Model : DAC-40 / 60 / 80 /100

Edition : January 2006

Autoclave

HumanLab Instrument Co.

Table of Contents

● **Safety warnings**

Before operating, read and understand safety warnings thoroughly and use this equipment properly.
Keep these warnings in mind for your safety.

Caution

Safety Warnings: Danger!,Warning!,Caution!

⚠ **Danger** : **Failure to observe this instruction can result in a**

personal injury or death.

⚠ **Warning** : **Failure to observe this instruction may cause a fatal injury**

⚠ **Caution** : **Violation of this instruction and improper use may**

cause a serious injury and property damage.

⚠ **DANGER**

🚫 **EXPLOSION !**

DO NOT OPERATE CHAMBER WITH FLAMMABLE OR EXPLOSIVE SUBSTANCES INSIDE.

⚠ **CAUTION**

⚠ **HOT!**

OUT SIDE WALLS AND PARTS ARE HOT DURING AND AFTER OPERATION

1 Features of the product

- -

This product is ideally suited to various applications such as sterilizing culture medium, glassware, metal instruments, and lab disposables with constant temperature and pressure in a saturated vapor. Efficient performance is provided to shorten the testing.
This product has following features for user's safety and convenience.

1) The grounded circuit prevents a short circuit and over current of electricity.
2) Accurate temperature controls by the Digital PID controller.
3) Full automatic feature. Just press "the start" key after setting the temperature and time,
   then the automatic process begins. The air inside is discharged.
   Sterilizing temperature is reached. After sterilizing process, the steam pressure is removed.
   The buzzer sounds at the end of whole process.
4) Easy to use door handle and stainless material for extra durability.
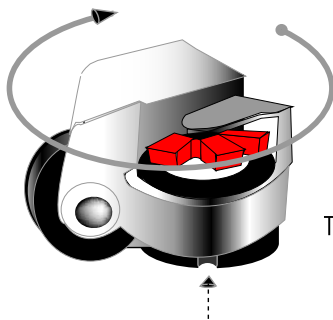
2 Setup Locations

- setup
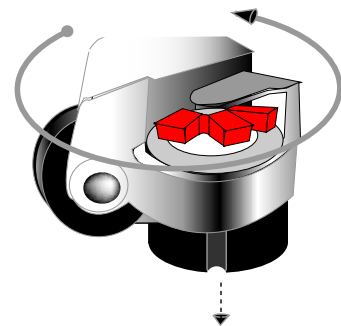
⚠ **Caution!**

Improper set up can cause a malfunction or an accident.
Do not damage the power cord and do not put any object on it.
It can cause a fire, or electric shock.

1) Install the equipment on a firm area avoiding heat, humidity, dust, and vibration.
2) Place it in a well-ventilated area with enough space.
3) Install it horizontally on a firm and stable surface.

Turn the parking screw counterclockwise to fix the unit.

Turn the parking screw clockwise to unfix the unit.

3 Cations

⚠️ **Caution!**

Do not put flammable, explosive materials in the chamber. Explosion or fire can occur.

⚠️ **Warning!**

Do not place flammable materials near the equipment. Fire may occur.
Do not touch the power cord with wet hands. Electric shock may occur.
Do not plug too many equipment into the same electric outlet.
Overload may cause a fire.
Make sure to connect a ground wire. Electric shock may occur without a ground wire.

