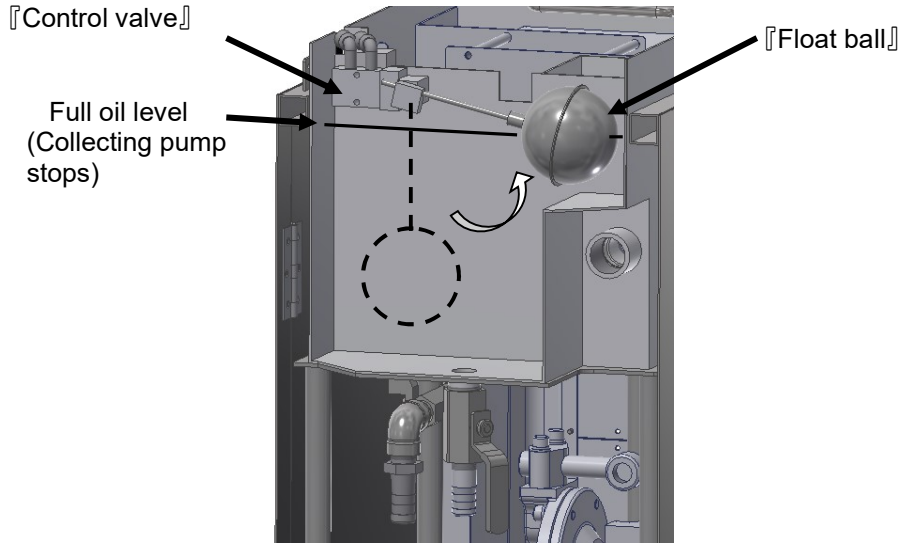
【Strainer unit】

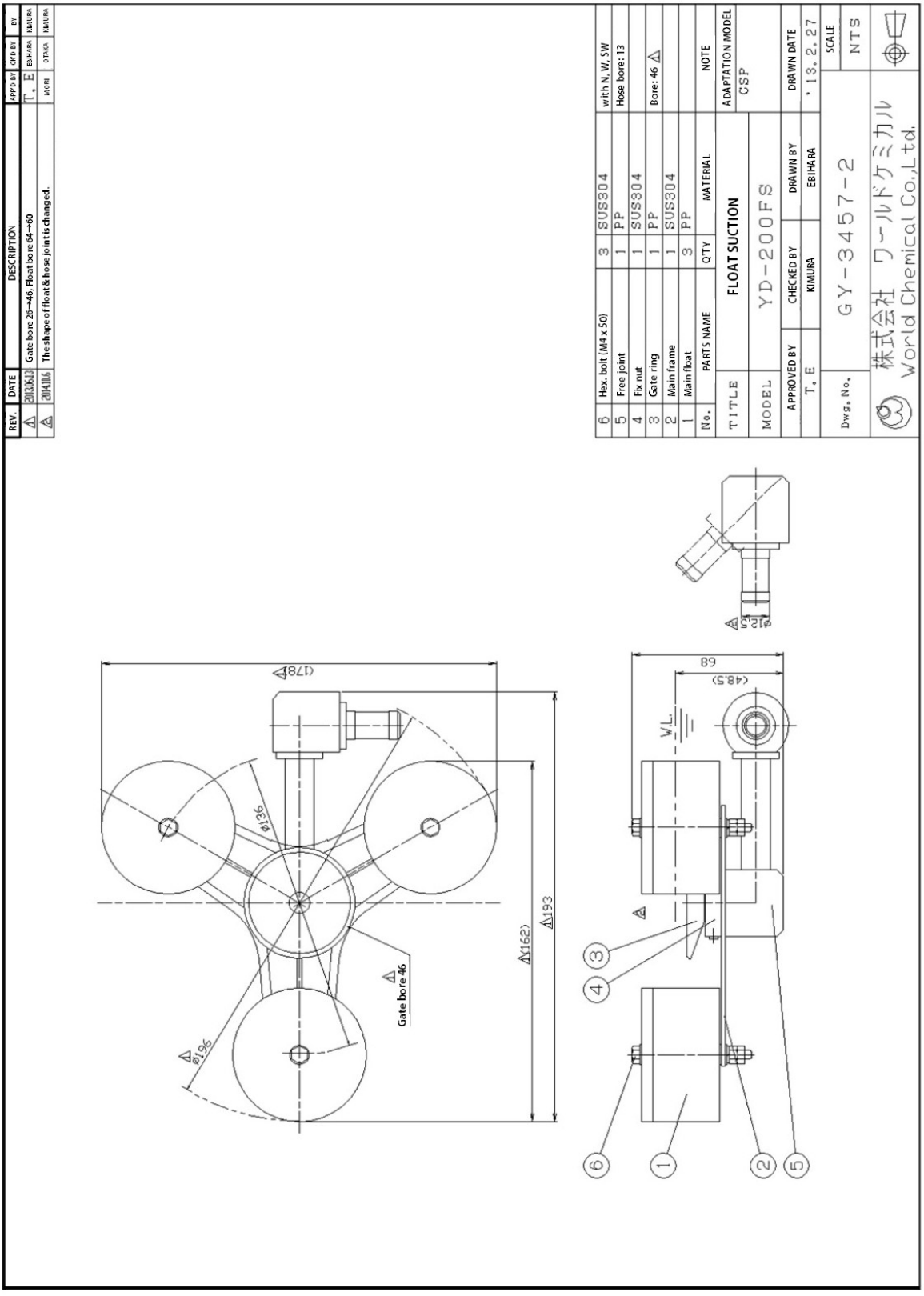


(5) Full oil automatic stop device (Option)

