Thank you very much for purchasing this Yamato LT series stirrer.

Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the “Warranty” at a handy place for future reference.

⚠️ **Warning** Before operating the unit, be sure to read carefully and fully understand important warnings in the operating instructions.
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1. Safety precautions

Explanation of pictograms

About pictograms

A variety of pictograms are indicated in this operating instruction and on products to assure safe operation. Possible results from improper operation ignoring them are classified as follows. Be sure to fully understand the descriptions below before proceeding to the text.

⚠️ Warning ⚠️
Indicates a situation which may result in death or serious injury (Note 1)

⚠️ Caution ⚠️
Indicates a situation which may result in minor injury (Note 2) and property damage (Note 3).

(Note 1) Serious injury means a wound, an electrical shock, a bone fracture or intoxication that may leave after effects or require hospitalization or outpatient visits for a long time.
(Note 2) Minor injury means a wound or an electrical shock that does not require hospitalization or outpatient visits for a long time.
(Note 3) Property damage means damage to facilities, devices and buildings or other properties.

Meanings of pictograms

⚠️ This pictogram indicates a matter that encourages the user to adhere to warning ("caution" included). Specific description of warning is indicated near this pictogram.

🚫 This pictogram indicates prohibitions Specific prohibition is indicated near this pictogram.

⚠️ This pictogram indicates matters that the user must perform. Specific instruction is indicated near this pictogram.

同じであれば貼付け
1. Safety precautions

**Warning**
- General warnings
- Danger!: High voltage
- Danger!: High temperature
- Danger!: Moving part
- Danger!: Hazard of explosion

**Caution**
- General cautions
- Electrical shock!
- Burning!
- Caution for no liquid heating!
- Caution for water leak!

- For water only
- Poisonous material

**Prohibitions**
- General bans
- Fire ban
- Do not disassemble
- Do not touch

**Compulsions**
- General compulsions
- Connect ground wire
- Install levelly
- Pull out the power plug
- Regular inspection
1. Safety precautions

**Warning**

- Never operate the unit in an atmosphere containing flammable or explosive gas.
  
  Never operate the unit in an atmosphere containing flammable or explosive gas. Otherwise, an explosion or a fire may result since the unit is not explosion-proof. See section “13. List of dangerous materials” on page 15.

- Be sure to connect the ground wire.
  
  Be sure to connect the ground wire correctly. Otherwise, electrical leak may result and cause an electrical shock or a fire.

- Ban on operation when an abnormality occurs
  
  When a smoke or an unusual odor is seen or sensed, immediately turn the power of the main unit off and pull out the power plug. A fire or an electrical shock may result.

- Never use electrical power cords bundled.
  
  When these are used bundled, they might overheat causing a fire.

- Take care not to damage electrical power cords.
  
  Avoid tightly bend, pull with a strong force or twist to prevent electrical power cords from damaging. A fire or an electrical shock may result.

- Never use an explosive or a flammable material with this unit.
  
  Never use an explosive material, a flammable material or a material containing them. An explosion or an electrical shock may result. See section “13. List of dangerous materials” on page 15.

- Never try to disassemble or alter the unit.
  
  Never try to disassemble or alter the unit. A malfunction, a fire or an electrical shock may result.

**Caution**

- When a thunder is heard.
  
  When a thunder is heard, turn the main power off immediately. A malfunction, fire or an electrical shock may result.
2. Before operating the unit

Precautions when installing the unit

1. Carefully select an installation site.
   - Take special care not to install the unit at a place described below:
     - Uneven surfaces or dirty surfaces
     - Where flammable gas or corrosive gas exists
     - Where the ambient temperature is 35°C or more
     - Where humidity is high
     - Where vibration is severe
   - Assure sufficient space around the unit.

2. Install the unit on a level surface.
   - Install the unit on a level surface. If the whole bottom surface of the unit does not contact
     the surface evenly, vibrations or noises may result. This might cause unexpected troubles
     or malfunctions.

3. Installation
   - The unit might fall down or move by an earthquake or an impact resulting a personal injury.
     We recommend making safety measures such as to avoid installing the unit at a place other
     than busy places.

