

Autoclave BF-FW

Translation of original instruction manual for Autoclave (Version 2.0.1)

English

written for
BF-FW45/60/80/100 models



"BF-FW100" Steam Sterilizers Autoclaves, 100Lit.



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Before Use

Thank you for purchasing our Digital PID controlled Autoclaves.

This manual provides information pertaining to the performance, instructions, and cautions of this product.

Please read this manual carefully before using this product.

Below are various types of cautions, warnings, and alerts and the corresponding signs. Please review the safety information below before using this product.

	Warning This sign informs the user that injuries may occur if the user does not follow the precautions.
	Cautions This sign informs the user that device failures may occur if the user does not follow the precautions.
	Alert This sign informs the user that this is the central component of the function and therefore, the user should not change or disassemble this part.
	Caution for High Temperature This sign informs the user about risks of burns from the use of the high temperature heater.

Use and Characteristics

Thank you for purchasing our Digital PID controlled Autoclaves.

This product has a mounted sensor that detects the internal temperature to prevent overheating. Also, the control panel has many features including display of the current temperature, an earth leakage breaker that shuts down when it is current leakage & setting up a use time, and PID Controller that automatically controls the power supplied to the heater.

It has been designed to provide operation functions with the simplest way. Manufacturing team made their utmost efforts to provide safety through applying the safe pressure control mechanism.

In addition, this product is made of stainless steel and processed with the press, in order to maintain the appearance of the chamber and high level of air tightness. High quality insulators are used to prevent the external side of the device from overheating.

When developing and manufacturing this product, highest considerations were given toward the convenience and safety of the users. Product characteristics are as follows.

- Microprocessor allows fully automated processes.
- Electrical and physical safety equipment that eliminates the risks associated to excessive increase of temperature and pressure.
- FND Digital Display: set temperature and current temperature are displayed simultaneously and the “Timer” becomes initiated when the sterilizing temperature is reached. Then, the working temperature and sterilizing time is displayed simultaneously.
- Safety Device: safety device for preventing overheating and overcurrent is installed. When the sterilizing time is reached, a buzzer rings for 30 seconds and the pressure is released.
- It has high temperature stability of $\pm 0.5^{\circ}\text{C}$ at 121°C .
- Two-stage perforated basket production for efficient use of space
- Built-in water tank and water level sensor for automatic water supply.

Intended Use

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Sterilizer used for the sterilization of metal, glass, laboratory tool, plant culture medium, liquid material, and so on.

Product Components

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Steam Sterilizers, Digital PID controlled Autoclaves..... 1 unit

Wire Basket 2 units

Heater Cover.....1 unit

Models

- (a) BF-FW45 : Autoclaves(Steam Sterilizers), Digital PID controlled Autoclaves, 45Liter
- (b) BF-FW60 : Autoclaves(Steam Sterilizers), Digital PID controlled Autoclaves, 60Liter
- (c) BF-FW80 : Autoclaves(Steam Sterilizers), Digital PID controlled Autoclaves, 80Liter
- (d) BF-FW100 : Autoclaves(Steam Sterilizers), Digital PID controlled Autoclaves,100Liter

Product Installation

1. Please install the product in a hard, flat and stable place.
2. please do not install the product in a place where it is exposed to direct sunlight, or in the dangerous places.
3. To minimize the risk of short circuits, do not install the product in the places where it will be subjected to the inflow of moisture or organic solvents on the regulator part or inside of the body
4. It works in a humid room(proper relative humidity : 30~70%) as much as possible and the room temperature is between 5 °C and 40 °C. Please keep the temperature and long-term use in an environment that exceeds the allowable range causes error
5. Remove the packaging after moving the product to the installation location.
6. Safely fix the product using the fixing device mounted on the wheel.
7. Check the entire exterior of the product for any damages that may have occurred during the delivery. If you any damages are detected please contact the vendor where you have made the purchase.
8. Do not use the product immediately after the installation. Wait couple of minutes for making the internal components to stabilize.
9. If you open the side door of the product, you can check the connection of parts including the electric component and copper tube for steaming. Before operation, visually inspect the connection conditions of the electric component connection wire and the copper tube. If you detect any abnormality, please contact the vendor where you have made the purchase or SJeng Service Team.
10. Please check that the Manual purge valve and Water Drain Valve are closed before using the product.

