DRAWELL

Artist of Science

USER MANUAL

CONTENT

II. TECHNICAL SPECIFICATION

PRECAUTIONS ON SAFE OPERATION

* For your safety and to operate the instrument properly, please read this Operation Instruction carefully before using and operate following the requirements in this manual. Where you violate the instruction of manufacturer in this manual, it is possible to damage the protection of this instrument.
* This instrument shall not be used for purposes other than sterilization, drying and melting the agar, and it shall also not be used for sterilizing the flammable, explosive and readily oxidizable products or strong acid, alkali and saline solutions to avoid explosion and corruption of sterilizer chamber or pipelines.
* The power supply of sterilizer should be properly connected according to nameplate on the instrument.In case of excessive voltage fluctuation, the regulated power supply shall be used to ensure optimum performance of the instrument; if you are using other types of voltage, a transformer must be used to prevent the instrument from being damaged.
* The power cord shall be connected to special power switch for electric device. It is not allowed to share power switch with other plugs, nor have power cord bound, distorted, tied or pulled. No heavy article is allowed to place on power cord and the damage or exposure of power cord or loosening of output lead may cause fire or electric shock.
* It is necessary to ground the instrument properly, and never connect the ground wire to plastic pipeline, gas pipe, telephone ground wire and lightning rod.
* Never block the steam exhaust hole on the safety valve with articles, so that the safety valve can work properly under abnormal conditions.
* Always ensure that the reading of pressure gauge is *0Mpa* before opening the chamber cover.Never attempt to open the chamber cover and drainage valve when the pressure inside the sterilizer chamber is over *0MPa* to avoid injury from ejected pressurized steam.
* Avoid dripping water to the control circuit when adding distilled water to the sterilizer chamber to against electric shock or other faults.
* When using waste processing bags or other type of bags, please put the bags into the stainless steel basket before putting the basket into sterilizer chamber to avoid affecting the precision of temperature.
* Observe the temperature variation inside the sterilizer chamber. The temperature is relatively high when operation has been finished, keep the face and hands away from the sterilizer chamber when opening the cover to avoid injury from ejected pressurized steam.Gloves must be used when taking articles out of the sterilizer chamber.
* Liquid does take some time to get cooling, verify whether the temperature is low enough or not, when taking the liquid after sterilization out of the chamber to avoid scalding.
* Use only distilled water as sterilizing water to avoid affecting the service life of sterilizer.
* When using the instrument continuously, 15 minutes and above interval is required before next operation to allow the instrument to cool down, so that it will be able to produce adequate saturated steam.
* In case of abnormal conditions, such as noise, odor and smog, please turn off the power immediately, and observe until the abnormal condition stops, and then contact the local dealer or customer service department of our company.

● The users shall observe the local regulations related to the use of pressure vessels.

● Class A is equipment is intended for use in an industrial environment. The (GR Series Autoclave) may Be potential difficulties in ensuring electromagnetic compatibility in other environments, due to conducted as well as radiated disturbances.

CHAPTER 1 ABOUT THE INSTRUMENT

1) This series of product is designed for sterilizing,drying heat and high pressure steam resistant products, including solid and liquid.
2) This product can also be used to melt the agar.

