

# shindaiwa®

Original instructions

---

OWNER'S AND  
OPERATOR'S MANUAL

---

**Welder-generator**  
**EGW165M-I/UKV**

Air-Cooled, 4 Cycle OHV Engine



**CAUTION:** Do not operate the Generator/Welder, or any other appliance, before you have read and understood the instructions for use.

EGW165M-I/UKV

X750-031 03 2

X750804-430 2





## Introduction







Thank you for purchasing Shindaiwa Sound Proof Petrol Engine Generator/Welder.







- This Operator's manual has been created to ensure the safe operation of this equipment. Therefore, the manufacturer of this equipment strongly recommends that the user follow the instructions herein, to avoid unnecessary accidents and repairs.
- Please operate this equipment after thoroughly reviewing and understanding the contents of this manual.
- Please include this manual, if the equipment is to be on-sold or rented out.
- Please store this manual with the equipment for easy reference.


- The following convention will be used throughout the manual to indicate the degree of caution.

 <b>Warning</b>	<b><i>Can cause serious injuries or death.</i></b>
 <b>Caution</b>	<b><i>Can cause minor injuries or damage to the equipment or other property.</i></b>
<b>&lt;Caution&gt;</b>	<b><i>Other types of caution</i></b>

- The following explanatory symbols will be used throughout the manual and on the product itself. Please make sure that you fully understand what each symbol means.

<b><i>Symbol form/shape</i></b>	<b><i>Symbol description/application</i></b>
	<b><i>Read and understand instructions</i></b>
	<b><i>Safety/Alert</i></b>
	<b><i>Do not operate this equipment in poorly ventilated areas</i></b>
	<b><i>Beware of fire</i></b>
	<b><i>Beware of electric shocks</i></b>
	<b><i>Beware of suffocation from welding fumes</i></b>

<b>Symbol form/shape</b>	<b>Symbol description/application</b>
	<b><i>Do not use for Indoor wiring</i></b>
	<b><i>Do not use in the rain</i></b>
	<b><i>Beware of eyes and skin</i></b>
	<b><i>Beware of hot surface</i></b>
	<b><i>Beware of high voltage</i></b>
	<b><i>Guaranteed sound power level</i></b>

- Some of the items noted in [ **Caution**] may also lead to serious injuries.
- Please read all items and follow all the safety guidelines.
- This product is solely for professional use. Please follow international regulations (if any) for the education/training in relation to welding works, the engine driven machine/fuel handling qualification, first aid, etc.
- The following statement refers to the noise level data contained in the EC Declaration of Conformity contained on the next page of this manual.

*“The figures quoted are emission levels and are not necessarily safe working levels. Whilst there is a correlation between the emission and exposure levels, this cannot be used reliably to determine whether or not further precautions are required. Factors that influence the actual level of exposure of work-force include the characteristics of the work place, the other source of noise etc. i.e. the number of machines and other adjacent processes, and the length of time for which an operator is exposed to the noise. This information, however, will enable the user of the machine to make a better evaluation of the hazard and risk”*

# Declaration of Conformity

The undersigned manufacturer: **YAMABIKO CORPORATION**  
**1-7-2 Suehirocho**  
**Ohme, Tokyo 198-8760**  
**JAPAN**

declares, under the sole responsibility thereof, that the hereunder specified new unit:

## **SOUND PROOF PETROL ENGINE GENERATOR/WELDER**

**Brand: Shindaiwa**  
**Type: EGW165M-I/UKV**

**Serial Number M03301000055 to M03301999999**

complies with:

- the requirements of Directive 2006/42/EC (use of harmonized standard EN 60974-1:2012)
- the requirements of Directive 2014/30/EU (use of harmonized standard EN 60974-10:2014  
EN 55012:2007/A1:2009  
EN 61000-6-2:2005)
- the requirements of Directive 2009/125/EC (use of other technical standard EN 60974-1:2012, Annex M)  
and Regulation (EU) 2019/1784 (as its implementing measure)
- the requirements of Directive 2011/65/EU (use of harmonized standard EN IEC 63000:2018)
- the requirements of Directive 2000/14/EC

Noise measurements have been made in accordance with 2000/14/EC  
annex 3 part B(57) with supervision by Notified Body No.0036  
(TUV SUD Industrie Service GmbH Westendstrasse 199 80686 Munchen)  
The declared noise values are as follows:

Measured sound power level	Guaranteed sound power level
94dB LwA	95dB LwA

Tokyo, August 16th, 2021

YAMABIKO CORPORATION



Hisashi Kobayashi

General Manager  
Quality Assurance Dept.

the person in Europe who is authorized to compile the technical file.

Company: Shindaiwa Limited  
Address: 6 The Dell, Enterprise Drive, Four Ashes, Wolverhampton WV 10 7DF United Kingdom

## Table of Contents

<b>1. Safety Guidelines</b> .....	<b>1</b>
<b>2. Specifications</b> .....	<b>5</b>
<b>3. Use</b> .....	<b>6</b>
<b>4. Parts</b> .....	<b>7</b>
<b>5. Equipment</b> .....	<b>8</b>
5-1. Earth Grounding Terminal.....	8
5-2. Frequency Changeover Switch .....	8
5-3. Engine Speed Control Switch (Eco-mode) .....	8
5-4. Weld Mode Selector .....	9
5-5. AC Output Switch .....	9
5-6. Overload/Overheat Protection Devices .....	9
5-7. Oil Sensor .....	10
5-8. Display .....	10
5-9. Wheel Brake .....	11
5-10. Earth Leakage Circuit Breaker and Grounding .....	12
<b>6. Operation</b> .....	<b>13</b>
6-1. Initialization/Pre-check .....	13
6-2. Starting.....	17
6-3. Stopping .....	19
<b>7. Welding Operation</b> .....	<b>19</b>
7-1. Selection–Welding Cable.....	19
7-2. Polarity.....	19
7-3. Connection–Welding Cable.....	20
7-4. Duty Cycle .....	20
7-5. Welding .....	21
<b>8. Generator Operation</b> .....	<b>22</b>
8-1. Operation.....	23
8-2. Output Limitation .....	23
<b>9. Checking and Maintenance</b> .....	<b>24</b>
<b>10. Long-term Storage</b> .....	<b>28</b>
<b>11. Troubleshooting</b> .....	<b>29</b>
<b>12. Wiring Diagram</b> .....	<b>31</b>

## 1. Safety Guidelines

### **Warning: Suffocation from exhaust fumes**

- Exhaust fumes from the engine contain many elements harmful to humans. Do not operate this equipment in poorly ventilated areas, such as inside a room or in a tunnel.

### **Warning: Electric Shock**

- Close all equipment doors during operation.
- Do not touch the output terminals during operation.
- Do not touch or operate the equipment, if the equipment or you are wet.
- Do not insert metal objects (such as pin or wire) into plug-in receptacles.
- Do not touch wiring or electric parts inside the equipment during operation.
- Ground every grounding terminal to the earth as set out in the manual.
- Even though all the terminals of the loads have been grounded to the earth, this equipment grounding terminal should be grounded to the earth.
- Before connecting or disconnecting a welding cable from output terminal, stop the engine, and remove the starter key.
- Before performing any equipment check or maintenance, stop the engine and remove the starter key. The person performing the check or maintenance must always keep the key.

### **Warning: Electromagnetic Interference**

- Persons using a heart pacemaker are not allowed near the Generator work area while the Generator is in operation without the permission of a doctor. The welder generates a magnetic field while energized that can negatively affect pacemaker operation.
- This product may cause interference if used in residential areas.
- Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

### **Warning: Suffocation from welding fumes**

- Be sure to wear a fume proof mask during operation, as welding fumes contain poisonous gases and dust. Pay attention to the airflow direction and ensure sufficient ventilation in order to prevent inhalation of the fumes.

### **Warning: Injuries to eyes and skin**

- Battery fluid contains diluted sulphuric acid. Avoid contact with eyes, skin and clothing. If the acid comes in contact with eyes, flush with lots of water, and contact your physician immediately.

### **Warning: Explosion**

- The battery may emit some combustible gas. Keep it away from fire and sparks.
- Do not use this equipment for the purpose of thawing pipes.

**⚠ Warning: Fire**

- The equipment uses Petrol as a fuel. When inspecting the equipment or refueling, always stop the engine, remove static electricity and keep away from sparks or naked flames. Always wait until the engine cools down before refueling.
- Never fill fuel above the upper level.
- Always wipe away any drips of fuel or lubrication oil. Do not use this equipment if a leak is found. Repair the equipment before use.
- Temperatures around the muffler and exhaust can get extremely high. Keep any flammable items (such as fuel, gas, paint, etc.) away from the equipment.
- Always operate the equipment on a flat surface and with at least 1 metre clearance from all objects.
- Never operate the equipment covers with the flammable products.
- Keep any flammable items and combustible items away from the welding area as welding creates hot sparks.
- Always set up extinguishers near the welding area.
- Always drain fuel before transporting by vehicle.
- Do not operate the equipment when it is stored in a vehicle.

**⚠ Warning: Injuries**

- When performing equipment checks and maintenance, always stop the engine, and remove the starter key.
- Do not operate the equipment, if the equipment has been modified or if parts have been removed.

**⚠ Caution: Suffocation from exhaust fumes**

- Do not point exhaust fume outlet pipe in the direction of pedestrians or buildings.

**⚠ Caution: Injuries to eyes and skin**

- Be sure to wear spark protection glasses/mask, long-sleeve shirts, gloves, etc. in order to protect the eyes and skin from harmful sparks during welding.

**⚠ Caution: Electric shock**

- Do not sprinkle water on the equipment and do not use where exposed to rain and thunder.
- This machine is rated to IP23.
- Do not touch the spark plug, plug cap or high-voltage wiring during operation.



**⚠ Caution: Fire**

- Do not connect AC output to any indoor wiring.
- Always wait until the equipment cools down, before covering for storage.
- Do not allow children near the equipment. Keep children at a safe distance from the machine at all times.
- Starting this product in an explosive atmosphere may cause an explosion even with the extremely weak sparks generated by the switch of the equipment. Do not carry this equipment into an explosive atmosphere as well as not start.

**⚠ Caution: Burns**

- Do not touch the engine and muffler during operation and immediately after stopping the equipment, as temperatures can reach extremely high levels.
- When checking engine oil or changing oil, always stop the engine, and wait until the engine cools down. Do not open the oil gauge/oil filler cap during operation, as hot oil may cause injury.
- Be sure to wear leather gloves, apron, shoe covers, eye protection glasses/mask, safety shoes, safety cap, and long sleeve shirts, to protect from sparks.

**⚠ Caution: Injuries**

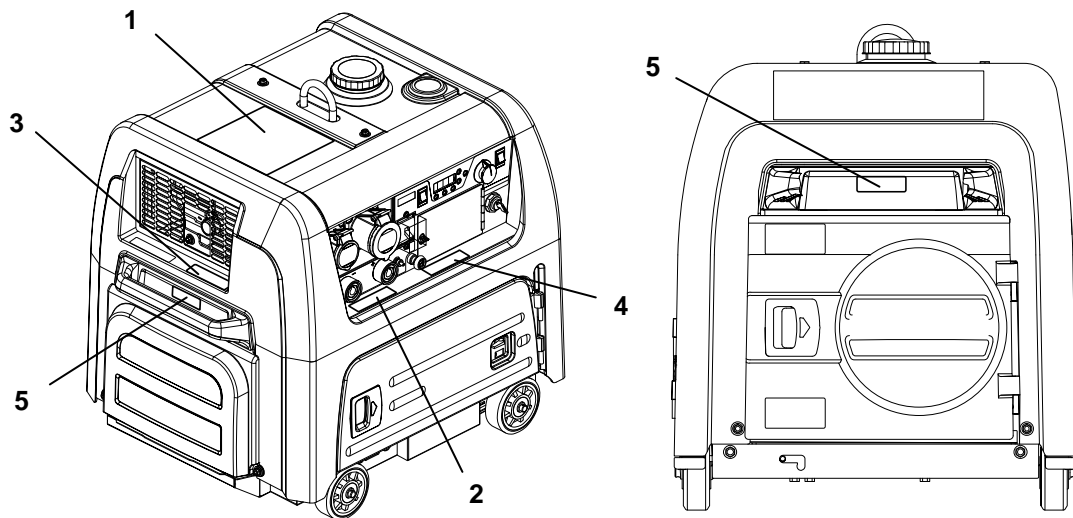
- When lifting the equipment, always use the top-mounted lifting lug. Do not lift using the positioning handles.
- Always use appropriate lifting gear and secure adequately during transportation.
- Always place the equipment on a flat and stable surface and fix the wheels using the brake, to prevent equipment movement.
- When starting the engine, turn off any connected equipment and set the AC output switch to the [OFF] position.
- Do not move the equipment during operation.









