SAFETY, OPERATING & MAINTENANCE INSTRUCTIONS

INCINERATOR

BGW-N
For Marine Use Incinerator

Introduction

Thank you very much for selecting the Incinerator.

Z incinerator BGW-N is manufactured and designed based on MEPC 76(40).

This operation manual contains instructions for safe, proper use of the Incinerator for marine use. Prior to using the system, be sure to appoint an operation supervisor (engineer), then read and understand the manual thoroughly. To carry out all of the operations with the manual at hand is recommended.

This operation manual gives an overview of the Incinerator for marine use, its main functions, operating the procedures, safety inspections and trouble shooting. Consult the operation manual of the Incinerator for operating equipment that is not described in this manual.

The operating methods and the safety precautions included in this manual are to be used for only specified purposes. Do not operate the system in any other manner. We are not responsible for any consequences due to misuse of the system.

Because of our continued efforts to improve the design of the Incinerator, some details in this manual may differ from those of your system. Be advised that the contents are subject to be changed without prior notice.

For any questions on your system or the contents of this operation manual, please feel free to contact us anytime.

Changes in operation due to product modification, special specifications, etc., are described in the instruction manual issued separately.
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1. Terminology

The following terms are used in this manual.

\[
\text{\textbf{\textdegree} WARNING \hspace{2cm} } \\
1. Indicates a condition or practice which may cause death or serious injury to the operator.
\]

\[
\text{\textbf{\textdegree} CAUTION \hspace{2cm} } \\
2. Indicates a condition or practice which may result in damage or destruction of property and/or minor personal injury.
\]

\[
\text{\textbf{NOTE}} \\
3. Indicates cautions for preventing the failure of the devices, and tips for effective operation.
\]

4. Number in the pointing hand sign indicates the page for related items.

5. Sign of danger, specific examples are denoted by this sign.
Here is a list of special terms used in this manual. Make sure of the terms and their meanings.

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-purge</td>
<td>To ventilate the inside the incineration chamber of the boiler before incineration.</td>
</tr>
<tr>
<td>Post-purge</td>
<td>To ventilate the inside the incineration chamber of the boiler after combustion.</td>
</tr>
<tr>
<td>Sludge</td>
<td>Impurity made by precipitate in oil.</td>
</tr>
<tr>
<td>Grate</td>
<td>Solid waste furnace that has bricks in front.</td>
</tr>
<tr>
<td>Flat Furnace</td>
<td>Solid waste furnace that has flat refractory.</td>
</tr>
<tr>
<td>Furnace for Burner</td>
<td>Combustion chamber for the burner.</td>
</tr>
<tr>
<td>Atomized Air</td>
<td>Pressurized air for atomizing the waste oil.</td>
</tr>
<tr>
<td>Ejector</td>
<td>An apparatus which absorbs the combustion gas from the furnace to maintain the negative pressure inside the furnace.</td>
</tr>
<tr>
<td>Cooling operation</td>
<td>An operation in which the fan is run to cool the inside of the furnace after incineration.</td>
</tr>
<tr>
<td>Electromagnetic pump</td>
<td>Pump for increasing the pressure of the diesel oil (for the auxiliary burner).</td>
</tr>
<tr>
<td>Residual flame</td>
<td>The flame that remains in the furnace after incineration has ended.</td>
</tr>
<tr>
<td>D.O.</td>
<td>Diesel Oil</td>
</tr>
</tbody>
</table>
2. **Name and Function of Components**

**Ejector**
- Release and cool combustion gas to keep negative pressure inside the furnace.

**Charging door**
- Door for loading solid waste.

**Sight window**
- A window for observing the incineration conditions of solid waste.

**Ash removal door**
- The door for removing the ashes of incinerated solid waste.

---

**Warning**

Remove ashes carefully because the hot residual materials may be contained even when the temperature of the combustion chamber is low. Hot ashes may cause personal injury of burn.

Attached to the door side casing are:
1. Warning label (ash removal)
2. Warning label (solid material)
3. Note label (solid material)
4. Operation label
External view of the burner (BGW-20N, 30N, 50N, 100N)
External view of the burner (BGW-80N)
Furnace pressure switch
Stops the combustion when the furnace pressure reaches -100Pa

Exhaust gas thermostat
Stops the combustion when the flue gas temp. reaches 350°C.

Furnace thermocouple
Warning label (electric shock)

**WARNING**
HAZARDOUS VOLTAGE
WILL CAUSE SEVERE
INJURY.

Placed in the back of cover.

- Fuse
- Manual, Auto Change over switch
- Breaker
- Relay for waste oil pump
- Relay for Ejector Blower
- Relay for Burner Blower
Air hole
Supplies air for the incineration of solid waste

Level incinerator floor

Grate
Leads carbonization gas to the burner chamber

Incineration chamber for solid waste
3. Basic Safety Precautions

⚠️ Warning
When operating the Z incinerator, you must strictly adhere to the following guidelines. If you do not follow these guidelines, you could cause damage to the equipment and/or serious injury to people.

<table>
<thead>
<tr>
<th>Items to be confirmed before operation</th>
</tr>
</thead>
</table>

Commissioning test must be done by maker
- After confirming the installation, a maintenance technician from our company, or one approved by our company, do a test run of the equipment.

Confirm the installation
- You must check the following installation items before using the Z incinerator and make sure that everything is properly installed. Do not use the equipment if it is improperly installed, as this may lead to a major accident.
  - Is the ventilation equipment (air supply and exhaust system) properly installed?
  - Is the floor made of non-combustible materials?
  - Are there any leaks in the fuel pipes?

Appoint someone to be in charge of the equipment.
- Appoint someone to be in charge of the equipment. Such person should have thoroughly read and understood the operation manual.

Do not use the equipment for other than its intended purpose.
- Until you have a thorough understanding of the operation manual, Do not operate the equipment or perform any maintenance on it.
Warning

When operating the Z incinerator, you must strictly adhere to the following guidelines. If you do not follow these guidelines, you could cause damage to the equipment and/or serious injury to people.

Wearing of proper work clothes and protective gear

Wearing of proper work clothes
- Do not wear loose fitting clothing, jewelry, etc., when operating or maintaining the equipment, as these items can become caught in valves and machinery.
  Also, do not wear oily clothing, as it can catch fire.

Wearing of safety equipment
- Remember to wear safety equipment such as helmets, goggles, safety boots, leather gloves, etc., when operating the equipment.

Do not operate equipment with wet hands! This could result in electric shock

Cautionary items for warning labels

Places where warning labels are attached
- Warning labels have been attached in places where there is special risk. For locations of these labels, please refer to Chapter 2, “Name and Function of components”

Maintenance of warning labels
- If warning labels peel off or become damaged, please replace them with new warning labels. For more information on warning labels, please contact Miura head office or representative.
Warning

When operating the Z incinerator, you must strictly adhere to the following guidelines. If you do not follow these guidelines, you could cause damage to the equipment and/or serious injury to people.

What to do if you notice abnormal operation

If you notice unusual sounds, strange smells, fuel leakages, etc., immediately push the OFF button of the incinerator, and close the Waste Oil and D. O. valves.

How to deal with malfunctions, etc.
- To handle malfunctions, etc., please contact Miura and follow the company's instructions. Do not use this equipment if the cause of the malfunction has not been eliminated. Use of malfunctioning equipment could result in fire, explosions, and/or other problems.