11. Connect the power line to the power socket.

12. **(Caution)** If you have purchased the BF-FW80 or BF-FW100, you cannot connect these devices to a general power socket because these devices require high electric power (Maximum specification of a general power socket in EU or countries in Asia is 3kW). Therefore, use a large pole plug and power cord indicated in the page that includes name of each part (single-phase 230V AC, ground connection) to connect these devices to a power supply that can supply sufficient amount of power to each model (BF-FW80, BF-FW100 requires minimum of 4kW)

13. If there is not sufficient amount of power line at the installation location, you must check with the person in charge of electrical power before installing the device.

Warnings before use

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● Before Use



Please review the instructions for use and the lab manual before using this device. Only authorized personnel should handle this device.



Please install on a hard and flat surface. Failure to do so may cause an accident

Please use proper power supply for this device (AC 220V, 50/60Hz, Single phase). Only use loads that are equal to or below the tolerated standards.







This device should only be used for appropriate purposes such as the following.

- Destroying infectious or perishable substances and waste in the glass containers, rubber items, pipet tips, equipment, filters, consumer goods, and pipes
- Sterilization of liquids, spirits, and buffers that are opened or closed in a container or a slightly closed state

	<ul style="list-style-type: none"> ● Sterilizing food waste ● Agar melting and liquidity liquefying
	<p>This device is not suitable for sterilizing the following substances.</p> <ul style="list-style-type: none"> ● Wood products ● Adhesive parts ● Plastic that is sensitive to heat ● Electric equipment ● Containers and equipment made of steel ● Measuring equipment (products that has labeled as unsuitable for steam pressure sterilization)
	<p>Please check the sterile water in this device. If tap water or water that has other components is used, it may cause damage to the components inside the container, container surface, pipe, and valve.</p>
	<p>Do not sterilize containers that have solution or food with this device. Also, do not sterilize substances with low ignition point or toxic substances.</p>
	<p>Bags with samples to be sterilized must be opened. If not, it may burst during the sterilizing process.</p>

● Warning

- Please follow the following procedures.

	<p>Please operate indoors and maintain room temperature of 5°C ~ 40°C. Long term use in an environment that exceeds the tolerance room temperature range may cause failures.</p>
	<p>Do not use volatile or flammable chemical including laccase, paint, or flammable spray on the product or near the product. Fire may be ignited by the flare from the switch.</p>
	<p>Do not directly spray water on the product or wash the product with water. It may cause electric shock or shortage.</p>
	<p>Do not touch electric parts such as the power plug or operate the switch if your hands are wet. This may cause electric shock.</p>



Do not use this product in a place with continuous sunlight or expose this product near the rain. This may cause overheating or electrical defects. (Outdoor use is prohibited).



Do not open the sterilizing device until all sterilizing cycles are complete and the pressure is released.



When opening the sterilizing device, wear the safety items listed below to handle the sterilizing samples.

- Apron
- Safety Goggle
- Heat-resisting gloves



When opening the sterilizing device, stay one step away from the device and take caution of the steam released from the device.



After sterilizing the solution, take caution for the below steps.

Be careful of the boiling temperature from the solution. For 1 liter of solution, open the sterilizing device after waiting at least 2 hours and 30 minutes.



For 2 liter of solution, open the sterilizing device after waiting at least 3 hours. Do not open the sterilizing device and remove the containers until the temperature of the sterilizing device has dropped to 70 degrees or lower.



Do not damage, processing, bend, pull, or tie the power cord. In addition, placing heavy materials on top of the power cord may cause fire or electrical shock.



When unplugging the power plug, pull by grabbing the plug. If the power plug is unplugged by grabbing the cord, it may cause overheating or fire.



Do not stop the operation by unplugging the power plug. It may cause electrical shock or shortage.



Check periodically to see if dust is on the power plug. Connection of the power plug must be properly done. If dust is on the power plug or connection is not done properly, it may cause electrical shock or fire.



If the device is not used for a long term, unplug the power plug from the electrical outlet for safety. If not, dust may cause overheating or fire.