## ■ Location of Warning Labels

When the warning labels become unreadable or damaged, place new labels on the appropriate locations, as specified in the following figure.

When ordering the label, use the following part numbers.

1. Suffocation from Exhaust Fumes (X505-011481)
2. Electric Shock (X505-011470)
3. Hot Surface (X505-011490)
4. High Voltage (X505-011500)
5. Lifting Point (X505-006430)



<b>1</b>	
<b>WARNING</b>	
 <p><b>SUFFOCATION FROM EXHAUST FUMES</b></p> <ul style="list-style-type: none"> <li>Do not operate this equipment in poorly ventilated areas.</li> </ul>	<p style="text-align: center;"><b>ELECTRIC SHOCK</b></p>  <ul style="list-style-type: none"> <li>Do not touch the equipment if you or the equipment are wet. (Welding output terminals, Auxiliary output terminals)</li> <li>Before performing any equipment check or maintenance always stop the engine.</li> <li>Do not touch wiring or any electric parts inside the equipment during operation.</li> </ul>
<p style="text-align: center;"><b>FIRE</b></p> <ul style="list-style-type: none"> <li>Always operate the equipment on a flat surface and at least 1 metre away from any objects (wall, box, etc.).</li> <li>Keep any flammable items (such as fuel, gas, paint, etc.) away from the place of work.</li> <li>Do not operate the equipment when it is stored in a vehicle.</li> </ul> <p style="text-align: center;"><b>Leaked fuel may cause fire</b></p> <ul style="list-style-type: none"> <li>Before starting the engine, be sure to check, for leakage in fuel pipes or fuel strainer (Open the fuel valve before checking).</li> </ul>  <ul style="list-style-type: none"> <li>When filling with fuel, always stop the engine and keep away from sparks or naked flames.</li> <li>Do not fill the fuel up more than the specified level (The upper surface of the red level mark of the fuel strainer net).</li> <li>Wipe away any fuel spills.</li> <li>Turn the fuel valve to close, when stopping the engine.</li> <li>Be sure to check the following when cleaning the fuel strainer. <ul style="list-style-type: none"> <li>Check for any dirt on the seal when installing the strainer cup.</li> <li>Check for leakage, by turning the fuel valve to OPEN, after the strainer cup is installed. (Close the fuel valve after checking).</li> </ul> </li> </ul>	<p style="text-align: center;"><b>SUFFOCATION FROM WELDING FUMES</b></p>  <ul style="list-style-type: none"> <li>Always operate the equipment in well ventilated areas.</li> <li>Always wear a fume proof mask during operation.</li> </ul>
<b>CAUTION</b>	
 <ul style="list-style-type: none"> <li>Do not connect AC OUTPUT to any indoor wiring.</li> </ul>	 <ul style="list-style-type: none"> <li>Do not operate this equipment in the rain. IP23</li> </ul>
<b>INJURIES TO EYES AND SKIN</b>	
 <ul style="list-style-type: none"> <li>For the protection of eyes from welding arc, always wear the arc proof glass(es).</li> <li>For the protection of skin from welding arc or spatter, always wear leather gloves, apron, shoe covers and shirts with long sleeves.</li> </ul>	 <ul style="list-style-type: none"> <li>Only operate the equipment after thoroughly reviewing and understanding the contents of the operators manual.</li> </ul>
<small>X505-011481</small>	


**2**

<b>WARNING</b>	
<small>X505-011470</small>	
<b>ELECTRIC SHOCK</b>	
Whenever touching DC Welding Terminal(s), always stop the engine.	

**3**

	<b>CAUTION</b> <b>Hot Surface</b>
<small>X505-011490</small>	

**4**

	<b>CAUTION</b>		<b>HIGH VOLTAGE</b> Do not touch the spark plug during operation.
<small>X505-011500</small>			



**5**

	<b>CAUTION</b> Positioning handle. Do not use as lifting point
<small>X505-006430</small>	

## 2. Specifications

Model		EGW165M-I/UKV	
Generating Method		Rotating Field, Synchronous AC Generator	
Welding Generator	Recommended	Rated Current (A)	145
		Rated Load Voltage (V)	25.8
		Duty Cycle (%) @ 40°C	50
		Rated Speed (min <sup>-1</sup> )	3600
	No Load Voltage (V)	75 (3800 min <sup>-1</sup> ) 54 (EN 60974-1:2012 Fig. 4, 3800 min <sup>-1</sup> )	
	Current Adjustable Range (A)	30-165 (3400-3700 min <sup>-1</sup> )	
	Welding Rod (φ)	2.0-4.0	
	Power source efficiency (%)	92	
	Idle state power consumption (W)	4	
AC Generator	Voltage Regulation System		Inverter
	Phase		1-Phase
	Rated Voltage (V)		110
	Frequency (Hz)		50/60
	Rated Speed (min <sup>-1</sup> )		3600
	Rated Output (kVA)		3.2
	Rated Current (A)		29
	Power Factor		1.0
	Rating		Continuous
Engine	Model		Yamaha MZ300
	Type		Air-cooled, 4-Cycle OHV Gasoline
	Displacement (L)		0.296
	Rated Output (kW/min <sup>-1</sup> )		5.8/3600
	Fuel		Unleaded Petrol
	Lubricant Oil		API Class SE or higher
	Lubricant Oil Volume (L)		1.0 (approx.)
	Starting Method		Electric Start and Recoil Start
Spark Plug		NGK BPR4ES	
Battery		Yuasa YTX9-BS	
Fuel Tank Capacity (L)		15 (approx.)	
Noise (dB(A))	Sound pressure level L <sub>pA</sub>		80 (2006/42/EC, d = 1 m, h = 1.6 m, l <sub>2</sub> = 165 A)
	Measured sound power level L <sub>WA</sub>		94(2000/14/EC, r = 4 m)
	Uncertainly K <sub>WA</sub>		1
	Guaranteed sound power level L <sub>WA</sub>		95 (2000/14/EC, r = 4 m) 95 (declared)(2000/14/EC, r = 4 m)
Dimension		L x W x H (mm)	
		730 x 545 x 647	
Dry Weight (kg)		87	

WELDING GENERATOR EN 60974-10 EMC Group 2 Class A

<b>SOUND PLOOF PETROL ENGINE GENERATOR/WELDER</b>				<b>AC GENERATOR</b>																								
 YEAR OF MANUFACTURE : 20XX Identification Manufacturer: YAMABIKO CORPORATION 1-7-2 Suehirocho, Ohme, Tokyo 198-8760 Japan Type: <b>EGW165M-I/UKV</b> Serial number: M03301000000				<table border="1"> <tr> <td>FREQUENCY</td> <td>RATED CURRENT</td> <td>RATED VOLTAGE</td> <td>RATED OUTPUT</td> </tr> <tr> <td>50/60Hz</td> <td>29A</td> <td>110V</td> <td>3.2kVA</td> </tr> <tr> <td>POWER FACTOR</td> <td>PHASE</td> <td colspan="2">RATING</td> </tr> <tr> <td>1.0</td> <td>1-PHASE</td> <td colspan="2">CONTINUOUS</td> </tr> </table>				FREQUENCY	RATED CURRENT	RATED VOLTAGE	RATED OUTPUT	50/60Hz	29A	110V	3.2kVA	POWER FACTOR	PHASE	RATING		1.0	1-PHASE	CONTINUOUS						
FREQUENCY	RATED CURRENT	RATED VOLTAGE	RATED OUTPUT																									
50/60Hz	29A	110V	3.2kVA																									
POWER FACTOR	PHASE	RATING																										
1.0	1-PHASE	CONTINUOUS																										
EN 60974-1 Welding output  <table border="1"> <tr> <td colspan="4">30A/21.2V to 165A/26.6V</td> </tr> <tr> <td>X</td> <td>38.6%</td> <td>60%</td> <td>100%</td> </tr> <tr> <td>I<sub>2</sub></td> <td>165A</td> <td>132.4A</td> <td>83A</td> </tr> <tr> <td>U<sub>0</sub>=75</td> <td>U<sub>2</sub></td> <td>26.6V</td> <td>25.3V 23.3V</td> </tr> </table>				30A/21.2V to 165A/26.6V				X	38.6%	60%	100%	I <sub>2</sub>	165A	132.4A	83A	U <sub>0</sub> =75	U <sub>2</sub>	26.6V	25.3V 23.3V	Energy supply <table border="1"> <tr> <td colspan="2">n=3600min<sup>-1</sup></td> <td rowspan="2">IP23</td> </tr> <tr> <td>n<sub>0</sub>=3000min<sup>-1</sup></td> <td>n<sub>1</sub>=2500min<sup>-1</sup></td> </tr> </table>				n=3600min <sup>-1</sup>		IP23	n <sub>0</sub> =3000min <sup>-1</sup>	n <sub>1</sub> =2500min <sup>-1</sup>
30A/21.2V to 165A/26.6V																												
X	38.6%	60%	100%																									
I <sub>2</sub>	165A	132.4A	83A																									
U <sub>0</sub> =75	U <sub>2</sub>	26.6V	25.3V 23.3V																									
n=3600min <sup>-1</sup>		IP23																										
n <sub>0</sub> =3000min <sup>-1</sup>	n <sub>1</sub> =2500min <sup>-1</sup>																											
<table border="1"> <tr> <td>FUEL TANK CAPACITY</td> <td>FUEL</td> <td>DRY WEIGHT</td> <td>NET WEIGHT</td> </tr> <tr> <td>15 L</td> <td>UNLEADED</td> <td>87 kg</td> <td>100 kg</td> </tr> </table>				FUEL TANK CAPACITY	FUEL	DRY WEIGHT	NET WEIGHT	15 L	UNLEADED	87 kg	100 kg																	
FUEL TANK CAPACITY	FUEL	DRY WEIGHT	NET WEIGHT																									
15 L	UNLEADED	87 kg	100 kg																									

### 3. Use

- Arc welding (Manual welding only)
- Power source for electric tools
- Power source for lights
- EMC classification Group 2 Class A

