Floating Oil Collecting System

“Coolant Saver Portable Hybrid”

YD-200FS-12CSPW
YD-270FS-12CSPW

Instruction manual

Ver. 20231227

World Chemical Co.,Ltd.

Preface

Thank you very much for purchasing our floating oil collecting system “Coolant Saver Portable Hybrid”.
This system is installed at coolant tanks, washing/waste tanks and various collection tanks, and two patterns of switching operation are possible. (1) Oil collecting (2) Slurry collecting. Operation can be selected according to the collection application.

<1. Oil collecting>
This is the floating oil collecting / separating system which is constructed mainly in combination with our float suction. It can be collected and separated floating oil in tanks into which oily waste liquids and sewage discharged from factories and facilities flow.
<2. Slurry collecting>
Mainly it can absorb and collect slurry by operating a manual nozzle.
Before use, make sure to read this manual so that you fully understand the functions and features of this product.
Also, keep this instruction manual in a safe place that you can refer to it as needed.

Contents

Caution	**This instruction manual is intended for standard specification systems. For special specification systems, replace the specifications with the corresponding items or words in the text when reading.**

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.

Note that items marked with “Caution” may lead to serious consequences depending on the situation.

Ⅰ. Transport and install precaution

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 wooden crates, 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 precaution

Danger (1) **When operatig with 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

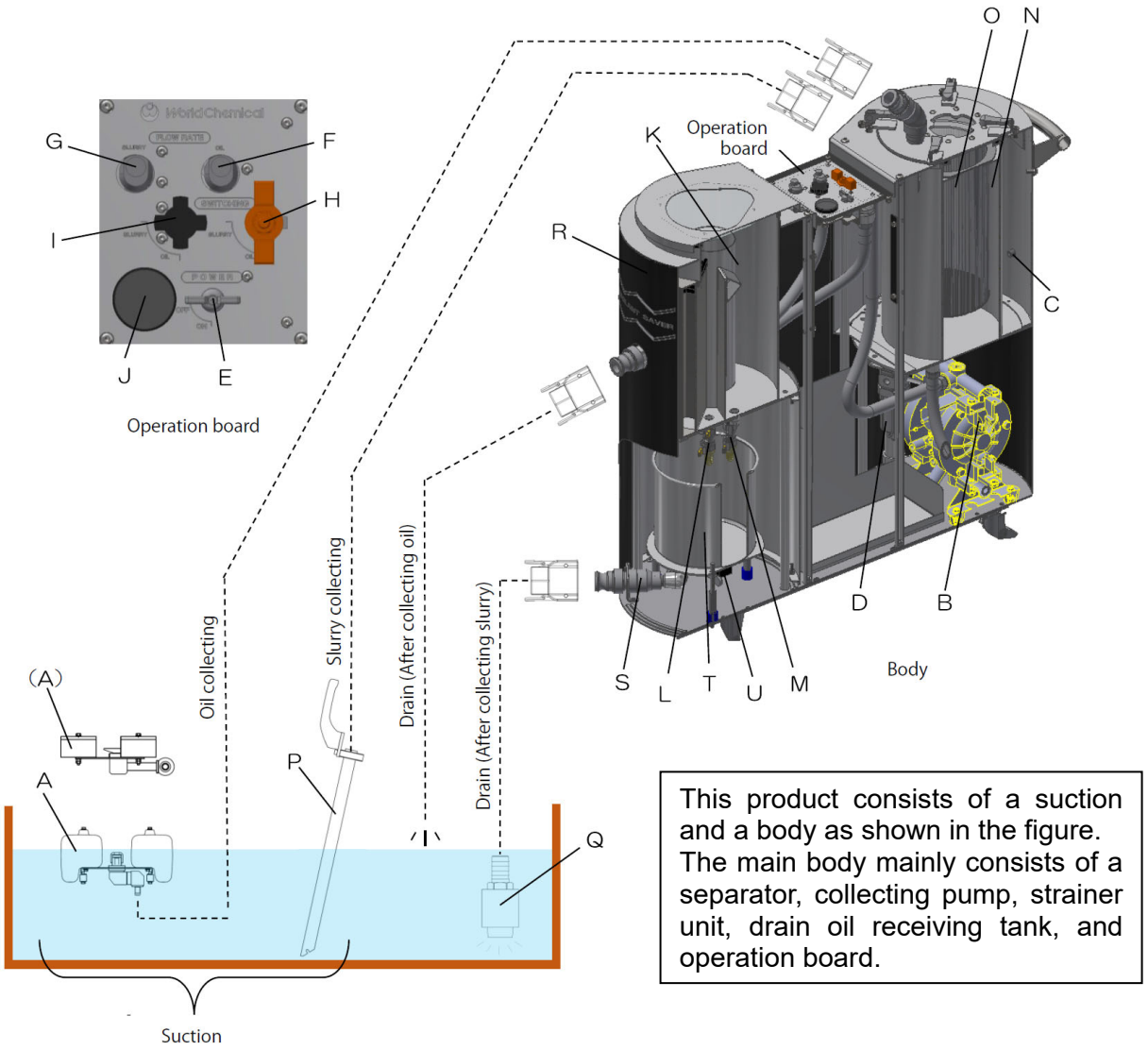
⚠ Caution (1) **Do not use the system with any specifications other than specified. Any use outside of the specifications is not covered by warranty.**

⚠ 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. Parts name and material



This product consists of a suction and a body as shown in the figure. The main body mainly consists of a separator, collecting pump, strainer unit, drain oil receiving tank, and operation board.