Items to note when using the incinerator

Please use only designated fuel.
- If you use fuel that has not been designated as proper by Miura, you could cause the equipment to explode.

Absolutely no fires, sparks or flames are allowed near fuel oil and flammable materials.
- If fires, sparks or flames come in close proximity with fuel oil, etc., it could cause a fire.
- Do not keep flammable materials in the control box, as this could cause a fire.
- Please store combustible materials in a safe place away from fire or sparks.

Use the ventilation equipment (air supply and exhaust system) during operation.
- During operation of the equipment, please have the ventilator fan running and do not cover the ventilation opening. Blockage of this opening could lead to incomplete burning that could produce the toxic gas carbon monoxide and/or cause the equipment to explode.

Do not carelessly touch the equipment during operation
- During operation, please do not touch any part of the equipment except for the controls. Touching other parts of the equipment could result in electric shock, burns, or other serious problems.
Warning
When operating the Z incinerator, you must strictly adhere to the following guidelines. If you do not follow these guidelines, you could cause damage to the equipment and/or serious injury to people.

Operation of the door

When opening the door, please go by the following procedure to ensure your safety. Failure to follow this safety procedure could result in serious damage and/or bodily injury!

1. When incineration has ended, make sure all the solid waste has been burned, then turn the incinerator off. Please look through the sight window to make sure there is no residual flame or smoke before turning the incinerator off.

2. Make sure the cooling system runs for at least 4 hours after incineration has ended.

3. Make sure that incineration chamber is a sufficiently low temperature.

4. Before opening the door, look through the sight window again to make sure there is no residual flame or smoke inside the incinerator.

When opening the door, make sure you stand away from the opening, just in case there is some backfire.

The charging door and ash removal door should be locked under the following conditions. If any of these conditions occur, you cannot open or close the doors.

- Incinerator temperature is 220°C or higher.
- Incinerator is in operation (all stages of incineration, including prepurging and cooling).
- There is no power supply.
Warning

When operating the Z incinerator, you must strictly adhere to the following guidelines. If you do not follow these guidelines, you could cause damage to the equipment and/or serious injury to people.

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Preparation of fire extinguishers and first aid kits

**Preparation of fire extinguishers and first aid kits**

**Place a fire extinguisher.**
- To prepare for possible emergencies, please place a fire extinguisher in a nearby easily reached location and be sure you know how to use it.

**Have a first aid kit available.**
- Find a suitable place to keep a first aid kit and have it ready there for possible emergency.

---

Unauthorized modifications are prohibited!

**Do not make any modifications to the equipment.**
- If you make any unauthorized modifications (like connecting to other types of supplementary equipment, alternative pipes, etc.), this could create serious safety problems.

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Miura will not take responsibility for any modifications that it does not authorize.

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What to do when relocating equipment or selling the ship

**If you transfer the equipment or sell your ship, please contact Miura.**
- The operation of the incinerator requires proper installation and supplementary equipment. If you transfer the equipment or sell your ship, please contact Miura.
  Unauthorized installation, operation, connection with supplementary equipment, etc., could cause damage to the equipment and/or serious injury to people.

**If you sell a ship equipped with this incinerator, please give the buyer this user's manual.**
- Since this user's manual is required for proper operation of the incinerator, please give it to the buyer if you sell your ship.
4. Instructions for operating equipment

Name and function of indicator

**Power lamp**
Illuminates when the unit is in operations.

**Mis-fire lamp**
Illuminates when mis-fire occurs during combustion.

**Pilot oil pressure lamp**
Illuminates when the pilot oil pressure for the pilot burner is low.

**Waste oil abnormal pressure lamp**
Illuminates when waste oil pressure is too low.

**Low air pressure lamp**
Illuminates when the atomizing air pressure of the waste oil burner is low.

**BCU abnormal lamp**
This lamp flashes if there's no power during operation, or if the BCU is not operating normally.

**Cooling fan lamp**
Illuminated while the cooling fan is operating.

**Cooling fan abnormal lamp**
This lamp flashes to warn that the cooling fan is not operating normally.

**Furnace high temperature lamp**
Illuminates when the furnace temperature is too high.

**High Exhaust temperature lamp**
Illuminates when exhaust gas temperature is too high.

**Furnace pressure high / cooling fan abnormal lamp**
Illuminates when the cooling fan is not working properly.

**Burner fan abnormal**
Illuminates when the Fan motor overloads.

**Combustion lamp**
Illuminates during combustion condition.

**Thermometer**
Indicates a temperature of the furnace.
Control Panel
Name and function of switches

**Combustion button**
Used to start combustion.

**Combustion stop button**
Used to stop combustion.

**Cooling fan switch**
- Used to start and stop the fan.
- Cooling fan will start running when it is turned to on.
- When it is turned off, cooling fan will stop four hour later automatically.

**Combustion changeover switch**
- Turn to 'solid' when incinerating solid waste.
- Turn to 'waste oil only' when incinerating NO solid waste.
- Turn to 'waste oil with auxiliary burner' when the condition of waste oil is not burning well.

**Lamp test switch**
Tests the condition of all lamps. All the lamps should be ON when this switch is pushed.

**Bell stop switch**
Used to stop alarm.

**Alarm reset switch**
 Resets the interlock system.

**Emergency shutdown switch**
This switch shuts off the power supply during an emergency.
5. **Inspections and Preparations before Start-up**

Please check the following items before starting operation of the incinerator:

**Cleaning the furnace**

1. Turn the power switch on to confirm the temperature of the furnace.
2. Make sure that the furnace is sufficiently cool.
3. From the sight window, please make sure that there is no fire or smoke still inside the furnace.

**Warning**

If fire or unburned gas remains, do not open the charging door, as you could cause a fire or be burned by backfire.

4. Open the charging door.

**Warning**

When opening the door, stand to the side and not in front to avoid injury that might be caused by backfire.

5. Hard ash that remains in the incineration chamber should be pushed through the grate to the burner chamber below.

**Warning**

Even if the temperature of the incineration chamber is low, unburned materials and ash can still be hot and cause burns.

6. Please make sure that the grates are evenly spaced.
   If the spacing is not even, please re-arrange the grates so that they are evenly spaced.

**Note**

If the spacing is not even, the solid waste will not completely incinerate, and an incineration will take more time.
7. Stick the cleaning rod up about 150 mm into the air pipe that is in the solid waste incineration chamber, and make sure the air holes are clean and allow air to pass through.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the air pipe is blocked or closed, it will take much longer for solid waste to burn.</td>
</tr>
</tbody>
</table>

8. Inspect the inside of the furnace and make sure that there is no damage, such as a collapsed castable.

9. Open the ash removal door and rubbish away the ash.

<table>
<thead>
<tr>
<th>Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Even if the temperature of the incineration chamber is low, unburned materials and ash can still be hot and cause burns.</td>
</tr>
<tr>
<td>• Put removed ash into a fireproof container, close tightly, and cool to prevent the risk of fire.</td>
</tr>
<tr>
<td>• When opening the door, stand to the side and not in front to avoid injury that might be caused by backfire.</td>
</tr>
</tbody>
</table>

10. Inspect the inside of the furnace and make sure that there is no damage, such as a collapsed castable. Then close the ash removal door.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the charging and ash removal doors are open, for your safety do not burn anything. Close the door, and turn the handle until it stops completely.</td>
</tr>
</tbody>
</table>
Preparing the pipe arrangement

1. Remove the sludge that has accumulated on the bottom.

⚠️ **Warning**
If there is too much sludge, it could clog up and damage the equipment and missfire.