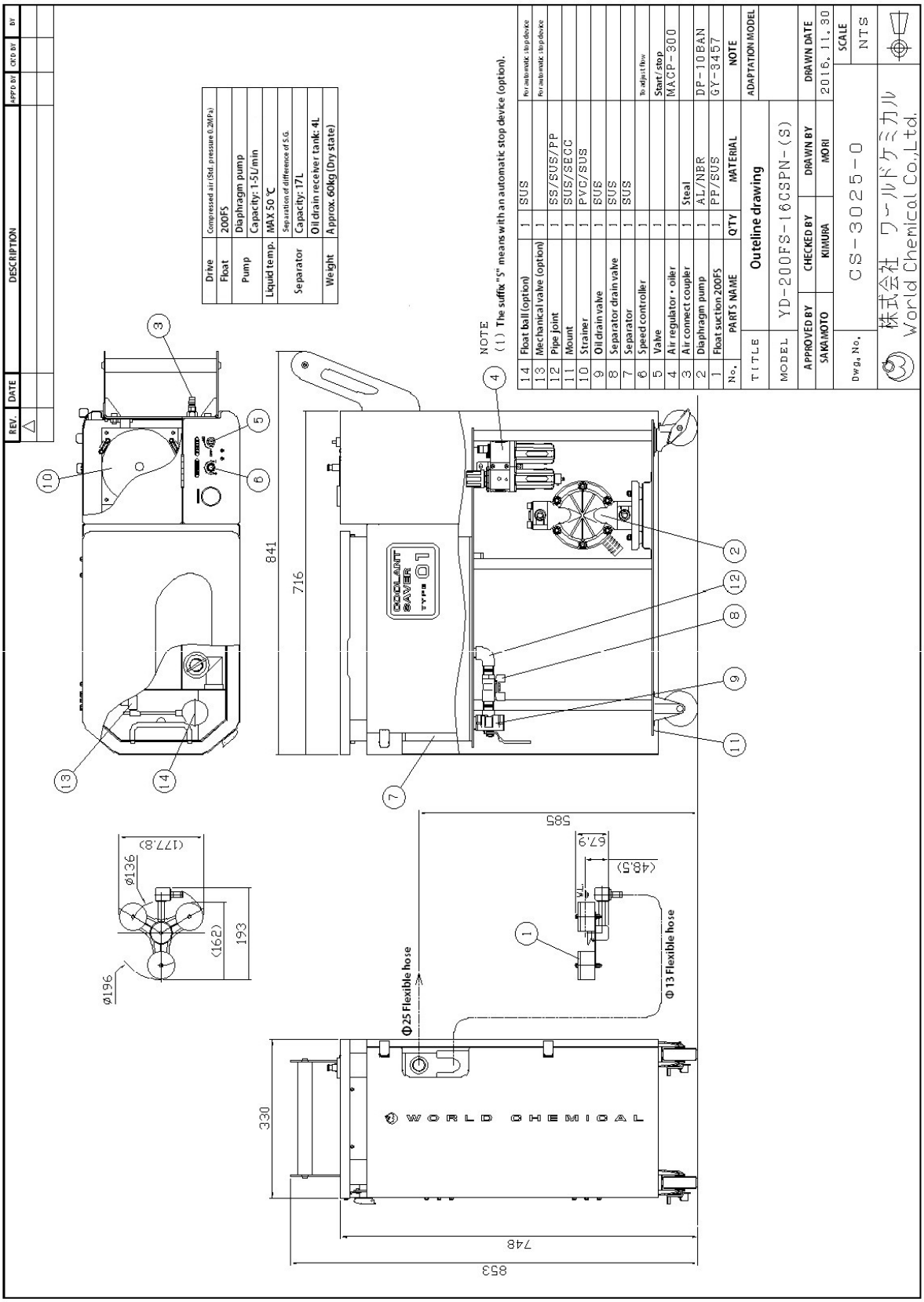
When close the oil drain valve to remain collected oil in the separator, the full oil automatic stop device is used as an option. It automatically makes the collecting pump stop when the collected oil stands until a certain amount. It is available to attach “Control valve” which prevents overflow from the collecting tank and “Float ball” as a stop device.