Parts name and material

	Part name	Material		Part name	Material
A	Float suction 270FS	PP / sus	K	Separator	SUS
(A)	(Float suction 270FS)		L	Drain valve for collected oil (10A)	SUS
B	Diaphragm pump	AL / NBR etc.	M	Drain valve for separator (10A)	SUS
C	Air connection coupler	Iron steel	N	Strainer housing	SUS
D	Air regulator		O	Strainer	SUS
E	Start/Stop valve		P	Nozzle to collected slurry	PVC
F	Speed controller to collect oil		Q	Drain catcher	SUS/PP/PC
G	Speed controller to collect slurry		R	Body	SUS/SGCC
H	Switching valve for liquid (15A)		S	Joint	SS/SUS/PP
I	Switching valve for air		T	Tank to receive oil	SUS
J	Air pressure gauge		U	Mechanical valve	

3. Specification

	Oil collecting	Slurry collecting
Model	YD-270FS-12CSPW	
Capacity	Oily water: 1-5 L/min.	Slurry liquid: to 30 L/min.
Operating temperature	Maximum 50 degrees	
Body dimension	980W x 330D x 990H (mm)	
Weight	Approx. 75 kg (Dry)	
Collection suction (Standard)	<Float type> Material: PE, PP, SUS Dimension: W270 x D116 x 139H (approx.) Hose: Φ13 x 2.5 m: Made of PVC *Lower liquid level in use: 80 mm	<Nozzle type> Material: PVC Dimension: Φ26 (20A) x L700 Hose: Φ25 x 2.5 m: Made of PVC
Collection pump	Diaphragm pump (Main material: Outer=Aluminum, Diaphragm=NBR)	
Recommended supply pressure to pump	0.4Mpa	
Regulator valve	Air two pieces set (Port: with 20PM male parts)	
Separator	Capacity: Approx. 12 L Structure: Separation by difference in specific gravity	-
Strainer	Main material: SUS, Basket material: SUS (Capacity: Approx. 6 L) (Mesh opening: 1 mm)	
Drain hose	Φ25 x 1.5 m: Made of PVC	Φ25 x 2 m: Made of PVC
Standard equipment	*Automatic stop device (When drain oil is full, it automatically stop collecting.) *4 L pail	
Option	*Small float (Lower liquid level in use: 48.5 mm) *Strainer bag filter (100 μ, 50 μ)	

- When setting the passage diameter finer than the existing strainer's one, an optional strainer bag filter is available.
- Consult us about μ filters other than listed.
- If the existing float suction 270FS cannot be installed due to space constraints, the smaller float suction 200FS is available.

4. Suction handling instructions

<1. Oil collecting> Handling instructions of the collecting skimmer

The collecting skimmer absorbs while keeping the water depth of the oily water inlet (Gate ring) constant and efficiently collects surface oil. Two types of 200FS and 270FS can be selected when ordering, depending on the amount of inflow and installation space.

It is possible to adjust the inflow by rotating the gate ring. The clockwise rotation makes the flow drop (H1 in the right picture) bigger and increases the inflow. On the other hand, the anti-clockwise makes the flow drop small and decreases the inflow. (Below Table 1)

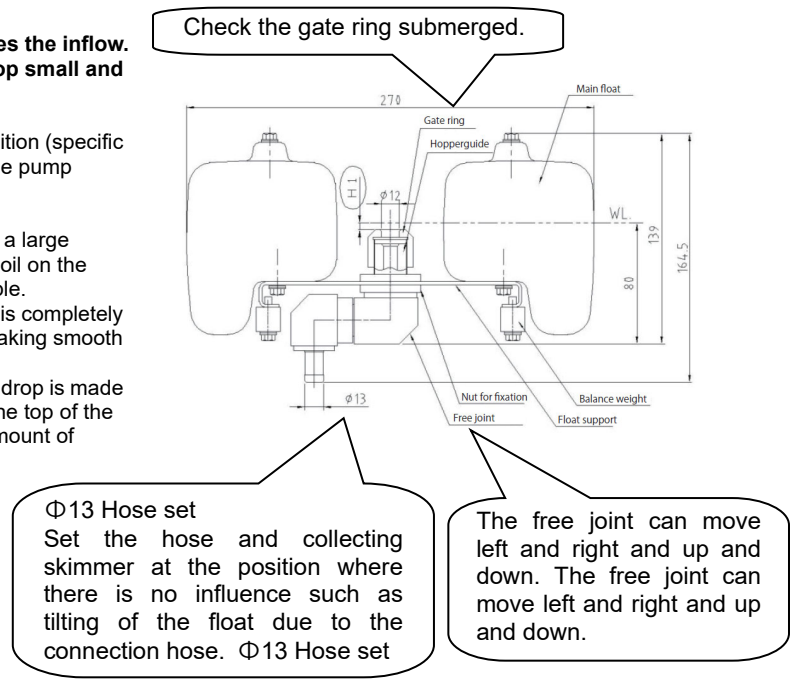
Adjust the inflow drop by maintaining a balance with the condition (specific gravity, viscosity, etc.) and thickness of the floating oil, and the pump capacity.

If the inflow drop is much deeper than the oil layer thickness, a large amount of water in the lower layer enters in compared to the oil on the surface. will overflow and smooth collection will not be possible.
If the suction capacity of the pump is exceeded, the gate ring is completely submerged and the floating oil overflows at the inflow port, making smooth collecting impossible.
In addition, if the oil layer on the surface is thin and the inflow drop is made too shallow to collect only the surface oil, the oil adheres to the top of the gate ring, and the viscosity of the oil drastically reduce the amount of inflow.

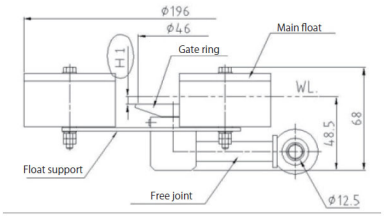
The optimum inflow drop is the state where the collected oily water flowing from the gate ring flows along the inner wall of the hopper as a thin layer. For normal mineral oil, the optimum inflow drop of the gate ring is approximately 3-5mm.

In order to continuous smooth operation, take the skimmer out of the water tank according to the dirtiness, wash it, and perform maintenance such as tightening the nut.