Model	GR60DR	GR85DR	GR100DR	GR110DR
Capacity	60L	85L	100L	110L
Dimension(LxWxM,mm)	660x644x980	660x644x980	660x644x1180	660x644x1180
Chamber Dimension(Dia*H, mm)	ф400×505	ф400×700	ф400×800	ф400×895
Net Weight	101kg	113kg	120kg	125kg
Power Supply	220V±10% 50Hz/60Hz			
Rated Power	2900W	4600W	4600W	4600W
Working Environment	5-40℃, relative humidity 10%-85%			
Material of Sterilizer Chamber	SUS304			
Sterilizing Temperature	105℃-138℃			
Sterilizing Time	1-300 min			
Melting Temperature	60℃-100℃			
Melting Time	1-300 min			
Warming Temperature	45℃-60℃			
Warming Time	1-9999min			
Drying Time	1-300min			
Cooling Lock OPEN Temperature	Solid and agar mode: 40℃-99℃, Liquid and waste mode: 40℃-80℃ (Boiling point:100℃)			
Exhaust Temperature	73℃-104℃(Boiling point:100℃)			
Volume of Water Tank	18L			
Startup Timer	0 minute-6 days delayed			
Range of Pressure Gauge	0-0.6MPa			
Rated Working Pressure	0.25Mpa			
Operation Mode	Solid mode: Heating→Sterilizing→Exhaust Solid(with Drying)mode: Heating→Sterilizing→Exhaust→Drainage→Drying Liquid(with Warming) mode: Heating → Sterilizing → Precooling → Exhaust → Warming Liquid mode: Heating→Sterilizing→Precooling→Exhaust Waste mode: Heating →Sterilizing→Exhaust Agar mode: Heating→Melting→Warming			
Controller	“inspiration” microcomputer intelligent control system			
Safety Devices	“eight-column evenly distributed” interlocking device, electric double inner locks, dry scorch protection, overpressure protection, safety valve, over temperature protection, over current and short circuit protection, leakage protection, cooling lock, anti-scald chamber cover and bench, automatic troubleshooting			
Accessories	Stainless steel baskets, water plate, waste water tank			
Optional Accessories	Load Thermometer, printer, printer set			

Model	GR60DF	GR85DF	GR100DF	GR110DF
Capacity	60L	85L	100L	110L
Dimension(LxWxM,mm)	660x644x980	660x644x980	660x644x1180	660x644x1180
Chamber Dimension(Dia*H, mm)	ф400×505	ф400×700	ф400×800	ф400×895
Net Weight	101kg	113kg	120kg	125kg
Power Supply	220V±10% 50Hz/60Hz			
Rated Power	2900W	4600W	4600W	4600W
Working Environment	5-40℃, relative humidity 10%-85%			
Material of Sterilizer Chamber	SUS304			
Sterilizing Temperature	105℃-138℃			
Sterilizing Time	1-300 min			
Melting Temperature	60℃-100℃			
Melting Time	1-300 min			
Warming Temperature	45℃-60℃			
Warming Time	1-9999min			
Cooling Lock OPEN Temperature	Solid and agar mode: 40℃-99℃, Liquid and waste mode: 40℃-80℃ (Boiling point:100℃)			
Exhaust Temperature	73℃-104℃(Boiling point:100℃)			
Volume of Water Tank	18L			
Startup Timer	0 minute-6 days delayed			
Range of Pressure Gauge	0-0.6MPa			
Rated Working Pressure	0.25Mpa			
Operation Mode	Solid mode: Heating→Sterilizing→Exhaust Liquid(with Warming) mode: Heating→Sterilizing→Precooling→Exhaust→Warming Liquid mode: Heating→Sterilizing→Precooling→Exhaust Waste mode: Heating →Sterilizing→Exhaust Agar mode: Heating→Melting→Warming			
Controller	“inspiration” microcomputer intelligent control system			
Safety Devices	“eight-column evenly distributed” interlocking device, electric double inner locks, dry scorch protection, overpressure protection, safety valve, over temperature protection, over current and short circuit protection, leakage protection, cooling lock, anti-scald chamber cover and bench, automatic troubleshooting			
Accessories	Stainless steel baskets, water plate, waste water tank			
Optional Accessories	Load Thermometer, printer, printer set			

