Floating Oil Collecting/Separating System with Scraper

GREASECOMING

ＹＤ－３００Ｐ－ＮＩ－３５ＦＯ（３５ＦＯ－ＮＩ）
ＹＤ－３００Ｐ－ＳＩ－３５ＦＯ（３５ＦＯ－ＳＩ）
ＹＤ－３００Ｐ－ＭＩ－３５ＦＯ（３５ＦＯ－ＭＩ）
ＹＤ－３００Ｐ－ＢＩ－３５ＦＯ（３５ＦＯ－ＢＩ）

INSTRUCTION MANUAL

Ver. 20250404

World Chemical Co.,Ltd.

ＹＤ−３００Ｐ−ＮＩ／ＳＩ／ＭＩ／ＢＩ−３５ＦＯ
Instruction manual

Contents

Notice	This instruction manual is directed to the standard system. Regarding the special unit, translate the specification into the appropriate articles or words.

Safety precaution

The rank of the safety precaution is classified and defined as “Danger” and “Caution” in this manual as follows.

Danger If the handling is failure, it may lead to a dangerous situati on. Fatal accident or serious injury may occur.

Caution If the handling is failure, it may lead to a dangerous situation. Moderate / slight injury or property damage may occur.

Even if “Caution” is indicated, it may have serious consequences by condition. At any rate, they are important and make sure to observe them.

I. Precaution when transportation & installation.

Danger (1) When carrying the product, surely drain liquid in the separator and be careful of **a fall or slip drop** because it is easily slip for adhered oil after use. Moreover, make sure to remove the power in a terminal box.

Caution (2) When opened a wooden box, attend inquiry **by nails and wood offcuts**.

Caution (3) Install the product **on a firmly level place** and fix it **with anchor bolts firmly.**

Caution (4) **The electric power box is connected by qualified person according to the regulations of electrical installation and company’s rules.**

Caution (5) **Use a crimp type terminal to connect the power supply cable.**

Danger (6) Make sure to **connect the earth terminal** to prevent electric leakage, electric shock or the motor damage. **A ground-fault interrupter is**

installed as standard, but make sure for the correct actuation.

Danger (7) **Do not bend the electric cable or motor lead, apply strong tension or pinch in a narrow space**, cause fire or electric shock by damage.

II. Precaution in preparation & operation.

Caution (1) **The rotating direction of the scraper is clockwise as viewed from the above of the separator. If reverse, turn off the switch of the ground-fault interrupter and switch 2 of 3 wires in the electric box.**

Caution (2) **The arrow label** is put on to **indicate the pump rotation. Check the rotating direction** before operation **by an inching motion (Instant power distribution).**

Danger (3) **When the pump is used for high temperature liquid, the temperature of the flow pass like the collecting skimmer, pump, separator and hose is raised.** Beware of the handling full well. Anyway, the lowest liquid temp. is 0 degree (no frozen) and the highest temp. is less than 70 degrees for 300P-NI/SI-35FO, 60 degrees for 300P-MI-35FO and 80 degrees for 300P-BI-35FO. The self-priming ability is changed depending on the liquid temperature.

Danger (4) **Turn off the main power when not in use** to prevent electric leakage or electric shock.

Caution (5) **When the power goes down or protection devices work, make sure to turn off the main power to prevent injury by the re-start accidentally.**

Caution (6) **Stop the operation at the emergency such as earthquake or fire.**

Caution (7) If **any failure occurs**, **stop the operation** immediately and **take appropriate measures.**

Danger (8) **Do not put any obstruction to prevent ventilation around the motor**. It may **cause fire or failure** by increases in heat.

Danger (9) **Do not use the product at the place where flammable gas enters or fire/explosion may occur.**

Danger (10) **Never put combustible materials** circumferentially. It is **in danger of fire when the motor is heated.**

Danger (11) **Do not put objects or your fingers into the opening of the motor**

during running. It may cause injury.

Danger (12) During operation, touching **the rotation parts** such as a shaft or coupling causes injury. **Never put your hands or fingers closer.**

Caution (13) **Never stop the rotating scraper forcibly during operation. It may cause the motor failure or malfunction.**

III. Precaution in maintenance.

Danger (1) **Make sure to turn off the main power when maintaining** the pump, motor or scraper. If do **with power distribution, electric shock may occur.**

Caution (2) **For repair, contact your supplier or our sales department.** When returned the product, **clean the main body firmly and check no adhered liquid or liquid leakage**. Pack and send it in a wooden or carton box after wrapping it with plastic bags.