<YD-270FS Collecting skimmer>



<YD-200FS Collecting skimmer>



If the surface of the float becomes dirty, solid foreign matter such as sludge easily adheres to it. In association with the grow, the ability of the float to follow waves deteriorates, so clean it periodically.

Also pay attention to dirt on the gate ring and free joint. Since the free joint moves according to the movement of the hose and float, smooth movement is not possible if they become dirty or have solid foreign objects caught in them.

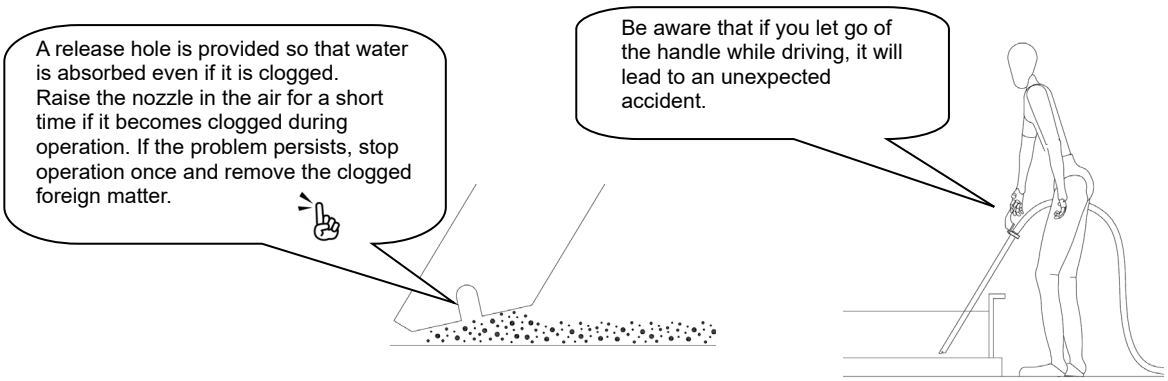
<Relationship between inflow head and inflow volume> Table 1

Inflow drop H1 (mm)	Gate ring inflow volume (L/min.)	
	270FS	200FS
3	1.5	3.5
4	3	5
5	4.5	6.5

This table shows the inflow of fresh water based on theoretical calculations and does not guarantee the actual amount of collecting. The collecting amount varies depending on the conditions of floating oil, water quality, the presence or absence of floating objects, the surrounding environment, and other factors.

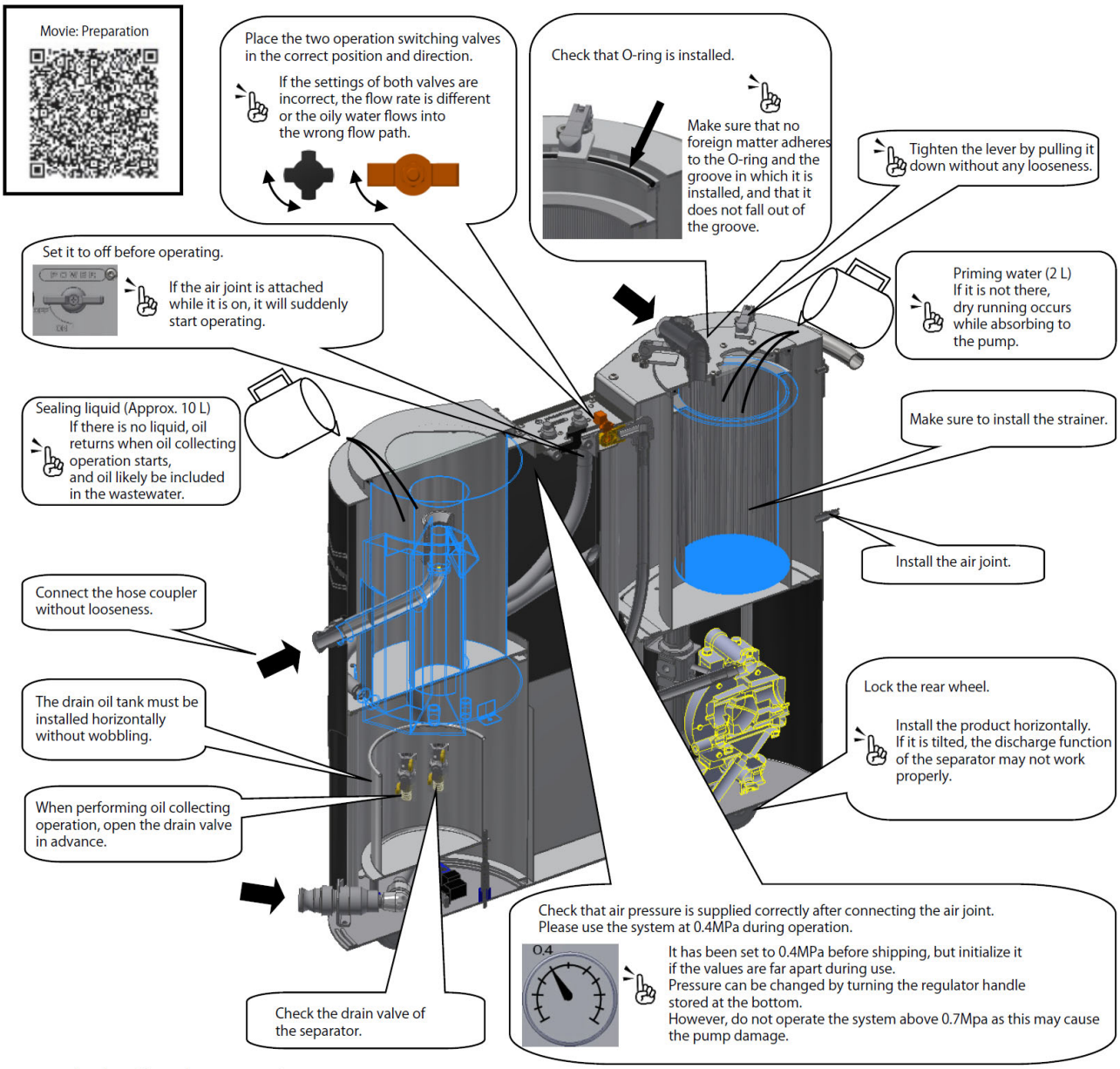
<2. Slurry collecting> Handling instructions of the collecting nozzle for slurry

The nozzle has a shape as shown in the figure below so that it takes up slurry accumulated at the bottom of the collection tank. Firmly fix the handle and start operation.