Unauthorized persons should not disassemble or modify this product. It may cause serious electrical problems and you may not be able to receive services under warranty.



If you detect any abnormal noises or abnormalities during the operation, turn off the power of the device and unplug the power line. Then, contact the vendor where you have made the purchase.



When transferring this product, make sure the power line is unplugged from the electrical outlet and protect the power line to avoid damages. If not, it may cause electrical shock or fire from the damaged power line.

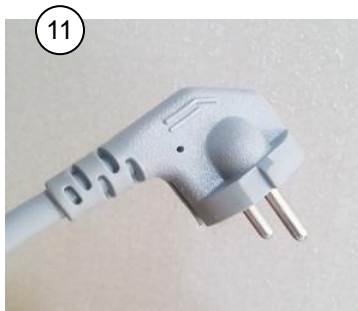
Name of Each Part

1. Exterior

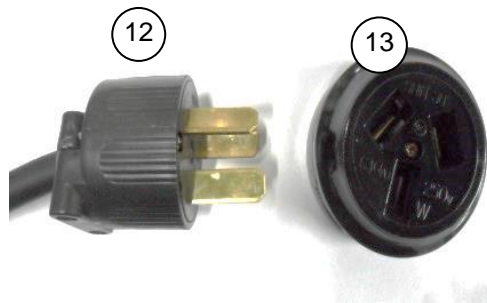


<Image 1>BF-FW45/60/80/100 - Name of each part

- <Image1-①> Lid Screw Handle
- <Image1-②> Lid Stiffener
- <Image1-③> Lid Clamp
- <Image1-④> Lid with Silicon packing
- <Image1-⑤> Pressure Gauge
- <Image1-⑥> Control Panel
- <Image1-⑦>Manual Steam Valve Knob
- <Image1-⑧>Steam Exhaust
- <Image1-⑨>Caster
- <Image1-⑩> Power Switch and Leakage Breaker



< BF-FW45~ 60 model>

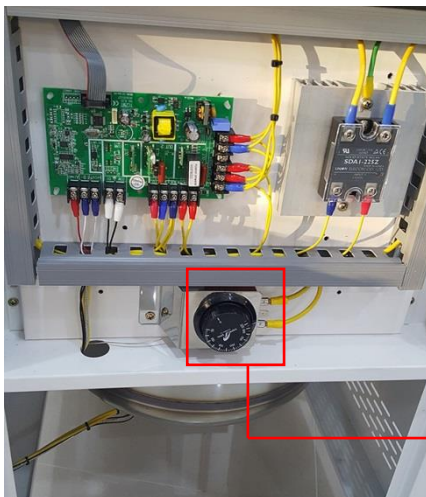


<BF-FW80 ~ 100 model>

<Image1-⑪> Power Cord

<Image1-⑫> Plug (for Single-phase 230V AC with Ground)

<Image1-⑬> Socket with Wiring connector



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<Image1-⑭> Safety Thermostat