IV. Other precaution.

Caution (1) Do not use the product for **other prescribed specification.** **Use for that is not covered by warranty.**

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

Caution (3) **Discard the product as an industrial waste** .

Caution (4) When the product is used for **chemical material** other than oil (mineral or animal/plant), **contact your supplier or our sales department.** It is not available for the product to use for **solvent, organic phosphorus, strong acid or strong alkali** unless a special unit though it is oily or water layer. Never use the product for **flammable liquid**.

Caution (5) When the motor is standard, use the product for the liquid whose viscosity is **less than 500cP** to protect the motor.

Caution (6) The self-priming ability is changed according to the specific gravity, viscosity, temperature of liquid, worn status of parts or whatever, but if **the liquid is ambient clear water and the pump is new, it is approx. 5m for 300P-NI-35FO and 4m for 300P-SI/MI/BI-35FO**.

1. Forward

Thank you for purchasing our floating oil collecting/separating system with scraper “GREASECOMING”. It is the system which is composed of an oil skimmer such as our float suction and a separator, and collects and separates floating oil by installing at a pit where oily wastewater or sewage flows into.
It smoothly collect/separate low fluidity high viscosity oil or scum (floating mixture with floating oil) for the scraper as standard. It has the quality to last long to be compact designed and adopted metal parts.
Make sure to read this instruction manual to use the product with fully understanding of the features and distinction of the product.
Please store this manual to refer when necessary.

2. Framework

It is mainly composed of a separator with scraper and collecting pump controlled by an inverter as shown in an outline drawing. The weigh is approx. 70 kg in a dry state as standard depending on the collecting pump and other specification.

(1) *Separator*

The forcibly waste oil separation system by the difference in specific gravity is adopted and the capacity is 35 liters. It is the small, light and easy handling structure. Waste oil or scum mixed with sludge is smoothly collected to adopt the scraper.
Oily water from the collecting skimmer to the collecting pump through the filling port goes into the separator, and it is poured the surface at the top of the separator from the top of the center pipe.
Oily water into the separator is separated to floating oil during it rides the entire loop along with the wall and fallen from the oil drain port to the hopper by the scraper. It is enable to check the collecting state through the checking window on the cover of the separator. The top of the oil drain port is a slope. When the scraper scoops floating oil, water in oil is come out to the separator and only oil is collected.
On the other hand, drain water is discharged from the bottom of the separator with overflowing from the drain cap. Generally, a flexible hose is used as a drain hose and placed that the drain water goes back to the oil collecting pit.
The liquid level of the separator is designed to be consistent with the highest level of the drain cap, and the bottom of the drain cap is shaped a thread (pitch is 2 mm). It is possible to adjust the liquid level of the separator by turning the drain cap.
When the oil is the normal runny mineral oil, it is recommended that the difference between the height of the slope at the drain oil port and liquid level (Oil drain gap) is approx. 3 – 5 mm.
The drain valve and port are attached with the bottom of the separator for drain.

(2) *Scraper*

The scraper system is composed of a scraper motor and scraper. It scrapes and drains oil out of the separator.
The standard scraper motor works with a switch “ON” & “OFF” on the power box. The rotating speed is approx. 5rpm and fixed. (It is possible to change the rotating speed by using an inverter as a special unit.)
The scraper is separated 3 pieces and attached with the scraper frame on the scraper bearing. The tip is designed that it contacts with the slope on the oil drain port.

(3) *Collecting pump*

It is possible to select the collecting pump, Snake pump (NI/SI), MONOFLEX pump (MI) or Vane pump (BI) depending on the customer’s request or environmental of use. The collecting pump is connected by a pulley which uses a motor and V belt. The motor of the collecting pump is controlled by an inverter in the power box and possible to change the rotating speed at will.

The motor of the collecting pump specification is as follows.

a.	Power source	3PH / 200V	c.	Pole	4P
b.	Output	0.4kW	d.	Frequency	50Hz/60Hz

(4) *Mount and power box*

The separator is installed on the mount and the collecting pump and motor are stored in the mount. The side of the mount is covered with a metal plate.
The bottom of the mount has holes for anchor bolts to fix on the floor, so install the mount to the dimension. (It is available for casters as a special unit.)
The power box on the mount contains the motor inverter and switch for the scraper motor as well as a ground fault interrupter. (Standard)
The inverter is usable for not only the frequency change but also various requirements. Read the accompanying instruction manual for details.

3. Installation

(1) **When transferring the unit, make sure to drain liquid in the separator**.

(2) The product drains water through the use of natural drop while separating oily water collected from the oil drain pit to oil and water in the separator. **Install the mount that the drain port is upper than the liquid level in the drain pit.**

(3) **Install the mount at the firm and level place**.
If inclined, the oil drain function of the scraper may not work properly.

