HIRAYAMA

AUTOCLAVE

HICLAVE

HRG-112, HRG-140

USER INSPECTION PROCEDURE

株式会社 平山製作所

HIRAYAMA

NO.S11G-005-A

AUTOCLAVE

HICLAVE

HRG-112, HRG-140

USER INSPECTION PROCEDURE

IMPORTANT

- **Read this manual carefully and follow the instructions to use the equipment correctly.**

Issued on May 18, 2011

HIRAYAMA

Introduction

●This user inspection procedure describes method and action of the periodical voluntary inspection which shall be performed by a user once for every period not exceeding one year. Users are requested to inspect the equipment carefully by following this procedure strictly and to record in detail about the date, inspector and any maintenance action taken on a check sheet of this procedure, and retain this sheet for a period of 3 years. It is also recommended for users to perform the periodical inspection about the minimum requirements once a month in accordance with this document in order to use the equipment safely for a long period.

●This user inspection procedure describes the minimal requirements, so, perform all inspections of this manual.

●When an abnormality is discovered during inspection, please contact our authorized distributor in your region.

① No part or all of this manual may be reproduced without our permission.

② The contents of this procedure are subject to change without prior notice.

③ Although we tried hard to make this manual error free, if you find any unclear descriptions, errors or omissions, please contact our authorized distributor in your region.

Read Carefully Before User Inspection

●In this manual, the following signs are applied to items to which great attention should be given:

⚠ WARNING	Precaution indicating an imminent dangerous situation which if not avoided may lead to death or serious injury.
⚠ CAUTION	Precaution indicating a dangerous situation which if not avoided may lead to moderate or slight injury.
ⓘ IMPORTANT	Indicates items that you are strongly advised to obey.

⚠ WARNING

●Never do another work during inspection of the safety valve. When discovery of abnormality was delayed, it might cause an explosion accident.

⚠ CAUTION

●Make sure that the main power switch has been turned off when putting your hands into the chamber.

●Put on heat resistant gloves to prevent burns when operating the ring and the valve rod of the safety valve.

●When inspecting the chamber and the lid, make sure that the autoclave has sufficiently cooled.

ⓘ IMPORTANT

●Never put materials other than the load which is used for user inspection into the chamber when performing an inspection.

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User Inspection Procedure

Basic Inspection Procedure

Prepare tools

Remove the rear panel and the right and left side-panels

Inspect the chamber, lid and lid gasket

Inspect the pipes and valves

Inspect the controller

Inspect the compound gauge

Inspect the safety valve

Inspect the overheating protection device for a heater

Inspect the pressure sensor

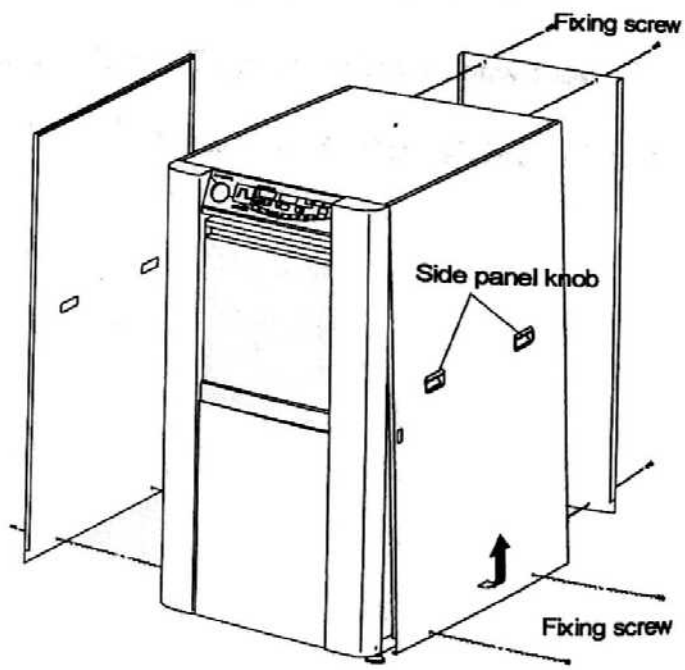
Inspect the Main power switch

Reassemble the rear panel and the right and left side-panels

●Required tools
- Phillips screwdriver for M4 screw
- Heat-resistant glove
- Ball-point pen or equivalents
- Maximum thermometer (which includes the measuring range of 100℃ - 140℃ and has been calibrated)