【Full oil automatic stop device】

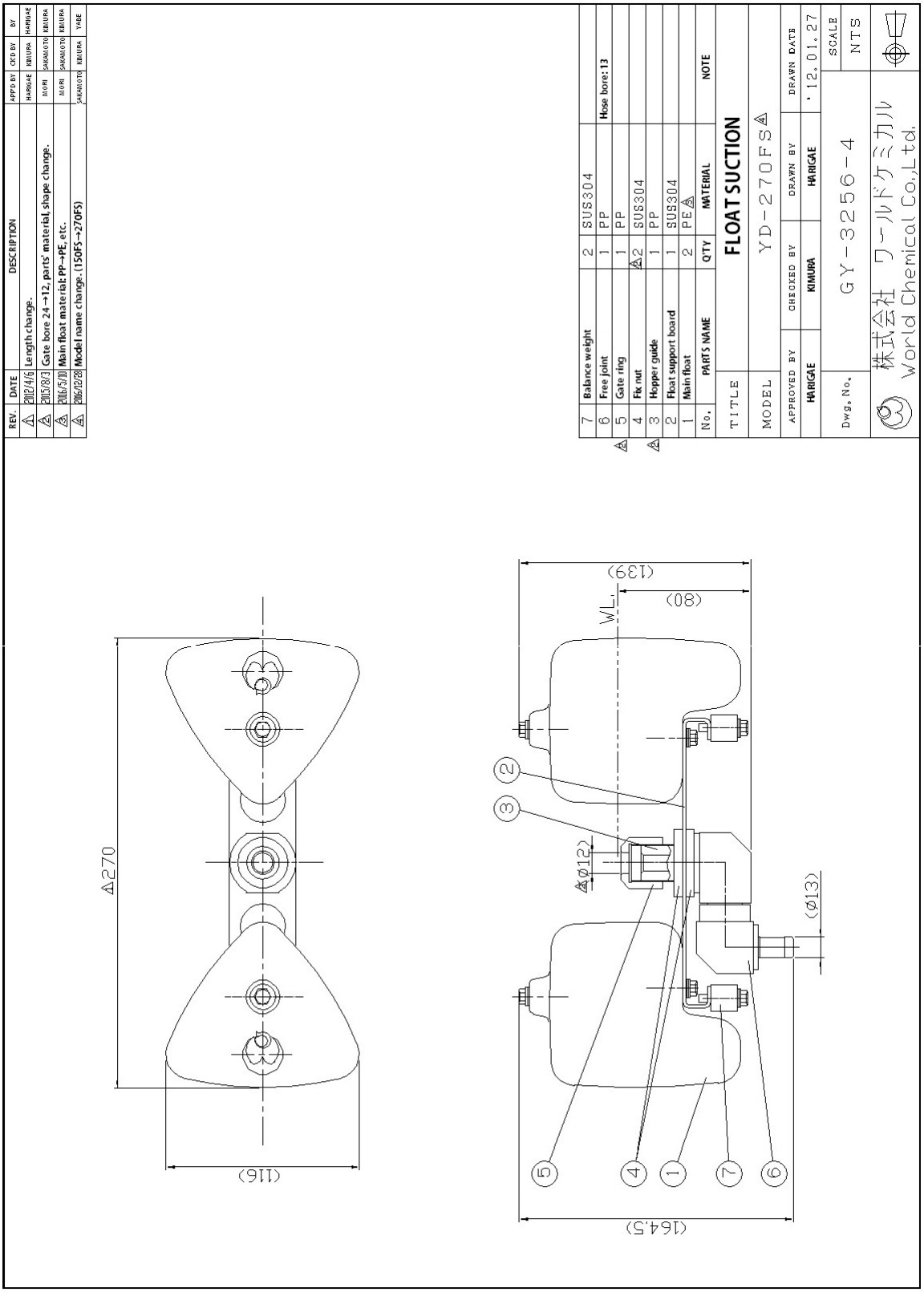




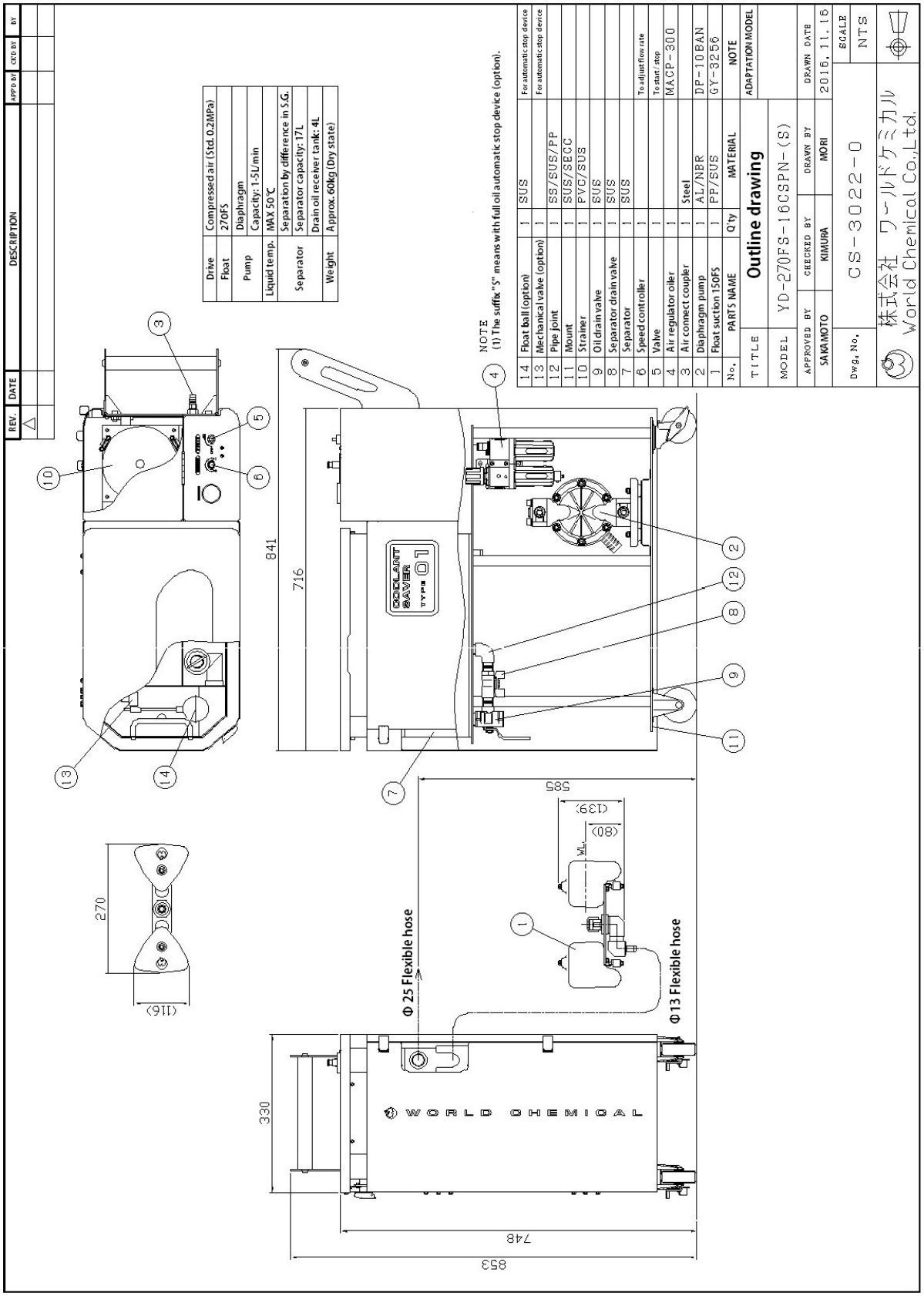
YD-200FS “FLOAT SUCTION” Outline drawing



YD-200FS-16CSPN “COOLANT SAVER PORTABLE” Outline drawing



YD-270FS “FLOAT SUCTION” Outline drawing



YD-270FS-16CSPN “COOLANT SAVER PORTABLE” Outline drawing

3. Installation

(1) When carrying the system, beware of oily water overflow from the separator by vibrations.
Discharging liquid from a drain to reduce the liquid level prevents overflow during .carrying.

(2) The oily water collected from the oil collecting pit is separated oil from water in the separator and discharged by natural drop. For this reason, make sure to set the drain port higher than the liquid level of the pit.

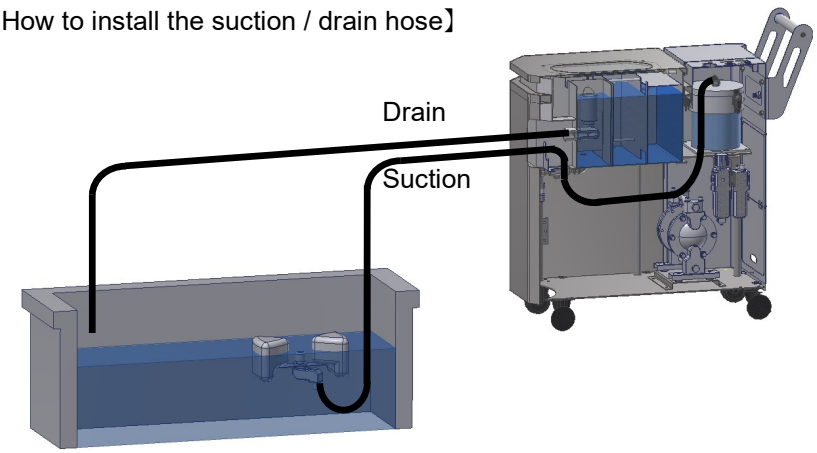
(3) Install the system at the firm and flat place.
If it is inclined, the drain and oil drain function may not work properly.

(4) Fix the system by using a stopper of casters or a wheel stopper.
If not, it may become unstable by vibrations. It also may cause unexpected accident for falling. Make sure the safety position and operate it.

(5) Connect a suction hose from the collecting skimmer with the suction inlet of the strainer unit and fix it with a hose band firmly.
If the hose is attached improperly, air enters from the connections and causes suction failure. Connect the hose not to twist or squeeze.

(6) Connect a drain hose with the drain port of the separator and fix it with a hose band firmly.
When returning separated water to a tank, set the tip of the hose at the nearly same height of the liquid level as far away from the collecting skimmer as possible.
If not, the power of the stream may stir floating oil and the oil collecting efficiency may reduce. If drain is higher than the liquid level, it enhances emulsion of oil.
However, the tip of the drain hose is submerged, it becomes less drain efficient. Do not submerge it.
When carrying the separated water to other tank, set the inlet of the tank lower than the drain port of the separator.
In any case, always tilt the drain hose downward to be discharged smoothly.