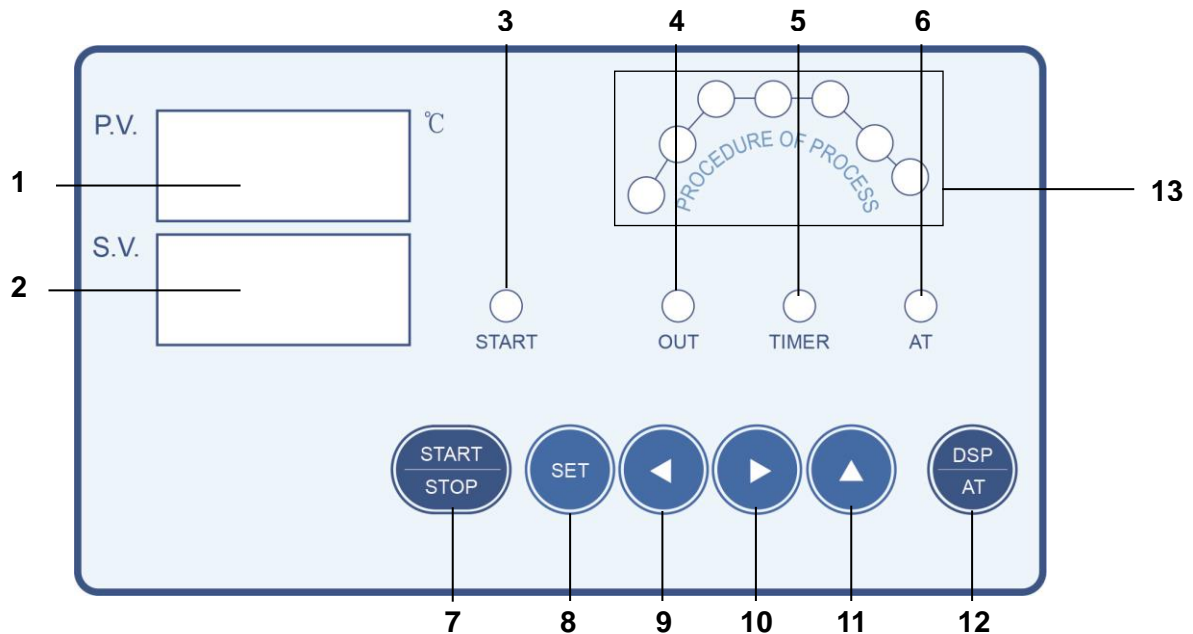
<Image1-⑮>Manual purge valve

<Image1-⑯> Water Drain Valve

<Image1-⑰>Safety symbols stickers attached to side of product. For meaning of each symbol, please refer to 6 warnings before use

Controller

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1. P.V : Current Temperature and Mode
2. S.V : Set Temperature and Data at a Mode
3. Lamp indicating START
4. Lamp indicating HEATER output
5. Lamp indicating TIMER operation
6. Lamp indicating AUTO-TUNING operation
7. START/STOP button
8. SET button
9. Shift Left button: For changing the position of digit in Set Value (to the Left)
10. Shift Right button: For changing the position of digit in Set Value (to the Right)
11. INC button: For increasing Set Value
12. AT button: For displaying Auto-tuning, Time and Temperature.
13. Procedure of Process.

How to Use the Lamp

- **START lamp** : It turns on with the START switch and turns off with the STOP switch.
- **OUT lamp** : It turns on when the heater is initiated.
- **TIMER lamp** : When START switch is initiated, it will start to blink. Then, it turns on once it reaches the target temperature. When the set time is over, the lamp turns off
- **AT lamp** : It turns on during the AUTO TUNING process and turns off once the process is complete.

How to Operate the Switch

- **START/STOP button** : Controlling START and STOP
- **SET button** : Switches over from set Temperature to Timer

If SET(MODE) button is pressed and held for more than a few seconds, it changes to the technician mode settings.

Do not change the value of any settings. Changing the settings may cause serious problems.

- **Shift Left button** : Moves the setting value change position to the left
- **Shift Right button** : Moves the setting value change position to the right
- **INC button** : It increases the temperature and timer of the Set Value.
- **AT button**:
 - 1) If pressed, it repeatedly displays the current temperature and timer.
 - 2) If pressed for 4 seconds or more, AUTO TUNING feature is initiated to correct the operation temperature of the device.

Instructions

I. Preparation before Operating

- This device is a type of high temperature steam sterilizer(Autoclaves) and therefore, pressure container must be filled with water before the operation. Using distilled water is recommended.
- Use clean distilled water and fill the auxiliary water tank with enough water.
- Before operating, Manual Purge Valve <Image 1-⑦>must be locked.

II. Setting the Controller

1. Initial Settings

- ① Check the input voltage (220V, 50/60Hz).
- ② Turn on the power switch located on the left side of the device.
- ③ Current temperature inside of the chamber will be displayed on the P.V.
The set temperature value is displayed on S.V.

P.V.	27.0
S.V.	27.0


2. Temperature Settings


- ① Press the SET button.
- ② Then, "TEMP" will be displayed on the P.V. Setting temperature value is S.V.
Show on
- ③ Press the keys to move the space left and right to move the value to the desired space.
- ④ To set the target temperature, change the set value with Set button.

P.V.	TEMP
S.V.	121.0

3. Timer Settings

- ① Press the SET button.
- ② Then, "TIME" will be displayed on the P.V. Setting temperature value is S.V. Show on
- ③ Press the keys to move the space left and right to move the value to the desired space.
- ④ To set the target time, change the set value with Set button.