●Remove the rear panel and the right and left side-panels according to the following procedure.

①**Turn off the main power switch.**
②Remove the fixing screws of the rear panel with a Phillips screw driver and detach the panel.
③Remove the fixing screws for the right and left side-panels with a Phillips screw driver.
④Detach the side panel by lifting the panel up while pulling the lower part of the panel to the front side with the knobs



●Reassemble the rear panel and the right and left side-panels according to the following procedure.

①**Turn off the main power switch.**
②Attach the rear panel and the right and left side-panels to the body.

1. Chamber, Lid and Lid Gasket

●Inspect the chamber and lid for corrosion or damage, and inspect the lid gasket for crack or scratches.

⚠ CAUTION

● When inspecting the chamber and the lid, make sure that the autoclave has sufficiently cooled.

Turn ON the Main Power Switch

▼

Open the sliding door

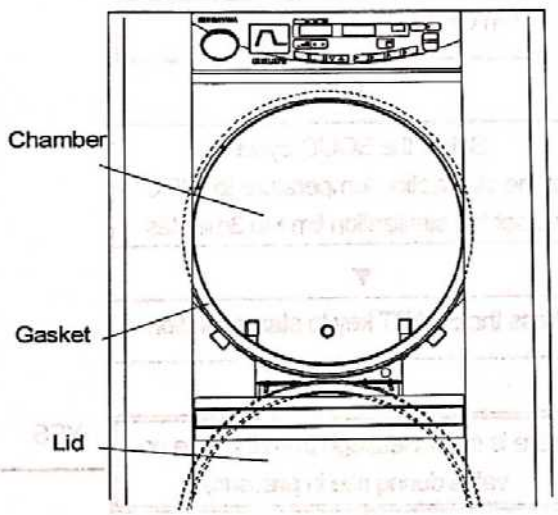
▼

Turn OFF the main power switch

▼

Clean the inside of the chamber (Refer to " 2.Cleaning the chamber " of the Operation Manual)

▼



There is corrosion or a scratch inside of the chamber or the lid.

YES → Polish the corrosion and scratch with a metal polisher.

▼

NO

NO ← Corrosion and scratches cannot be removed.

YES

There is a crack or scratch in the lid gasket

YES → Please contact our authorized distributor in your region

NO

Inspection of the chamber, lid and gasket has been completed

2. Pipes and Valves

●Inspect the pipes and valves for corrosion, damage, or steam leakage.

Turn OFF the Main Power Switch

▼

There is corrosion or damage in the pipe. — YES → Please contact our authorized distributor in your region.

↓ NO

Turn ON the Main Power Switch

▼

Select the SOLID cycle, set the sterilization temperature to 135℃ and set the sterilization time to 3minutes

▼

Press the START key to start operation

▼

There is steam leakage from the pipe or valve during rise in pressure — YES → **Turn OFF the main power switch immediately.**

↓ NO

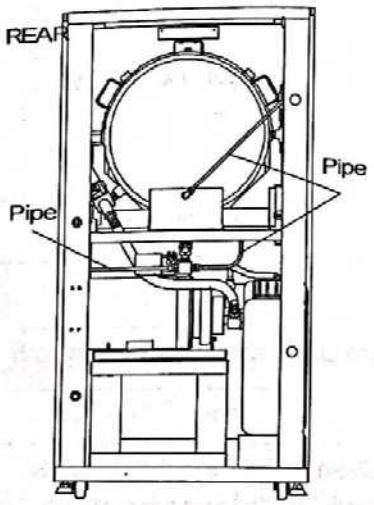
Confirm the completion of operation

▼

Inspection of pipes and valves has been completed

▼

Please contact our authorized distributor in your region.