2. Heat the waste oil in the waste oil tank to 90°C.

**Note**
- Waste oil that is particularly viscous should be heated to about 100°C.
- Also heat oil to 100°C when there is high water content, then drain.

3. Adequately drain the inside of the tank during and after the heating of the waste oil tank.

4. If a smoke damper is installed, the damper should be completely open.

5. Open the D. O. tank valve.

**Note**
Use the D.O. for start-up and for stopping incineration. This will prevent clogging of the pipes and damage to equipment.

6. Open the valve for the air atomizer.

7. Make sure that there is no fuel leakage in the fuel pipes.
6. Operation

Introduction

The Model BGW-N on-board incinerator can process both solid waste and waste oil. The basic cycle is one incineration of solid waste and 6-8 hours of oil incineration per day. Solid waste is charged, then the waste oil burner is ignited to incinerate both the oil and the solid waste. After all the solid waste is gone, only the waste oil is incinerated. After all incineration is completed, the burner is allowed to cool until the next day. Then the ash should be removed before the next incineration cycle begins.

In order to incinerate all the solid and oil wastes produced on your ship as well as to use the equipment safely, we ask you to plan your operations so they are close to the basic incineration cycle.

Start-up (waste oil incineration)

1. Go to Chapter 5 (Inspections and Preparations before Start-up)

2. Turn the "Cooling Fan" switch to the "ON" position. (When the cooling fan is on, the cooling fan lamp will light up).

⚠️ Warning

The cooling fan must be continuously on between incineration and cooling operations. If it is turned off at such time, workers could get burned or the equipment could be damaged.

3. Turn the "Combustion changeover" switch to "Waste Oil only"

⚠️ Warning

If the waste oil does not burn easily, turn the "Combustion changeover" switch to "Waste Oil With + Aux". At this position, the pilot burner will continue to operate with the waste oil burner.

4. Push the "Combustion" button.
   - After prepurging, ignite and commence automatic incineration.
   - When the burner ignites, the "Combustion" lamp will be lighted.
5. Before incinerating waste oil, preheat the incinerator by burning about 15 minutes' worth of waste with diesel oil (D.O.)

**Note**

At this time, the lever of the 3-directional valve at the top of the waste oil pump should be turned up so that D.O. does not flow into the waste oil tank. In addition, do not pass a steam trace through the waste oil line, since this may damage the equipment.

6. Make sure that the waste oil tank is sufficiently heated (about 90°C), then open the waste oil tank outflow valve.

7. Close the D.O. tank valve.

8. Turn down the lever of the 3-directional valve at the top of the waste oil pump, and return excess oil to the waste oil tank.

9. Adjust the flow adjustment valve of the burner entrance to match the incineration conditions.

**Note**

- For proper incineration, you must adjust the flow to match the conditions of the waste oil.
- Model BGW-N is adjusted so that the flow adjustment valve will completely open when waste oil is burned. However, when the caloric content of the oil is high, the cock should be adjusted accordingly. This is because over-input could cause damage inside the incinerator. (Please, adjust the temperature inside the incinerator to 900-1000°C.)
Items to inspect during operation

⚠️ Warning

- If you detect unusual sounds, smells, black smoke, etc., during operation, immediately push the "Combustion stop" button and close the waste oil and D.O. oil valves. If you do not do this, a fire or explosion could occur.
- If you detect malfunctions, abnormalities, etc., contact Miura head office. Do not use the incinerator until the problems have been resolved. Operating this equipment when there is a malfunction could result in a fire or explosion.

- Make sure that black smoke, white smoke, etc., are not coming out from the chimney.
- Make sure that there are no strange noises coming from the fan, waste oil pump, etc., during operation.
- Make sure that the oil pressure and air pressure gauges are not showing abnormally high values.
- Make sure that no fuel is leaking.
Shut-down

1. Open the D.O. tank valve.

2. Close the waste oil tank valve.

3. Continue burning in this condition then replace the waste oil in the pipes with D.O. After that, the lever of the 3-directional valve at the top of the waste oil pump should be returned to the upright position so that D.O. does not flow back in to the return pipe.

4. Continue burning for another 10-20 minutes and replace the waste oil still in the pipes with D.O.

CAUTION

- Waste oil in the pipes of this equipment should be replaced with D.O. otherwise, you could cause damage to gauges, pumps, etc.
- Make sure that, continue burning for another 10-20 minutes. Inadequate replacement could cause damage to the equipment.

Note

At this time, gradually close the flow adjustment valve to adjust the incineration.

5. Push the "Combustion Stop" button.
   - This will stop incineration in the burner, and the "Combustion" lamp will shut off.
6. Turn the "Cooling Fan" switch to the OFF position.
   * The cooling fan will then turn off automatically after 4 hours of cooling operation.

⚠️ **Warning**

Do not turn the breaker off! This will shut off the cooling fan and stop the operation of the incinerator. Turning off the cooling fan before the unit has cooled sufficiently could cause damage to the incinerator.

⚠️ **Warning**

Do not open the charging or ash removal doors until the unit has sufficiently cooled. (While the furnace will be locked until the temperature falls to 220°C or less, there is still a chance of fire, burns, etc. so please cool the unit down to 100°C or less.

7. Close the waste oil valve, Diesel oil valve, and the air valve for atomizing.

⚠️ **CAUTION**

Immediately after shutting down incineration, the oil inside the fuel pipe could expand due to the heat released by the incinerator, so close the valves after sufficient cooling. Closing the valves without sufficient cooling could cause damage to the equipment.
Incineration of solid waste

1. Make sure that the inside of the furnace has cooled sufficiently before opening the charging door.

2. Remove the ashes from the chamber and clean it.

3. Incinerate solid waste.

⚠️ Warning

- Do not incinerate the solid waste beyond capacity show as below. Such waste might not burn properly, and might damage the incinerator.
- As per MEPC76 (40), the maximum weight of a solid waste load is 20 kg.

(Model BGW-80N, 100N has a capacity of 40kg.)

<table>
<thead>
<tr>
<th>Type of solid waste</th>
<th>Percent of total waste</th>
<th>Specified weight</th>
<th>Specified weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food waste</td>
<td>50</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Paper</td>
<td>15</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Cardboard</td>
<td>20</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Cloth</td>
<td>5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Plastic</td>
<td>10</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Make-up of mixed waste</td>
<td>20</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

- If the proportion of solid wastes is different from that above, please divide up the waste into units and incinerate at different times.
- Please note, however, that maximum weight depends on the condition and type of solid waste.
- If waste of only one kind is being incinerated, please do not incinerate more than the maximum amount listed below.

<table>
<thead>
<tr>
<th>Type of loaded waste</th>
<th>BGW-20N, 30N, 50N</th>
<th>BGW-80N, 100N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper, cardboard only</td>
<td>17kg</td>
<td>35kg</td>
</tr>
<tr>
<td>Plastic only</td>
<td>3kg</td>
<td>10kg</td>
</tr>
<tr>
<td>Solid sludge only</td>
<td>8kg</td>
<td>15kg</td>
</tr>
</tbody>
</table>

- Waste that produces a high temperature when burned, such as plastics or waste that contains a lot of oil, should be placed on the level incinerator floor. It might cause damage the incinerator.
- By all means, load solid waste through the charger door. If you load it through the ash removal door, you could cause incomplete incineration and/or damage the equipment.