⚠️ **Caution!**

- Before plugging into the electric outlet, make sure that the power voltage is 220VAC, 50/60Hz.
- Avoid using other electric equipment with high voltage current near this equipment.
- Do not pour water on this equipment directly.
  A short circuit may occur.
  Do not use acid solution, benzene, and sharp objects, to clean the equipment.
  It may cause changes of color or damage. Rubber and plastic parts are likely to change easily. Do not use any volatile material.
- Use mild detergent only and wash it with water thoroughly.
  Unplug from an outlet by holding the plug.
- Do not unplug it by pulling on the power cord.
  If this unit is not going to be used for a long period of time, remove the plug from an outlet.
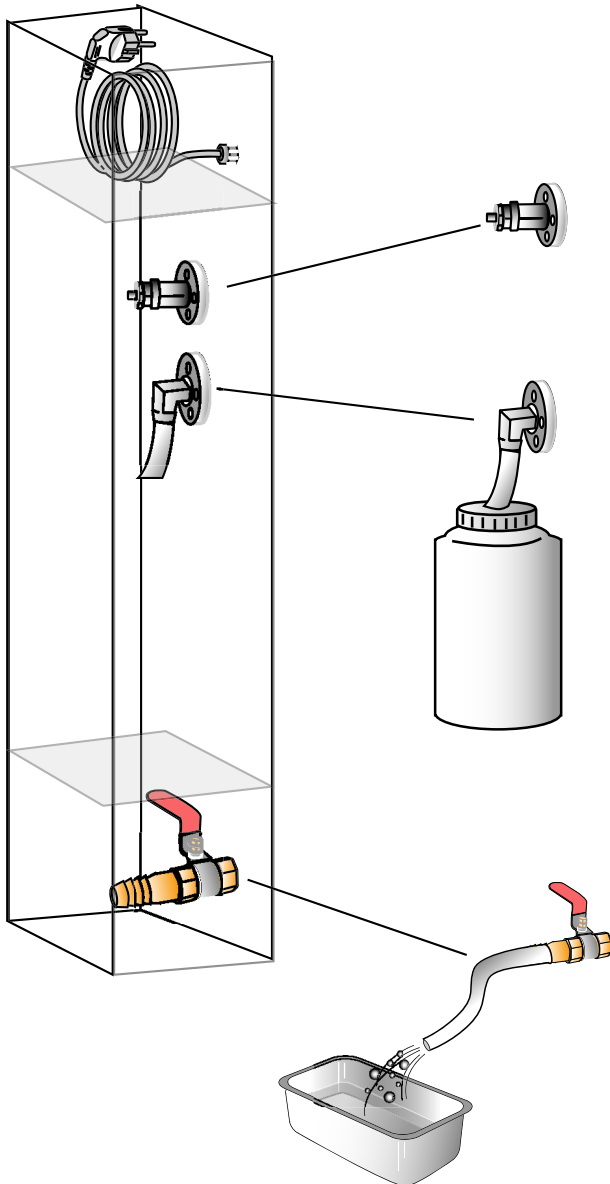- Damaged power cord can cause a short circuit or a fire.

4

Description of Parts and Functions

1. CONTROL PANEL
2. POWER SWITCH
3. DOOR HANDLE
4. TOP COVER
5. CASTERS
6. MANUAL STEAM VALVE HANDLE
7. PRESSURE GAUGE

4

Description of Parts and Functions - The Valves

The Automatic steam valve
This valve releases the pressure automatically,
when the pressure is reached to certain level.

The Manual steam valve.
This valve located next to the door works manually.
Turn the 'AIR' handle to release the pressure.
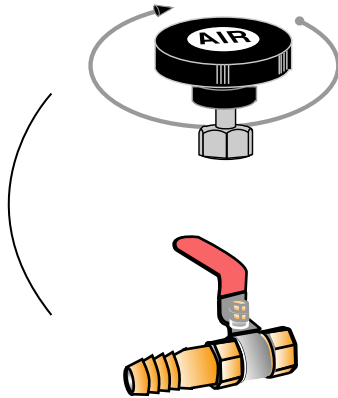(Connect rubber hose or water container).

The drain valve.
This valve is used to drain the sterilizing
water from the autoclave.
(Use a water container).