4. Never operate the unit in an atmosphere containing flammable or explosive gas.
   - Never operate the unit in an atmosphere containing flammable or explosive gas. Otherwise, an explosion or a fire may result since the unit is not explosion-proof.
     See the section “13. List of dangerous materials” on page 1 for flammable and explosive
     gases.

5. Be sure to connect the power plug to the dedicated wall outlet.
   - Use a power distribution panel or a wall outlet that meets the electrical capacity of the unit.
     (The unit can be operated with the power supply voltage in the range of VAC100〜VAC125.)
     Electrical capacity:
     - LT400A/B/C/D: 100V〜125V  200VA 10%  (2A at VAC100; 1.7A at VAC120)
     - LT500A/B: 100V〜125V  400VA 10%  (4A at VAC100; 3.3A at VAC120)
2. Before operating the unit

6. Handling of a power cord

Never use electrical power cords bundled. When these are used bundled, they might overheat causing a fire.

Do not convert, forcibly bend, twist or pull the power cord. Otherwise, a fire or an electrical shock may result.

Do not place the power cord under a desk or a chair, or sand between objects to avoid it from being damaged.
Otherwise, a fire or an electrical shock may result.

Do not place the power cord close to a stove or other heat generating device. Sheath of the cord may burn and result in a fire or an electrical shock.

If the power cord should be damaged (exposure of core wire or disconnection), immediately turn the main unit off and ask your dealer to replace the cord. Otherwise, a fire or an electrical shock may result.

Connect the power cord to an appropriate wall outlet.

7. Be sure to connect the ground wire.

- When the unit has no ground terminal, class 3 grounding work is necessary and please consult your dealer or our nearest sales office.
- Securely connect to an outlet.

We recommend use of a ground type outlet tap.

- When there is no ground terminal, In this case, class 3 grounding work is necessary and please consult your dealer or our nearest sales office.

Insert the ground adaptor included as an option, into a power plug confirming the polarity of the outlet. Connect the grounding wire (green) of the ground adaptor to the ground terminal on the power supply equipment.

- Do not connect the grounding wire to any parts or lines other than a correct grounding terminal such as a gas pipe, a water pipe or a telephone line. Otherwise, an accident or a malfunction may result.
- Stirring work handles liquid in nature and uses chemical, poisonous or other dangerous liquids. Never fail to connect the ground wire to prevent an accident since a small amount of leak current always occurs at the stirrer just like other devices and the total amount of such current will be unignorable when some tens of stirrers are operated on the same power source.
3. Names and functions of parts

Main body

The rating sticker indicating the model number and the serial number of the product is found on the rear panel of the main body.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Name</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
<td>Torque indicator</td>
<td>Displays rotations of the stirring motor in [rpm]. Displays [- - - -] blinking while the thermal protector is activated.</td>
</tr>
<tr>
<td>□</td>
<td>Speed adjusting knob with a power switch</td>
<td>This is a speed adjusting knob with a power switch. Turn this knob clockwise to turn power on and increase the rotation speed.</td>
</tr>
<tr>
<td>□</td>
<td>Drill chuck for 8 mm</td>
<td>Up to 8 mm stirring axis can be held using the attached special chuck handle.</td>
</tr>
<tr>
<td>□</td>
<td>Clamp</td>
<td>The main body is fixed onto the stand with the clamp attached.</td>
</tr>
<tr>
<td>□</td>
<td>Safety cover</td>
<td>This is a safety cover for preventing catching something during rotation.</td>
</tr>
</tbody>
</table>

Overview and features of the product

Overview

LT series stirrers include LT400A and LT500A with higher torque, LT400B and LT500B with well-balanced speed and torque, LT400C with high speed and LT400D with high speed to support different applications. The product has been designed to provide user-friendliness and safety with a light-weight aluminum die-cast body, an SUS chuck, a current restricting circuit for overload protection, and a thermal protector to enable stirring work as expected.