You must NOT incinerate waste that contains toxic or hazardous substances.
The MARPOL Treaty prohibits incineration of the following types of waste:
- PCBs
- Waste that contains heavy metals (even trace amounts)
- Refined oil that contains halogen compounds
**Warning**

- Even if only a small amount of waste is being incinerated at one time, it still takes at least ONE HOUR for incineration.
- When incinerating solid waste, please set the "Combustion changeover" switch to "SOLID WASTE". Otherwise, you could cause a breakdown in the equipment.

**Note**

- Small bits of garbage that can fall out of the grate should first be put in a cardboard container, or on a cardboard plate that covers the grate.
- Waste paint and other liquids should be put into metal cans and set on the lower floor of the incinerator on the chimney side.
- Waste that contains a lot of water (food scraps, etc.) can be incinerated in a shorter time by setting it on the grate (upper floor).

4. Close the charging door.

**Note**

If the charging door and ash removal door are not completely closed and the handle is not in the locked position, the incinerator will not operate.

5. Please refer to Chapter 6, "Operation" before running the equipment.

**Note**

When the waste oil burner is incinerating, the solid waste will automatically catch on fire and burn.
7. Regular Maintenance

Chart for periods and places to inspect and clean

⚠️ Warning
Do not do any kind of work that is not mentioned here. Doing unauthorized work could result in personal injury.

- To keep the Model BGW-N Z incinerator operating safely for a long time, and to prevent accidents and breakdowns, you should perform the following cleaning and inspections on a regular basis. (Some items do not apply to some systems. Please contact to Miura representative for details.)

- Although the following chart lists standard inspections and cleanings to be performed on a regular basis, the frequency of such work varies depending on how the equipment is used, so consider this chart to be a general set of guidelines.

<table>
<thead>
<tr>
<th>Items for inspection/cleaning</th>
<th>Page</th>
<th>Frequency of inspection/cleaning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Daily</td>
</tr>
<tr>
<td>Oil pressure check</td>
<td>29</td>
<td>●</td>
</tr>
<tr>
<td>Cleaning of Cds cell</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Cleaning of pilot burner</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Cleaning of waste oil burner</td>
<td>33</td>
<td>●</td>
</tr>
<tr>
<td>Cleaning and inspection of ash removal door and inside the incinerator</td>
<td>18</td>
<td>●</td>
</tr>
<tr>
<td>Cleaning of D.O. strainer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Atomized Air and Oil pressure check

⚠️ CAUTION

Please check the Atomized air and oil pressure when the "Combustion" lamp is on. This is because the oil pump is engaged during the incineration process; if the pump is not engaged, you cannot check the oil pressure accurately.

1. Follow the procedure in Chapter 6 for operation.

2. Make sure that the oil pressure gauge is showing the right value.

⚠️ Warning

If there is abnormal oil pressure, please stop operation immediately and contact a Miura maintenance representative. If you continue operation with abnormal oil pressure, you could cause damage to the incinerator or injury to people.

<table>
<thead>
<tr>
<th>Standard values for atomized air and oil pressure (operating pressure)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atomized air                                                   : 0.08MPa</td>
</tr>
<tr>
<td>Waste oil pressure, primary side                              : 0.2~0.4MPa</td>
</tr>
<tr>
<td>Waste oil pressure, secondary side*                           : 0.05MPa</td>
</tr>
<tr>
<td>Diesel oil                                                    : 0.8MPa</td>
</tr>
</tbody>
</table>

* For Model BGW-80N,100N the pressure reading is taken from the pressure gauge that is nearest from the burner on the waste oil pipe.
Cleaning of CdS cell

⚠️ Warning
Immediately after incineration has ended, the incinerator is still very hot and could burn you, so wait until it has sufficiently cooled before performing any maintenance or cleaning.

1. Turn the electrical power (Breaker) to the incinerator OFF.
2. Remove the CdS cell cover.
3. Take out the CdS cell.
4. Remove the soot on the front end of the CdS cell by wiping it with a soft cloth.
5. Put the CdS cell back into its original place and put the cover back on.
Cleaning the pilot burner

⚠️ Warning
Immediately after incineration has ended, the incinerator is still very hot and could burn you, so please wait until it has sufficiently cooled before performing any maintenance or cleaning.

Note
The frequency of burner cleaning depends on how it is used and the condition of the fuel.

1. Turn the electrical power to the incinerator OFF.
2. Close the fuel valve of the waste oil tank, then close the pilot fuel valve.
3. Remove the copper pipe union and the check bolt of the burner lid in the front part of the wind box.
4. Remove the CdS cell and the plug cap of the spark rod, then take out the burner.
5. Use a wire brush, etc., to remove the soot from the baffle plate.
6. Turn the nozzle chip to remove it from the burner.
7. Use paper clothes or similar materials to remove the soot that is attached to the nozzle tip.

Note
The fuel sprayer at the end of the nozzle tip should be cleaned so that soot, grime, etc., do not clog it.

8. Make sure that there is no damage at the place where the nozzle tip comes into contact with the burner.

⚠️ Warning
If you find damage, please contact a Miura maintenance representative. Using a damaged nozzle tip could cause fuel to leak, which in turn could cause a fire or explosion.
9. Reassemble the pilot burner in the exact opposite order in which it was disassembled.

10. Make sure that the copper pipe union is completely closed. Then tape the copper pipe with glass fiber tape.

⚠️ Warning

Make sure that the copper pipe union is tightly closed. A loose pipe union could cause fuel to leak, which in turn could cause a fire or explosion.

11. Following the procedure in Chapter 8, vent the air from the solenoid pump.

<Burner dimension>

<table>
<thead>
<tr>
<th>NO.</th>
<th>name</th>
<th>NO.</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>Baffle plate (complete)</td>
<td>206</td>
<td>CdS cell</td>
</tr>
<tr>
<td>202</td>
<td>Nozzle chip</td>
<td>2C1</td>
<td>Copper pipe fitting</td>
</tr>
<tr>
<td>204</td>
<td>Nozzle pipe (complete)</td>
<td>2C4</td>
<td>Insulator bushing</td>
</tr>
<tr>
<td>205</td>
<td>Spark rod</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nozzle chips, spark rods and insulator bushings wear out, so you should replace them once a year.
Cleaning the waste oil burner

⚠️ Warning
Immediately after incineration has ended, the incinerator is still very hot and could burn you, so please wait until it has sufficiently cooled before performing any maintenance or cleaning.

Note
The frequency of burner cleaning depends on how it is used and the condition of the fuel. Contact a Miura maintenance representative for more information.

1. Turn the power source for the incinerator OFF. Then close the fuel valve.
2. Remove the copper air pipe for the waste oil/atomizer.
3. Remove the set screw from the burner lid of the waste oil burner, then remove the burner itself.
4. Loosen the shroud set screw, then remove the shroud.
5. Tighten the part of the casing where the air enters for the atomizer as tightly as possible by a vise, then remove the nozzle case at the end of the burner.
6. Remove the copper pipe fitting at the waste oil entrance, loosen the set screws at the three locations on the nozzle pipe, then pull the nozzle pipe off toward the end of the burner.
7. Make sure there is nothing clogging the inside of the nozzle.
8. Use a wire brush to scrape off soot that is adhering to the burner and to the shroud.