5 Using Autoclave

1

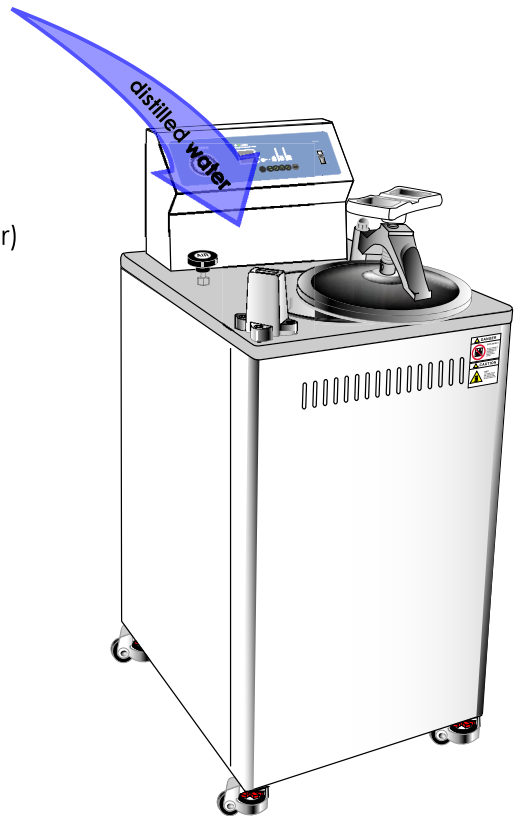Close the manual valve.
(Turn the 'AIR' handle clockwise to close the valve.
It is located next to the door.)

Close the drain valve.

2

Feed the Autoclave with water (distilled water)
until the bottom plate is submerged.
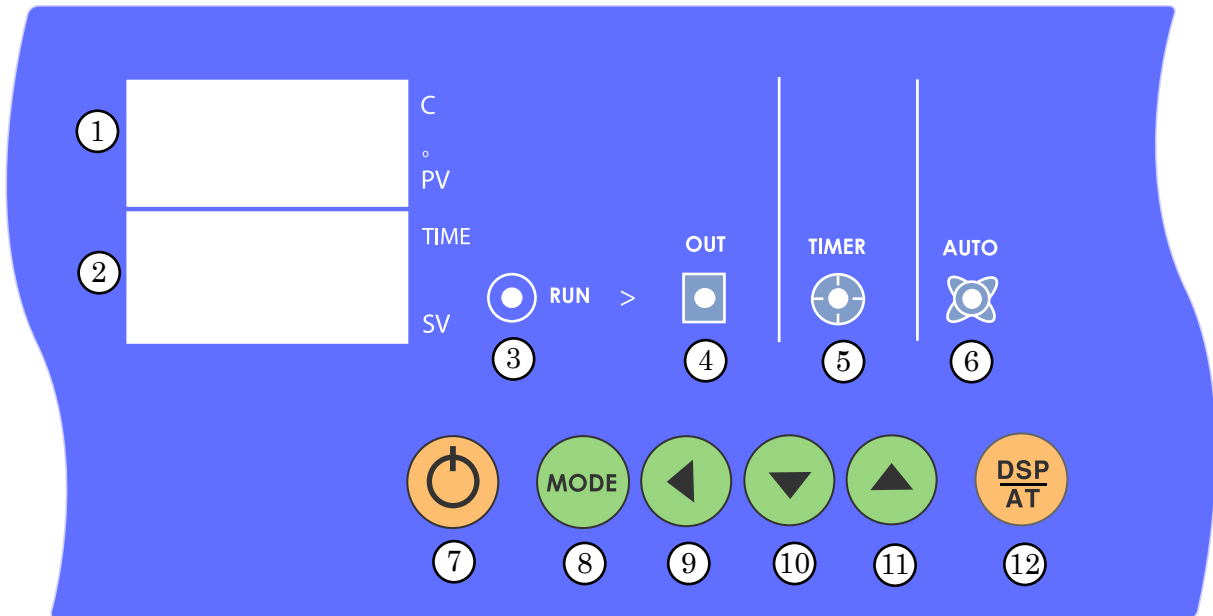(Shortage of water can damage the heater.)

distilled water

3

Turn the main power on.

4

Set the temperature and time for sterilizing.
(Refer to 'temperature control')

6 Using Control Panel

(1) Functions of the control panel

1) Displays actual temperature & each mode
2) Displays set temperature, and data of each mode
3) Displays the system is running.
4) Displays the heater is operating
5) Displays the timer is working
6) Displays Auto Tuning is functioning.

7) Start/Stop running key.
8) Parameter setting key
9) Digit position movement key.
10) Decease value key.
11) Increase value key.
12) DSP Auto tuning key.

(2) Indicator lights

Run : This light is on when the system is running/ Turns off when it stops running.

Out : This light is on when the heater is operating.

Timer : This light begins flashing until set temperature is reached.
After set temperature is reached, it will be turned on.
It turns off at the end of set time.
(If timer set is 00:00, this light will not be on.)