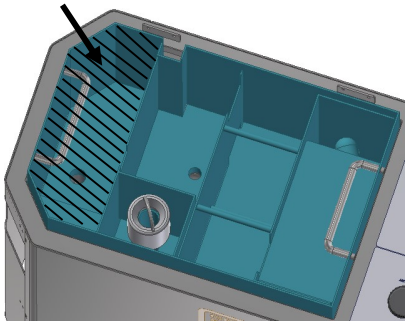
【How to install the suction / drain hose】



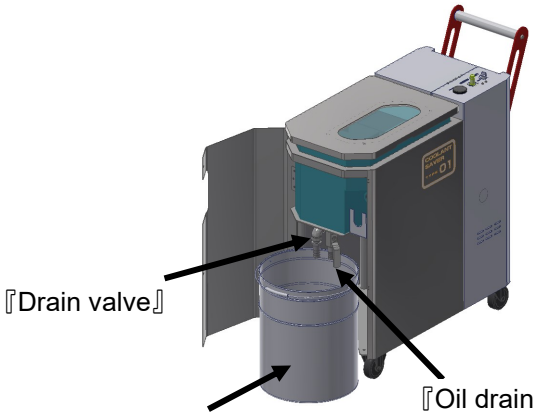
(7) When closing the “Oil drain valve”, the collected oil is remained at the drain oil receiver tank. When opening it, the oil is discharged from the separator. Put the appropriate container beneath for it.
By open the front cover, it is possible to put 20L pale under the “Oil drain valve” and “Drain valve”. (A pale is an option.)

〈At the close of the oil drain valve〉

『Drain oil receiver tank』



〈At the open of the oil drain valve〉

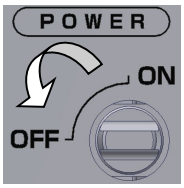


(8) Oil type to fill into the oiler of the 3 air set.
- Lubrication: Turbine oil correspondent to ISO VG32.

4. Operation procedure

- Check to complete the installation of the collecting skimmer, connection of a drain hose and set of an oil drain container. Also check to make sure to connect the flexible hose firmly and the correct connection port.

OFF

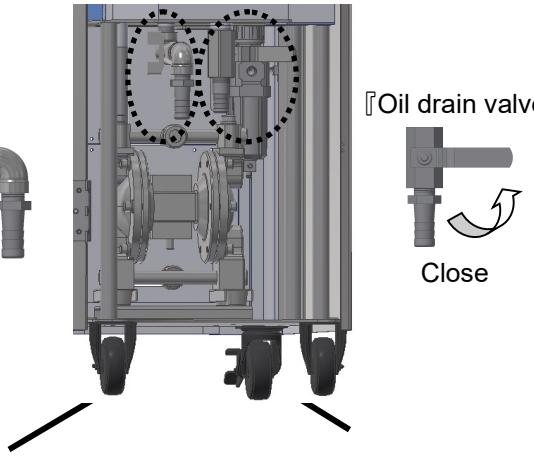


- <u>Check that the switch is OFF.</u> If not, <u>the pump unexpectedly starts at the same time of the connection.</u>

- Check that “Drain valve” and “Oil drain valve” of the separator are closed.

『Drain valve』

Close

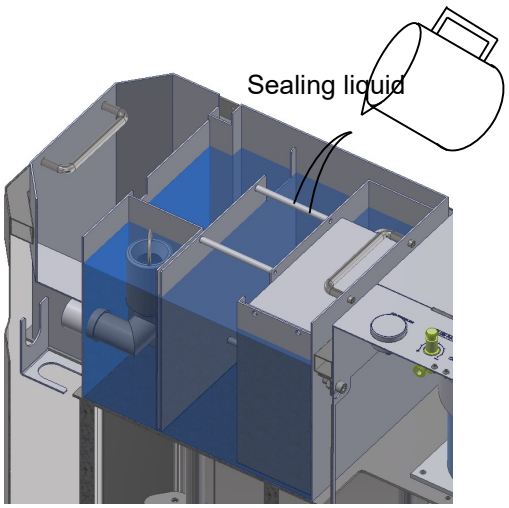


『Oil drain valve』

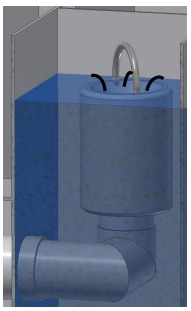
Close

(1) Pour the same liquid as one in a raw tank or tap water, if no problem, to the separator.
* For the separation by difference in S.G., sealing water is necessary in the separator.

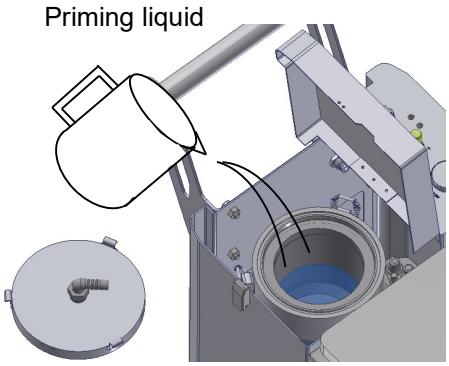
Pour liquid until overflow from “Drain cap”.
At that time, if the top of the drain cap is higher than the top of the oil drain slope, liquid goes into the drain oil receiver tank before overflow from the drain cap.