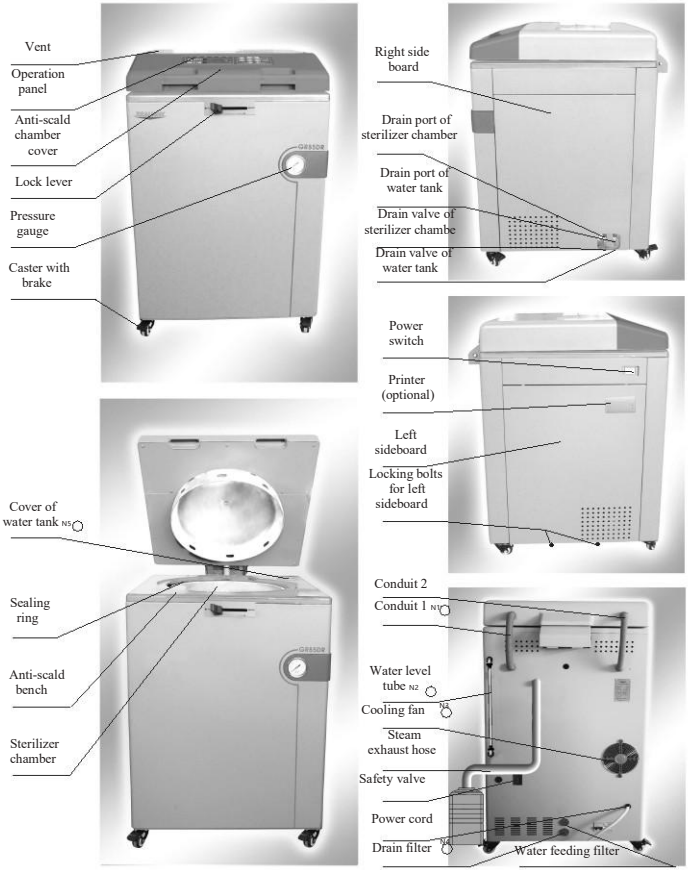
Model	GR60DA	GR85DA	GR100DA	GR110DA
Capacity	60L	85L	100L	110L
Dimension(LxWxM,mm)	660x644x980	660x644x980	660x644x1180	660x644x1180
Chamber Dimension(Dia*H, mm)	ф400×505	ф400×700	ф400×800	ф400×895
Net Weight	101kg	113kg	120kg	125kg
Power Supply	220V±10% 50Hz/60Hz			
Rated Power	2900W	4600W	4600W	4600W
Working Environment	5-40℃, relative humidity 10%-85%			
Material of Sterilizer Chamber	SUS304			
Sterilizing Temperature	105℃-138℃			
Sterilizing Time	1-300 min			
Melting Temperature	60℃-100℃			
Melting Time	1-300 min			
Warming Temperature	45℃-60℃			
Warming Time	1-9999min			
Cooling Lock OPEN Temperature	Solid and agar mode: 40℃-99℃,Liquid and waste mode: 40℃-80℃ (Boiling point:100℃)			
Exhaust Temperature	73℃-104℃(Boiling point:100℃)			
Volume of Water Tank	9L			
Startup Timer	0 minute-6 days delayed			
Range of Pressure Gauge	0-0.6MPa			
Rated Working Pressure	0.25Mpa			
Operation Mode	Solid mode: Heating→Sterilizing→Exhaust Liquid(with Warming) mode: Heating→Sterilizing→Precooling→Exhaust→Warming Liquid mode: Heating→Sterilizing→Precooling→Exhaust Waste mode: Heating →Sterilizing→Exhaust Agar mode: Heating→Melting→Warming			
Controller	“inspiration” microcomputer intelligent control system			
Safety Devices	“eight-column evenly distributed” interlocking device, electric double inner locks, dry scorch protection, overpressure protection, safety valve, over temperature protection, over current and short circuit protection, leakage protection, cooling lock, anti-scald chamber cover and bench, automatic troubleshooting			
Accessories	Stainless steel baskets, water plate, waste water tank			
Optional Accessories	Load Thermometer, printer, printer set			

* Note:

N1 When the elevation is less than or equal to 2km,the highest temp is 138*;when the elevation is over 2km,the highest temp should decrease 3* with each increase of 1 km in elevation.