Features

- The product will not damage laboratory environment thanks to its outstanding quietness.
- A highly sensitive feedback system keeps the set speed even with changing viscosity during stir.
- A brushless motor is employed.
- Noise prevention measures for optimal work environment
  The product has been so designed that does not generate noises which may give influence on other devices and unlikely to malfunction even when it receives noises.
- More safety-oriented design
  For protection against overload, double or triple safety mechanisms have been employed in the current limiting circuit such as a thermal protector, a brushless motor without a spark, highly air-tight body and the safety cover for preventing catching an object.
4. Operating procedures

Preparation for operation • operation

From installation of the unit to starting operation

1. Preparation
(1) Select a stable installation site such as on a laboratory table.
(2) Prepare a stable rack with shaft diameter of 20 □〜25 □.
   (We recommend use of special Y-type rack sold separately.)
(3) Prepare a special □8 stirring shaft and special stirring blades sold separately.

2. Installing the main unit
(1) Fix the main unit to the rack shaft using the clamp holders attached.
(2) Loosen the drill chuck and securely fix the stirring shaft with the chuck handle.
(3) Install the stirring blades and the safety cover.
(4) Make sure that the speed adjusting knob is at OFF and connect the power plug into the power outlet.

3. Operating the unit
Set a container and set the speed adjusting knob to the rpm you want.

The torque indicator on the torque indicator displays load in five steps on LED.
Over load status is notified by blinking indications on the torque indicator when load exceeding the maximum torque is applied.

When rotation is stopped because of the thermal protector, turn power OFF and wait for about 30 minutes until the temperature inside the motor is cooled down and change liquid viscosity or blade shape that caused overheat to reduce load to the motor.

The internal thermal protector shuts off current to the motor when the temperature rises beyond the upper limit to prevent burnout of the motor.

Optional accessories

<table>
<thead>
<tr>
<th>Product code No.</th>
<th>Item name</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>231086</td>
<td>Y-shaped rack</td>
<td>Shaft diameter 25 mm x length 725 mm</td>
</tr>
<tr>
<td>231384</td>
<td>Stirrer shaft</td>
<td>Shaft diameter □8 □500 mm L</td>
</tr>
<tr>
<td>231077</td>
<td>Stirrer blades: Four blades</td>
<td>Diameter 75 mm Attaching screw M5</td>
</tr>
<tr>
<td>231076</td>
<td>Stirrer blades: Four blades</td>
<td>Diameter 60 mm Attaching screw M5</td>
</tr>
<tr>
<td>231075</td>
<td>Stirrer blades: Four blades</td>
<td>Diameter 40 mm Attaching screw M5</td>
</tr>
<tr>
<td>231065</td>
<td>Stirrer blades: Two blades</td>
<td>Diameter 100 mm Attaching screw M5</td>
</tr>
<tr>
<td>231083</td>
<td>Stirrer blades: Two blades</td>
<td>Diameter 28mm Attaching screw M5</td>
</tr>
<tr>
<td>280081</td>
<td>Blades for narrow port</td>
<td>Two blades 45 mm Attaching screw M5</td>
</tr>
</tbody>
</table>
| 231385           | Glass blade | Shaft diameter □8 □500 mm L
                      Two blades, diameter 60 mm |
| 231064           | Turbine with a disc | Diameter 100 mm Attaching screw M5 |
| 231062           | Turbine with a disc | Diameter 60 mm Attaching screw M5 |
| 231386           | Turbine with a disc for two-step operation | For □8, diameter 60 mm |
5. Cautions on handling

1. About substances that cannot be used for the unit

Warning

Never use an explosive substance or a flammable substance or a substance containing them for this device. An explosion or an electrical shock may result.


2. Ban on use/countermeasures when an error occurs

Caution

If smoke is emerges on the unit or an odd odor is felt, immediately turn the switch on the main unit off, remove the power plug and contact your dealer or a Yamato sales office for inspection. Otherwise, a fire or an electrical shock may result. The user shall never attempt to repair the unit to avoid any possible dangers.

3. Do not attempt to modify the unit.

Caution

The user shall never try to modify the unit; otherwise, an accident, a malfunction, a fire or an electrical shock may result.

1. When a thunder is heard.

Caution

When a thunder is heard, turn the switch off and remove the power plug immediately. Otherwise, a lightning strike may result and cause a fire.