(4) **Fix the mount on the ground with anchor bolts firmly. If not, the product may become unstable by vibration or earthquake. It may lead to unexpected accidents by fall.**

(5) Connect the suction hose from the collecting simmer to the suction port and fix it with a hose band firmly.
If the fixing is failure, air is drawn in from the joint and it may cause suction failure. Connect the hose without twist or crash.

(6) Connect the drain hose to the drain port of the separator and fix it with a hose band firmly. **When the separated water is back to the oil collecting pit, place the tip of the hose near the liquid surface as far as from the collecting skimmer.** If the drain hose is set near the collecting skimmer, the floating oil layer may be troubled by the impulse of the drain water and the oil collecting efficiency may be decreased. Also, if the drain is from the higher level, emulsion of the floating oil is furthered. However, **the tip of the drain hose is submerged, the drain efficiency is decreased and do not submerge it.**
On the other hand, **when transferring the separated water to other tank, set the drain port of the tank which is lower than the drain port of the separator.**
In any case, **incline the drain hose downward to discharge water smoothly.**

(7) Put an appropriate tank for waste oil under the oil drain hopper of the separator. **The tank for waste oil is not accompanying as standard. Prepare it by yourself.**

4. Preparation for operation

(1) **Check that the power specification on the inverter nameplate is correct to the AC power to be possible connected.**

(2) Connect the AC power to the terminal block in the power box.
When connecting, make sure to turn off the main power to prevent electric shock or short circuit.

(3) **Check that the drain valve of the separator is closed**.

(4) **Check that the flexible hose is connected firmly and the destination is correct**.

(5) **Open the cover and pour water to the separator until the water overflows from the drain port cap**. At that time, if the top of the drain port cap is higher than the top of the oil drain port slope, the water flows from the oil drain port before overflowing from the drain port cap, so set the drain port cap lower in advance.

(6) **Remove the hose from the filling port of the separator and pour priming water into the pump. If the pump is operated without priming water, it runs dry and the inside temperature of the stator is raised by friction, cause the pump damage.**

(7) Turn on the switch of the scraper motor and check the rotating direction. **The correct direction of the motor is clockwise as viewed from the checking window (above). If it is reverse, make sure to turn off the ground fault interrupter and switch 2 of 3 wires connected to the terminal block in the power box.**

(8) **Do not put easily tangled lint, string or cloths around the bearing of the collecting pump or peripheral devices during operation.**

(9) Turn on the switch “RUN” of the inverter and operate the collecting pump for a few seconds, and **check that it rotates the same direction as the arrow label on the cover.**

(10) The casing inside is possibly dry at the pump running and it may make noise at start-up. **If it does not pump up and the noise is not resolved 20 seconds after starting, check the sealing water of the separator at Article 5 and priming water at Article 6.**
If the operation is every day, it is not necessary to pour sealing or priming water every time.

(11) **Before operation, check the V belt which is used to roll the pulley. When oil or water is adhered on it, it cuts easily because there is a progression of swelling and abrasion.**

5. How to operate and adjust

Observe the followings when operating.

Warning	**No reverse** (The rotating direction is shown as the arrow label.)
	No dry running (Make sure to pour priming or sealing water when re-starting after long suspension to protect the pump.)
	No dead head operation (When suction/discharge valves are installed, make sure to open them to protect the pump.)
	No suction of big & solid foreign objects (Take measures to protect the pump that the collecting pump does not draw in big & solid foreign objects.)
	No use for high temperature liquid (The maximum temperature of oily water to operate is less than 70 degrees for 300P-NI/SI-35FO, 60 degrees for 300P-MI-35FO and 80 degrees for 300P-BI-35FO.)
	No operation with up to the motor current rating (The motor current value is changed depending on any causes such as the specific gravity / viscosity of oily water, head and capacity. Use the product under the condition within the current rating.)

To set up to operate, turn on the switch of the ground fault interrupter and scraper motor, and push the inverter button “RUN” to start.
Next is the adjustment from the start of running. When adjusting, **observe the following cautions.**

(1) Turn off the power except an adjustment during operation.

(2) When the product is used for high temperature oily water, the temperature of the collecting skimmer, pump, separator and hoses is raised to the liquid, so stop the operation and adjust the product after the temperature of each parts lowers enough. Take extra care of the adjustment during operation.

(3) When the product is used for hazardous liquid, take safety measures for worker such as wearing rubber groves and protection glasses as their obligation.