Note
The fuel and air sprayers at the end of the burner should be cleaned so that soot, etc., do not clog them.
9. Reassemble the burner in the exact opposite order that it was disassembled.

**Note**

- Check the dimensions of the burner, then tighten the hexagonal lock bolts of the burner with the same tightness. If the burner is not correctly assembled, the atomizer will not work properly, resulting in poor incineration, poor ignition, and maybe even an explosion.
- The nozzle pipe should be fixed by pushing it toward the nozzle case, and tightening the screws at the three locations evenly.
- After assembly, make sure that everything has been assembled with the proper dimensions.

10. Make sure that the copper pipe fitting is tightened securely.

    Then tape the copper pipe with glass fiber tape.

**Warning**

Make sure the copper pipe fitting is tightened securely. If it is not tight, fuel may leak, which in turn could cause a fire or explosion.
<table>
<thead>
<tr>
<th>No.</th>
<th>name</th>
<th>No.</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Shroud</td>
<td>109</td>
<td>O ring</td>
</tr>
<tr>
<td>103</td>
<td>Burner lid</td>
<td>110</td>
<td>Casing</td>
</tr>
<tr>
<td>106</td>
<td>Nozzle case</td>
<td>1C1</td>
<td>Nipple</td>
</tr>
<tr>
<td>107</td>
<td>Waste oil nozzle</td>
<td>1D1</td>
<td>Set screw</td>
</tr>
<tr>
<td>108</td>
<td>Nozzle pipe</td>
<td>1D4</td>
<td>Set screw</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>L-size</th>
<th></th>
<th>M-size</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGW-20N</td>
<td>253</td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>BGW-30N</td>
<td>260</td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>BGW-50N</td>
<td>320</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>BGW-80N</td>
<td>295</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>BGW-100N</td>
<td>361</td>
<td></td>
<td>27</td>
</tr>
</tbody>
</table>
Inspection of the castable in the furnace

The castable in the furnace usually contains hot gas, so cracking and abrasions will inevitably appear when the operating time is increased. Since the castable is fixed by the anchor, there will be no immediate effect on operations, but the castable should be inspected regularly. If it appears to be warped, please repair or replace it.

< Signs that repairs are necessary >
- Cracking of 3 mm wide or wider occurs
- Numerous irregular cracks appear and intersect themselves. This means that part of the furnace wall is "blocking" and may collapse.

![Diagram of a crack and part that is "blocking".](image-url)
8. Trouble shooting

What to do when the buzzer sounds and the "Alarm" light starts flashing

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Warning&quot; refers to a system in which it has been determined that it is too dangerous for the incinerator to continue operating, incineration is stopped, and a alarm signals that there is a malfunction or other abnormality.</td>
</tr>
</tbody>
</table>

- When a alarm occurs, incineration will stop automatically.
- After that, the incinerator will be cooled.
- A bell will sound and a flashing lamp will indicate the type of warning.

1. Check to see what kind of alarm has been given, then push the "Bell Stop" button.
   - Pushing the "Bell Stop" button will stop the alarm bell and cause the flashing lamp to stop flashing but still be lighted. It will still be in a state of interlock.

2. Following the "Trouble shooting" resolve the cause of the alarm.

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<table>
<thead>
<tr>
<th>Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td>The procedure for resolving the cause of the alarm should be done strictly &quot;by the operation manual&quot;. Improper procedures could result in a major accident.</td>
</tr>
</tbody>
</table>

3. Push the "Alarm Reset Button".
   - This will turn off the "Alarm" lamp and reset the alarm indicator.
   - If the "Bell Stop" switch is not flipped, the "Alarm Reset" switch will not work.

4. Follow the procedure in Chapter 6, Operation of the incinerator.

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If the same alarm occurs again, the cause of the trouble could be something else. In that case, please contact a Miura maintenance representative.
How to remove air from the solenoid pump

1. Open the fuel valve for the auxiliary burner.

2. Put the end of the vinyl tube that is attached to the air release valve of the solenoid pump into a container.

3. Turn the "Cooling Fan" ON to run the cooling fan.

4. Push the "Combustion" button.

5. Loosen the air release valve.

Note

| Turn the air release valve of the solenoid pump at least one turn. Failure to do so could result in the spraying of oil. |

6. Make sure that all air has been released and that only oil comes out.
   - If not all air is released, repeat Steps 4 to 8.

Warning

| Finish above operations during prepurging. Immediately after prepurging, aux. burner start the ignition. |
| Do not release the air during incineration! It is too dangerous! |

7. Close the air release valve.

8. Push the "Combustion Stop" button.

9. Follow the procedure in Chapter 6 Operation, for start up the incinerator.

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How to adjust the pressure

- **Adjusting the atomizing pressure**
  1. You can make adjustments by pushing down on the adjustment lever on the bottom of the atomizer air pressure regulating valve (pressure regulating valve for atomized air).
  2. The waste oil incinerator is activated following the procedure in Chapter 6, Operation.
  3. Adjust the pressure by moving the regulator lever.
  4. After making adjustments, push the lever up until it locks.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raising the atomizing air pressure tends to improve combustibility. If the waste oil is in bad condition, adjust the pressure to around 1.2 MPa.</td>
</tr>
</tbody>
</table>

- **Adjusting the waste oil pressure**
  - By tightening the pressure regulating valve for oil in the waste oil pipe, you can raise the secondary pressure and increase the flow of waste oil. Loosening the valve will decrease flow.
  - The Z incinerator BGW-N has been preadjusted at the factory, etc., so that it will provide the proper flow. Therefore, DO NOT TOUCH the pressure regulating valve!! Under normal conditions, switching between diesel oil and waste oil can be done using the flow adjustment valve.

- **Adjusting the diesel oil pressure**
  - Diesel oil pressure can be adjusted by turning the adjustment screw on the solenoid pump.
  - Since the solenoid pump is set to the proper position (pressure), DO NOT touch it on ship.
How to adjust the air for the burner

The air supplied for incineration in the burner is adjusted by the damper on the burner fan. Since this damper also regulates the temperature in the furnace, it should not be touched.

Damper open: Incineration air increases, reducing the temperature inside the furnace.
Damper close: Incineration air decreases, increasing the temperature inside the furnace.

- Oxygen concentration and temperature inside the furnace is determined by MEPC76 (40).
- Adjusting the position of the damper will not only cause incineration settings to stray from proper values, it will also cause the "Furnace Temperature" and "Furnace Pressure High" warning light to come on. When replacing parts, make sure the adjustment screw of the damper is kept in its original place.
### Warning

- When troubleshooting problems, turn the incinerator power switch OFF. After that, carefully follow each step of the following procedure.
- If the abnormality has not been resolved even though proper repairs have been made, immediately shut down the incinerator following the procedure in Chapter 6 (Operation), then contact a Miura maintenance representative.
- Do not perform any unauthorized work, since this could result in personal injury.