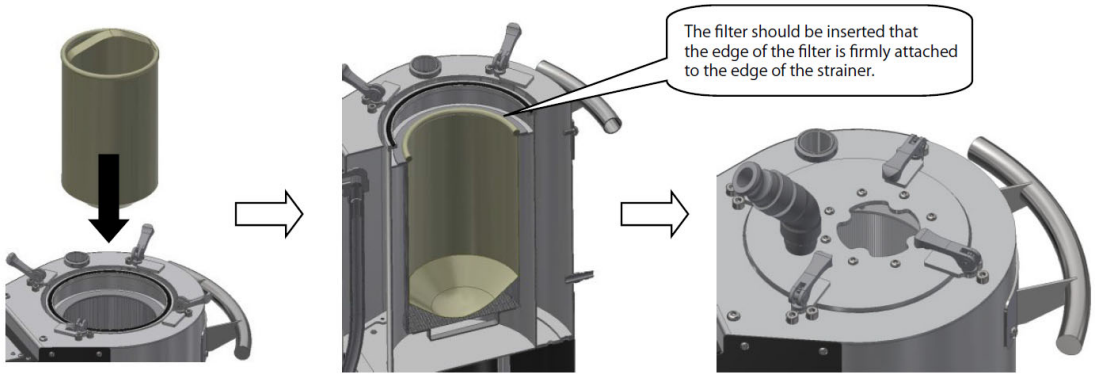


5. Operation preparation

⚠ To use the product safely, be sure to make the following preparations before operation.



- Attach the filter (as Option).
  Please use by inserting the filter from above the strainer.



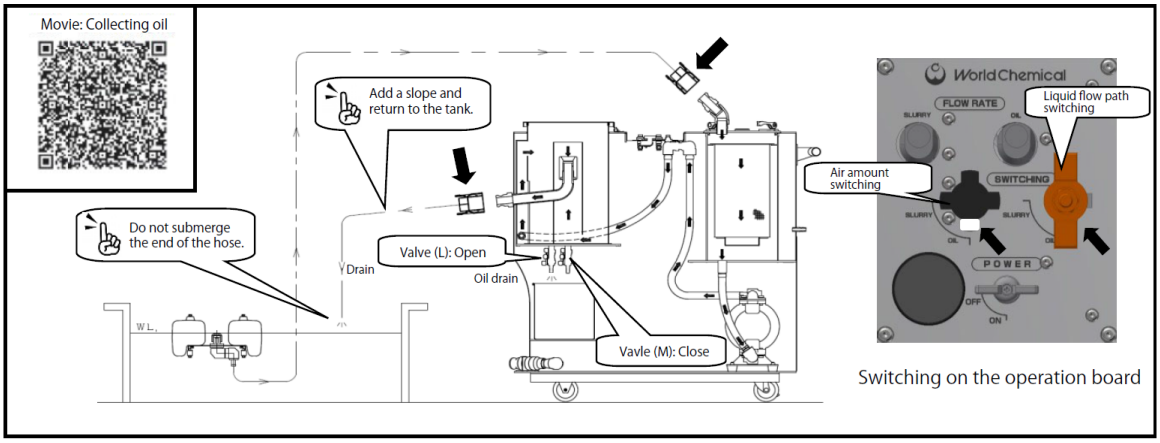
6. Operation switching

This product can be switch between two patterns of operation: (1) oil collecting and (2) slurry collecting and select the operation depending on use. To switch the operation, change the switch on the operation board and the hose shown below. The operation is switched by turning the two knobs. When collecting oil, set the knobs to the "OIL" position, and when collecting slurry, set the knobs to the "SLURRY" position. (This product cannot operate oil collecting and slurry collecting at the same time.

<1. Oil collecting>

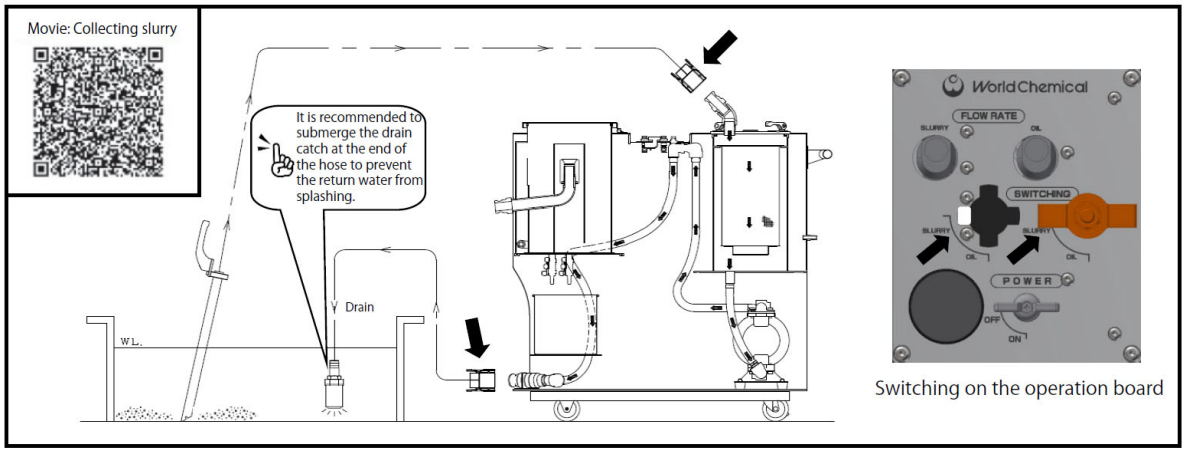
A float in a tank collects the floating oil. Oily water in the separator is separated into oil and water by specific gravity separation and discharged.