Auto : This light begins flashing during Auto tuning.
It turns off at the end of Auto tuning.

6 Using Control Panel - Operating Procedures

°C

PV

TIME

SV

Turn the power switch on.
The sensor type and temperature range are displayed.

The PV display (1) shows the actual temperature in the chamber.

The SV display (2) shows set temperature.

MODE

Press the "Mode" key to enter temperature set mode.
'TEMP' appears in the PV display.
Set temperature display (SV display) begins flashing to set desired temperature.

MODE

Press the "Mode" key once more to enter timer mode.
'TIME' appears in the PV display. The SV display begins flashing to set the timer.

Default time format is Minute/Second (MM.SS).
Other time formats are Date.Hour/Hour.Minute/Minute.Second (DD.HH/HH.MM/MM.SS)

6

Using Control Panel - Operating Procedures

Turn the power switch on. PV display shows the actual temperature
in the chamber and SV display shows the set temperature of the chamber.

MODE — Press the "Mode" key to enter the temperature set mode.
'TEMP' appears in the PV display. Set temperature display (SV display)
begins flashing to set desired temperature.

◀ — Press the "<" key to move to the next digit position.

▼ ▲ — Press the "up" key to increase value. Press the "down" key to decrease value.

MODE — Press the "Mode" key to enter timer mode.
'TIME' appears in the PV display. The SV display begins flashing to set timer.

◀ ▼ ▲ — You can set the timer as the same way of temperature set
by using of the arrow keys. If timer set is 00:00, the timer will not function.
Only set temperature will operate.

MODE — Press the "Mode" key to complete settings. The set value stops flashing.
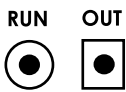The displays return to PV/SV mode.

⚠ **Caution!**

The factory default timer set is MM.SS. (Minute.Second).

6

Using Control Panel - Operating Procedures

Press "START" key for 2 seconds.

RUN   OUT

Start: The RUN and the OUT indicator lights turn on
and the heater begins operating.

TIMER

The timer does not begin operating with the blinks of the timer indicator,
until set temperature is reached. After actual temperature is reached
to set temperature, the timer begins operation with its indicator light on.

RUN

Stop of operation: The RUN light will blink with "beep" tone for 30 seconds.

DSP / AT

Auto Tuning: Auto tuning function calculates the most effective integer
for PID and ARW automatically. Auto Tuning can start while temperature
is rising or after set temperature is reached. To start Auto tuning,
press "Auto" key for 4 seconds until the "beep" tone. It begins to function
with the AUTO indicator light flashing and completes its function as
the AUTO light turns off. If you want to stop Auto Tuning,
press the "AUTO" key for 4 seconds during Auto tuning function.

Because the Auto tuning has already been set from the factory,
Auto tuning is not necessary. Use the Auto tuning function only if the operation
is unstable, or only if it is necessary.

7 Maintenance and Storage

⚠️ **Warning!**

Make sure to unplug the unit from an outlet before cleaning he unit
to avoid an electric shock.

⚠️ **Caution!**

Pull the plug when disconnecting from an outlet. Do not pull the power cord.
Do not use acid solution, benzene, and sharp objects to clean the equipment.
It may cause changes of color or damage of the equipment.

1) To clean the inside of the chamber.
-. Remove the plug from an outlet.
-. Wipe the inside with a soft cloth using a neutral detergent.
-. Clean the inside once more with a soft towel.

2) To clean the surface of the equipment.
-. Use a sponge or a soft cloth with a neutral detergent
-. Wipe the unit with a dry cloth.
-. Do not use organic solvent.

3) To clean the electric parts.
-. Always use a dry cloth.

4) If this system is not going to be used for a long period of time.
-. Remove the plug from an outlet.
-. Clean the unit with a soft towel.
-. Wrap and store it.

8 Troubleshooting

⚠ Warring!

- Switch off the unit before any maintenance and make sure to disconnect the power.
- If you are not authorized personnel, do not try to open, repair, or modify the unit.
- It can cause a fire or malfunction inflicting an injury upon people.