The product is water tested in our factory and performed all necessary inspection and adjustment. However, perform the adjustment depending on the liquid condition to be collected as follows.

(1) The necessary adjustment of the separator is the height of the liquid level. It is possible to adjust it by change of the height of the drain cap. Firstly, **collect liquid and turn the drain cap for adjustment with checking the drained oil state.**

(2) **When the collected oil is runny and water in the waste oil is reduced, turn the drain cap clockwise as viewed from above to lower the liquid level in the separator**. The adjustment range of the drain cap is 2 mm by a turn and it is possible to lower the liquid level to about 20 mm from the top of the oil drain port slope.

(3) **When the collected oil is high viscosity or mixed with sludge/foreign objects, turn the drain cap anticlockwise to raise the liquid level in the separator.** In this case, when the collected oil is discharged from the oil drain port by the scraper, a small amount of water acts as a lubricant by scraping with oil. It prevents to accumulate oil at the oil drain port or hopper to discharge oil smoothly.

(4) **When the collected oil is high viscosity and mixed with sludge/foreign objects as well as water in the waste oil is reduced, turn the drain cap clockwise to lower the liquid level in the separator**. However, the collected oil accumulates at the oil drain port or hopper in this case, and the oil drain efficiency gradually may become worse. **Occasionally, clean it to remove the adhered oil.**

(5) **The processing ability of the separator is 5 – 10 liters per minutes. Adjust the collecting skimmer and pump depending on the ability.**
If the separator is operated that the capacity is more than the processing ability, it may cause separation or drain failure.

(6) The capacity of the collecting pump differs depending on the specific gravity or condition of the collected oil, total head or pump. **At the trial run or maintenance, adjust the inverter frequency.**
It is possible to adjust the flow amount of the collected oil by the adjustment of the gate ring for the collecting skimmer or the change of the pump rotating speed by the change of the inverter frequency.
The pump rotating speed is so fast that the abrasion each consumable parts is quick. Operate the pump as slow as reasonably possible.
However, if the produce is operated with the inverter frequency with less than 15Hz for a long time, the temperature of the motor is much raised to get worse the motor cooling efficiency and it may cause failure. Do not operate the product with less than 15Hz for a long time.

6. Maintenance

If large amount of sludge/foreign objects are mixed into the collected oily water, the specification is an obstacle. **Give a maintenance and check periodically as necessary. When performing the maintenance, observe the following cautions.**

(1) Turn off the power except an adjustment during operation.

(2) When the product is used for high temperature oily water, the temperature of the collecting skimmer, pump, separator and hoses is raised to the liquid, so stop the operation and adjust the product after the temperature of each parts lowers enough. Take extra care of the adjustment during operation.

(3) When the product is used for hazardous liquid, take safety measures for worker such as wearing rubber groves and protection glasses as their obligation.

Go through the following procedure for maintenance.

(1) *Collecting pump*

1) **Determine whether any abnormality is present such as abnormal noise, bigger vibration than usual or heat up.** If any failure occurs, refer to the next chapter “Troubleshooting” or take appropriate measures in consultation with our sales department. **As necessary, overhaul or replace parts.**

2) Remove the suction hose at the filling port from the suction skimmer.

3) **Remove the cover plate of the mount and check the pump, motor and transmission members such as a V belt or pulley**.
If found the abrasion or scratch on the V belt or pulley, replace it. When the V belt is used for a long time, cracks and scratches easily occur for aging degradation. **When replacing the V belt or pulley, adjust the belt tension or the spin finishing of the pulley. Refer to the pump instruction manual separately to adjust the V belt.**

4) **The life time of the consumable parts differ according to the use condition and is not covered by our warranty**.

5) When the pump is operated every day, it is not necessary to pour sealing or priming water every time. However, **make sure to pour sealing or priming water for an irregular operation or after long suspension**.

6) If there is any failure such as abnormal noise / vibration occurs or suction failure, stop the pump immediately, check the inside and take appropriate measures such as parts replacement.
Even if the pump runs correctly, overhaul once and more a year.

7) The condition of the consumable parts is depending on the use. **Determine whether any abnormality is present such as abrasion, corrosion, scratch or deformation at the overhaul and replace it as necessary**.

8) **Refer to the pump instruction manual separately about the detail**.

(2) *Separator*

1) When liquid in the separator is discharged, connect a flexible hose to the drain port at the lower part of the main body.

2) Open the drain valve to drain liquid in the separator.

3) Check the inside of the separator and **clean it with tap water if sludge, dust or scum is adhered on the inside wall**.