※ Open the drain oil valve (L) at the bottom of the separator and keep the drain valve of the separator (M) close, because the oil is discharged into the drain oil tank at the bottom.



<2. Slurry collecting>

The nozzle for slurry collecting is manual and mainly collects slurry, which has settled on the bottom of the tank, from the nozzle tip. The absorbed slurry is caught in a strainer basket and the impurity-free water is returned to the tank.



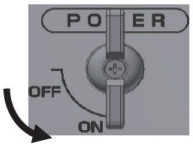
※ Note that incorrect operation on the operation board or incorrect hose connection may result in improper operation.
In particular, switching on the operation board incorrectly may result in a different flow rate or the liquid may flow into an unintended flow path.

7. Operation

Regarding oil or slurry collecting, there are differences in operating methods and routes.
Two operations are explained.

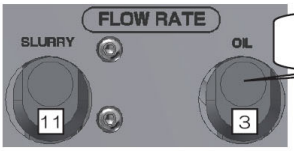
<1. Oil collecting>

(1) Turn on the ON/OFF valve to start operation.



Movie: Oil collecting

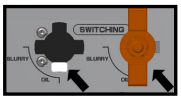
(2) Adjust “Flow rate valve” on the operation board that the collecting flow rate becomes appropriate while checking the suction situation of the float suction, separation status of oily water in the separator, waste oil/water situation and amount.
The flow rate valve to use for oil collecting is shown “OIL”.



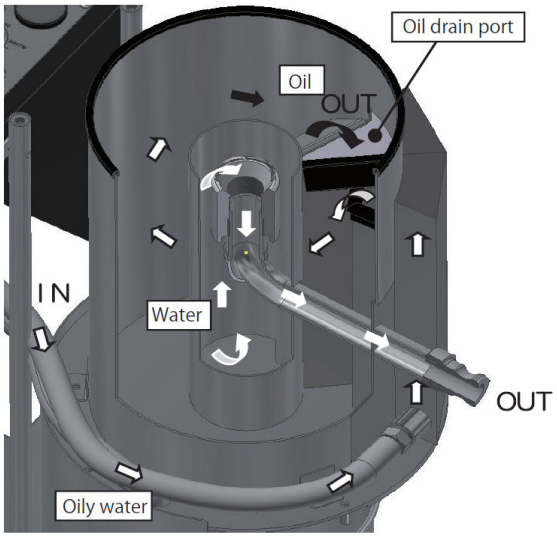
【Flow rate valve to adjust oil】
Dial scale at time of shipment: 3.

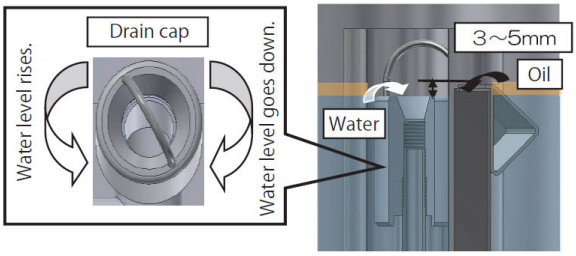
Dial adjustable range: 0 - 9
* If the dial value is set to a small value, the separation is better, but the suction amount is less and the collecting speed becomes slower.
* If the dial value is set to a big value, the suction amount is big and the collecting speed becomes faster. Howevder, the separability cannot keep up with the oily water.

※ Make sure to switch the three way valve in advance.
(Refer to Page 10)



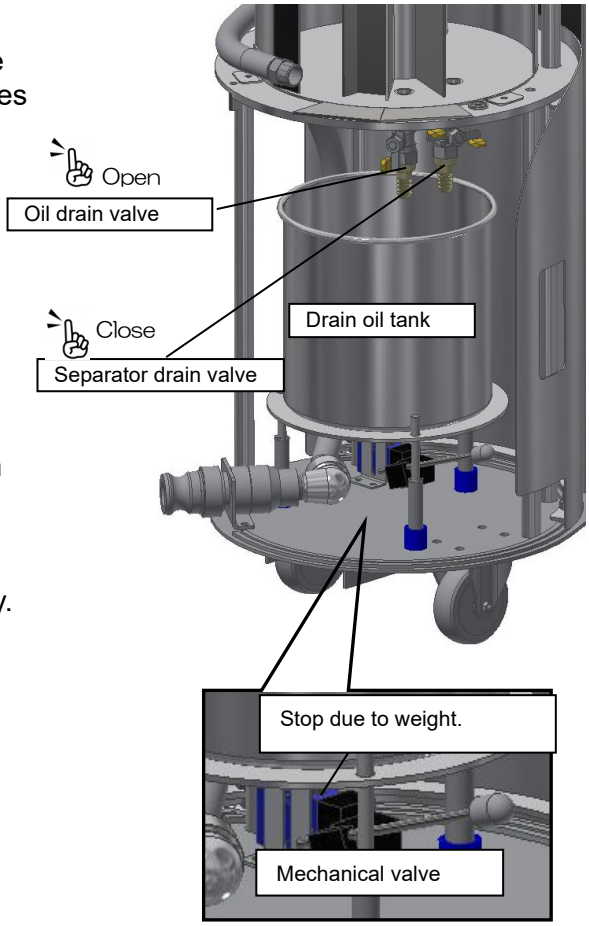
(3) Oily water discharged from the pump flows in from the top of the separator like a waterfall. As the water level in the tank rises, it is transferred in a circular motion toward the oil drain port, and during this time, the floating oil separated due to the difference in specific gravity climbs over the slope and overflows to the oil drain port.
Meanwhile, the separated water rises inside the pipe from the lower notch in the central pipe. Then it discharged by overflow from the drain cap. The water level in the separation tank is designed to match the height of the top of the drain cap, and it is possible to adjust the water level in the separation tank by raising and lowering the cap. The cap is screwed in and the height can be changed by turning the cap. In the case of normal low viscosity mineral oil, the gap between the height of the top of the oil drain port and the top of the drain is approximately 3 to 5 mm. After the oil has accumulated in the gap, it is discharged to the oil drain port.