3. Controller

●Perform operation check of the controller (Switchboard, Control temperature sensor).

IMPORTANT

● Be sure to use the maximum thermometer which has been calibrated.

Turn ON the Main Power Switch

▼

Open the sliding door

▼

Place the maximum thermometer in the center of the sliding tray.

▼

Close the sliding door

▼

Select the SOLID cycle, set the sterilization temperature to 121℃, and set the sterilization time to 20minutes.

▼

Press the START switch to start operation

▼

Take out the maximum thermometer at the end of operation .

▼

The maximum thermometer indicates 121℃-123℃.

NO → Please contact our authorized distributor in your region.

YES ↓

Inspection of the controller (Switchboard, control temperature sensor) has been completed

4. Compound Gauge

●Inspect the compound gauge.

Turn ON the Main Power Switch

▼

Open the sliding door

▼

The compound gauge indicates 0MPa when the door is opened

NO

YES

Close the sliding door

▼

Select the SOLID cycle, set the sterilization temperature to 121℃, and set the sterilization time to 20minutes.

▼

Press the START switch to start operation

▼

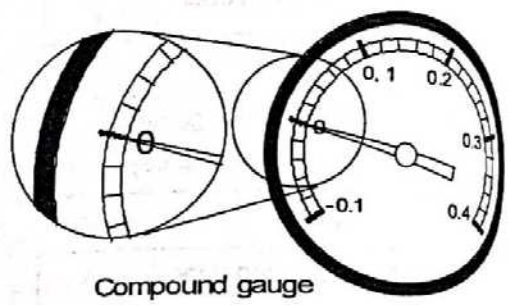
The compound gauge indicates 0.1-0.12MPa during the sterilization stage.

NO

Please contact our authorized distributor in your region.

YES

Inspection of the compound gauge has been completed



Compound gauge

5. Safety Valve

●**Perform operation check of the safety valve and inspect it for steam leakage.**

⚠ WARNING

● **Never do another work during inspection of the safety valve.** When discovery of abnormality was delayed, it might cause an explosion accident

⚠ CAUTION

●Put the heat-resistant gloves on to prevent burns when operating the ring and rod of the safety valve,.

Turn ON the Main Power Switch

▼

Select the LIQ cycle,
set the sterilization temperature to 105℃, and
set the sterilization time to 3 minutes.

▼

Press the START switch to start operation.

▼

Turn OFF the Main Power Switch when
the sterilization timer has begun to operate.

▼

Pull up the rod with the ring of the safety valve

▼

Steam gushes from the discharge port. — NO → Please contact our authorized distributor in your region.

YES

▼

Leave it untouched for 30 minutes to lower
the temperature and pressure

▼

Push down the valve rod.

▼

continued

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▼

Raise the S1-7 DIP switch of the board to the ON side with a ball point pen etc.

▼

Turn ON the Main Power Switch

▼

Select the LIQ cycle,
set the sterilization temperature to 135℃,
and set the sterilization time to 3 minutes.

▼

Press the START switch to start operation.

▼

Steam gushes from the discharge port when the pressure indicated by the compound gauge is less than 0.145MPa

YES → **Turn OFF the Main Power Switch immediately**

NO

↓

Steam gushes from the discharge port when the pressure indicated by the compound gauge is between 0.146MPa and 0.184MPa

NO → **Turn OFF the Main Power Switch immediately**

YES

↓

Turn OFF the main power switch.