<table>
<thead>
<tr>
<th>Symptom/type of warning</th>
<th>Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power lamp doesn’t come on</strong></td>
<td>No power supply.</td>
<td>Turn the power switch ON.</td>
</tr>
<tr>
<td></td>
<td>A fuse is blown.</td>
<td>Check for a short in the wiring, replace fuse(s).</td>
</tr>
<tr>
<td></td>
<td>The power lamp is broken.</td>
<td>Replace the lamp.</td>
</tr>
<tr>
<td><strong>During prepurging</strong></td>
<td>There is residual flame in the incinerator.</td>
<td>Check the incinerator from the sight window, run the cooling fan until all residual flame is extinguished.</td>
</tr>
<tr>
<td></td>
<td>The CdS cell is broken.</td>
<td>Clean the CdS cell. If there is no improvement, replace the CdS cell.</td>
</tr>
<tr>
<td><strong>When there is a warning</strong></td>
<td>The burner is improperly adjusted.</td>
<td>Clean the burner. Replace defective parts.</td>
</tr>
<tr>
<td><strong>Alarm Missfire / Flame failure</strong></td>
<td>The solenoid valve is not working.</td>
<td>Replace the solenoid valve.</td>
</tr>
<tr>
<td></td>
<td>The pipe is clogged.</td>
<td>Clean the pipe(s). If operation is stopped, replace the diesel oil.</td>
</tr>
<tr>
<td></td>
<td>There is too much water in the waste oil.</td>
<td>Drain the water.</td>
</tr>
<tr>
<td></td>
<td>The CdS cell is broken.</td>
<td>Clean the CdS cell. If there is no improvement, replace the CdS cell.</td>
</tr>
<tr>
<td><strong>During cooling</strong></td>
<td>There is residual flame in the incinerator.</td>
<td>Check the incinerator from the sight window, run the cooling fan until all residual flame is extinguished.</td>
</tr>
<tr>
<td>Symptom/type of warning</td>
<td>Cause</td>
<td>Corrective Action</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>Furnace Temperature High</td>
<td>Excessive incineration</td>
<td>Reduce incineration/amount of solid waste loading</td>
</tr>
<tr>
<td></td>
<td>Temperature sensor inside furnace is broken.</td>
<td>If the temperature indicator shows -- ---, the sensor is broken and should be replaced.</td>
</tr>
<tr>
<td>Auxiliary Burner Oil Pressure Drop</td>
<td>Fuel is not being supplied.</td>
<td>Open the fuel valve. Make sure the fuel pipe is not clogged.</td>
</tr>
<tr>
<td></td>
<td>Air has entered in the fuel pipe.</td>
<td>Let the air out.</td>
</tr>
<tr>
<td></td>
<td>Pilot oil pump is broken.</td>
<td>Replace the pump.</td>
</tr>
<tr>
<td>Exhaust GasTemp. High</td>
<td>Excessive incineration</td>
<td>Reduce incineration/amount of solid waste loading</td>
</tr>
<tr>
<td></td>
<td>Exhaust gas temperature sensor is broken.</td>
<td>Replace the exhaust gas temperature sensor.</td>
</tr>
<tr>
<td>Waste Oil Pressure Drop</td>
<td>Fuel is not being supplied.</td>
<td>Open the fuel valve. Make sure the fuel pipe is not clogged.</td>
</tr>
<tr>
<td></td>
<td>Thermal relay of the waste oil pump is tripped.</td>
<td>Make sure the electromotor is not locked, then reset the thermal relay.</td>
</tr>
<tr>
<td>Furnace Pressure High</td>
<td>Ejector/smoke duct is clogged with foreign substance.</td>
<td>Inspect and clean ejector/smoke duct.</td>
</tr>
<tr>
<td></td>
<td>Excessive incineration</td>
<td>Reduce incineration/amount of solid waste loading</td>
</tr>
<tr>
<td></td>
<td>The pressure sensor in the furnace is clogged or broken.</td>
<td>If the same warning occurs even after cleaning the conduit of the pressure sensor, replace the sensor.</td>
</tr>
<tr>
<td>Atomized Air Pressure Drop</td>
<td>No atomized air is being supplied.</td>
<td>Open the air valve.</td>
</tr>
<tr>
<td></td>
<td>The atomized air switch is broken.</td>
<td>Replace the atomized air pressure switch.</td>
</tr>
<tr>
<td>Burner Fan Abnormal</td>
<td>Thermal relay of the burner fan is tripped.</td>
<td>Make sure the electromotor is not locked, then reset the thermal relay.</td>
</tr>
<tr>
<td></td>
<td>Fan pressure switch (optional) is broken.</td>
<td>Inspect the pipe to the pressure switch to make sure it is not clogged.</td>
</tr>
<tr>
<td>BCU Abnormal</td>
<td>Low voltage or power outage during incineration.</td>
<td>Make sure the power supply is stable.</td>
</tr>
<tr>
<td>Cooling Fan Abnormal</td>
<td>Thermal relay of the cooling fan is tripped.</td>
<td>Make sure the electromotor is not locked, then reset the thermal relay.</td>
</tr>
</tbody>
</table>
### Symptom/Type of Warning

<table>
<thead>
<tr>
<th>Symptom/Type of Warning</th>
<th>Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Even when the &quot;Combustion&quot; button is flipped, the &quot;Combustion&quot; lamp does not flicker</strong></td>
<td>The loading or ash removal door is open.</td>
<td>Close the door and turn the lever until it stops.</td>
</tr>
<tr>
<td></td>
<td>The cooling fan switch is not in the ON position.</td>
<td>Turn the cooling fan switch ON.</td>
</tr>
<tr>
<td></td>
<td>The door remit switch is broken.</td>
<td>Replace the remit switch.</td>
</tr>
<tr>
<td><strong>The cooling fan does not come on.</strong></td>
<td>Cooling is in progress.</td>
<td>Wait until cooling has ended.</td>
</tr>
<tr>
<td><strong>The temperature indicator failure.</strong></td>
<td>The temperature indicator is defective.</td>
<td>Replace the temperature sensor.</td>
</tr>
<tr>
<td></td>
<td>The temperature sensor in the furnace is wired wrong.</td>
<td>If the temperature indicator is LLLL only during incineration, check the polarity of the wiring. If the indicator shows ————, make sure the wiring is connected.</td>
</tr>
<tr>
<td><strong>The door does not open.</strong></td>
<td>The temperature in the furnace is increasing.</td>
<td>Cool until the temperature inside the furnace has fallen to 220°C or less.</td>
</tr>
<tr>
<td></td>
<td>There is residual flame in the furnace.</td>
<td>Make sure the incineration lamp has shut off.</td>
</tr>
<tr>
<td></td>
<td>Cooling is in progress.</td>
<td>Wait until cooling has ended.</td>
</tr>
</tbody>
</table>

### Options Specifications

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Oil Temperature Abnormal</td>
<td>Waste oil temperature is too high</td>
<td>Reduce waste oil temperature</td>
</tr>
<tr>
<td></td>
<td>Waste oil temperature is too low</td>
<td>Increase waste oil temperature</td>
</tr>
</tbody>
</table>

### Waste oil incineration

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame does not stabilize during incineration</td>
<td>Atomizer air pressure is wrong.</td>
<td>Check the atomizer air pressure and set it to the proper value. Make sure the atomizer pipe and waste oil burner are not clogged, and clean out the burner.</td>
</tr>
<tr>
<td></td>
<td>Viscosity of waste oil is too high.</td>
<td>Check the heating temperature and pipe trace.</td>
</tr>
<tr>
<td></td>
<td>Too much water is in the pipe.</td>
<td>Empty the drain.</td>
</tr>
<tr>
<td></td>
<td>The waste oil pipe is clogged.</td>
<td>Check and clean the pipes.</td>
</tr>
<tr>
<td></td>
<td>The burner is dirty.</td>
<td>Clean the burner.</td>
</tr>
<tr>
<td>Auxiliary burner flame does not stabilize.</td>
<td>Junk is clogging the nozzle tip.</td>
<td>Clean the burner.</td>
</tr>
<tr>
<td></td>
<td>The burner is dirty.</td>
<td>Clean the burner.</td>
</tr>
</tbody>
</table>
### Other Problems