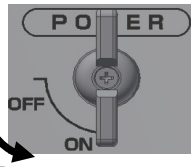
(4) The discharged oil from the oil drain port of the separator passes through the collected oil drain valve and enters the 4L drain oil tank at the bottom. When approximately 3L of oil accumulates in the tank, the mechanical valve detects the weight and stops operation. In this way, it is equipped with a mechanism which allows it to stop safely even when unattended. After detection, turn the valve on the operation board to "OFF" before discarding the oil accumulated in the tank. If you remove the tank while it is "ON", it suddenly starts operating, which is dangerous.

When the liquid in the separator is drained, open the drain valve and collect the oily water in the tank. In addition, the tip of the oil drain valve is equipped with a 10A hose joint, so it is possible to connect a hose and throw it away.



< 2. Slurry collecting>

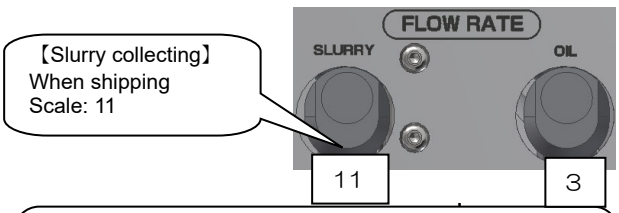
(1) Turn on the “ON/OFF” valve to start operation.



Movie: Slurry collecting

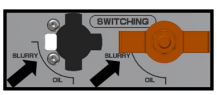
(2) Submerge the tip of the nozzle for collecting slurry into a tank. After that, move the tip of the nozzle to points where slurry is accumulating to collect.

(3) Adjust liquid collected by the nozzle by using the flow adjustment valve on the operation board.

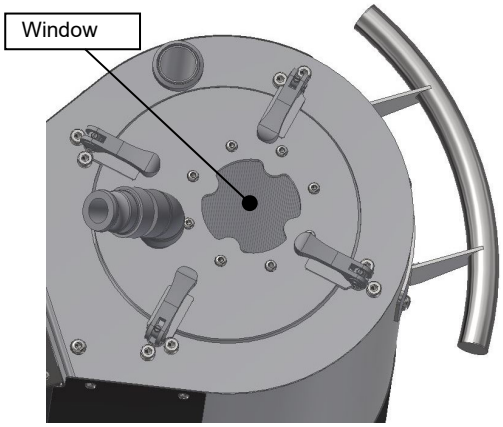


Adjustable range: 0～1 1
* Basically, it is recommended to use the product with the scale 11. If it is changed to the small scale, The suction flow rate decreases, and the suction power tends to be insufficient.

※ Switch the 3-way valve for air fluid in advance.
(Refer to Page 10)



(4) It is possible to check the collected slurry through the window of the strainer. Before the strainer is full, remove slurry. At that time, remove foreign objects stuck to the mesh of the strainer. The foreign objects cause clogging during operation. When collecting oil, also the strainer should be treated as the same.

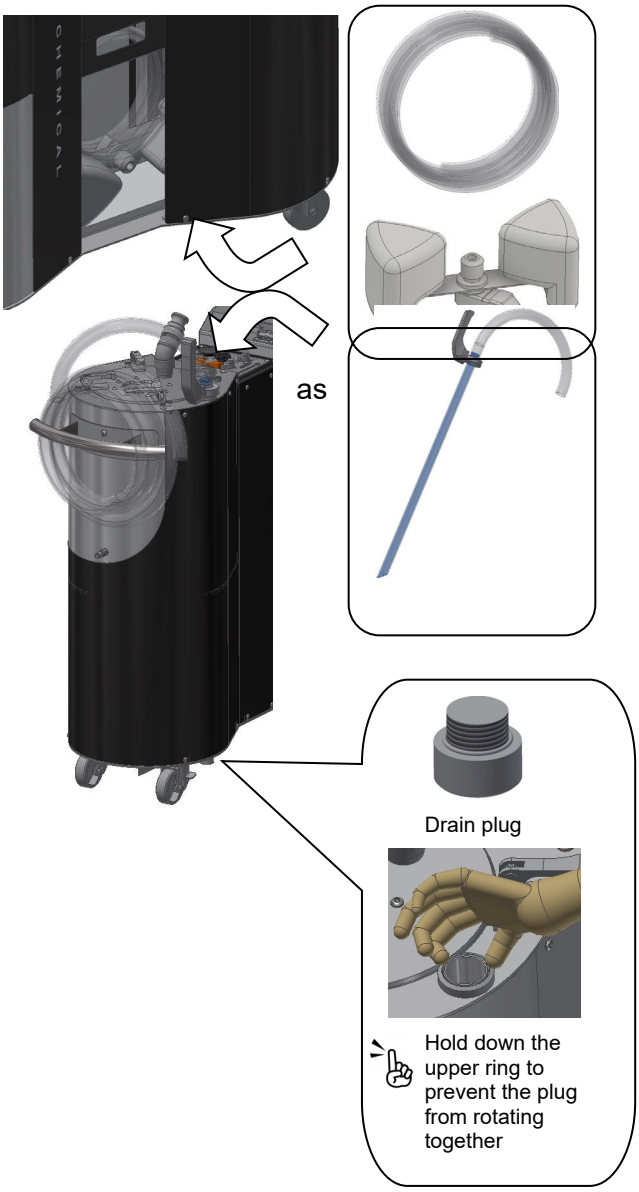


8. Store

It is possible to store the suction float (200FS・270FS) in the center door. It is convenient to store the suction hose together.