2. About recovery from power outage.

Caution

Since it is dangerous if the unit resumes operation unmanned when it recovers from power outage, be sure to turn power switch off when power outage occurs.
6. Maintenance procedures

Daily inspection/maintenance

Be sure to perform daily inspection and maintenance to assure reliable operation of the unit.

⚠️ Warning

- Be sure to pull out the power cord unless necessary before trying to do inspection and maintenance works.
- Start these works after the device has returned to the normal temperature.
- Never try to disassemble the unit.

⚠️ Caution

- Wipe off any dirt with a tightly wrung soft cloth. Never try to clean the unit with benzene, thinner or scouring powder, or rub with a scrubbing brush. Deformation, degradation or discoloration may result.
7. When the unit is not to be used for a long time or when disposing

When the unit is not to be used for a long time or when disposing

<table>
<thead>
<tr>
<th>Caution</th>
<th>Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the unit is not going to be used for a long time</td>
<td>When disposing the unit</td>
</tr>
<tr>
<td>□ Turn the power switch off and pull out the power cord.</td>
<td>□ Do not leave the unit in the area where children may have access.</td>
</tr>
<tr>
<td></td>
<td>□ Remove the power cord before disposing the unit.</td>
</tr>
<tr>
<td></td>
<td>□ In general, dispose the unit as a bulky waste.</td>
</tr>
</tbody>
</table>

Notes about disposition

Always pay attention to the preservation of the global environment.

* We highly recommend taking the unit apart as far as possible for separation or recycling to contribute to the preservation of the global environment. Major components and materials for the unit are as follows:

<table>
<thead>
<tr>
<th>Names of major components</th>
<th>Major materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major exterior components</strong></td>
<td></td>
</tr>
<tr>
<td>Exterior</td>
<td>Steel plate Melamine resin baking finish, aluminum, stainless steel</td>
</tr>
<tr>
<td><strong>Major electric parts</strong></td>
<td></td>
</tr>
<tr>
<td>Switches and relays</td>
<td>Resin, cupper and other composite parts</td>
</tr>
<tr>
<td>Boards</td>
<td>Glass fiber and other composite parts</td>
</tr>
<tr>
<td>Power cord</td>
<td>Resin sheath, cupper, nickel and other composite parts</td>
</tr>
<tr>
<td>Wiring material</td>
<td>Flame-retardant vinyl, cupper, nickel and other composite parts</td>
</tr>
<tr>
<td>Stickers</td>
<td>Resin material</td>
</tr>
</tbody>
</table>
If you drop an object in liquid or liquid fall into the motor in the stirrer, immediately turn the power switch OFF and remove the power plug. Turning power on again after drying only may cause an electrical shock and is extremely dangerous. Contact your dealer or one of our sales offices for inspection.

**Error codes**

Confirm the error code and immediately stop operation.

<table>
<thead>
<tr>
<th>Indication</th>
<th>Possible causes and measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 : Loc</td>
<td>Displayed when the motor shaft is caught for two minutes or more in the operating status. Forced stopping of operation. Turn power on again for recovery.</td>
</tr>
<tr>
<td>2 : Err1</td>
<td>Motor over speeding stop. It is detected when the motor shaft rotation exceeds 4255rpm. Forced stopping of operation. Turn power on again for recovery.</td>
</tr>
<tr>
<td>3 : - - -</td>
<td>Thermal stop. Detection of thermal stop activated by motor overheating. Automatic recovery after recovered from thermal stop.</td>
</tr>
</tbody>
</table>

**When a malfunction is suspected**

If any of the symptoms below occurs

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the unit is overloaded?</td>
<td>When rotation is stopped because of the thermal protector, turn power OFF and wait for about 30 minutes until the temperature inside the motor is cooled down and change liquid viscosity or blade shape that caused overheat to reduce load to the motor.</td>
</tr>
</tbody>
</table>
| Turning the power switch on will not activate the unit. | □ Check if the power supply is on.  
□ Check if the power outage is occurring. |

□ If the symptom does not match any of the above, immediately turn the power switch on the main unit off, pull out the power plug from the power supply and contact your dealer or one of our sales offices.

