

LAMPIRAN GAMBAR

CHECK THE BURNER CAPACITY
연소용량확인

Check the burning volume of sludge by scale of sludge tank during specified time.
소각기 작동 중 규정 시간 동안에 태운 폐유량을 측정하여 기록한다.

COMBUSTION CAPACITY	: 50.0	Liters/h
HEAT VOLUME OF WASTE OIL	: 7,500	Kcal/Kg
SPECIFIC GRAVITY	: 960	Kgf/M ³
HEATING OF WASTE OIL	: 80	°C

Calculate the burning capacity :
연소용량 계산

$$V \text{ (Kcal/h)} = \text{연소량 (Liter/h)} \times \text{비중} \times \text{열량 (Kcal/kg)}$$

$$= 50.0 \times 7,500 \times 0.96 = 360,000 \text{ Kcal/Hr}$$

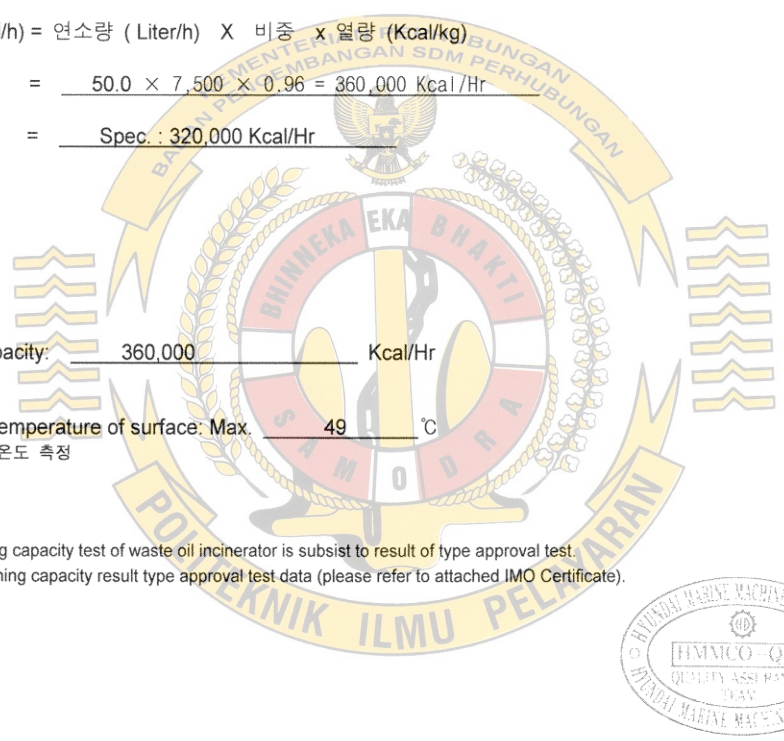
$$= \text{Spec. : } 320,000 \text{ Kcal/Hr}$$