N2 The upper limit of cooling lock OPEN temp and exhaust temp is related with boiling point: the upper limit of cooling lock OPEN temp under solid & agar modes is 1* below local boiling point; that under liquid & waste modes is 20* below local boiling point; and the upper limit of exhaust temp is 4* above local boiling point. For example, if the boiling point is 90*, the preset cooling lock OPEN temp range is: 40-89* under solid & agar modes and 40-70* under liquid & waste modes; the preset exhaust temp range is: 73-104*.

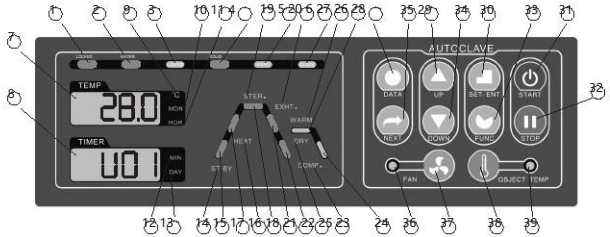
III.EXTERNAL FEATURES & PARTS



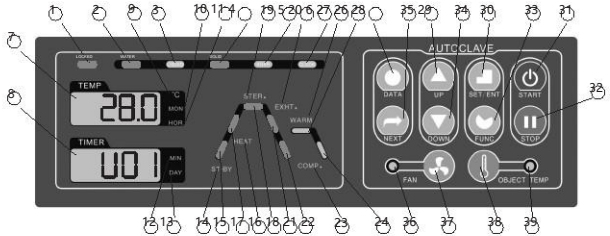
N1 Conduit1 is only for DR series
N2 Water level tube is not for DA series
N3 Cooling fan is Optional for DA Series
N4 DA series do not have filters
DF series only have water feeding filter
DR series have both water feeding filter and drain filter
N5 Cover of water tank of DA series can not be opened

IV:FUNCTONS OF PARTS

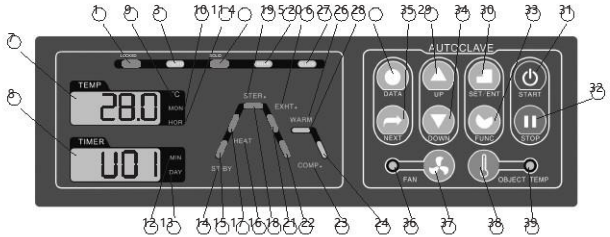
GR110DR/GR100DR/GR85DR/GR60DR (DR Series) Panel