4) **If the drain port is clogged with foreign objects, drain failure occurs and it cause overflow from the oil drain port or separator. Therefore, check and clean it periodically depending on the accumulation. Turn the drain port cap at the checking to prevent anchoring of bolts**.

5) Check no corrosion on the wall when cleaning the inside the separator. If any occurs, scour the rust off with sand papers.

6) **Check the bolts for the scraper loosened. If loosened, re-tighten the bolts.**.

7) Close the drain valve on the main body and remover the flexible hose after drying the inside of the separator well.

8) **If oil or sludge is adhered on the wall, drain oil port slope, scraper or attached parts, it may cause damage or drain oil efficiency failure for applying a load to the scraper motor. Check and clean it periodically depending on the accumulation**.

9) The checking frequency of the separator is depending on the floating oil condition or inflow of sludge or dust. Even if it works properly, **drain liquid and check the inside once a month**. If sludge or dust flows in, it may cause a bad effect like drain or drain oil failure. **Drain liquid or clean the inside depending on the inflow**.

7. Troubleshooting

	Trouble	Cause	Measures
Suction failure	Suction failure	Maladjustment of the collecting skimmer	Readjust the inflow of oily water by turning the gate ring of the collecting skimmer.
		Reduction of pumping amount	Check the pump and replace parts as necessary.
		Pump clogged by foreign objects	Check and clean the suction/discharge port or inside of the pump.
		Flexible hose clogged by foreign objects	Check and clean the inside of the flexible hose.
		Air suction	Optimize the inflow of oily water by adjusting the gate ring of the collecting skimmer and check the joint of the flexible hose.
Noise	Abnormal noise from the pump	Foreign objects suction to the pump	Disassemble the pump by reference to the pump instruction manual separately and remove foreign objects.
		Pump dry running	Pour priming water to the pump and sealing water to the separator to be wet state inside the pump.
		Pump bearing abrasion	Replace the pump bearing by reference to the pump instruction manual separately.
		Pump consumable parts abrasion	Disassemble and check the pump by reference to the pump instruction manual separately and replace consumable parts.
	Abnormal noise from the motor	Overload	Check the flow pass of oily water including the inside of the pump.
		Power incompatibility	Check the connection status of the power voltage and code.
		V belt degradation	Check no loosening, chap or abrasion of the belt. If any occurs, replace it.
		Spin finishing failure of the pulley	Check the parallelism of the pulley. If misaligned, spin finishing.
		Motor bearing abrasion	Replace the motor bearing.
Separation failure	Mix oil in the drain water	Maladjustment of the pump capacity	Adjust the capacity according to the separator's processing ability. (5 – 10 liters per minutes.)
		Maladjustment of the oil drain feature	Check the scraper and drain cap and that the collected oil is discharged smoothly.
	Mix water in the collected oil	Emulsion of the collected oil	It is hard to separate water from emulsion oil completely.
		Maladjustment of the drain cap	Turn the drain cap to lower the liquid level in the separator.

	Trouble	Cause	Measures
Drain failure	Separated water is not discharged smoothly	Separator installed at a lower position	Reset the drain port of the separator which is the higher position than oily water level in the oil collecting pit.
		Grade failure of the drain hose	Reset the drain hose on the down grade.
		Submerged tip of the drain hose	Reset the tip of the drain hose up to the oily water level in the oil collecting pit.
		Drain hose clogged	Check and clean around the drain port and the inside of the drain hose.
		Sludge accumulated at the bottom of the separator	Remove the drain of the separator and the clean the inside.
Oil drain failure	Collected oil is not discharged smoothly	Drain oil port clogged	Remove and clean oil and solids adhered around the drain oil port.
		Solid foreign objects accumulated at the slope of the drain oil port	Clean the slope and make a recover the flatness.
	Scraper failure	Scraper not contacted with the surface of oily water	Lower the liquid level in the separator by turning the drain cap and adjust that the scraper is submerged into oily water.
		Scraper motor failure	Clean the scraper and the inside wall of the separator, and remove oil and solid foreign objects.
			Check the power cable of the motor.
			The motor may be damaged. Contact us.
Electric failure	Power failure	Does not work when turning on the switch	Check the power state of the ground fault interrupter, inverter or motor.
	Ground fault interrupter failure	Ground fault interrupter does not work	Check the wiring state including the main power to may cause electric shock.
		Ground fault interrupter works when starting an operation	Check the wiring state and tighten the terminal firmly.
	Inverter failure	“RUN”/”STOP” switch does not work	Read the inverter instruction manual and check the set condition. Contact the electric engineer.
	Notice	**Checking electric system should be performed by the qualified person.**	

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:

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