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Corrective Action</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cracks occur in castable.</td>
<td>Hairline cracks of less than 3 mm wide do not cause breakdowns. The equipment can be used with no problem.</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Part of castable is sagging.</td>
<td>Consult a Miura service representative.</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Oil is leaking.</td>
<td>Loose pipe</td>
<td>Tighten more securely.</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>The oil seal for the waste oil pump is broken.</td>
<td>Replace the waste oil pump. Clean and inspect the waste oil strainer.</td>
<td>—</td>
</tr>
</tbody>
</table>

---

**Hair crack and Surface peeling of the fire proof material**

The fireproof material of the incinerator can be worn out over a period of time as it is always exposed to flame and corrosive gas. The hair-crack and surface peeling of the fireproof material is formed by thermal expansion and cooling shrinkage. The extent of the crack and wear depend on the waste oil contents, volume and property of solid materials. Miura would not warranty the fireproof material against the worn down, hair-crack, and surface peeling.
## 9. Specification

<table>
<thead>
<tr>
<th></th>
<th>BGW - 20N</th>
<th>BGW - 30N</th>
<th>BGW - 50N</th>
<th>BGW - 80N</th>
<th>BGW - 100N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Max capacity</strong></td>
<td>kW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>301</td>
<td>417</td>
<td>650</td>
<td>1067</td>
<td>1299</td>
</tr>
<tr>
<td></td>
<td>kcal/h</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$25.8 \times 10^4$</td>
<td>$35.8 \times 10^4$</td>
<td>$55.8 \times 10^4$</td>
<td>$91.7 \times 10^4$</td>
<td>$112 \times 10^4$</td>
</tr>
<tr>
<td><strong>Waste oil</strong></td>
<td>kW</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Amount of heat</td>
<td>233</td>
<td>349</td>
<td>582</td>
<td>930</td>
<td>1163</td>
</tr>
<tr>
<td></td>
<td>kcal/h</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$20.0 \times 10^4$</td>
<td>$30.0 \times 10^4$</td>
<td>$50.0 \times 10^4$</td>
<td>$80.0 \times 10^4$</td>
<td>$100.0 \times 10^4$</td>
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<tr>
<td>Max capacity</td>
<td>kg/h</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>25.0</td>
<td>37.5</td>
<td>60.7</td>
<td>97.1</td>
<td>121.4</td>
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<tr>
<td><strong>Solid waste</strong></td>
<td>kW</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Amount of heat</td>
<td>68.0</td>
<td>136.0</td>
<td>136.0</td>
<td></td>
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<tr>
<td></td>
<td>kcal/h</td>
<td></td>
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<tr>
<td></td>
<td>58,405</td>
<td>116,810</td>
<td>116,810</td>
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<tr>
<td>Max capacity</td>
<td>kg/h</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20.0</td>
<td>40.0</td>
<td>40.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max capacity</td>
<td>kg/one charge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20.0</td>
<td>40.0</td>
<td>40.0</td>
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</tr>
</tbody>
</table>

**Control system**  
Automatic combustion controller

**Waste oil burner**  
Air atmizing burner

**Aux burner**  
Type: Pressurized atmizing burner

| Fuel consumption | kg/h | 4.3 (Diesel oil) | 5.5 | 5.5 |
| Ignition         |      | High voltage electric spark |

**Power**  
$\phi 3$ 440V, 60Hz

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Electric consumption</th>
<th>kW</th>
<th>8.1</th>
<th>11.0</th>
<th>15.9</th>
<th>38.1</th>
<th>48.1</th>
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<tbody>
<tr>
<td>Dimensions</td>
<td>Width</td>
<td>mm</td>
<td>2,075</td>
<td>2,345</td>
<td>3,060</td>
<td>3,155</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Depth</td>
<td>mm</td>
<td>1,275</td>
<td>1,305</td>
<td>1,550</td>
<td>1,590</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Height</td>
<td>mm</td>
<td>2,165</td>
<td>2,425</td>
<td>2,950</td>
<td>2,710</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
<td></td>
<td>3,200</td>
<td>3,470</td>
<td>5,630</td>
<td>6,750</td>
<td></td>
</tr>
</tbody>
</table>

**Connection**  
- Waste oil inlet: 25A  
- Atmizing air inlet: 15A  
- Diesel oil inlet: 15A  
- Chimney diameter: 350A, 400A, 500A, 700A, 800A

---

For an improvement of a system technical data may alter without notice.

The descriptions and specifications in this manual were in effect at time of printing.
Miura's policy is one of continuous improvement and update or discontinuation of specific models may occur from time to time without notice or without incurring obligations.
10. Supplement

How to check the operability of safety equipment

- Missfire
  1. Take out the CdS cell during incineration, and cover sensor with your hand.
  
  2. Make sure that incineration has stopped when the "Combustion" lamp goes out and the "Missfire / Flame failure" lamp comes on.

- Determining of there is residual flame
  1. Remove the CdS cell and start incineration with light hitting the light-sensing surface.
  
  2. The "Combustion" lamp comes on, and the "Missfire / Flame failure" warning comes on during prepurging.

- Waste oil pressure drop
  1. Close the waste oil/diesel oil valve during incineration.
  
  2. The "Waste Oil Pressure Drop" alarm comes on.

- Aux. Burner Oil pressure drop
  1. Close the diesel oil valve and begin incineration.
  
  2. After ignition has started, the "Aux. Burner Oil Pressure drop" warning comes on.

- Atomized air pressure drop
  1. Close the atomized air valve during waste oil incineration in the burner.
  
  2. The "Atomized air pressure drop" alarm comes on.

- BCU Abnormal
  1. Flip the "Emergency Stop" switch during the cooling operation.
  
  2. After returning the breaker switch to its original position, the "BCU Abnormal" alarm comes on.
Burner fan Abnormal
1. Trip the thermal relay for the electric switching apparatus of the burner fan, then incinerate.
2. The "Burner Fan Abnormal" warning comes on.

Cooling fan Abnormal
1. Trip the thermal relay for the electric switching apparatus of the cooling fan, then incinerate.
2. The "Cooler Fan Malfunction" warning comes on.

Furnace temperature high
1. Open the door on the control panel and turn the "Test switch for internal temperature" switch ON. Make sure that the set value temporarily goes to 600°C.
2. Begin incineration.
3. When the temperature in the furnace reaches 600°C, make sure the "Furnace Temperature high" alarm comes on and incineration is stopped.
4. Turn the "Test switch for internal temperature" switch OFF. Make sure the set temperature has changed.

Exhaust gas temperature high
1. Lower the setting on the exhaust gas thermostat during incineration.
2. Make sure the "Exhaust Gas Temperature High" alarm comes on.

Furnace pressure high
1. During incineration, remove the conduit leading to the furnace pressure switch.
2. When the "Furnace Pressure high" warning comes on, stop incineration.