Burning capacity: 360,000 Kcal/Hr
연소용량

Check the temperature of surface: Max. 49 °C
소각기 표면 온도 측정

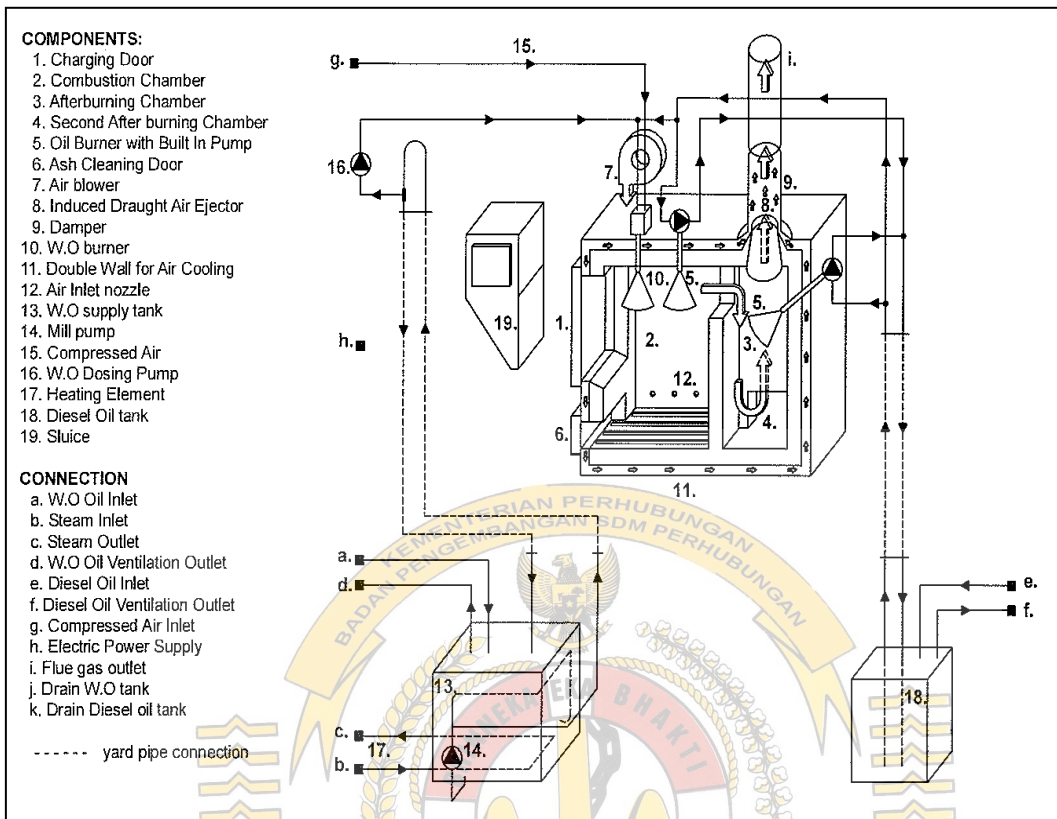
Remark:
기타

* The burning capacity test of waste oil incinerator is subside to result of type approval test.
Above burning capacity result type approval test data (please refer to attached IMO Certificate).



Gambar 2.1 checklist burner capacity

Sumber data instruction manual book



Gambar 3.1 Bagian-bagian dari incinerator

Sumber data :Instruction manual book

3. INSTRUCTION FOR OPERATION

3.1 OPERATING INSTRUCTIONS

PREPERATION

Preparation for start of the incinerator

Before start of the incinerator, the following is to be carried out :

1. Open all inlet and outlet valves for diesel oil
2. Open inlet valve for compressed air
3. Make sure that there is no hindrance for air admission to primary blower, as well as free flow of flue gas to the outlet.
4. Make sure that the ash and sluice door are closed.
5. Make sure that W.O is available in the W.O tank and W.O reached temperature 60 °C.
6. Make sure that diesel oil is available in the diesel oil tank
7. Remove ashes and dregs of possible combustion before incinerator starting, and confirm cleaning state of air main entrance for combustion (air nozzle).

OPERATIONS

The incinerator is operated via a control panel and the START/STOP switch.

A green light indicates that the incinerator's primary blower is in operation.

A red light indicates that there are alarms active on the incinerator.

MODE [MD1] = WASTE OIL BURNING

1. When the main switch is turned on, WASTE OIL MODE (MD1) is settled automatically.
For only solid waste burning, the mode should be changed to SOLID WASTE MODE (MD2).
When the WASTE OIL MODE (MD1) is settled waste oil and solid waste can be burnt together.
2. Make sure that the mode is settled on MD1.
3. Check the alarm messages on display screen by touch panel.
4. Activate the START-STOP switch to START position on control panel.
5. Incinerator is operated automatically by PLC.
If the abnormal alarm is occurred during operation, remove the cause of the abnormal alarm and reset alarm by touching the alarm display on touch panel and start again.
For the details, refer "Trouble shooting table".

MODE [MD2] = SOLID WASTE BURNING

1. Make sure that the mode is settled on MD2.
2. Check the alarm messages on display screen by touch panel.
3. Activate the START-STOP switch to START position on control panel.
4. Incinerator is operated automatically by PLC.
If the abnormal alarm is occurred during operation, remove the cause of the abnormal alarm and reset alarm by touching the alarm display on touch panel and start again.
For the details, refer "Trouble shooting table" .

Gambar 3.2 proses start incinerator

Sumber data : instruction manual book

Type : MAXI NG25/50/100/150SL WS

3.3 STOP OF THE INCINERATOR

1. When the "START-STOP" switch is turned to STOP position all open oil solenoid valves are closed and the atomizing air valve is closed.
2. After finished W.O burning, the rest in the W.O burner is cleaned with diesel oil during 3sec. The incinerator cools down.
3. When the temperature in the combustion chamber is below 100°C, the primary blower is stopped, the each cooling fan of the Primary & Secondary D.O burner are stopped and the ash door is released.