**About maintenance**

Do not attempt to perform test of the insulation resister tester (megger test) that will damage the internal circuit boards.
9. After sales service and warranty

When requesting a repair

When requesting a repair

If any trouble occurs, immediately stop operation, turn the GFI off, pull out the power plug and contact your dealer or our sales office.

Information necessary for requesting a repair

- Model name of the product
- Serial number
- Date (y/m/d) of purchase
- Description of trouble (as in detail as possible)

See the warranty card or the nameplate installed on the unit. See 3. Names and functions of parts on page 6.

Be sure to indicate the warranty card to our service representative.

Warranty card (attached separately)

- Warranty card is given by your dealer or one of our sales offices and please fill in your dealer, date of purchase and other information and store securely.

- Warranty period is one full year from the date of purchase. Repair service for free is available according to the conditions written on the warranty card.

- For repairs after the warranty period consult your dealer or one of our sales offices. Paid repair service is available on your request when the product’s functionality can be maintained by repair.

Minimum holding period of repair parts

The minimum holding period of repair parts for this product is seven years after end of production.

Repair parts here refer to parts necessary for maintaining performance of the product.
### 10. Specifications

#### LT400 series

<table>
<thead>
<tr>
<th>Model</th>
<th>LT400A</th>
<th>LT400B</th>
<th>LT400C</th>
<th>LT400D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>For high viscosity</td>
<td>For middle viscosity</td>
<td>For middle to low viscosity</td>
<td>For low viscosity</td>
</tr>
<tr>
<td>Rotation speed</td>
<td>10～300 rpm</td>
<td>15～600 rpm</td>
<td>25～1200 rpm</td>
<td>60～3000 rpm</td>
</tr>
<tr>
<td>Rated torque</td>
<td>0.9N·m (9.0 kg·f·cm)</td>
<td>0.5N·m (6.0 kg·f·cm)</td>
<td>0.3N·m (3.0 kg·f·cm)</td>
<td>0.1N·m (1.0 kg·f·cm)</td>
</tr>
<tr>
<td>Motor</td>
<td>DC brushless motor B type insulation Output: 35W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotation control</td>
<td>DC brushless motor B type insulation Output: 35W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panel indication</td>
<td>Rotation speed: four digits digital, overload indication, torque indicator (20% for one scale)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chuck</td>
<td>SUS drill chuck for 8 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety device</td>
<td>Current limiting circuit Thermal protector: motor coil temperature: 110 °C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power cord</td>
<td>Power cord with a 3p plug: 2m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power • power consumption</td>
<td>Single phase: 100V～120V 10% for 50/60 Hz 200VA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions • weight</td>
<td>Main body: 146W x 154D x 165H mm 2.4 kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Included items</td>
<td>Clamp holder x 1, safety cover x 1 Operating manual x 1, warranty card x 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### LT500 series

<table>
<thead>
<tr>
<th>Model</th>
<th>LT500A</th>
<th>LT500B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>For middle viscosity</td>
<td>For middle viscosity</td>
</tr>
<tr>
<td>Rotation speed</td>
<td>15～600 rpm</td>
<td>25～1200 rpm</td>
</tr>
<tr>
<td>Rated torque</td>
<td>0.9N·m (9.0 kg·f·cm)</td>
<td>0.5N·m (6.0 kg·f·cm)</td>
</tr>
<tr>
<td>Motor</td>
<td>DC brushless motor B type insulation Output: 65W</td>
<td></td>
</tr>
<tr>
<td>Rotation control</td>
<td>DC brushless motor B type insulation Output: 65W</td>
<td></td>
</tr>
<tr>
<td>Panel indication</td>
<td>Rotation speed: four digits digital, overload indication, torque indicator (20% for one scale)</td>
<td></td>
</tr>
<tr>
<td>Chuck</td>
<td>SUS drill chuck for 8 mm</td>
<td></td>
</tr>
<tr>
<td>Safety device</td>
<td>Current limiting circuit Thermal protector: motor coil temperature: 90 °C</td>
<td></td>
</tr>
<tr>
<td>Power cord</td>
<td>Power cord with a 3p plug: 2m</td>
<td></td>
</tr>
<tr>
<td>Power • power consumption</td>
<td>Single phase: 100V～120V 10% for 50/60 Hz 400VA</td>
<td></td>
</tr>
<tr>
<td>Dimensions • weight</td>
<td>Main body: 146W x 154D x 165H mm 2.4 kg</td>
<td></td>
</tr>
<tr>
<td>Included items</td>
<td>Clamp holder x 1, safety cover x 1 Operating manual x 1, warranty card x 1</td>
<td></td>
</tr>
</tbody>
</table>
11. Wiring diagram