P.V. 

S.V. 

4. Operating the Heating Function

- ① Press the SET button to store the set value.
- ② This will reset the device.
- ③ Press the START/STOP button to initiate the heating process.
- ④ Initiate the heating process until the target temperature is reached.

5. Operating the Timer

When the temperature inside of the pressure container reaches the target temperature, the temperature will be maintained and the timer will start automatically.

6. Changing the Displayed Value

If AT button is pressed during the operation, the information window will display the current value of the timer and the set temperature.

7. Sterilization Complete

When the sterilizing process is complete, the timer is automatically initiated for 30 seconds to notify the end of the sterilization process. The steam inside of the pressure container is released as the automatic valve opens.

8. Message and Error Correspondence

- ① Open: Please close the door because the door is open
- ② Display output W.err: Injecting water into the chamber. If necessary, add water
- ③ Display output 0000: Check temperature sensor and level sensor disconnection

III. Maintenance After Sterilization

- When the sterilization process is complete, steam is released and remaining of the distilled water is left in the pressure container. Visually check the water level and supplement the water for next time use.
- When steam is released automatically, make sure that all pressure has been released through the <Image 1-⑤>Pressure Gauge located beside controller. After the temperature has been decreased sufficiently, release the small amount of steam by opening door of the <Image 1-⑮>Manual Purge Valve
(It is for inspection when there is a problem with the pressure gauge. Therefore, please open it slowly).
- If you desire to remove the remaining distilled water in the pressure container, open the door located in the left side of the device and open the <Image 1-⑯>Water Drain Valve in the lower side. For cleaning the inside of the pressure container, rinse the pressure container and the pipe by continuously supplying clean distilled water while leaving the valve open.

IV. Auto Tuning Function

AUTO TUNING feature is initiated when the AT button is pressed for 4 seconds.

AUTO TUNING is a feature that precisely adjusts the set temperature to 121℃ which is the same value as the factory shipping value.

Product Specification

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Technical Information

Model Spec	BF-FW45	BF-FW60	BF-FW80	BF-FW100
Type	Fully Automatic type			
Chamber type	Round Vertical type			
Capacity	45 liter	62 liter	81 liter	103 liter
In size(ØxH)m/m	300x650	350x650	400x650	450x650
Dimension(wxdxh)m/m	600x550x1070	600x550x1070	670x620x1110	670x620x1110
Heater capacity	2kw	3kw	4kw	4kw
Temp range	Ambient to 121℃			
Temp Controller	FND Microprocessor programmable control			
Time range	99 hours 59min Digital Display			
Temp Sensor	Pt 100Ω(Exclusively for sterilizing, Auto tuning)			
Accuracy	121℃ from ±0.5℃			
Material	Stainless steel(#304)-pressure vessel, powder coated steel-external			
Door system	One touch handle type(single screw door)			
Basket	Stainless steel(#304), 2ea			
Design Pressure	2.0 bar			
Using pressure	0~1.2bar			
Caster	Movable & fixed type caster			
Electronic power	AC 220V, 50/60Hz			
Safety device	Safety pressure valve, over temp. controller N.F.B. Buzzer, switch, etc			

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Maintenance and Storage

1. If the device will not be used for a long period of time, unplug the power plug, inside product dry it, and package it for storing.
2. Only use genuine parts provided by our company if parts need to be replaced from failures during use.
3. Failure due to abnormal use can not be repaired
4. When cleaning the product, unplug the power plug and wipe it with a soft towel, and wipe only the dirt with a soft towel to clean the area that can not be erased

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Types of Failures

Condition	Measures
Temperature does not increase above the room temperature	Check the temperature that is currently set. Check to see if the power switch is set to ON. Check to see if the SAFETY Knob is set to 0. If the SAFETY Knob is at 0, it sets the temperature 20℃~30℃ higher than the operation temperature.
Power does not come on	Check to see if the Power Cord is plugged in. Check to see if there is any abnormality in the power supply. Check to see if the earth leakage breaker is turned ON. Inspect the fuse circuit.

※If the problem persists after following the above inspection steps, contact the vendor where you purchased the device to request After sales Service.