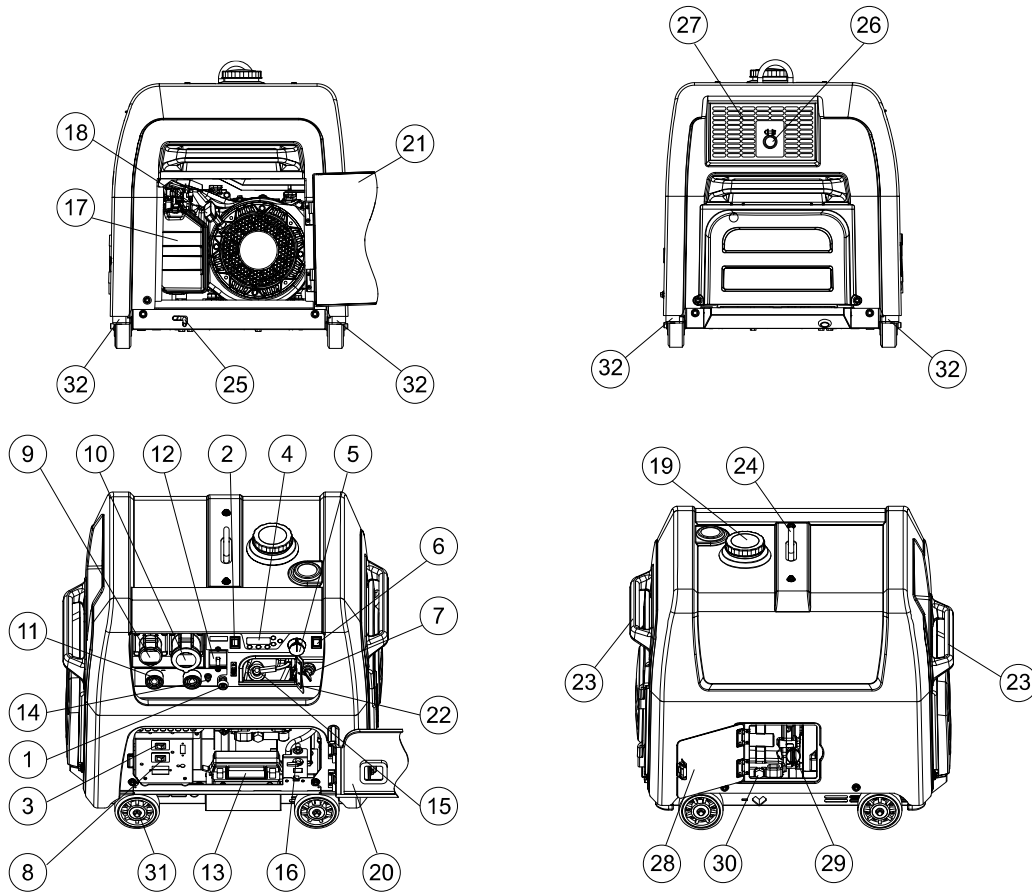


#### **Caution: Damage to the equipment or other properties**

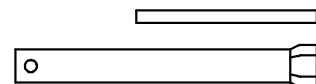
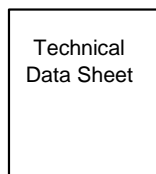
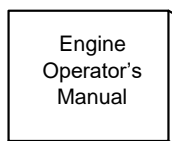
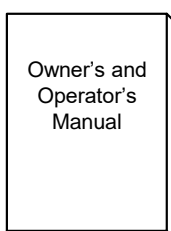
- This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.
- Consult with our dealer or authorized distributor when utilizing this equipment around devices with microcomputer control or ultra-precision items, which are very sensitive to voltage fluctuation.
- Keep the equipment away from those devices to avoid influence from electromagnetic noise.
- Consult with hospital or medical equipment companies before using this equipment on medical apparatus.
- This product is solely for manual welding. Even if some ancillary equipment (such as a wire-feeder) can connect with this product, do not use this product in conjunction with them because they may cause malfunctions.
- It is recommended you follow this instruction manual strictly, to avoid any unnecessary accidents, repairs and damage.

## 4. Parts

1. Choke
2. AC Output Switch
3. Frequency Changeover Switch
4. Display
5. Current Adjusting Dial
6. Engine Speed Control Switch
7. Starter Switch
8. Weld Mode Selector
9. AC Output Receptacle (16 A)
10. AC Output Receptacle (29 A)
11. Welding Output Terminal
12. Earth Leakage Circuit Breaker (ELCB)
13. Battery
14. Earth Grounding Terminal
15. Plug Cap (Spark Plug)
16. Fuel Valve
17. Air Cleaner (Cleaner Cover)
18. Recoil Knob
19. Fuel Inlet
20. Front Door
21. Side Door
22. Plug Maintenance Cover
23. Handle
24. Lifting Lug
25. Wheel Stopper
26. Muffler (with Exhaust Wire Mesh)
27. Exhaust Outlet
28. Oil Maintenance Cover
29. Oil Gauge/Oil Inlet
30. Oil Drain Plug
31. Wheel
32. Grip for Lifting



### Accessories



Starter Key 2 pcs

Plug Wrench 1 set

## 5. Equipment

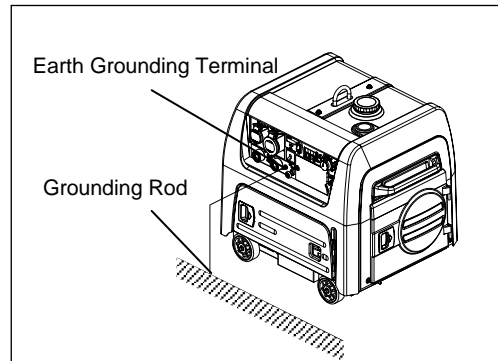
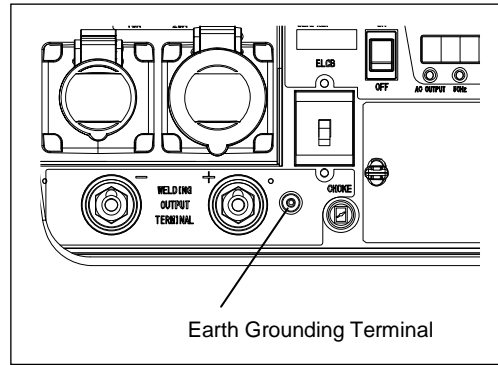
### 5-1. Earth Grounding Terminal

The grounding terminal of this equipment. Even though all the terminals of the loads have been grounded to the earth, this machine grounding terminal should be grounded to the earth.

(Grounding resistance: 500  $\Omega$  or below)

#### <Caution>

- In the event you cannot ground the generator to the earth, consult with the authorized distributor or our dealer.



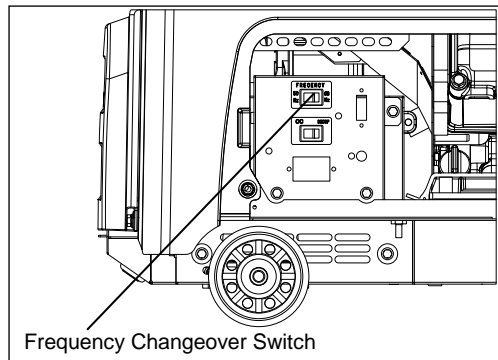
### 5-2. Frequency Changeover Switch

This Frequency Changeover Switch changes the frequency either 50 Hz or 60 Hz.

Change the frequency:

50 Hz: Turn the frequency changeover switch to [50 Hz].

60 Hz: Turn the frequency changeover switch to [60 Hz].



### 5-3. Engine Speed Control Switch (Eco-mode)

The Eco mode is designed to control the engine speed based on the required current to minimize the noise level and fuel consumption. Turn the Idle control switch to [ECO] position to use this function.

#### (1) Welding

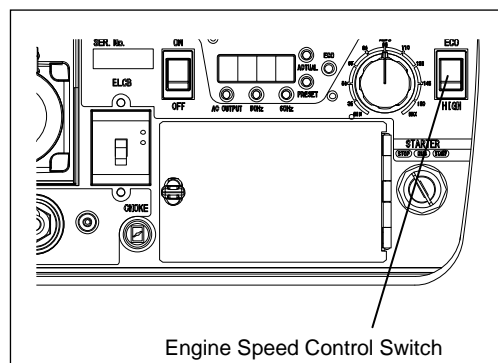
When welding current output is detected, the engine turns to appropriate speed and returns to idling rpm approximately 8 seconds after welding has finished.

#### (2) Generator

While utilizing AC output, the engine turns to appropriate speed and returns to idling rpm when not utilizing AC output. [HIGH] mode will always turn the engine to high rpm.

#### <Caution>

- Always select [HIGH] mode while utilizing high load equipment to ensure constant output.

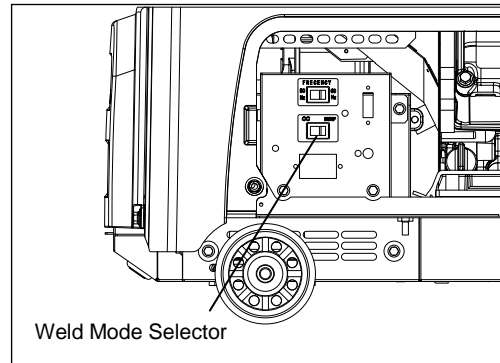


#### 5-4. Weld Mode Selector

You can select a weld mode of [DROOP] or [CC] in accordance with the type of welding being performed.

##### ■ DROOP (Drooping Characteristic)

The weld current can be adjusted by manipulating the welding rod due to being able to increase or decrease the current for changing the arc length, thereby allowing you to adjust the arc status and weld beads. The arc start is good and the arc is strongly felt. This mode is optimal for welding work such as pipe welding.



##### ■ CC (Constant Current)–STICK

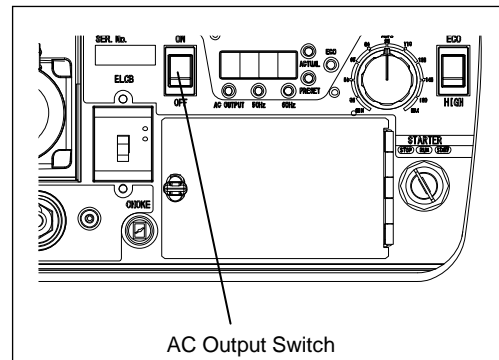
Welding can be performed at a constant uniform current even if the arc length changes due to a shaky hand or similar cause to provide a stable arc that is not easily extinguished.

Welding can be performed at a specified current value without being affected by the length or thickness (thinness) of the welding cable.

This mode is optimal for general welding as the stable arc reduces the amount of spatter.

#### 5-5. AC Output Switch

This AC Output Switch changes between connecting and disconnecting of AC power source. This switch does not have function to automatically shut off the output like a breaker does.



#### 5-6. Overload/Overheat Protection Devices



##### Caution: Injuries

- Be sure to turn off any connected equipment before restarting the engine after the overload and/or overheat protection devices are activated.

This device is designed to protect the welding machine by tripping the AC output when the overload or extreme temperatures are detected in the inverter circuit.

Display will indicate the following abbreviations when the device is activated.

[OC]: Overload (over current)

[OH]: Overheat (high temperature at inverter circuit)

Follow the instructions below to reset the device after protection has been activated.

Shut off any connected equipment and change the AC output switch to [OFF] position.

Allow the unit to cool down during idling mode for a minimum of 5 minutes.

Shut off the engine.

After checking the engine has stopped completely, turn the engine on again, and then change the AC output switch to [ON] position.

**<Caution>**

- Refer to 8-2 Output Limitation (P. 23) for a table showing maximum currents from the circuit.
- There is no automatic shut off function with AC output switch.
- Insufficient air cooling may cause Overheating [OH].

### 5-7. Oil Sensor



**Caution: Injuries**

- When re-starting the engine in order to check oil sensor activation, turn off the connected equipment and set the AC output switch to [OFF] position.



**Caution: Injuries**

- When checking engine oil, always stop the engine, and wait until the engine cools down. Do not open the oil gauge/oil filler cap during operation, as hot oil may cause injury.
- Do not touch the engine immediately after stopping the equipment, as temperatures can reach extremely high levels.

If the engine oil sensor is activated during operation, the display of the control panel will indicate [OIL], and the automatic shutoff will be engaged in order to protect engine from failure, this is the function of the oil sensor unit.

After the engine has stopped automatically, the display on the control panel shows [OFF]. In this instance, you should re-start the engine to check the cause of engine shutoff. If the engine stops again and the display shows [OIL], check the engine oil level and replenish to the maximum level if needed. Please refer to 6-1 (1) Checking Engine Oil (P. 13).

**<Caution>**

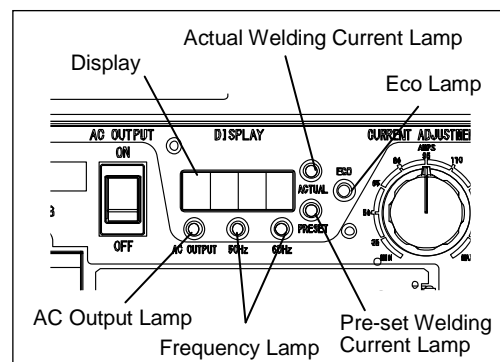
- The engine oil sensor cannot detect degradation of engine oil. Please check the engine oil periodically, and change if required. Refer to 9. Checking and Maintenance (1) Change Engine Oil (P. 25).
- Always operate the equipment on a flat and stable surface, as the engine can stop after operating the oil sensor.