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Part name</th>
<th>Symbol</th>
<th>Part name</th>
</tr>
</thead>
<tbody>
<tr>
<td>70C05</td>
<td>LT500 control circuit board</td>
<td>85A06</td>
<td>Speed adjusting volume</td>
</tr>
<tr>
<td>30C05</td>
<td>LT400 control circuit board</td>
<td>M</td>
<td>DC brushless motor</td>
</tr>
<tr>
<td>30C04</td>
<td>LCD circuit board</td>
<td>THERMAL</td>
<td>Thermal sensor</td>
</tr>
</tbody>
</table>

12. List of replacement parts

<table>
<thead>
<tr>
<th>Part name</th>
<th>Code No.</th>
<th>Specifications</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill chuck</td>
<td>LT00009868</td>
<td>For SUS □8</td>
<td>Yamato Scientific</td>
</tr>
<tr>
<td>Chuck handle</td>
<td>LT00009869</td>
<td></td>
<td>Yamato Scientific</td>
</tr>
<tr>
<td>Safety cover</td>
<td>LT00009870</td>
<td></td>
<td>Yamato Scientific</td>
</tr>
<tr>
<td>Brushless motor</td>
<td>LT00009871</td>
<td>FZ4047</td>
<td>Yamato Scientific</td>
</tr>
<tr>
<td>Control circuit board for</td>
<td>LT00009872</td>
<td>30C05</td>
<td>Yamato Scientific</td>
</tr>
<tr>
<td>LT400</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For LT500</td>
<td>LT00010325</td>
<td>70C05</td>
<td>Yamato Scientific</td>
</tr>
<tr>
<td>Display circuit board</td>
<td>LT00009873</td>
<td>30C04</td>
<td>Yamato Scientific</td>
</tr>
<tr>
<td>Volume</td>
<td>LT00009874</td>
<td>85A06</td>
<td>Yamato Scientific</td>
</tr>
<tr>
<td>Power cord</td>
<td>LT00009875</td>
<td>3P</td>
<td>Yamato Scientific</td>
</tr>
</tbody>
</table>

Do not attempt to perform test of the insulation resister tester (megger test) that will damage the internal circuit boards.
### 13. List of dangerous materials

Never use an explosive substance a flammable substance or a substance containing them for this device.