The nozzle for collecting slurry can be inserted into the main body and stored

shown in the figure. The attachment hose and drainage hose can be made compact by hanging them together. Accumulated water can be drained by removing the drain plug at the bottom of the area where the nozzle for collecting slurry. In that case, water may drip, so prepare a drain pan etc. at the bottom.



9. Maintenance

If large amount of slurry or solid foreign objects get mixed in collected oil, the performance is affected, so perform maintenance and inspection periodically or as necessary.
When performing maintenance and inspection, make sure to observe the following precautions.

Cut off the pump air supply to the device.

If the oily water to be collected reaches a high temperature, the collecting skimmer, pump, separator, hoses and whatever rise to near the liquid temperature, so stop operation and leave them until the temperature of each part has cooled sufficiently.

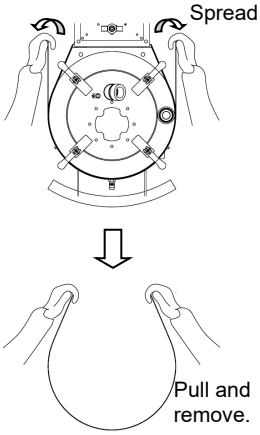
When collecting hazardous liquids (hazardous materials), workers are required to take safety measures such as wearing rubber gloves and safety glasses.

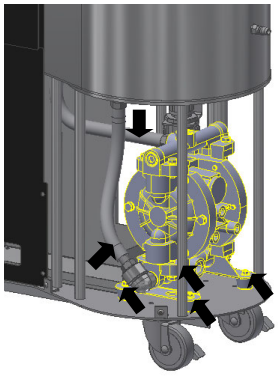
Follow the pump instruction manual when disassembling and checking the pump.

(1) Remove the pump & cover.

Loosen the bolts (9 locations) and remove the rear exterior cover.
It is possible to remove the cover from the main body by slightly spreading the left and right ends of the cover.
It is necessary to remove the bolts which fix the suction/discharge hoses and mount to remove the pump from the product.
※Regarding the maintenance of the pump, refer to the pump's instruction manual as separately.

Remove bolts.



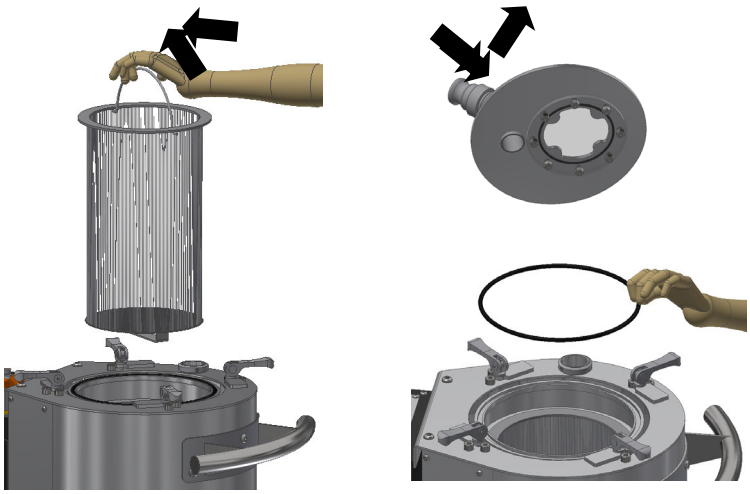


Remove bolts and hoses.

(2) Strainer

Open the cover and discard slurry and foreign objects which accumulate in the strainer. At that time, remove foreign objects which had adhered to the basket inside the strainer.
Replace O-rings when they wear out.
If O-rings lose their seal inside the strainer, performance may deteriorate or water may not be pumped. Also, if there is dirt on the O-rings or strainer cover, or if there is dirt in the O-rings groove, the sealing performance may be lost. Make sure to check them before operation.

Remove adhered objects.



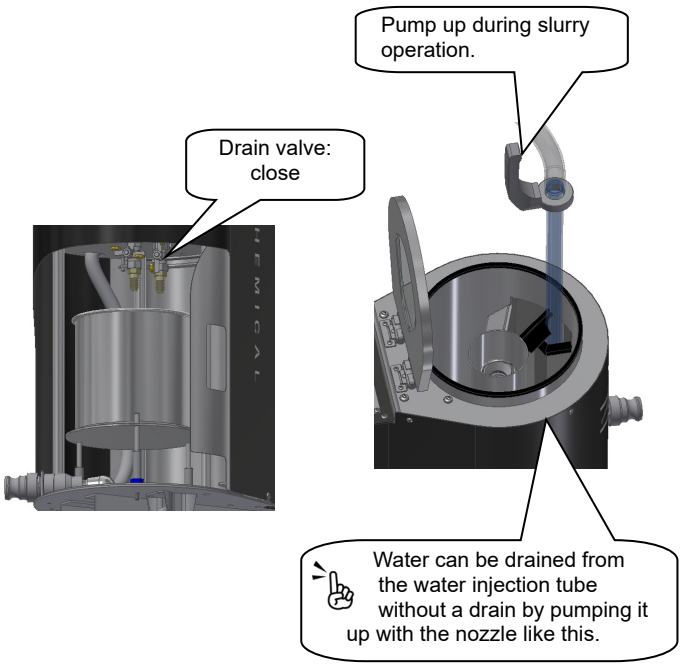
(3) Separator

Accumulation of foreign objects such as slurry at the bottom of the separator inhibit normal oil and water discharge. If there is the following signs, it may be due to accumulation, so please clean it.