### 5-8. Display

This equipment has a multi display which indicates operation status on the control panel, while the engine is running.

(1) Digital hour meter

Total operation hours will be indicated for 5 seconds only, after the engine has started. (Maximum indication up to 9,999 hours) Then the display will alternate between pre-set/actual welding current.





(2) Welding current (pre-set/actual)

Default display mode indicates pre-set welding current.

(The pre-set welding current lamp turns on.)

The display indicates actual welding current while welding.

(The actual welding current lamp turns on.)

(3) Oil warning

If the engine oil sensor is activated during operation, the display will indicate [OIL].

Please refer to 5-7 Oil Sensor (P. 10).

(4) Overload warning

When the AC output current exceeds the machine rating, the display will indicate [OC].

Please refer to 5-6 Overload/Overheat Protection Devices (P. 9).

(5) Overheat warning

When extreme high temperature is detected at the inverter circuit, the display will indicate [OH]. Please refer to 5-6 Overload/Overheat Protection Devices (P. 9).

(6) AC Output

When the AC output switch is ON, the AC output lamp will turn on green. And when the AC output switch is OFF, the AC output lamp will turn off.

(7) Frequency

The lamp turns RED in accordance with the position of the Frequency Switch.

(8) Eco-mode

When the engine speed control switch is in the [ECO] position, the eco lamp will turn on green. And when the engine speed control switch is in the [HIGH] position, the eco lamp will turn off.

## 5-9. Wheel Brake



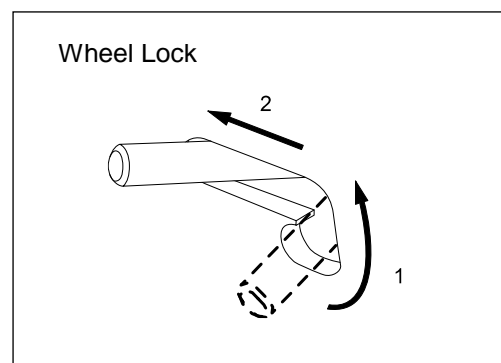
### Caution: Injuries

- Be sure to place this equipment on a flat surface and lock the wheel by lifting the brake arm as shown below.

The wheel brake is designed to lock the wheels to avoid unnecessary movement of the equipment when operating on a flat surface. It is recommended you secure additional stoppers and/or ropes to fix the position during transportation or when operating the machine on uneven ground.

(1) Lock the wheel

1. Lift the brake arm upward to position 1.
2. Move the equipment back and forth gently to allow the brake arm to slide into position 2 with a clicking noise.
3. Confirm the equipment is now locked.

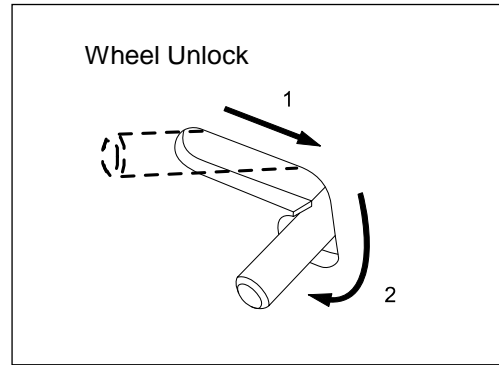


(2) Unlock the wheel

Slide the brake arm to position 1 and then down to default position 2.

**<Caution>**

- Be sure to unlock the brake, before attempting to move the equipment to avoid a locking system malfunction.



## 5-10. Earth Leakage Circuit Breaker and Grounding



**Warning: Electric Shock**

- Ground the grounding terminal to the earth as set out in the manual. Failure to do so could result in injury.
- Even though all the load terminals have been grounded to the earth, the canopy grounding terminal should also be grounded to the earth.
- Grounding should be made whilst the engine is stopped.
- Whenever the earth leakage circuit breaker has been activated, you should always repair the fault before re-using the machine.

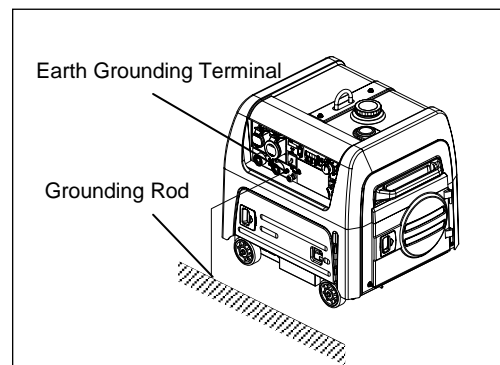
(1) Grounding Work

A qualified electrician should perform the grounding work of the following 2 points (500 Ω or below).

The grounding terminal of this equipment.  
The Outer Bonnet of the load.

**<Caution>**

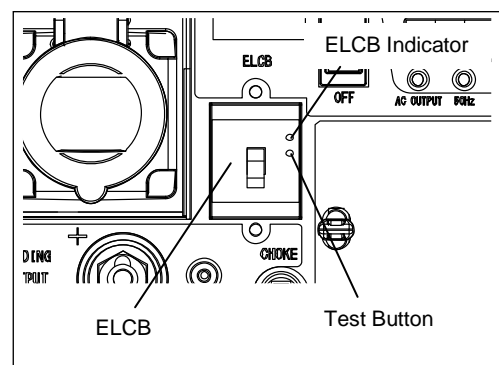
- In the event you cannot ground the generator to the earth, consult with the authorized distributor or our dealer.



(2) Operation Check

Before operating the equipment, please follow the instruction below.

1. Start the engine as per starting procedure.  
Please refer to 6-2 Starting (P. 17).
2. Turn the AC output switch to [ON] position.
3. Switch the ELCB to [ON] position.
4. Press the test button (Gray) in the ELCB.  
(Once the test button is pressed, the ELCB indicator (White) must be out and the switch in the middle position.)
5. Push down the ELCB switch [OFF] position.
6. Return the ELCB switch to [ON] position.  
(The ELCB indicator (White) will return to its original position)



- In the event you cannot complete all 6 steps in the above procedure, the ELCB is faulty. Consult with our authorized distributor or our dealer to repair.

7. Be sure to set the AC output switch to [OFF] position before starting the engine.

(3) The Earth Leakage Circuit Breaker has activated



**Warning: Electric Shock/Injuries**

- Be sure to disconnect all the loads to the equipment before turning the ELCB ON again, after the earth leakage circuit breaker has activated.

When the Earth Leakage Circuit Breaker has activated, the ELCB indicator button (White) will be out and the ELCB switch will have moved to the middle position.

In this case, stop the engine, trace the earth leakage fault and repair.

After repairing the leakage fault, reset the ELCB using the following procedure.

Push the ELCB switch down to [OFF] position.

Lift the ELCB switch to return to the [ON] position.

## 6. Operation

### 6-1. Initialization/Pre-check



**Caution: Fire/Burns/Injuries**

- When checking the equipment, always stop the engine, and wait until the engine cools down.  
Never place the equipment close to flammable products. Maintain a minimum clearance of 1 metre around the equipment.

(1) Checking Engine Oil

Position the equipment on a flat and stable surface, Open the oil maintenance cover and insert the oil gauge into oil inlet to check the engine oil level (do not screw the oil gauge into the oil tank).

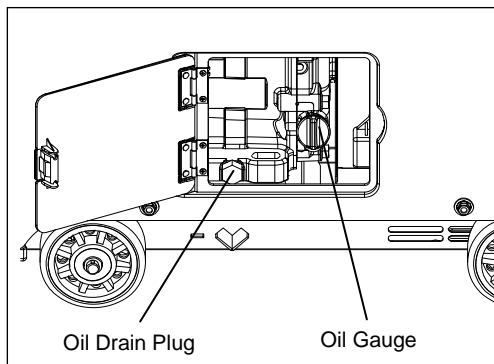
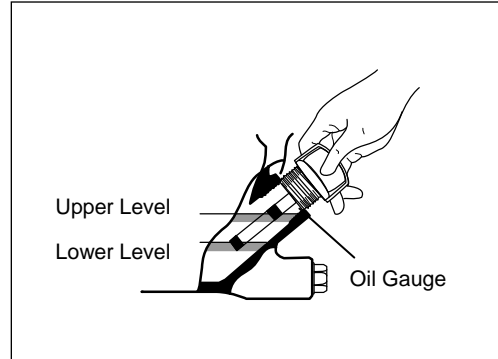
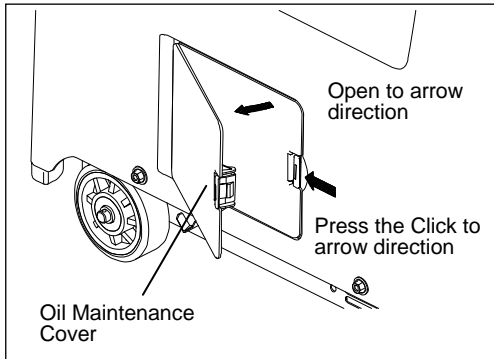
Before operation, ensure oil is to upper level.

Oil Capacity: approximately 1.0 litre (maximum)

Effective Oil Volume: approximately 0.5 litre (between the LOWER and UPPER)

**<Caution>**

- You cannot measure the oil level accurately when the equipment is on an uneven surface.
- If the machine is placed on an uneven surface, it is still possible for the engine to run, however, the oil sensor may not detect accurately the true level of oil and this may cause engine failure.



**■ Engine Oil Selection**

Use the engine oil with the correct viscosity, based on the ambient temperature (Refer to the chart below).

**<Caution>**

- Use oil of Class SE or superior.
- Check the remaining oil level more frequently when using a multi-grade type oil, as the oil consumption rate increases under high ambient temperature.

Oil Selection Criteria

Single Grade	10W					
	20W					
	#20					
	#30					
	#40					
Multi Grade	10W-30					
Ambient Temperature	-10 14	0 32	10 50	20 68	30 86	40 °C 104

## (2) Checking Fuel



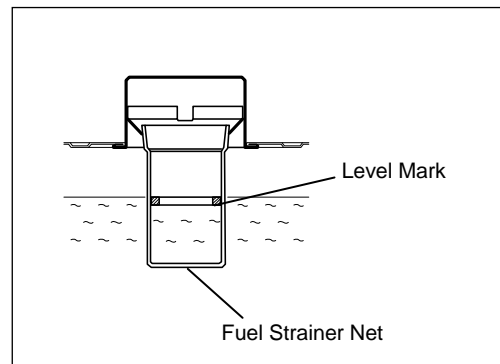
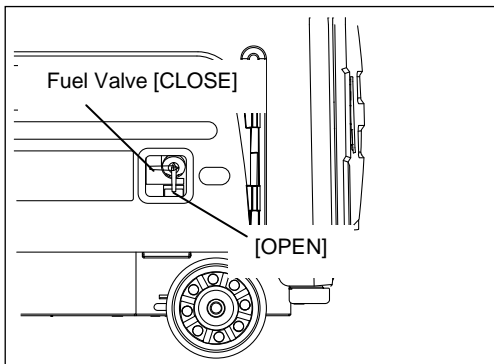
### Warning: Fire

- When checking and refueling fuel, always stop the engine, remove static electricity.
- Never fill fuel above the upper level.
- Always wipe away any drips of fuel.

Check the fuel valve and add fuel if necessary.

### <Caution>

- Replace the fuel when the equipment has not been used for 2 months or more.
- Use unleaded petrol only.
- Keep or turn the fuel valve to [CLOSE] position beforehand when filling with fuel. Be sure to use the fuel filter net when filling with fuel.
- Never fill fuel above the upper level.
- Never smoke whilst refueling.