Waste oil temperature abnormal (optional)
1. Open the door of the control panel and turn the "Low Waste Oil Temperature" switch ON. Make sure that it initially shows 0°C. After that, the current oil temperature will be displayed.
2. In addition, CHE4 and 300 will be displayed alternately, with the temperature being temporarily set to 300°C. At this time, the "Waste Oil Temperature Abnormal" lamp will come on and a warning buzzer will sound.
- **Waste oil temperature Abnormal (optional)**
  1. Open the door of the control panel and turn the "High Waste Oil Temperature" switch ON. CHE2 and 0 will be displayed alternately, with a temporary value set at 0°C.

  2. After that, the "Waste Oil Temperature Abnormal" lamp will come on and a warning buzzer will sound.

- **Furnace temperature drop (optional)**
  1. Open the door of the control panel and turn the "Low Furnace Temperature" switch ON. CHE5 and 0 will be displayed alternately, with a temporary value set at 0°C.

  2. Begin incineration.

  3. During incineration, CHE6 and 1200 will be displayed alternately, with a temporary value set at 1200°C. At this time, make sure the "Furnace Temperature Drop" alarm comes on and that incineration stops.

  4. When the test switch is turned OFF, nor4 and 800 will be displayed alternately. This means that the set temperature has returned to 800°C.
### Supplement - 1 Aux. Burner Drawing

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baffle Plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Nozzle Tip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Packing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Nozzle Pipe</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Spark rod</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Flame Eye</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Plug Cap</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Copper Pipe</td>
<td>2C1</td>
<td>1 B6-PT1/4</td>
</tr>
<tr>
<td>Screw</td>
<td>2D1</td>
<td>4 M4 \times 10L</td>
</tr>
<tr>
<td>Hexagon bolt</td>
<td>2D2</td>
<td>1 M6 \times 12L</td>
</tr>
<tr>
<td>Screw</td>
<td>2D3</td>
<td>1 M5 \times 8L</td>
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<tr>
<td>Guide Bushing</td>
<td>2D4</td>
<td>2</td>
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<tr>
<td>Gland</td>
<td>2D5</td>
<td>1 A15C</td>
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Supplement -2 Waste Oil Burner Drawing

<table>
<thead>
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<th>Part</th>
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<tr>
<td>101</td>
<td>Baffle Plate</td>
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<tr>
<td>102</td>
<td>Shroud</td>
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<tr>
<td>103</td>
<td>Burner cover Plate</td>
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<tr>
<td>104</td>
<td>Sight Glass</td>
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<tr>
<td>105</td>
<td>Sight Glass Cover</td>
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<tr>
<td>106</td>
<td>Nozzle case</td>
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<tr>
<td>107</td>
<td>Waste Oil Nozzle</td>
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<tr>
<td>108</td>
<td>Nozzle Pipe</td>
</tr>
<tr>
<td>109</td>
<td>O ring</td>
</tr>
<tr>
<td>110</td>
<td>Casing</td>
</tr>
<tr>
<td>1C1</td>
<td>Nipple</td>
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<tr>
<td>1C2</td>
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<td>Fitting</td>
</tr>
<tr>
<td>1D1</td>
<td>Screw</td>
</tr>
<tr>
<td>1D2</td>
<td>Screw</td>
</tr>
<tr>
<td>1D3</td>
<td>Hexagon bolt</td>
</tr>
<tr>
<td>1D4</td>
<td>Hexagon Bolt</td>
</tr>
<tr>
<td>1D5</td>
<td>Nut</td>
</tr>
<tr>
<td>1D6</td>
<td>Union Packing</td>
</tr>
</tbody>
</table>
1. MIURA Assemble & Supply.
2. Maintain the W.O. temperature 80-100°C
3. Install steam trace for W.O. piping
4. The elevation of D.O. tank should be higher than the D.O. inlet.
5. The D.O. piping should be connected to the nearest position of the W.O. tank outlet valve.

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Parts</th>
<th>SIZE</th>
<th>No.</th>
<th>Name of Parts</th>
<th>SIZE</th>
<th>No.</th>
<th>Name of Parts</th>
<th>SIZE</th>
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<td>D.O. Strainer</td>
<td>6A</td>
<td>8</td>
<td>W.O. Pressure Limit Switch(Low)</td>
<td>10A</td>
<td>15</td>
<td>Air Pressure Gauge</td>
<td>8A</td>
</tr>
<tr>
<td>2</td>
<td>Solenoid Pump</td>
<td>6A</td>
<td>9</td>
<td>Pressure Regulator</td>
<td>15A</td>
<td>16</td>
<td>Air Pressure Limit Switch(Low)</td>
<td>10A</td>
</tr>
<tr>
<td>3</td>
<td>D.O. Pressure Gauge</td>
<td>8A</td>
<td>10</td>
<td>W.O. Solenoid Valve</td>
<td>10A</td>
<td>17</td>
<td>Air Solenoid Valve</td>
<td>10A</td>
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<tr>
<td>4</td>
<td>Pressure Limit Switch(Low)</td>
<td>10A</td>
<td>11</td>
<td>W.O. Pressure Gauge</td>
<td>8A</td>
<td>18</td>
<td>Exhaust Gas Thermoat</td>
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<tr>
<td>5</td>
<td>D.O. Solenoid Valve</td>
<td>8A</td>
<td>12</td>
<td>Orfis</td>
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<td>19</td>
<td>Thermo Couple</td>
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<tr>
<td>6</td>
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<td>10A</td>
<td>13</td>
<td>Ball Valve</td>
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<td>Furnace Pressure Limit Switch</td>
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<td>7</td>
<td>W.O. Pressure Gauge</td>
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<td>14</td>
<td>Air Pressure Regulator</td>
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</table>

Piping diagram

- D.O. Tank
- V.O. Tank
- Heater
- Atomize Air Inlet
- V.O. Return
- V.O. Strainer
- V.O. Inlet
- Cooling & Ejector Air
- Combustion Chamber
- Expansion Joint
Name and functions of display section (specifications for options)

- **Power lamp**: Illuminates when unit is in operations.
- **Mis-fire lamp**: Illuminates when mis-fire occurs during combustion.
- **Pilot oil pressure lamp**: Illuminates when fuel oil pressure for pilot burner is low.
- **Waste oil abnormal pressure lamp**: Illuminates when low waste oil pressure is too low.
- **Low air pressure lamp**: Illuminates when atomizing air pressure of the waste oil burner is low.
- **BCU malfunction lamp**: This lamp flashes if there's a power stoppage during operation, or if the BCU is not operating normally.
- **Cooling fan lamp**: Illuminated while the cooling fan is operation.
- **Thermometer**: Indicates a temperature of the furnace.
- **Furnace Temp.Drop lamp**: Illuminates when the furnace temperature is too low.
- **W.O.Temp.Abnormal lamp**: Illuminates when waste oil temperature is too high or too low.
- **Furnace high temperature lamp**: Illuminates when exhaust gas temperature is too high.
- **High Exhaust temperature lamp**: Illuminates when exhaust gas temp is too high.
- **Furnace pressure high / cooling fan abnormal lamp**: Illuminates when the cooling fan is not working properly.
- **Burner fan malfunction**: Illuminates when the Fan motor over loads.
- **Cooling fan malfunction lamp**: This lamp flashes to warn that the cooling fan is not operating normally.
- **Combustion lamp**: Illuminates during combustion condition.
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