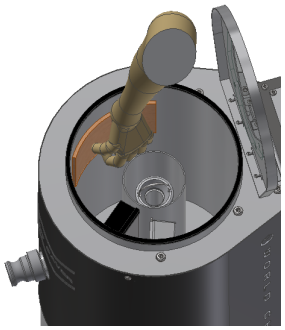
① Foreign objects have entered the wastewater.
② More water is mixed into the drain oil than normal.

To clean, drain the oily water from the separator. To discharge, open the drain at the bottom of the separator, or when

doing it faster, pump up with the nozzle for collecting slurry during slurry operation. Then, pump up fresh water and circulate it through the separator to remove dirt. Oil stains can be removed better if household detergent is used. (Make sure no detergent remains)
Finally, wipe the inside with a cloth.



How to drain oily water in the separator



Wipe the inside of the separator.

10. Troubleshooting

＜ 1. Oil collecting＞

	Trouble	Cause	Measure
Suction failure	Suction failure.	Improper adjustment of the skimmer.	Move the inlet of the collecting skimmer up and down to readjust the inflow of oily water.
		Decrease in pumped water.	Check the pump and replace parts as necessary.
		Pump is clogged by foreign objects.	Check the suction inlet, discharge outlet and inside of the pump, and clean them.
		Flexible hose is clogged by foreign objects.	Check the inside of the flexible hose and clean it.
		Air intake.	Adjust the inlet of the skimmer to optimize the inflow of oily water. Additionally, check the connection of the flexible hose.
		Full of drain oil tank.	Dispose of oil in the tank.
Noise	Strange noise.	Foreign objects enter into the pump casing.	Disassemble the pump and remove foreign objects.
Separator	Improper adjustment of the capacity of the pump.	Excessive collecting flow rate due to incorrect slurry collecting operation settings.	Set the flow rate and air 3-way valve on the control panel to oil collecting mode.
		Improper adjustment of pump discharge amount.	Adjust the pump capacity less than the separator processing capacity (3 L/min.).
	Water mixes with collected oil.	Emulsification of collecting oil.	It is difficult to completely separate water from emulsified oil.
		Improper adjustment of the drain cap.	Adjust the drain cap downward to lower the water level in the separator.
Drain failure	Separated water does not drain smoothly.	The installation position of the separator is low.	Reinstall the separator that the drain outlet is higher than the oil level in the oil collecting pit.
		Improper drainage hose slope.	Reinstall the drain hose downhill.
		The tip of the drain hose is submerged in water.	Place the tip of the drain hose above the oil level in the oil collecting pit.
		The drain hose is clogged.	Check and clean the area around the drain outlet and the inside of the drain hose.
		Slurry accumulates at the bottom of the separator.	Remove the drain from the separator and clean the inside.
Oil drain failure	Oil is not drained smoothly.	The drain oil port is clogged. Clogging	Remove oil or solid objects adhering to the area around the oil drain port and clean it thoroughly.

＜ 2. Slurry collecting ＞

	Trouble	Cause	Measure
Suction failure	Suction failure	Clogging of the tip of the attachment due to foreign objects.	Raise the attachment out of the water and remove any foreign objects.
		Decreased in pumped water.	Check the pump and replace parts as necessary.
		Clogging of the pump due to foreign objects.	Check and clean the suction inlet and discharge outlet and the inside of the pump.
		Clogging of the flexible hose due to foreign objects.	Check and clean the inside of the flexible hose.
		Air intake.	If the volume of water in the tank has decreased and it is absorbing air, increase the volume of water.
Noise	Strange noise	Foreign objects enter into the pump casing.	Disassemble the pump and remove foreign objects.
Drain failure	The collected water is not drained properly.	Insufficient collecting flow rate due to incorrect settings during oil collecting operation.	Set the flow rate and air 3-way valve on the control panel to slurry collecting mode.
		Discharged water scatters.	Submerge the tip of the drain catcher in water.
		The drain hose is clogging.	Check and clean the area around the drain port and the inside of the drain hose.
		The drain catcher is clogging.	Remove the drain catcher and remove foreign objects clogged.

11. Warranty, Repair

1. The warranty period and range
   (1) The warranty period is 12 months from the date dispatched from our factory.
   (2) During the warranty period, when pumps break down caused by our manufacturing detects even if they are used under the condition instructed in this manual, the failed parts are repaired free of charge.
   (3) Basically, even if failure is within the warranty period, the following cases are charged.
   - Failure and breakdown due to use or safekeeping different from the instructions in this manual.
   - Failure and breakdown due to incorrect use or unjust repair of modification.
   - Failure and breakdown as result of pollution, salt damage, gas damage, unusual voltage or undesignated power (voltage, frequency) as well as disaster beyond control such as fire, earthquake, flood, lightning strike and other natural disaster.
   - Abrasion and degradation of consumable parts such as gaskets and O-rings.
   - Failure and breakdown during transportation after shipment, for relocation of the installation site or fall.

   (4) Failure and breakdown of products made to the specification or materials customer-specified are not responsible.
   (5) Irregularities or breakdowns due to chemical or hydrodynamic corrosion by liquid 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) Questions arose about the determination of the cause of failure or breakdown are attributed to the negotiation between the customer and us.
   (7) Expenses or other damage incurred as a result of breakdown at the use under the point of use different from the instruction in this manual are not covered under the warranty.
2. Repair

Notice:
Consult your supplier for repair. When returning pumps, thoroughly clean and pack the wet parts kit.

If irregularities are detected during operation, stop the operation immediately and 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) The travel expenses are charged for business trip for repair service to remote sites.
(4) Inform the followings for requesting repair.
- Model name and serial number.
- Used duration and conditions.
- Failure parts and conditions.
- Used liquid (Name, Specific gravity, Temperature, Slurry contained).

Liquid leakage during transportation is dangerous. Make sure to clean the inside thoroughly before returning.

Model name:	
Purchase date:	Serial No.
Beginning of use:	Supplier:

Ver.20240819

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