Problems	Remedy
The unit does not operate	-. Make sure the power cord is plugged. -. Make sure the switch is on. -. Check a power outage.
Decrease of heating ability	-. Check the heater
Temperature does not rise	-. Check the set temperature -. Check the heater
Malfunctions of the controller	-. Check whether other high voltage electric equipment is working nearby.

9

Warranty

☐ **Product Name** : **AUTOCLAVE**

☐ **Model** :

☐ **Serial No.** :

☐ **Warranty period** : **1 year after purchase**

☐ **The date of purchase** :

☐ **Purchased from** :

- This product is manufactured under strict quality control and has passed the quality test.
- This product will be warranted against defects accordingly to this warranty.
- Fill out all the items mentioned.
- Keep this warranty with care, it will not be reissued.

1) Contact your dealer for the services against defects in material or workmanship, when it is used under appropriate conditions.

2) In case of followings, the repair service will be charged.
   - -. Damage due to improper operation, modification, or unauthorized attempt to repair
   - -. Damage due to acts of God such as fire, flood, and improper voltage supply.
   - -. Damage due to not following operating instructions.

3) This warranty does not cover consequential damages caused by the product .

4) Contact authorized service center or your dealer for additional information.

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Model		DAC-40	DAC-60	DAC-80	DAC-100
Capacity		40 liter	60 liter	80 liter	100 liter
Chamber size (mm)		300D x 630H	350D x 630H	400D x 650H	450D x 650H
Temp.	Range	Amb. to +130℃ / Operation 121℃			
	Accuracy	±0.5℃			
Timer		99 min / 59 sec			
Material	Interior	Stainless steel			
	Exterior	Steel plate with powder coating			
	Basket	Stainless steel x 2 pcs			
Control & Display		Microprocessor PID controller , Digital display			
Operation Pressure		1.2 Kg/cm² / Gauge : 0 - 3 Kg/cm²			
Heating Element		2 Kw	3 Kw	4 Kw	5 Kw
Safety Device		Pressure safety valve, Over currunt protector			
Power Source		220VAC, 50/60Hz			
Overall (WxBxH)mm		450x650x850	530x750x950	750x600x950	850x650x980

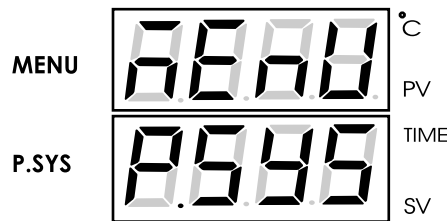Specifications are subject to change without notice.

Appendix

Autoclave Operation Procedure

1. Put the main power plug into electric outlet. (220V)

2. Make sure the manual valve ('AIR') is closed.
   (Turn the valve clockwise to close.)

3. Make sure the drain valve on the bottom is closed.
   (The lever should be positioned at an angle of 90 degree to the valve.)

4. Fill the autoclave with water (distilled water) until the bottom
   plate is submerged.
   (Shortage of water can damage the heater.)

5. Put the sterilizing material into the chamber and close the door
   by turning the handle.
   (Make sure the silicon gasket on the door in good condition.)

6. Turn the main power switch on. (It has over current protection function.)

7. Set the temperature and timer.

8. The steam pressure releases automatically, when the sterilizing process is over.
   Do not turn off the power switch until the pressure is removed completely.
   (Automatic pressure removal will stop when the power is off.)

9. Make sure the pressure gauge is at '0' before opening the door.

10. Make sure to turn the switch off before taking the sterilizing material out.
    (Electric shock may occur.)

11. Keep the 'AIR' valve open when it is not used.
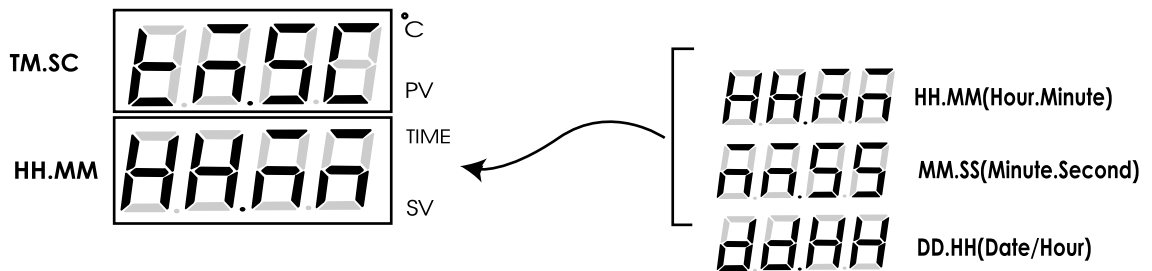   (The door may not be open when the chamber cools off due to vacuum.)