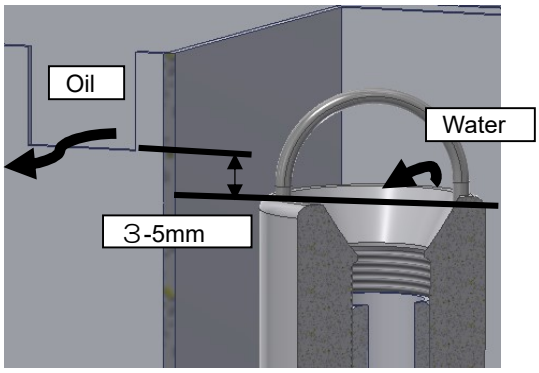
* It is possible to pump the collected liquid without pouring, but if large amount oil is floating, oil may goes back to the raw tank not to separate properly by less sealing liquid to be necessary for oil separation in the separator. When starting the system from the empty, make sure to pour sealing liquid.



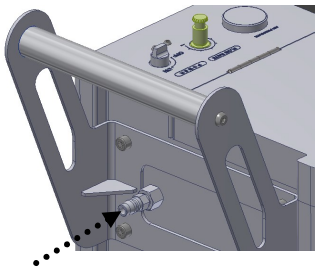
(2) Open the cover of the strainer unit and pour priming liquid for self-priming of the pump.
* Self-priming may be possible without priming liquid. However, for the smooth operation, pour priming liquid at the first operation.



(3) Adjust the drain cap of the separator up and down that the liquid level of the separator 3-5mm is lower than the oil drain port.
It is possible to adjust it during operation as necessary.

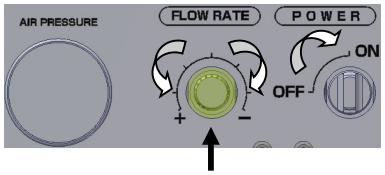


(4) Connect an air hose to the air regulator at the back of the main body.



『Air is supplied.』

Switch ON. Open the adjustment dial 1 or 2 turns as a guide. The recommended capacity of the collecting pump is 3L/min or less.



ON

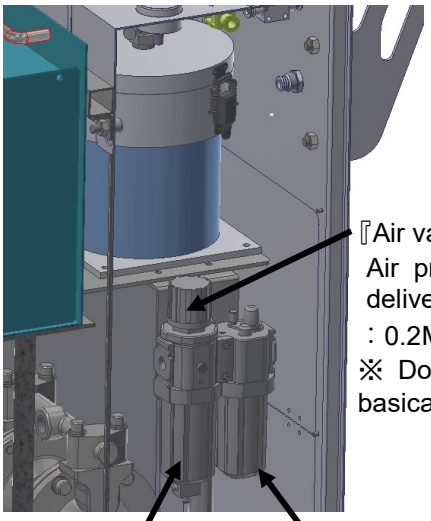
『Adjustment dial』

At the delivery, air pressure of “Air valve” is set 0.2MPa. Basically, do not change it and use the adjustment dial for appropriate pump work.

If the air volume is increased by a regulator, the pump works too much and it may cause damage or accident.

Adjust the collecting amount depending on the condition of liquid and oil.

*** When the collecting amount is increased, the separating ability decreases. If the ability is not enough, decrease the collecting amount by adjustment of the gate ring of the skimmer and the capacity of the pump.**

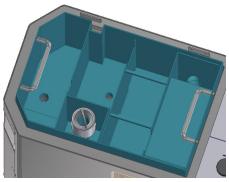


『Air valve』
Air pressure at the delivery
：0.2MPa
※ Do not change , basically.

『Air regulator』 『Oiler』

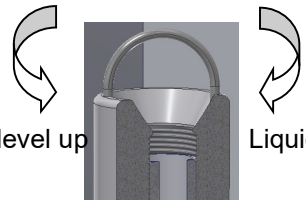
(5) The collected oil is possible to be remained in the drain oil receiver tank by closing the oil drain valve. When discharging the oil, open the oil drain valve. At that time, prepare a container such as a pale beneath of the oil drain valve.

〈At the close of the oil drain valve〉 〈At the open of the oil drain valve〉



『Drain oil receiver tank』

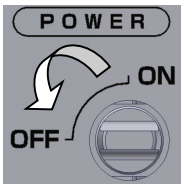
The collected oil is discharged with increasing the amount for light specific gravity. If not discharging, adjust the drain cap upward. The liquid level up makes collected oil discharge.



Liquid level up Liquid level down

(6) When stopping the operation, switch OFF.

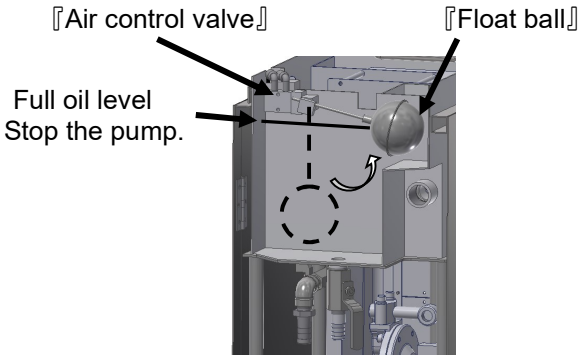
OFF



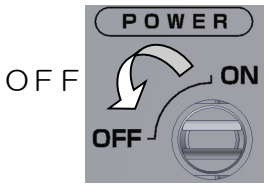
- Full oil automatic stop device (Option)

When it is an unattended operation, the collected oil is remained until the appropriate the liquid level in the drain oil receiver tank and the control valve of the device cuts the supplied air to stop the operation automatically.