3.4 ABNORMAL START UP AND OPERATION OF INCINERATOR

1. By the first start-up of the incinerator, oscillating combustion can occur which must be stopped immediately. Activating the switch "STOP".
2. If there should be any problems during start-up and operation, the incinerator must be stopped immediately by activating the "STOP" switch.
3. Try to find the reason for this abnormal start-up/operation of the incinerator.
4. See the instruction manual under "Trouble Shooting".

3.5 ATTENDANCE OF THE COMBUSTION CHAMBER

1. Do not put glass, bottles, and other materials which may not be burner into the combustion chamber.
2. Do not fill wet solid waste into the combustion chamber more than one hour before starting the incinerator.
3. When burner oil-containing materials, such as filter cartridges, oily cotton waste, and scrapings from the centrifuges, do not put more than (see warning plate) liters per-charge into the combustion chamber.
4. When combusting material with high calorific value with explosion-like combustion, e.g. plastic, max. (see warning plate)Kg per charge is allowed to be fed into the incinerator.
5. Do NOT overload the incinerator with waste. Max.(See warning plate)kcal per charge of solid waste and max. 20% of the volume of the combustion chamber see warning plate liters).
6. When the incinerator is cold, remove ashes and slags from combustion chamber. The ashes and the slags must be carefully removed. Do not knock or hammer on the sides of the combustion chamber.

Gambar 3.3 proses stop incinerator

Sumber data : Instruction manual book

Type : MAXI NG25/50/100/150SL WS

4. TROUBLE SHOOTING CHART

The following trouble shooting chart is by no means complete, but covers the more general type of problems, which would most likely occur if a breakdown is experienced.

4.1 ADJUSTMENT OF DAMPER & AIR NOZZLE

The damper of the exhaust gas funnel is to be completely open. This damper is only used, if there is too much 'draught' in the funnel, like for instance if the negative pressure in the combustion chamber drops below 50 mm WG.

The ideal condition of W.O burning is when the negative pressure is 10 ~ 30 mmWG.

When the negative pressure is under 10mmWG.

Combustion air nozzle should be closed to protect back fire.

When the negative pressure is over 30mmWG combustion air nozzle should be open for optimum combustion performance.

The negative pressure has to be controlled by the U-tube with water (UM).

4.2 ADJUSTMENT OF BURNER

If the temperature in the secondary combustion chamber does not reach 700 °C within 30minutes, a thing which can occur when the vessel is placed in cold areas, the oil pressure to the burner must either be raised or alternatively a nozzle with a larger capacity must be installed.

Gambar 3.4 trouble shooting chart

Sumber data : Instruction manual book

4.3 FAULT LOCATION of INCINERATOR

ALARM OF PRIMARY & SECONDARY D.O BURNER FLAME FAILURE

The text "Primary D.O burner flame fail / Secondary D.O burner flame fail" will appear in the control panel display. The reason may be:

When heating up the incinerator:

No diesel oil to the incinerator:

Check liquid level in the diesel oil tanks.

Pressure gauge (M1/M2) of diesel oil pump oscillating

Clean filter on diesel oil pump. Check whether admission hoses of diesel oil pump are tight.

Flame detector (21B9/21B13) of incinerator soot up

Clean the glass.

Wrong adjustment of ignition electrodes

See instruction for auxiliary oil burner.

Oil nozzle filter on D.O burner (8M4 OR 8M6) is obstructed

Take out the nozzle and clean the filter.

Solenoid valves do not open (18Y4/Y5, 19Y11/12)

Check coil and electric connection.

Waste Oil burner soot up (B)

Take out the W.O burner and clean it, - see instruction for W.O burner.

Reset alarm.

During combustion of W.O

Reset alarm and the incinerator will run again. Watch the W.O dosing pump(7M2) before a possible new alarm sets in.

If the W.O dosing pump (7M2) is running and a flame can be seen through the sight glass:

Flame detector (21B9/21B13) of the incinerator soothed up

Clean the glass

Gambar 3.5 trouble shooting chart

Sumber data : Instruction manualbook

Type : MAXI NG25/50/100/150SL WS

If the W.O dosing pump (7M2) is running but you keep getting flame failure:

The W.O burner is soot up

Take out the W.O burner and clean it, - see instruction for W.O burner.