1. Turn the power "On"

2. Press the "Mode" key for 2 seconds until the 'beep' sound.
   (Entering Parameter Set mode)

3. Press the "Mode" key and the "<" key at the same time
   for 2 seconds until 'beep' sound.(Entering Main Menu of Factory Mode).

MENU

P.SYS

4. After P.SYS displayed, Press the "Mode" key continuously
   until TM.SC(time format set) displays.

5. Use the "Up/ Down" arrow keys to set time format (TM.SC).
   HH.MM(Hour.Minute)/DD.HH(Date/Hour)/MM.SS(Minute.Second)

TM.SC

HH.MM

HH.MM(Hour.Minute)

MM.SS(Minute.Second)
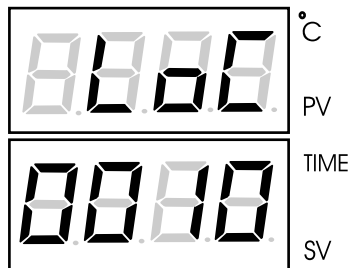
DD.HH(Date/Hour)

6. Press the "Mode" key to store the input.
   (LED stops flashing after input completed)

7. Press the "Mode" and the "<" keys at the same time for 2 seconds
   to exit to the initial stage.

Appendix - - - - - - - - - - - - **Restoring the factory default setting**

1. Turn the power on

2. Press the "Mode" key for 2 seconds until the 'beep' sound.
   (Entering Parameter Set mode)

3. Press the "Mode" key to display 'LOC'.

4. Change to '1000' by using of the "Left / Down" arrow keys and press the
   "Mode" key once to complete the input.(LED stops flashing after input completed)

5. Press the "Mode" key to change to 'LOAD' display.
   Use the arrow keys to change 'NO' to "YES" and Press the "Mode" key
   once to complete the input. (LED stops flashing after input completed)

6. Press the "Mode" and the "<" keys at the same time for 2 seconds to
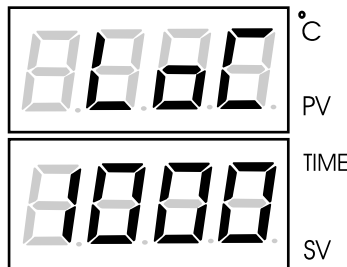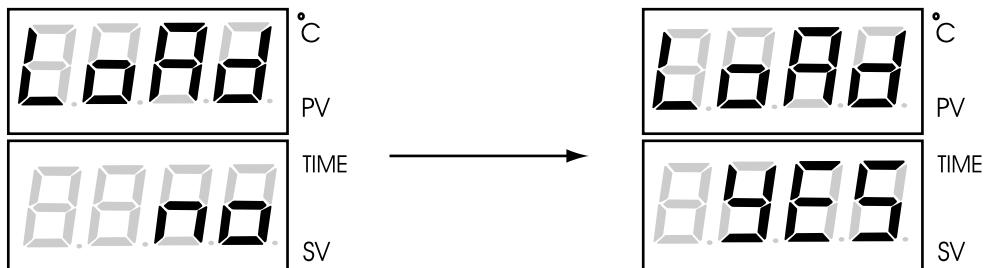   exit to the initial stage.

Appendix

A	B	C	D	E	F	G	H	I	J	K	L
Ā	b	Ē	d	Ē	F	Ḡ	H	I	J	Ʞ	L
		c						ı			L

M	N	O	P	Q	R	S	T	U	V	W	X
Ā	n	ō	P	ꟼ	r	5	Ē	U	H	ō	ꟻ
A		b					t	U			

Y	Z	0	1	2	3	4	5	6	7	8	9
Ч	Z	0	1	2	3	Ч	5	6	ī	8	9
	5										

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