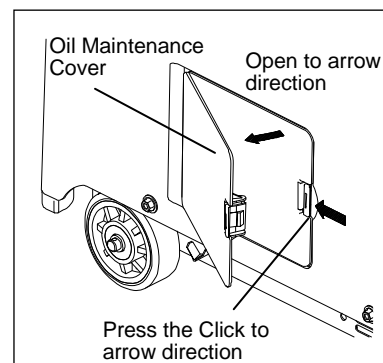
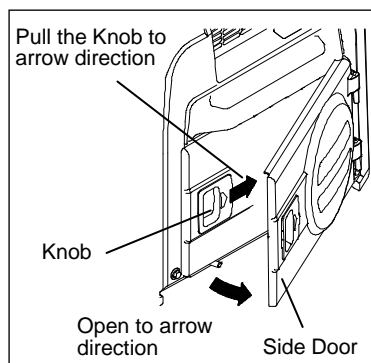
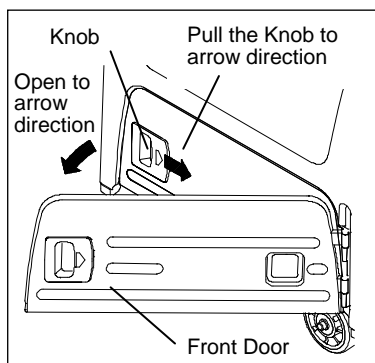
## (3) Checking Fuel or Oil Leakage



### Warning: Fire

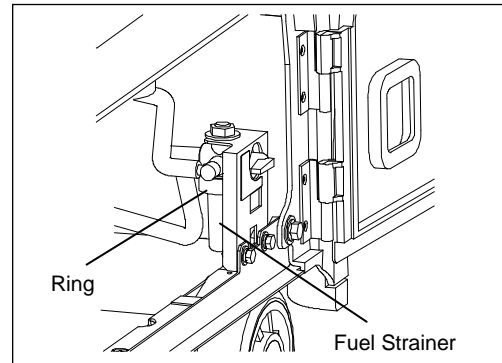
- When checking oil leakage, stop the engine, remove static electricity.
- Do not use the equipment if a leak is found. Repair the equipment before use.

Open the front door, side door and oil maintenance cover to check for any fuel leaks or oil leaks at the hose connection. When checking for any fuel leaks, OPEN the fuel valve. Be sure to CLOSE the fuel valve after checking.



**<Caution>**

- Tighten the ring more in order to prevent fuel leakage from the Fuel Strainer.



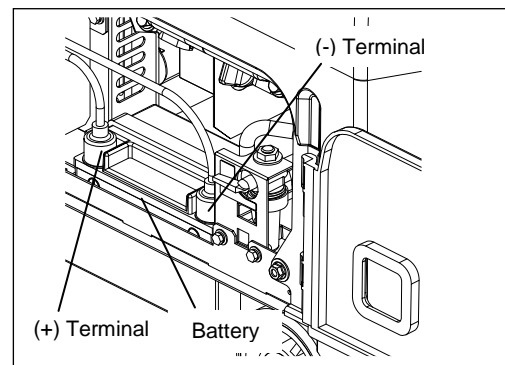
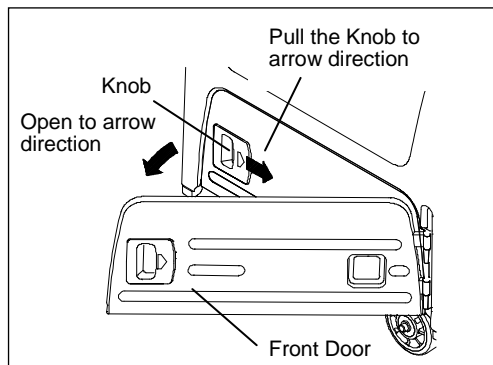
**(4) Checking Battery Terminal Tightening**



**Warning: Explosion**

- The battery may emit some combustible gas. Keep it away from fire and sparks.
- A loose battery terminal can be a cause of sparks.

Open the front door to check battery terminal tightening. When checking for the looseness of battery terminal, retightening the battery terminal.



**<Caution>**

- Only use the following battery.  
Yuasa YTX9-BS
- It is unnecessary to check the fluid level and refill the distilled water, as this equipment is installed with a 12 V sealed battery only.

## 6-2. Starting

### **Warning: Suffocation from exhaust fume**

- Exhaust fumes from the engine contain many elements harmful to humans. Do not operate this equipment in poorly ventilated areas, such as inside a room or in a tunnel.

### **Warning: Fire**

- Temperatures around the muffler and exhaust can reach extremely high levels. Keep flammable items (such as fuel, gas, paint, etc.) away from the equipment.
- Always operate the equipment on flat a surface and, with at least 1 metre clearance from any objects.
- Never operate the equipment covers with the flammable products.
- Do not operate the equipment when it is stored in a vehicle.

### **Caution: Suffocation from exhaust fumes**

- Do not point the exhaust fume toward pedestrians or building.

### **Caution: Injuries**

- Always place the equipment on a flat and stable surface and fix wheels with brakes, to prevent the equipment moving.
- When starting the engine, turn off any connected equipment and set the AC output switch to [OFF] position.

Total operation hours will be indicated for 5 seconds only, after the engine has started.

Then the display will automatically change to pre-set welding current.

(The pre-set welding current lamp turns on.)

#### <Caution>

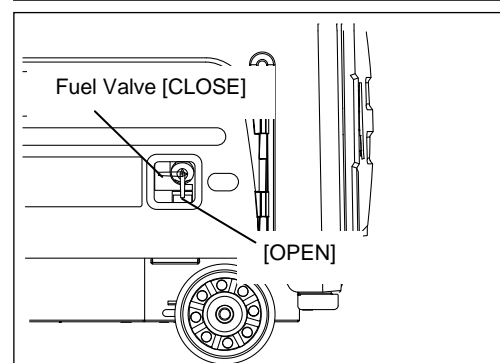
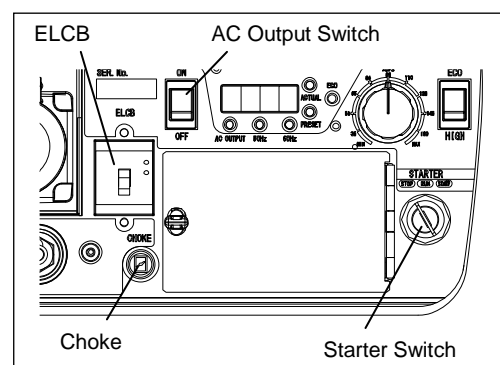
- Before starting the engine, be sure the safety of surroundings.
- Please avoid operating in places with high temperatures, high humidity and lots of dust as much as possible.
- Close all equipment doors during operation of this equipment, to avoid malfunction by losing balance of the cooling capability.

#### (1) Starting by Starter Motor

1. Switch the AC output switch to [OFF] position.
2. Open the front door and turn the fuel valve to [OPEN] position.
3. Pull out the choke.
4. Turn the starter switch to [START] position.  
The starter motor turns and then the engine starts.

#### <Caution>

- Do not keep the starter motor ON for more than 5 seconds.
  - When restarting, wait for 30 seconds or more
5. When the engine starts, release the starter key immediately.



**<Caution>**

- Never turn the starter switch to [START] position once the engine is running.

6. Push back the choke.

**<Caution>**

- Just after starting, the engine may stop if the choke is prematurely pushed back in. In this case, push back the choke slowly once the engine is warm.

7. Keep engine idling for approximately 5 minutes.

**(2) Starting by Recoil Starter**

1. Switch the AC output switch to [OFF] position.
2. Turn the fuel valve to [OPEN] position.
3. Pull out the choke.
4. Turn the starter switch to [RUN] position.
5. Open the side door.
6. Pull the recoil knob slowly to the compression point, then allow the recoil knob to return and pull it again to start.

**<Caution>**

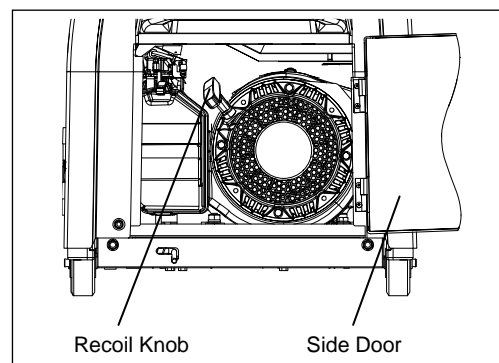
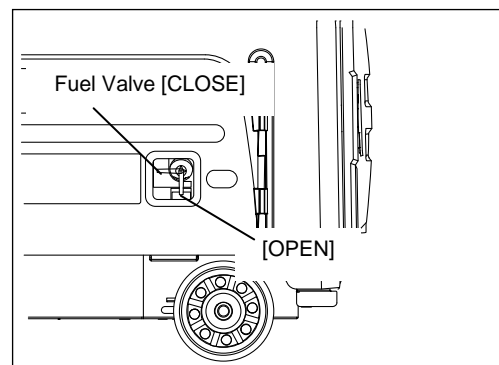
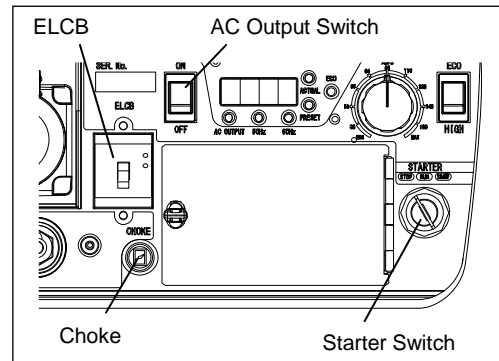
- Do not fully extend the recoil knob.

7. After the engine starts, push back the choke.

**<Caution>**

- Just after starting, the engine may stop if the choke is prematurely pushed back in. Therefore, push back the choke slowly along the engine condition and keep the choke back always when the engine is warm.

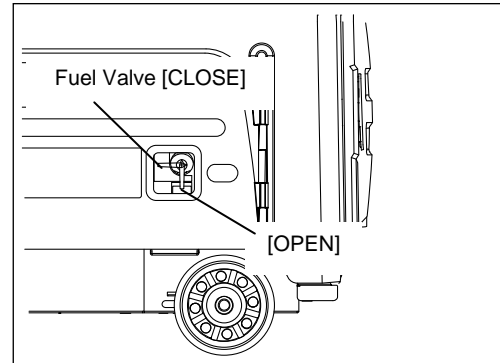
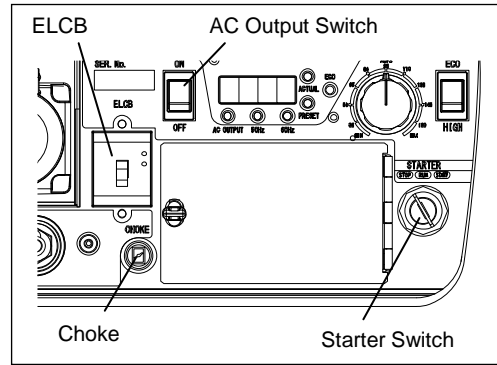
8. Keep engine idling for approximately 5 minutes.





### 6-3. Stopping

1. Switch the AC output switch to [OFF] position.
2. Turn the idle control switch to [ECO] position.
3. Keep the engine idling for approximately 3 minutes to cool.
4. Turn the starter switch to [STOP] position.
5. After the engine stops, turn the fuel valve to [CLOSE] position.



## 7. Welding Operation

### 7-1. Selection–Welding Cable

Ensure adequate lighting is available. If ambient light is insufficient, use additional lights. Select the cable, based on the allowable amperage and distance as per the table shown below.

The welding capacity is reduced if too small a gauge cable is used.

#### <Caution>

- Welding cables should be used uncoiled.

When the welding cables are used coiled, welding capacity is reduced.

		Correct Size of Cable					(Unit: mm <sup>2</sup> )
Return Length	Welding Current	20 m	30 m	40 m	60 m	80 m	100 m
	165 A	22	22	30	50	60	80
	145 A	22	22	22	38	50	60
	100 A or below	22	22	22	22	30	38

### 7-2. Polarity

There are two welding output terminals, [+] and [-].

Select the polarity according to the operation, referring to the table below.

#### <Caution>

- Follow the instructions of the welding rods, the polarity will be specified.