The stator in the W.O dosing pump is damaged

Replace stator.

W.O valve (POV1/POV2) is obstructed

Dismount, inspect or clean.

Solenoid valve (18Y13/18Y14) does not open

Examine coil and electric connection.

The self-cleaning strainer is blocked with fibers

Clean strainer.

No constant waste oil circulation in the circulation pipe

The rubber stator of the W.O dosing pump (7M2) is worn out.

See list of spare parts.

The W.O dosing pump is partly blocked, clean if possible.

The W.O dosing pump (7M2) is not running.

Check connections.

The frequency control of the pump (7M2) has failed or there is no start signal from the PLC, reset alarm or switch off the main power and turn it on again after 3 min.

Gambar 3.6 trouble shooting chart

Sumber data : Instruction manual book

Type : MAXI NG25/50/100/150SL WS

ALARM OF PRIMARY & SECONDARY COMB. CHAMBER TEMP. HIGH AND SENSOR FAILURE

The text "**Primary & Secondary chamber temp. high / Primary & Secondary chamber TC sensor fail**" will appear in the control panel display.

The reason can be:

Too much high-calorific waste in chamber

See capacities and instructions mounted on incinerator

The thermocouple (TC1/TC3) has been interrupted

Display text: "high temperature"

Check the thermocouple connection cable.

Reset alarm.

ALARM OF EXHAUST GAS TEMPERATURE HIGH AND SENSOR FAILURE

The text "**Exhaust gas temp high / Exhaust gas TC sensor fail**" will appear in the control panel display

The reason may be:

The thermocouple (TC2) has been interrupted

Check the thermocouple and the connection cable. Replace the thermocouple or try to fasten the connection cable.

Too high calorific value of solid waste

Cool down, observe capacities and instructions mounted on incinerator reset alarm, and try again.

ALARM FOR W.O PANEL INTERLOCK SIGNAL FROM W.O TANK OR MOTOR FAILURE

The text "**W.O panel interlock signal or motor failure**" will appear in the control display and the alarm 'feed back or motor relay failure' will be shown. The reason may be:

The heating control system has failed

Check the heating control system and reduce the heating.

The thermostat on the W.O tank wrongly adjusted

Adjust to correct temperature, 100°C.

Low level in W.O tank

Fill the W.O tank.

Motor relays failure

Reset the automatic fuses.

Reset alarm.

Gambar 3.7 trouble shooting chart

Sumber data :Instruction manual book

Type : MAXI NG25/50/100/150SL WS

ALARM FOR ATOMIZING AIR PRESSURE FAILURE

The text "W.O burner atomizing air pressure low" will appear in the control panel display and the alarm 'W.O burner atomizing air pressure low' will be shown. The reason may be:

Pressure regulator (TR) wrongly adjusted

Adjust to correct pressure which is between 0.8 and 2.0 Bar, depending on the W.O oil viscosity.

Failure in air supply

Check air supply

Pressure control (15S13) wrongly adjusted

Adjust to correct range of pressure (0.8 Bar).

Valves in air-pipe system closed

Clean them.

Filter for air (OL) obstructed

Clean it.
Reset alarm.

ALARM FOR COMBUSTION AIR PRESSURE FAILURE

The text "Combustion air pressure low" will appear in the control panel display and the alarm 'Combustion air pressure low' will be shown. The reason may be:

Failure in air supply to the primary blower (VH)

Check air supply to the incinerator place

Pressure control (TR) wrongly adjusted

Adjust to correct range of pressure.

Reset alarm.

Gambar 3.8 trouble shooting chart

Sumber data : Instruction manual book

Type : MAXI NG25/50/100/150SL WS

ALARM MOTOR OVERLOAD FAILURE

The text "Primary blower overload trip, W.O dosing pump motor overload trip" and **OPTIONAL ITME (Mill pump overload trip, D.O transfer pump overload trip, Exhaust fan motor overload trip)** will appear in the control panel display.

Alarm at abnormal stop of Primary blower(VH), W.O dosing pump (7M2),
OPTIONAL ITME - Mill pump (6M2), Flue gas draft fan (6M8), D.O trans pump (6M5).