▼

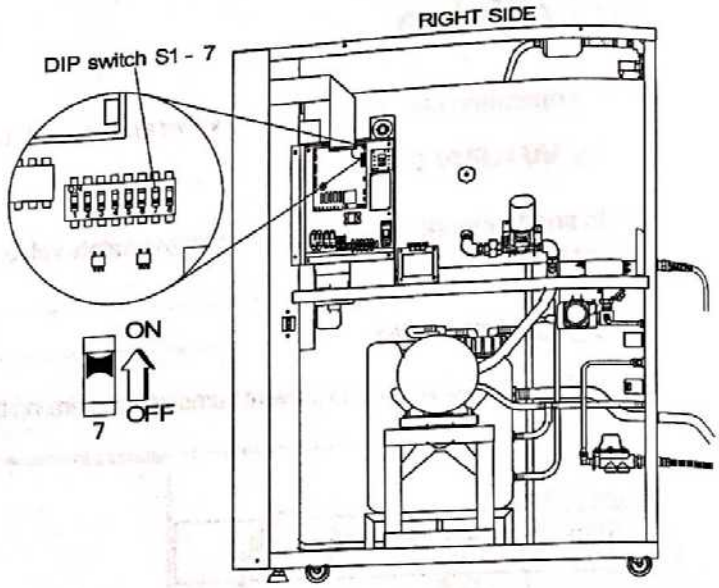
Leave it untouched for one hour to lower the temperature and pressure

▼

Push down the valve rod

▼

continued



- Lower limit of the opening pressure : Exhaust pressure + 0.005Mpa at the highest working temperature
- Upper limit of the opening pressure : Conforming to the Pressurized Vessel Safety Regulations

▼

Please contact our authorized distributor in your region.

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▼

Lower the S1-7 DIP switch of the board to the OFF side with a ball point pen etc.

▼

Turn ON the Main Power Switch

▼

Press the START switch to start operation.

▼

Steam leaks from the discharge port during the sterilization stage.

YES → **Turn OFF the Main Power Switch immediately.**

▼

Please contact our authorized distributor in your region.

NO

▼

Turn OFF the Main Power Switch.

▼

Inspection of the safety valve has been completed

6. Overheating Protection Device for a Heater

●Perform operation check of the overheating protection device for a heater.

Turn OFF the Main Power Switch.

▼

Set the overheating protection device to140℃.

▼

Turn ON the Main Power Switch.

▼

Select the ADD DRY cycle, and set the drying time to 10minutes

▼

Press the START switch to start operation

▼

The overheat alarm "E 1" is indicated during drying stage

NO → Please contact our authorized distributor in your region.

YES

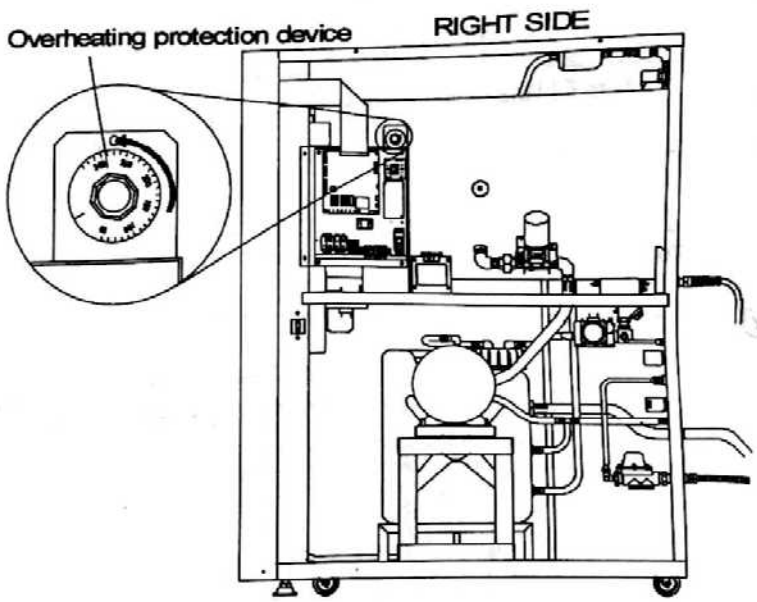
Turn OFF the Main Power Switch.