	Application	Connection
Normal Polarity	Generals Welding, such as construction	[-] Minus to holder (Rod) [+] Plus to the Earth (Material)
Reverse Polarity	Thin plate, Build-up Welding, Stainless Steel	[-] Minus to the Earth (material) [+] Plus to holder (Rod)

### 7-3. Connection–Welding Cable



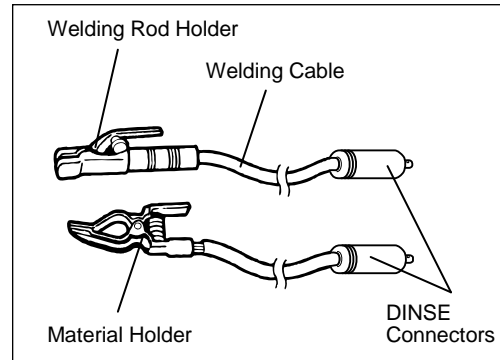
#### **Warning: Electric Shock**

- Always examine welding cables, power cables and plugs etc., to ensure there are no defects present, prior to operation.
- Before connecting or disconnecting a welding cable from welding output terminals, stop the engine, and remove the starter key. A person performing this task must always keep the key.
- Do not connect a welding cable to AC output terminal.

1. Stop the engine.
2. Connect the welding cables to the DINSE connectors, a welding rod holder and a material holder.
3. Connect the welding cables to the welding output terminals.

#### **<Caution>**

- Always fit the correct size DINSE connectors. ( Recommended parts: DIX SK 35 or DIX SK 50 or DIX SK 70)
- Ensure the DINSE connectors and welding cables connections are made correctly.
- Be sure to connect the DINSE connectors and welding cables securely to welding output terminals. Welding output terminals may burn due to the heat caused by a poor connection.
- Do not use a cable without the DINSE connectors. Personal injury or damage to the machine may result as a consequence.



### 7-4. Duty Cycle

Duty cycle means the welding time ratio for 10 minutes. The duty cycle of the equipment is 50%, namely, the welding time is 5 minutes or less for each continuous 10 minutes of welding time. Be sure to take 5 minutes break after each 5 minutes of continuous welding time.

#### **<Caution>**

- The equipment may become damaged due to overheating, if continuous welding periods exceed 5 minutes or if break period is reduced.

## 7-5. Welding

### **Warning: Electromagnetic Interference**

- Persons using a heart pacemaker are not allowed near the Generator work area while the Generator is in operation without the permission of a doctor. The welder generates a magnetic field while energized that can negatively affect pacemaker operation.
- This product may cause interference if used in residential areas.
- Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

### **Warning: Suffocation from welding fumes**

- Be sure to wear a fume proof mask during operation, as welding fumes contain poisonous gases and dust. Pay attention to the airflow direction and ensure sufficient ventilation in order to prevent inhalation of the fumes.

### **Warning: Fire**

- Keep any flammable items and combustible materials away from the welding area as welding creates hot sparks.
- Always set up extinguishers near the welding area.

### **Warning: Explosion**

- Do not use this equipment for the purpose of thawing pipes.

### **Caution: Injuries to eyes and skin**

- Be sure to wear spark protection glasses, long-sleeve shirts, gloves, etc. in order to protect eyes and skin from harmful sparks during welding. (Refer to the table below.)

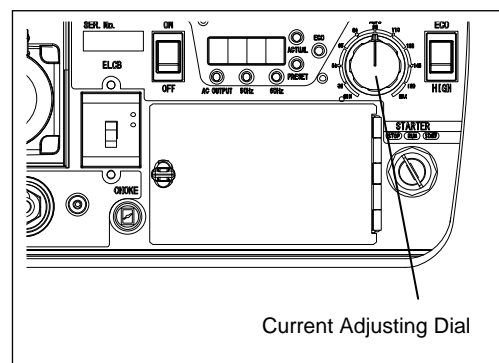
Light Shielding Standard Glass

Light Shielding Degree No.	7	8	9	10	11	12	13
Welding Current (A)	30-75		76-200			201-400	

### **Caution: Burns**

- Be sure to wear leather gloves, apron, shoe covers, eye protection glasses/mask, safety shoes, safety cap and long sleeve shirts, to protect from sparks.

1. Start the engine.
2. Adjust the current using current adjusting dial.  
Be sure to check the preset welding mode lamp turns on. Rotate the current dial to the desired preset welding current as indicated on the display.
3. After striking welding arcs, the display indicates actual welding current and the actual welding lamp illuminates.



## 8. Generator Operation



### **Warning: Electric Shock**

- Do not operate the equipment, if the equipment or you are wet.



### **Caution: Injuries**

- Attach a plug to the receptacle of the equipment, after confirming the breaker is in the [OFF] position.
- Be sure to use the frequency designated in the load.
- Ensure the AC Output Switch is in the [OFF] position before connecting any plugs to the AC Output Receptacle.
- Always examine welding cables, power cables and plugs etc., to ensure there are no defects present, prior to operation.
- Do not connect the equipment to any power supply network.
- Extra precautions must be taken whenever performing more hazardous welding operations such as:
  - environments with increased risk of electric shock, for example due to humidity or conductivity;
  - flammable surroundings and/or atmospheres;
  - flammable products;
  - closed containers;
  - elevated working positions or platforms.

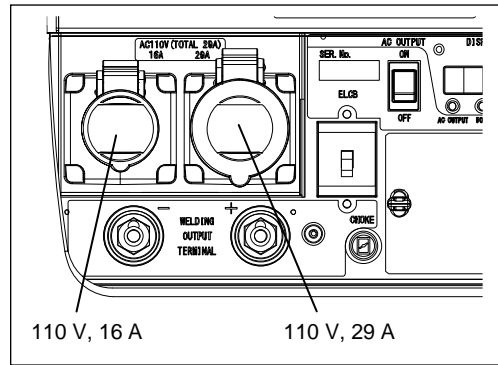


### **Caution: Damage to the equipment or other properties**

- Consult with our dealer or authorized distributor when utilizing this equipment around devices with the microcomputer control or the ultra-precision items, which are very sensitive to voltage fluctuation.
- Keep the equipment away from those devices to avoid influence from electromagnetic noise.
- Consult with hospital or medical equipment companies before using this equipment on medical apparatus.
- It is recommended you follow this instruction manual strictly, to avoid any unnecessary accidents, repairs and damage.
- In the event of using the equipment to provide power for computers, microcomputers incorporated loads and precision equipment, there is a possibility for them to mal-function.
- Be sure to use the frequency designated in the load. Otherwise the load may become damaged.
- Consult with our dealer or an authorized distributor when utilizing this equipment on devices with microcomputer control or ultra-precision items, which are very sensitive to voltage fluctuation.
- EMC classification Group 2 Class A.
- Do not use this equipment for the purpose of thawing pipes.
- If utilizing this equipment in conditions where altitude, ambient temperature and/or humidity is higher than the reference conditions, a reduction in power may be necessary.

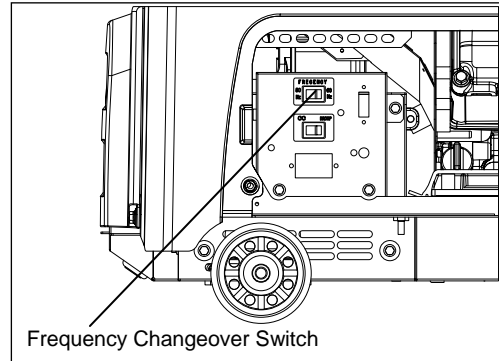
**<Caution>**

- Single phase AC output from the 29 and 16 amp sockets are as follows.  
110 V, 16 A  
110 V, 29 A
- Total current should be limited to within the rated current specification.
- The rated current for this equipment :  
29 A/50 Hz (29 A/60 Hz)



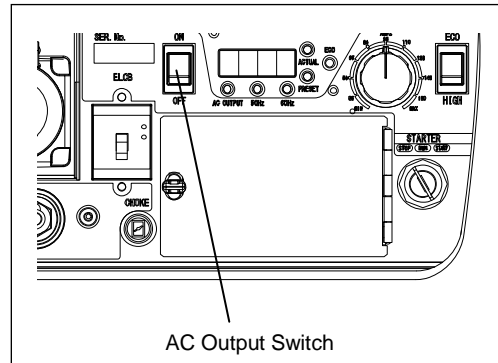
**8-1. Operation**

1. Set the frequency.  
50 Hz: Turn the frequency changeover switch to [50 Hz].  
60 Hz: Turn the frequency changeover switch to [60 Hz].



2. Start the engine.
3. Turn the AC Output Switch to [ON] position.
4. Turn the ELCB to [ON] position.

By the above procedures, the equipment generates 110 V output from receptacles.



**8-2. Output Limitation**

Please refer to the following table. Electric tools and home appliances cannot be judged only by the rated output or the power consumption due to the efficiency and character of the components.

Applicable Load (For reference only)

Load	Capacity (Watt)
Electric Bulb, Heater, etc.	3200
Electric Tools (Series Motor), etc.	1500
Mercury Bulb (High Power Factor Type)	1200
Submersible Pump, Compressor, etc. (Induction Motor)	1200

**<Caution>**

- Be sure to use the frequency designated in the load incorporated in mercury bulb or induction motor.
- The load incorporated in a motor may require greater power than the rated power consumption. Therefore, consult with our authorized distributor or our dealer to clarify.
- When connecting 2 sets or more, start the load one by one, do not start them simultaneously.
- When switching a Mercury bulb on again, wait for 15 minutes (approximately) until it cools down.

## 9. Checking and Maintenance



### Warning: Electric Shock/Injuries

- Before performing any equipment check or maintenance, stop the engine and remove the starter key. The person performing the maintenance must always keep the key.



### Warning: Fire

- Never operate the equipment close to naked flames.



### Caution: Burns

- When checking the equipment, always stop the engine and wait until the engine cools down.

To optimize the use of this equipment, we recommend periodical checks and maintenance as per the following maintenance matrix.

#### <Caution>

- Only authorized technicians should perform all checking and maintenance work, except for the pre-startup checks. Contact a dealer when a guard fixed by bolts (the enclosure) needs to be removed.
- Request for the maintenance items with ● mark to the authorized distributor or our dealer.
- Always use the genuine part.
- When draining waste fluid from the equipment, catch it in a tray.
- When disposing of oil, fuel, fuel filter, battery and /or other harmful materials, please follow international regulations.
- When disposing of parts containing liquids (capacitors and batteries), handle the waste parts thereof carefully so that they do not leak due to cracking.
- Please do not dispose of harmful items or waste fluid into the ground or any water source.

No.	Checking Item	Startup	Every 50 hrs	Every 100 hrs	Every 300 hrs	Every 500 hrs	Other
1	Check/Supply Engine Oil (P. 13)	○					
2	Check Leakage Fuel/Engine Oil (P. 15)	○					
3	Check Battery Terminal Tightening (P. 16)	○					
4	Recharge/Replace Battery (P. 27)						*
5	Change Engine Oil (P. 25)			○ (1st 20 hrs)			
6	Clean/Adjust Spark Plug (P. 25)		○				
7	Clean/Change Air Cleaner (P. 26)		○ (Clean)				** (Change)
8	Clean Fuel Strainer (P. 26)			○			
9	Clean Exhaust Wire Mesh (P. 27)					○	
10	Check/Adjust Engine Valve Clearance				●		
11	Decarbonize Cylinder Head				●		
12	Check/Change Breather Hose				●		
13	Clean Fuel Tank/Fuel Strainer/Carburetor					●	
14	Change Fuel Hose						● Every 4 yrs
15	Change Vibration-Absorbing Rubber						● Every 4 yrs

\* Refer to (6) Checking the Battery (P. 27) below.

\*\* Refer to (3) Clean and Change Air Cleaner (P. 26) below.