The alarm marked "**motor overload failure**" will be shown. The reason may be:

The motor thermal overload protectors for primary blower(VH) or W.O dosing pump(7M2) are switched off.

After cooling down, reset motor overload protector and restart.

Check the corresponding motor and thermal overload setting.
Restart after cooling down.

Fault in control equipment cabinet

Check electric cables and the function according to the key diagram.

Reset alarm.

ALL ALARMS AT THE SAME TIME

No lamps light and nothing is functioning

The reason may be:
Emergency stop activated.
Current interruption.
Find the reason.
The automatic fuses are switched off.

Reset the automatic fuses and find the reason why they are switched off.

Reset the alarm.

ALARM FOR CHAMBER NEGATIVE PRESSURE FAILURE

The text "Chamber negative pressure low" will appear in the control panel display and the alarm '**Chamber negative pressure low**' will be shown.

The reason may be:

Incorrect adjustment of pressure sensitive switch (15S7)
The primary fan is obstructed
No vacuum is obtained

Check the uptake, especially after standstills or repairs.

Reset alarm.

Gambar 3.9 trouble shooting chart

Sumber data : Instruction manual book

Type : MAXI NG25/50/100/150SL WS

ALARM AT SLUICE INSIDE DOOR FAILURE

The text "**Sluice inside door open**" will appear in the control panel display and the alarm 'Sluice inside door open' will be shown the reason may be:

The inside gate is blocked by waste that has not fallen into the combustion chamber

Alarm will activate cooling process. When the incinerator temperature has fallen to 100°C it is possible to open the sluice door and remove the waste blockage.

Failure in air supply, low air pressure

Check air supply to incinerator by controlling the pressure on the pressure gauge on the pressure regulator (TR).

ALARM FOR SLUICE FEED DOOR FAILURE

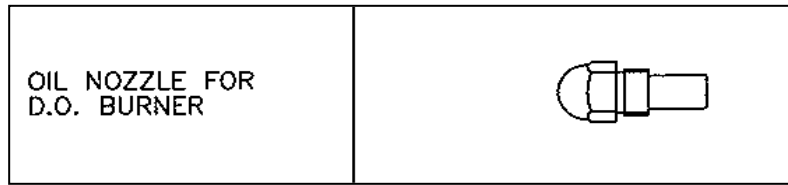
The text "**SLUICE FEED DOOR OPEN**" will appear in the control panel display and the alarm 'Sluice feed door open' will be shown. The reason may be:

The front door is not closed

The micro switch on front door is broken, check the electrical -connections.

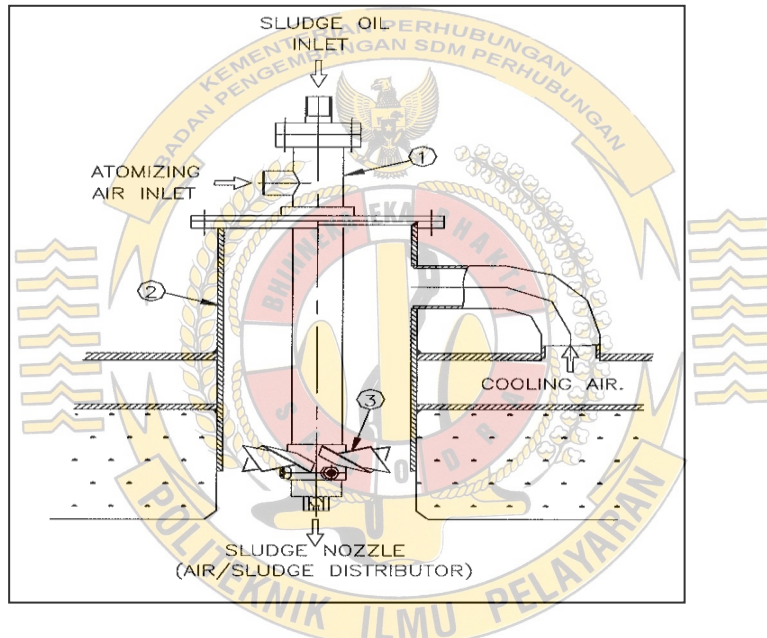
Gambar 3.10 trouble shooting chart

Sumber data : Instruction manual book



Gambar 4.9 nozzle D.O burner

Sumber data : instruction manual book



Gambar 4.11 wasted oil burner pipe

Sumber data : instruction manual book