<table>
<thead>
<tr>
<th>Explosive substance</th>
<th>Explosive substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitroglycerin, glycerine trinitrate, cellulose nitrate and other explosive nitrate esters</td>
<td></td>
</tr>
<tr>
<td>Trinitrobenzen, trinitrotoluene, picric acid and other explosive nitro compounds</td>
<td></td>
</tr>
<tr>
<td>Acetyl hydperoxide, methyl ethyl ketone peroxide, benzoyl peroxide and other organic peroxides</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Explosive substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal “lithium”, metal “potassium”, metal “natrium”, yellow phosphorus, phosphorus sulfide, red phosphorus, cellulois, calcium carbide (a.k.a, carbide), lime phosphide, magnesium powder, aluminum powder, metal powder other than magnesium and aluminum powder, sodium dithionous acid (a.k.a., hydrosulphite)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oxidizing substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium chlorate, sodium chlorate, ammonium chlorate, and other chlorates</td>
</tr>
<tr>
<td>Potassium perchlorate, sodium perchlorate, ammonium perchlorate, and other perchlorates</td>
</tr>
<tr>
<td>Potassium peroxide, sodium peroxide, barium peroxide, and other inorganic peroxides</td>
</tr>
<tr>
<td>Potassium nitrate, sodium nitrate, ammonium nitrate, and other nitrates</td>
</tr>
<tr>
<td>Sodium chlorite and other chlorites</td>
</tr>
<tr>
<td>Calcium hypochlorite and other hypochlorites</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flammable substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl ether, gasoline, acetaldehyde, propylene chloride, carbon disulfide, and other substances with ignition point at a degree 30 or more degrees below zero.</td>
</tr>
<tr>
<td>n-hexane, ethylene oxide, acetone, benzene, methyl ethyl ketone and other substances with ignition point between 30 degrees below zero and less than zero.</td>
</tr>
<tr>
<td>Methanol, ethanol, xylene, pentyl acetate, (a.k.a.amyl acetate) and other substances with ignition point between zero and less than 30 degrees.</td>
</tr>
<tr>
<td>Kerosene, light oil, terebinth oil, isopentyl alcohol (a.k.a. isoamyl alcohol), acetic acid and other substances with ignition point between 30 degrees and less than 65 degrees.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Combustible gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen, acetylene, ethylene, methane, ethane, propane, butane and other Substance which is a flammable gas at 15 degrees, one air pressure.</td>
</tr>
</tbody>
</table>

*(Quoted from the separate table 1 in Article 6, the enforcement order of the Industrial Safety and Health Law)*
14. Standard installation manual

*Install the product according to the following: (Confirm separately for optional items or special specifications)

<table>
<thead>
<tr>
<th>Model</th>
<th>Serial number</th>
<th>Date</th>
<th>Installation mgr. (company name)</th>
<th>Installation mgr.</th>
<th>Judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

 specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Implementation method</th>
<th>TOC No. Reference page of the operating instruction manual</th>
<th>Judgement</th>
</tr>
</thead>
</table>

### Specifications

1. Included items
   - Check for number of staffs against the included item field
   - 10. Specifications field P.13

2. Installation
   - Visual check of environmental conditions
     - Caution: Take care for environment
   - Securing a space
     - 2. Before operating the unit
       - On the installation site P.4

### Operation-related matters

1. Source voltage
   - Measure the user side voltage (distribution board • outlet) with a tester
   - Measure voltage during operation (shall meet the specifications)
     - Caution: Always use a plug that meets the specification for attaching to the GFI.
   - 2. Before operating the unit
     - Power supply is....
     - Be sure to connect the ground wire.
     - 10. Specifications
       - Specification-power supply P.13

2. Operation start
   - Starts operation
     - Set to the maximum speed and make sure the stable status
   - 4. Operating procedures
     - 5. Cautions on handling P.7
     - P.8

### Description

1. Operational descriptions
   - Explain operations of each component according to the operational instructions
   - 1. Safety precautions
     - ~13. List of dangerous materials P.1 ~ 15

2. Error codes
   - Explain the customer about error codes and procedures for release according to the operational instructions
   - 8. Troubleshooting
     - ~9. After sales service and warranty P.11 ~ 12

3. Maintenance and inspection
   - Explain operations of each component according to the operational instructions
   - 6. Maintenance procedures
     - Daily inspection/ maintenance P.9

4. Completion of installation Entries
   - Fill in the installation date and the installation mgr. on the nameplate of the main unit
   - Fill in necessary information to the warranty card and hand it over to the customer
   - Explanation of the route for after-sales service
   - 9. After sales service and warranty P.12

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⚠️ Never attempt to perform megger test using an insulation resistance tester. The stirrer will malfunction due to the structure of the circuits.
Limited liability

Be sure to use the unit strictly following the handling and operating instructions in this operating instruction. Yamato Scientific Co., Ltd. assumes no responsibility for an accident or a malfunction caused by use of this product in any way not specified in this operating instruction. Never attempt to perform matters prohibited in this operation instruction. Otherwise, an unexpected accident may result.

Notice

- Descriptions in this operating instruction are subject to change without notice.
- We will replace a manual with a missing page or paging disorder.