## (1) Change Engine Oil

First Time	20 hours mark
2nd or after	Every 100 hours

1. Open the oil maintenance cover.
2. Put the oil saucer under the oil drain outlet.
3. Remove the oil gauge.
4. Loosen the oil drain plug and allow the oil drain fully.
5. Reinstall the oil drain plug.
6. Checking the oil level by the oil gauge, add oil into the oil fill up to the max level.  
(Approximately 1.0 Liter)

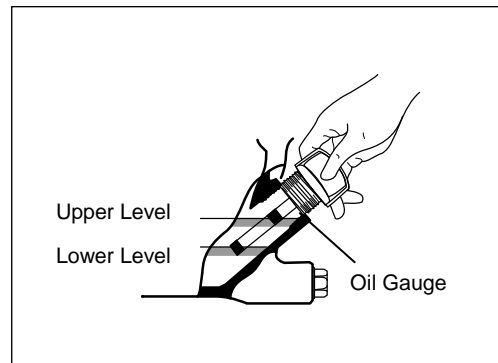
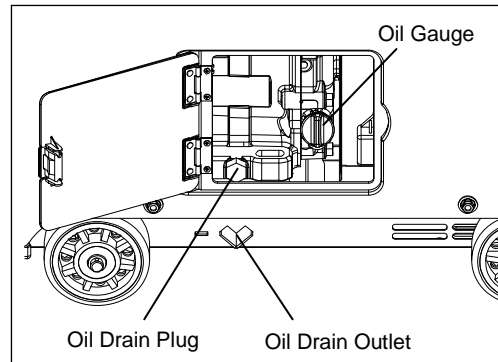
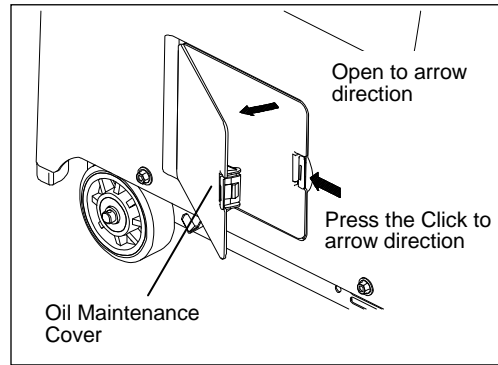
### <Caution>

- Refer to 6-1. (1) Checking Engine Oil (P. 13) to select engine oil.

7. Reinstall the oil gauge hand tight.

### <Caution>

- Keep the engine idling for a while to be sure no oil leakage from the oil drain outlet after changing oil.



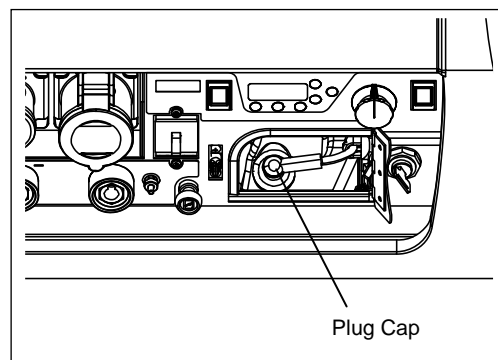
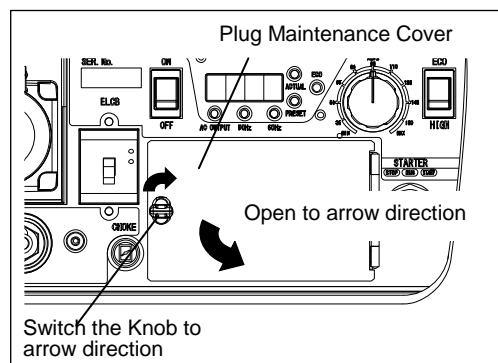
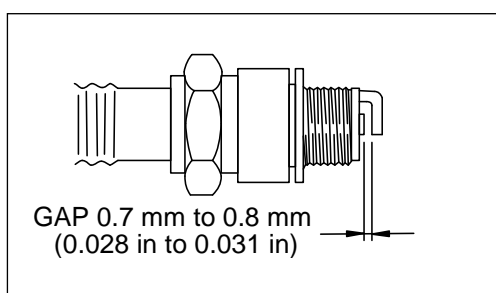
## (2) Clean/Adjust Spark Plug

Clean/Adjust	Every 50 hours
--------------	----------------

1. Open the plug maintenance cover.
2. Remove the plug cap and remove the spark plug.
3. If the spark plug is dirty, wipe out the dirt by using spark plug cleaner or wire brush.
4. Adjust the opening to 0.7-0.8 mm between the electrodes.
5. Tighten the spark plug and reassemble the plug cap.

### <Caution>

- Tightening torque of the plug: 20 N·m
- Use the plug of [NGK BPR4ES].



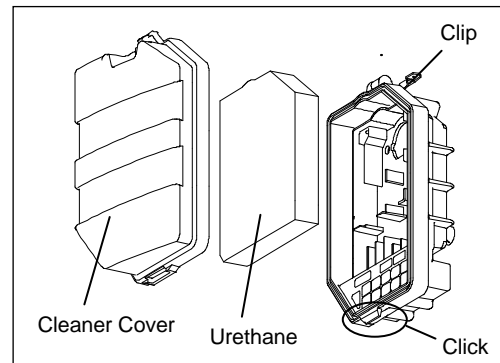
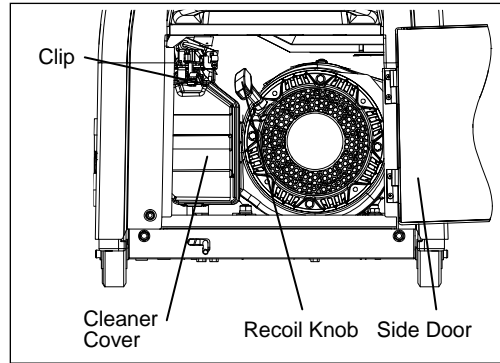
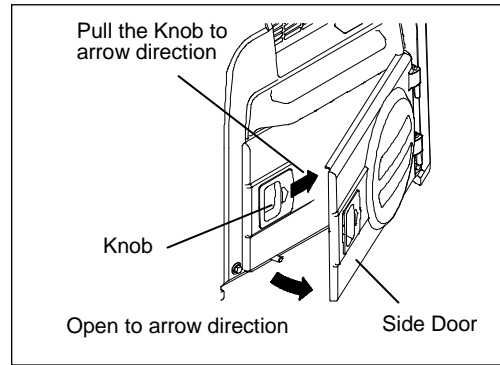
### (3) Clean and Change Air Cleaner

Clean	Every 50 hours
-------	----------------

#### <Caution>

- Clean more frequently, if used in dusty environment.
- Change the urethane part if the urethane part deteriorated with time.
- Use the urethane part of [Yamaha P/No. 7CT-E4451-00].

1. Open the side door.
2. Unclip the clip.
3. Remove the air cleaner cover.
4. Remove the urethane part.
5. Clean the urethane part in kerosene, then dip it into a liquid mix of 3 parts kerosene: 1 part engine oil and squeeze it tight.
6. Reassemble it in reverse order.



### (4) Clean Fuel Strainer



#### Warning: Fire

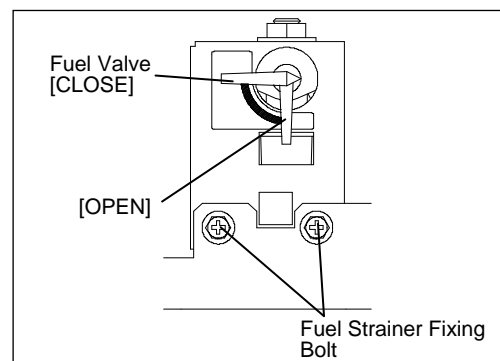
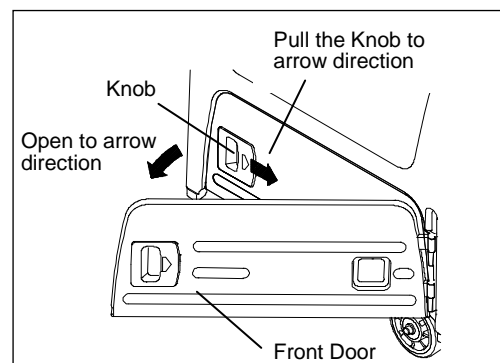
- When cleaning the fuel strainers, always stop the engine, remove static electricity.

Clean	Every 100 hours
-------	-----------------

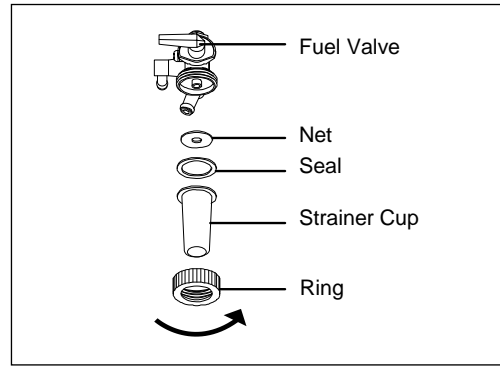
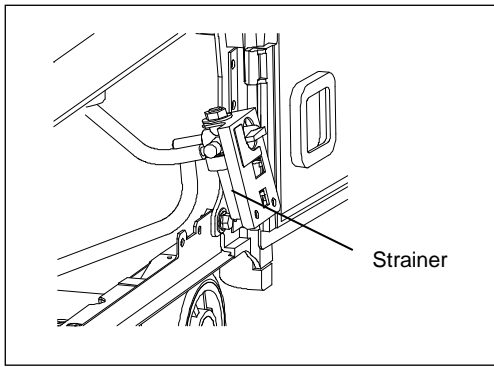
1. Open the front door.
2. Turn the fuel valve to [Close] position.
3. Unscrew the bolts.
4. Pull out the fuel valve.
5. Remove the strainer cup by turning the ring counter-clockwise.
6. Discard any dust or water inside the strainer cup, and clean away dust from the net.
7. Reassemble be sure to screw tightly to prevent leaks.

#### <Caution>

- Be sure to remove any contaminants on the seal, whenever reassembling the strainer cup.
- Turn the fuel valve to [OPEN] position after assembling, and check for any leaks.



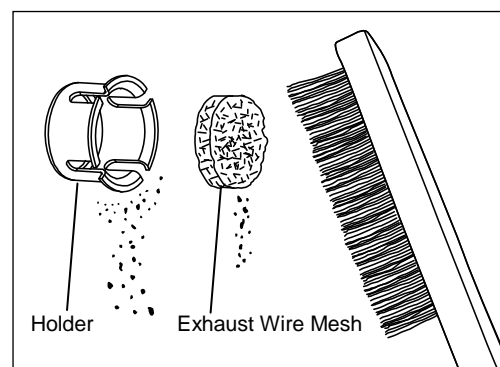
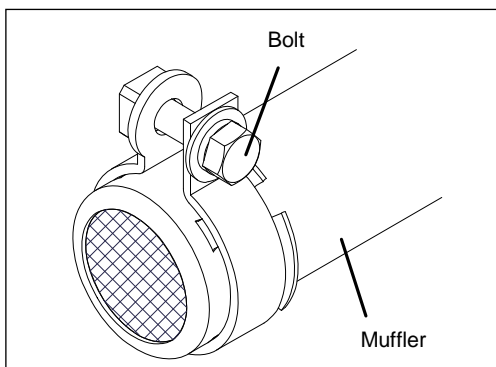




(5) Clean Exhaust Wire Mesh

Clean	Every 500 hours
-------	-----------------

1. Loosen the bolt and remove the exhaust wire mesh and holder.
2. Clean off the carbon deposits from the exhaust's wire mesh using a wire brush.
3. Reassemble it in reverse order.



(6) Checking the Battery

**Warning: Explosion**

- The battery may emit some combustible gas. Keep it away from fire and sparks.
- A loose battery terminal can be a cause of sparks.

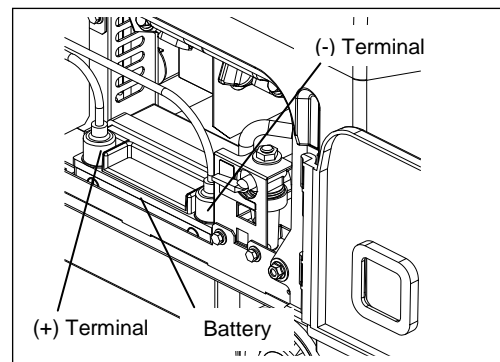
**Caution: Injuries to eyes and skin**

- The battery used in the equipment is the sealed type 12 V. Therefore, it is not necessary to check the liquid level or replenish water. Do not remove the sealed plug.
- Battery fluid contains diluted sulphuric acid. Avoid contact with eyes, skin and clothing. If the acid comes into contact with eyes, flush with lots of water, and seek medical attention immediately.