GR110DF/GR100DF/GR85DF/GR60DF (DF Series) Panel



GR110DA/GR100DA/GR85DA/GR60DA (DA Series) Panel



1.LOCKED: Interlocking indicator, which will be on during interlocking.
2.WATER: Water level indicator (only for DR Series and DF Series). Under standby condition, the indicator on means that there is sufficient water in sterilization chamber for sterilization, and indicator off indicates water shortage and then the system will automatically start for water intake. At this time, screen A will show and flash "ADD", and the system will come back to standby condition after water intake completes.
3.LIQUID: The light indicates the current operation mode is liquid mode
4.SOLID: The light indicates the current operation mode is solid mode
5.AGAR: The light indicates the current operation mode is agar melting mode
6.CLOCK: The light indicates the current operation mode is auto startup mode
7.Screen A: Display the set temperature, actual temperature, month and hour. It will display the year information in time checking and calibration mode, and menu code in administration mode.
8. Screen B:Display the set time, remaining time, minute, date, error information or user program No.
9.*: The light indicates the current unit is *
10.MON: The light indicates the current unit is month
11.HOR: The light indicates the current unit is hour
12.MIN: The light indicates the current unit is minute
13.DAY: The light indicates the current unit is day
14.ST-BY: The light blinking indicates the instrument is in standby status
15.Heating status indicator 1: The light blinks from initial sterilizing temperature until the local boiling point
16. HEAT: *HEAT* is light and heating status indicator is blinking to indicate that the instrument is in heating stage or melting stage; if *HEAT* and heating status indicator blink together, it indicates entering the melt parameters modification status
17.Heating status indicator 2: The light blinks from the local boiling point until the set sterilizing temperature
18.Sterilizing status indicator: The light blinks in course of sterilizing
19. STER. : *STER.* is light and sterilizing status indicator is blinking to indicate that the instrument is in sterilizing stage, the temperature of this stage shall be the set sterilizing temperature. If *STER. * and sterilizing status indicator blink together, it indicates entering the sterilizing parameters modification status
20. EXHT. : *EXHT* is light, and steam exhaust status indicator is blinking to indicate that the instrument is in steam exhaust stage. If *EXHT.* and steam exhaust status indicator blink together, it indicates entering the steam exhaust temperature modification status.Under liquid & waste modes, the sterilization chamber and articles can be pre-cooled through setting exhaust temp to avoid liquid boiling over caused by great pressure drop when exhausting
21. Exhaust indicator: The light blinks from the completion of sterilization until the temp is lower than the cooling lock OPEN temp set by the user and as for the programs with warming or drying, blinks from the completion of sterilization until the beginning of warming or drying.
22. Cooling status indicator 1: The light blinks from the temperature lower than the cooling lock OPEN temperature to 40* in program without warming or drying.
23. COMP.: The letter blinking indicates that the running of program is finished
24. Cooling status indicator 2: The light blinks from the completion of warming or drying to 40*
25. DRY: *DRY* is light, and drying/warming status indicator is blinking to indicate that the instrument is in drying stage. If "DRY" and drying/warming status indicator blink together, it indicates entering the drying parameters modification status (only for DR Series)

26. Drying/Warming status indicator: The light blinks in course of drying or warming
27. WARM: *WARM* is light, and drying/warming status indicator is blinking to indicate that the instrument is in warming stage. If *WARM* and drying/warming status indicator blink together, it indicates entering the warming parameters modification status.
28. DATA: Under standby status, you can press *DATA* button to inquire the detailed parameters of current program; When setting the parameters of program, press *DATA* button to cancel the modification and exit, unless the *SET/ENT* button has been pressed to save the modification before pressing the *DATA* button.
29. UP: Under standby status, you can press *UP* button to enter the immediate next program, i.e., the current program is U10, press *UP* button, it will enter U11, and display the detailed parameters of current program; When modifying the parameters of programs, you can press *UP* button to increase the set value, and press and hold the button to increase the display value by 10 units until the maximum value
30. SET/ENT: Setting and Entering button, press the *SET/ENT* button at the first time to enter the program parameters modification status, and press the button again to save the change. With the start of sterilization program, press *SET/ENT* and then the screen B will show pressure of current sterilization chamber and screen A will show pressure unit: *KPa*,*PSI*or*bar ** While another press of *SET/ENT* will come back to temperature display. The pressure display unit may be set in menu (see details in Chapter IV: Setting of Administrator).
31. START: Start button is used to start sterilization or melt; For the avoidance of misoperation, this button has delay response function so it could only work when pressed and held for over 2 seconds.
32. STOP: Stop button is used to stop sterilization or melt; For the avoidance of misoperation, this button has delay response function so it could only work when pressed and held for over 2 seconds.
33. FUNC: *FUNC* button must work with other buttons, press the *FUNC* button and *STOP* button together to delete the current program,press the *FUNC* button and *NEXT* button together to enter the auto startup mode, press the *FUNC* button and *DATA* button together to enter the administrator menu.
34. DOWN: Under standby status, you can press *DOWN* button to enter the immediate previous program, i.e., the current program is U10, press *DOWN* button, it will enter U09, and display the detailed parameters of current program; When modifying the parameters of programs, you can press *DOWN* button to decrease the set value, and press and hold the button to decrease the display value by 10 units until the minimum value
35. Next: Enter the next option
36. Cooling fan status indicator: The light indicates the cooling fan is working.
37.FAN: Start/Stop button for cooling fan is used to control the start and stop of fan from the completion of sterilization stage or drying/warming stage to the temp lower than 40*, while the cooling fan indicator will be on or off with this switching. The cooling fan may shorten the waiting time for sterilized articles cooling.
38.OBJECT TEMP: Load temp and chamber temp switch button. When the optional load thermometer is equipped and set for enabled in administrator menu, this button may be used for showing the load temp or chamber temp. After the load thermometer is enabled, the load sensor Should be placed in articles properly, otherwise sterilization program may not run smoothly.
39.Object temp indicator: When it is on, it means the load thermometer is enabled, and the indicator off indicates the load thermometer is disabled.