▼

Set the overheating protection device to 270℃

▼

There is no abnormality in the overheating protection device.



7. Pressure Sensor

●**Inspect the pressure sensor.**

Turn ON the Main Power Switch

▼

Set the sterilization temperature to 121℃

▼

Press the START switch to start operation

▼

During the heating stage, the difference in the values between the digital pressure indicator and the compound gauge is within ±0.02MPa

NO → **Turn OFF the Main Power Switch immediately.**

▼

Please contact our authorized distributor in your region.

YES

▼

Turn OFF the Main Power Switch

▼

Inspection of the pressure sensor has been completed

8. Main Power Switch (Earth Leakage Breaker)

●Check if the shut-off function of the main power switch (Earth leakage breaker) works normally.

Turn ON the Main Power Switch.

▼

Press the leakage test button of the main power switch.

▼

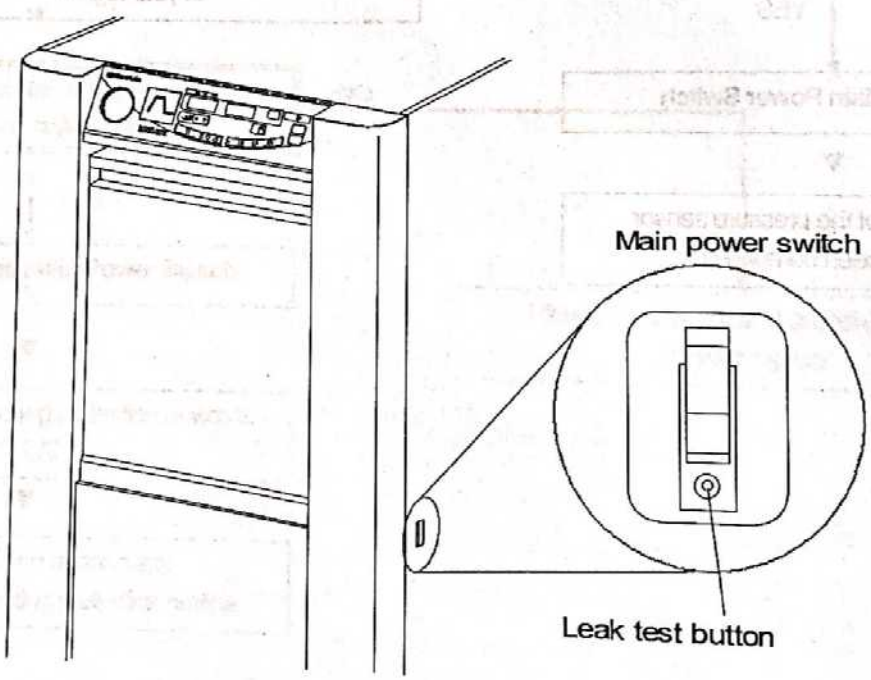
The Main Power Switch is turned OFF. → NO → **Turn OFF the Main Power Switch.**

YES ↓

Inspection of the main power switch has been completed

▼

Please contact our authorized distributor in your region.



Inspection Record Paper for Small Size Pressure Vessel

Write down the inspection result and the executed maintenance work using the following symbols

Symbols : 0=No problem, A=Adjustment, C=Cleaning, X=Replacement,
Z=Other work (Write down the work to the remarks column)

Model				Serial number				
Date of Inspection								
Chamber								
Lid								
Gasket								
Pipes								
Valves								
Controller								
Compound gauge								
Safety Valve								
Overheating protection device for a heater								
Pressure sensor								
Main power switch								
Inspector								
Approved by								
Remarks								

(Form: CE-014c-00)

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