1. As full of collected oil, “Float ball” moves and the related “Air control valve” cuts the supplied air to stop the pump.

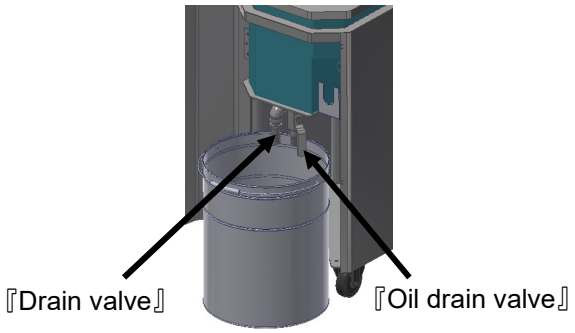


2. <u>Switch OFF to prevent to start the pump during work.</u>
   * At the state of the valve ON, if the float works unexpectedly, the pump starts. Make sure to switch OFF.

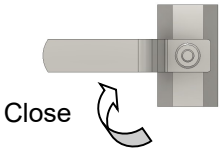


3. Prepare a container for drain oil such as a pale. As opening the front cover, possible to put 20L pale beneath “Oil drain valve” and “Drain valve”. (The pale is an option.)

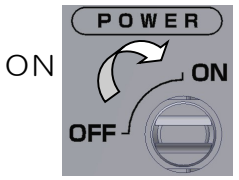
4. Open “Oil drain valve” to discharge collected oil from the drain oil receiver tank to the pale.
   * At that time, do not open “Drain valve”.



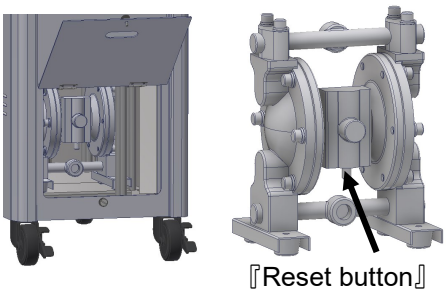
5. Close “Oil drain valve”.



6. Switch ON to start an operation.



* If by any change switching ON and the pump does not work, open the back cover and push “Reset button” on the diaphragm pump.



5. Operation precaution & adjustment

Adjustment after starting an operation is described. When adjusting, follow the above precautions.

⚠ **When the temperature of the collected oily water is high, the temperature of the collecting skimmer, pump separator and hoses rises near the liquid temperature. At that time, stop the operation and leave it until the each temperature becomes enough low.**
When adjusting during operation, be careful not to burn.

⚠ **When collecting hazardous liquid, take safety measures such as rubber gloves and protect grasses as required.**

The system is tested in our factory as necessary, but when setting the way of the oil drain for the customer's request, follow the above adjustment procedure depending on the condition of the collected oil.

The necessary parts to adjust for the oil drain are the adjustment dial and the height of the drain cap.

Firstly, collect oil as per normal and adjust the drain cap by checking the oil drain condition. When the collected oil is low-viscosity and water in the waste oil is decreased, turn the drain cap clockwise and lower it. The liquid level in the separator is lowered.

When it is fine to mix small amount of water in the waste oil for the collected oil with sludge, turn the drain cop anti-clockwise and raise it. The liquid level in the separator is raised.

When the collected oil is mixed with sludge, but water in the waste oil is decreased, turn the drain cap clockwise and lower it. The liquid level in the separator is lowered.

The ability of the separator is 5L/min or less. Adjust the collecting skimmer and pump depending on the processing ability. (Our recommended: 3L/min and less.)

The capacity of the collecting pump depends on the collected oily water rate, the condition of the floating oil, the stroke count of the pump (air supplied amount, pressure, etc.) or head. At the time of the test run or adjustment, check the pump capacity and adjust it according to the separator processing ability against the pump capacity.
When the collected oily water is more than the processing ability of the separator, it causes the separation or drain failure.

6. Maintenance

If a large amount of sludge or solid objects are mixed with the collected oil water, the ability is an obstacle. Maintain the system periodically or as necessary.
At the time of maintenance, follow the precautions.

⚠ **Stop the supplied air.**

⚠ **When the temperature of the collected oily water is high, the temperature of the collecting skimmer, pump separator and hoses rises near the liquid temperature. At that time, stop the operation and leave it until the each temperature becomes enough low.**

⚠ **When collecting hazardous liquid, take safety measures such as rubber gloves and protect grasses as required.**

⚠ **Disassemble and maintain the pump in accordance with the pump instruction manual.**

(1) Collecting pump

1) Remove a suction hose with the collecting skimmer from the water filling port.

2) Check the abnormal noise, liquid leakage from the pump or performance degradation during operation.
If any abnormality occurs, refer to the next “Troubleshooting” or consult us, and take appropriate measures.
As necessary, overhaul the pump or replace parts.

3) The life of consumable parts depends on the use condition. It is not covered by warranty.