1. Open the front door.
2. Make sure that the battery cables are firmly secured to the posts. Tighten the clamps if necessary.

**<Caution>**

- Check and measure the voltage between terminals. If it is lower than 12.8 V, recharge is necessary.



### ■ Replacing the battery

1. Remove the clamp and the cable from the negative (-) post on the battery. (Always remove negative side first.)
2. Remove the clamp and cable from the positive (+) post on the battery. (Never touch the battery fixing plate to the terminals)
3. Remove the battery fixing plate from the battery. (Never touch the battery fixing plate to the terminal)
4. Pull out the battery. (Never touch the terminals to the equipment body)  
Reinstall a new battery in reverse order. (Always attach the cable to the positive (+) post on a battery first.)

#### <Caution>

- Only use the following battery.  
Yuasa YTX9-BS

## 10. Long-term Storage



#### **Warning: Electric Shock/Injuries**

- Before performing any equipment check or maintenance, stop the engine, and remove the starter key. The person performing the maintenance must always keep the key.



#### **Warning: Fire**

- When checking engine, always stop the engine and keep far away from fire.
- When refueling fuel and cleaning the fuel strainers, always stop the engine, remove static electricity.



#### **Caution: Burns**

- Temperatures around the muffler and exhaust can get extremely high. Wait until the engine cools down, before performing any checks.



#### **Caution: Fire**

- Always wait until the equipment cools down, before covering for storage.

#### <Caution>

- Leaving petrol inside the carburetor for a long term can cause a starting failure or irregular engine speed.
- When disposing of oil, fuel, fuel filter, battery and /or other harmful materials, please follow international regulations.
- When disposing of parts containing liquids (capacitors and batteries), handle the waste parts thereof carefully so that they do not leak due to cracking.

If the equipment is not to be used for more than 2 months, perform the following maintenance and storage procedures.

1. Turn the fuel valve to [CLOSE] position. Unscrew the bolts. Pull out the fuel valve.  
(Refer to 9. Checking and Maintenance (4) Clean Fuel Strainer (P. 26))
2. Loosen the ring and remove the strainer cup.
3. Turn the fuel valve to [OPEN] position, drain all the fuel in the fuel tank.

4. Turn the fuel valve to [CLOSE] position and re-fit the strainer cup tight with the ring.

**<Caution>**

- Be sure to check for any contaminants on the seal, whenever reinstalling the strainer cup.

5. Re-fit the fuel valve with the bolts.

6. Pulling out the plug of the load from the receptacle, start the engine and leave running until it stops. (The fuel in the carburetor is consumed)

7. Turn the starter switch to [STOP] position, and remove the starter key.

8. Change the engine oil.

(Refer to 9. Checking and Maintenance (1) Change Engine Oil (P. 25))

9. Remove the spark plug and inject engine oil approximately 5 ml.

(Refer to 9. Checking and Maintenance (2) Clean and Adjust Spark Plug (P. 25))

10. Insert the starter key again, use the starter switch to crank the engine for approximately 5 seconds.

11. Turn the starter switch to [STOP] position, and remove the starter key.

12. Re-fit the spark plug and ensure it is tight.

13. Clean the air cleaner.

(Refer to 9. Checking and Maintenance (3) Clean and Change Air Cleaner (P. 26))

14. Remove the battery.

(Refer to 9. Checking and Maintenance (6) Checking the Battery (P. 27))

(Always remove negative (-) side first and always reinstall positive (+) side first.)

**<Caution>**

- Store the battery in a well ventilated area, keeping it away from risk of naked flames.
- Recharge the battery once a month.

15. Clean all the parts, cover and store it in a clean and dry place.

## 11. Troubleshooting



**Warning: Electric Shock**

- Do not operate the equipment, if the equipment or you are wet.
- Before performing troubleshooting, stop the engine and remove the starter key. The person performing troubleshooting trouble must always keep the key.



**Warning: Injuries**

- Before performing troubleshooting, stop the engine and remove the starter key. The person performing troubleshooting trouble must always keep the key.



**Warning: Fire/Burns**

- When checking engine, always stop the engine, and keep away from fire.
- When cleaning the fuel strainers, always stop the engine, remove static electricity.



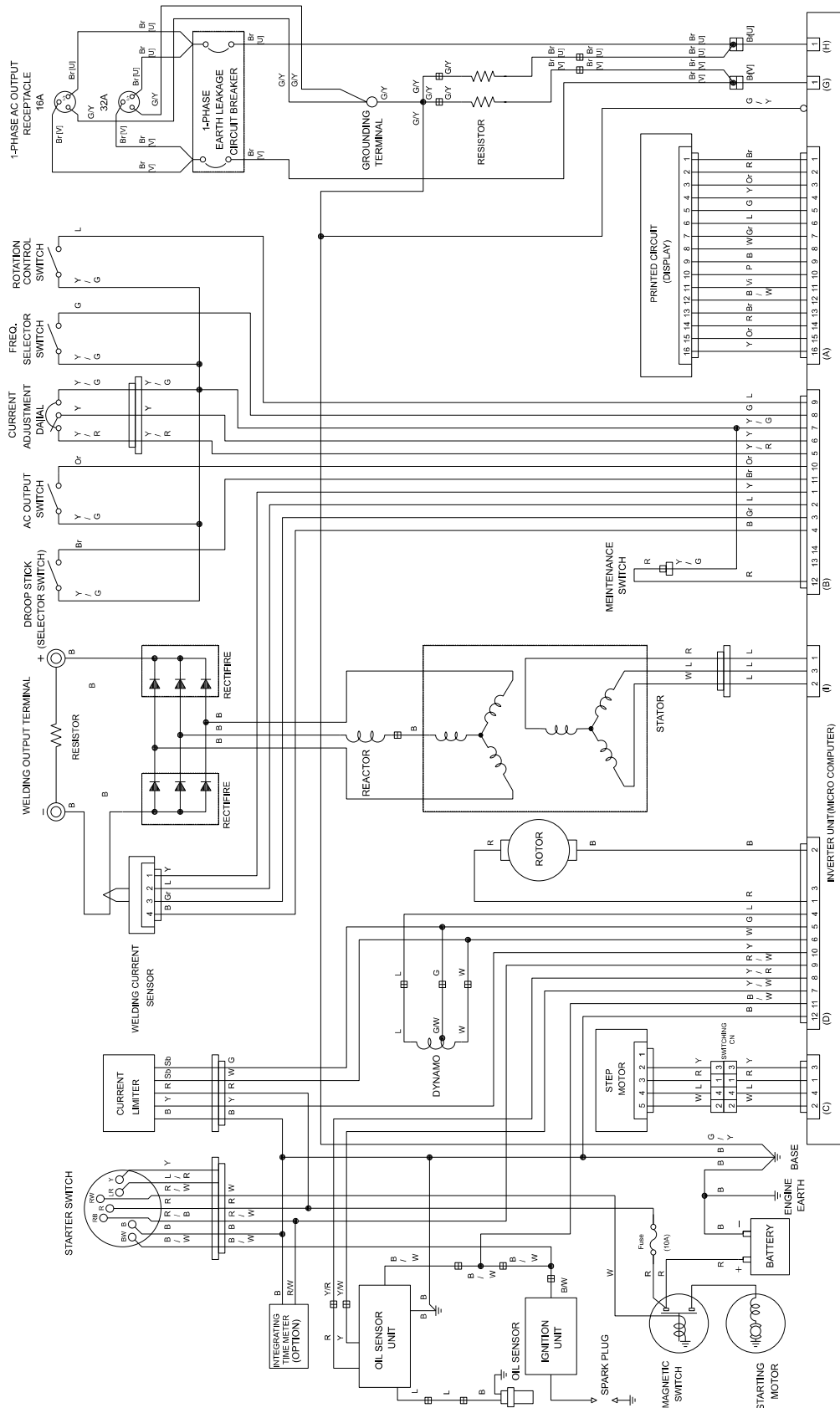
**Caution: Burns**

- Temperatures around muffler and exhaust can get extremely high. Wait until the engine cools down, before performing any checks.

Follow the guidelines below, when performing any troubleshooting. If you cannot resolve the problems by this method, contact our authorized distributor or our dealer to request the repair.

Symptoms	Presumed Cause	Corrective Actions
Starter motor does not start	<ol style="list-style-type: none"> <li>1. Weak Battery</li> <li>2. Dead Battery</li> </ol>	<ol style="list-style-type: none"> <li>1. Recharge Battery</li> <li>2. Replace Battery</li> </ol>
Engine does not start	<ol style="list-style-type: none"> <li>1. Fuel Valve [CLOSE] position</li> <li>2. Insufficient fuel</li> <li>3. Fuel is contaminated by the water or dust</li> </ol>	<ol style="list-style-type: none"> <li>1. Fuel Valve [OPEN] position</li> <li>2. Replenish fuel</li> <li>3. Drain water or clean fuel tank, fuel strainer</li> </ol>
Engine starts, but stalls immediately	<ol style="list-style-type: none"> <li>1. Oil sensor activated</li> </ol>	<ol style="list-style-type: none"> <li>1. Replenish oil</li> </ol>
Engine does not stop	<ol style="list-style-type: none"> <li>1. Malfunction of Starter Switch</li> </ol>	<ol style="list-style-type: none"> <li>1. Stop the engine by turning Fuel Valve [CLOSE] position, replace Starter Switch.</li> </ol>
Welding arc is weak	<ol style="list-style-type: none"> <li>1. Wrong setting of current adjustment dial</li> <li>2. Poor contacts of cables</li> <li>3. Improper cable diameter</li> <li>4. Improper connection to the base material</li> <li>5. Engine output is down</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn the dial CLOCKWISE</li> <li>2. Contact cables securely</li> <li>3. Change cables according to [Selection–Welding Cable]</li> <li>4. Contact securely</li> <li>5. Keep 50% duty cycle and/or repair the engine</li> </ol>
Excessive welding arc	<ol style="list-style-type: none"> <li>1. The wrong setting of current adjustment dial</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn the dial COUNTER-CLOCKWISE</li> </ol>
No AC 110 V output	<ol style="list-style-type: none"> <li>1. The AC output switch position is [OFF]</li> <li>2. The ELCB position is [OFF]</li> <li>3. Display indicates [OC] or [OH]</li> </ol>	<ol style="list-style-type: none"> <li>1. Select the AC output switch to [ON] position</li> <li>2. Select the ELCB to [ON] position</li> <li>3. Stop and then restart the engine</li> </ol>
AC 110 V output is weak	<ol style="list-style-type: none"> <li>1. Wrong frequency</li> <li>2. The current in the load exceeds the rated current</li> </ol>	<ol style="list-style-type: none"> <li>1. Change the frequency to the correct one</li> <li>2. Refer to the table of Output Limitation</li> </ol>
Unable to activate [Eco]Mode	<ol style="list-style-type: none"> <li>1. The Idle Control switch position is [HIGH]</li> </ol>	<ol style="list-style-type: none"> <li>1. Select the Idle Control switch to [ECO] position</li> </ol>

# 12. Wiring Diagram



WIRE COLORS

COLOR	CODE	COLOR	CODE
Black	B	Blue	L
White	W	Light Green	Lg
Red	R	Orange	Or
Green	G	Violet	Vi
Yellow	Y	Grey	Gr
Brown	Br	Pink	P

STARTER SWITCH CONNECTION

	Y	LR	BW	B	R	RB	RW
STOP	○	○	○	○	○	○	○
RUN							
START	○	○	○	○	○	○	○





# **YAMABIKO CORPORATION**

**1-7-2 SUEHIROCHO, OHME, TOKYO 198-8760, JAPAN**

**PHONE: 81-428-32-6118. FAX: 81-428-32-6145.**

# **shindaiwa<sup>®</sup>**