4) Even if the pump works properly, overhaul it once and more a year.
Regarding the consumable parts of the pump, check no abrasion, friction, corrosion, scratch or deformation at the overhaul and replace it as necessary.

(2) Separator

1) When discharging liquid in a separator, put a container like a pale beneath the drain valve and open the drain valve.

2) Check the inside of the separator and wash out sludge, dirt or scum oil adhered on the inside wall with water.

3) Check no rusty or excrescence on the wall after washing inside. If happen, remove them.

4) Connect each hose to the separator. If necessary, wash the hoses, too.

5) Pour sealing liquid by little and little after closing the drain valve and check no liquid leakage from the drain or hose connections.

6) The frequency of the separator check depends on the condition of the floating oil or the inflow of sludge or dirt. Even if it works properly, discharge liquid once a month and check inside.
If sludge or dirt goes into, it affects drain or oil drain failure by accumulation. Discharge liquid or wash inside depending on the inflow.

(3) Strainer

1) The strainer is made of transparent PVC. Check it periodically and clean it when sludge is adhered.

2) It is easy to open the cover by three unlocking.

3) Clean the basket and inside after removing the cover.

4) It has an O-ring. When assembling, do not get caught it. If the O-ring gets caught and the sealing between the container and cover is lost, the self-priming ability disappears.

7. Troubleshooting

	Problem	Cause	Measures
Suction failure	Suction failure	Maladjustment of the collecting skimmer.	Move the suction inlet of the collecting skimmer up-and-down and re-adjust the flow rate of oily water.
		Reduction of the amount to pump.	Check the pump and replace parts as necessary.
		Pump clogged for foreign objects.	Check the suction inlet, discharge outlet and the inside of the pump and clean them.
		Flexible hose clogged for foreign objects.	Check and clean the inside of the flexible hose.
		Air suction.	Adjust the inlet of the collecting skimmer and oily water flow rate properly. Check the connection of the flexible hoses.
Noise	Abnormal noise of the pump	Foreign objects enter into the casing.	Disassemble the pump and remove foreign objects.
Separa-tion failure	Oil in drain.	Maladjustment of the pump capacity.	Adjust the pump capacity accordance with the capacity of the separator (3 L/min or less).
	Water in the collected oil.	Emulsification of the collected oil.	It is too hard to separate water from emulsified oil completely.
		Adjustment failure of the drain cap.	Adjust the drain cap to be lower and become the water level low.

	Problem	Cause	Measures
Drain failure	Separated water is not drained smoothly.	Separator is installed at the lower position.	Re-install that the drain outlet of the separator is higher than the oily water level in the oil collecting tank.
		Gradient failure of the drain hose.	Re-install that the drain hose is gradient.
		The tip of the drain hose is submerged.	Install the tip of the drain hose upper than the oily water level in the oil collecting tank.
		The drain hose is clogged.	Check and clean around the drain outlet and the inside of the drain hose.
		Sludge is accumulated at the bottom of the separator.	Discharge liquid from the separator and clean the inside.
Oil drain failure	Oil is not drained smoothly.	Oil drain outlet is clogged.	Remove oil and solid material adhered around the oil drain outlet, and clean it.

8. Warranty / Repair

1. period and coverage

(1) The warranty period is 12 months from dispatched from our factory.

(2) During warranty period, if the pump breaks down or is damaged at the use under the condition instructed in this manual due to manufacturing defect(s), the failure parts are repaired free of charge.

(3) Even if the failure occurs within the warranty period, the followings are repaired or replaced for compensation in principle.

- Breakdown or damage due to different use or safekeeping from the instructions in this manual.
- Breakdown or damage due to incorrect use or unjust repair or modification.
- Breakdown or damage as result of pollution, salt damage, gas damage, abnormal voltage or undesigned power (voltage, frequency) as well as fire, earthquake, flood disaster, lightning strike or other natural disaster.
- Abrasion or degradation of consumable parts like a gasket or O-ring.
- Breakdown or damage during transportation, for relocation or fall after your purchase

(4) We cannot be responsible for the break down or damage of the customer-specified pump.

(5) Irregularities or breakdowns due to chemical or hydrodynamic corrosion by liquid and abrasion by the slurry are not covered under the warranty. The material chosen at the time of the contract is only a recommendation. We do not guarantee the chemical resistance of the material.

(6) If the determination of the cause for the breakdown or damage is questionable, it attributes to the negotiation between the customer and us.

(7) Expenses or other damage incurred as a result of breakdowns at the use under the different condition from the instruction in this manual are not covered under the warranty.

2. Repair

Notice:
For repair, consult the supplier. When returning a pump, thoroughly clean and pack the wet parts kit.

If irregularities are detected during operation, stop the operation immediately for check. (Refer to the section on “troubleshooting”).

(1) Consult your supplier or us for repair.

(2) Read this manual again and re-check before requesting repair.

(3) When visiting to a distance location for repair, the travel expenses are charged.

(4) Inform the followings when requesting repair.

- Model name and serial number
- Use duration and condition
- Damages parts and condition
- Liquid (Name, Specific gravity, Temperature, Slurry)

If liquid leaks during transportation, it is very dangerous, so make sure to clean inside thoroughly.

Installation record

Model:	
Purchase date:	Serial number:
Start date:	Supplier:

Ver.20240819

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