2*Cooling Lock Function

In general condition, the cooling of chamber will be faster than that of sterilized articles, and in other words, the actual temp of load may be higher than the value on meter (especially for liquid). Where the cover of chamber is opened before sterilized articles reaching safe condition, the operator may face scald dangers. For safety purpose, this series sterilizer is designed with cooling lock function so that the user may set cooling lock OPEN temp to have the cover only be opened when temp in chamber is lower than set OPEN temp. In case the load thermometer is equipped, the cover could only be opened when the temp in chamber and load temp are both lower than the set OPEN temp.

3*Optional accessories:

1*Load thermometer:

* There are some articles (such as liquid) with higher thermal inertia, so when the temp of chamber reaches sterilization temp, the temp of load is not high enough for sterilization. For the purpose of better sterilization effect, it is recommended to monitor the real temp of load with load thermometer. In this case, the temp of sterilization chamber will firstly reach sterilization temp, but the sterilization timer will only start when the load really comes to the set sterilization temp.

* Note:

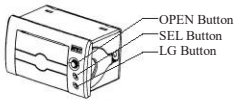
After the installation of load thermometer, set it in administrator menu to be enabled. (see details in Chapter IV: Setting of Administrator).

After use, the load thermometer should be placed on water level plate and kept in sound. The load thermometer should be set to disabled in administrator menu for long term idling.

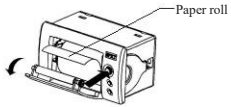
2)Printer:

* The printer is optional for the need of recording sterilization process parameters. For enabling the printer, the operator shall enter into administrator menu to set printer to enabled and choose language of printing (English or Chinese) and display of date (DDMMYY or YYMMDD).

* Control panel
  * Press OPEN button to open the door
  * The SEL button is the red online indicator, indicator on means printer is online, indicator off means printer is offline
  * The LF button is the green power indicator, it will be on as long as there is power. LF button is also the paper delivery button.
    Paper Delivery Way: Make sure the power is on, then press the SEL button, when the red indicator is off, press the LF to deliver the paper.
    Self-test method: Keep pressing the SEL button, at the same time turn on the power, and then release the SEL button, the printer will print the sample note



* Installation of the paper roll
  * Press the OPEN button, open the door, install the paper and then close the door.

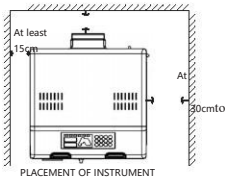


3)Printing Set: Where it is required to record the sterilization process parameters and check the accuracy of temp, the printing set is optional. This set is comprised of printer and pressure sensor. For enabling, in addition to printer setup, the display unit of the pressure sensor shall be set. (Kpa, PSI or bar)

CHAPTER 2 INSTALLATION OF INSTRUMENT

I. PLACEMENT OF INSTRUMENT

* This is a precision instrument, and it must be placed on the level ground with the brakes of four wheels pressed down during installation. Never place the instrument in an environment with high humidity and direct sunlight or a room with temperature lower than 5* or over 40 *.
* For better heat dispersion, it is recommended to keep some gaps between the instrument and the wall, normally at leastAt least15cm 15cm from the back , 15cm from the left and 30cm from the right.
* During steam exhaust or when opening the chamber cover, leastsome steam may spill over, therefore, it is recommended not install the instrument beneath the fire alarm sensor to avoid triggering the alarm.
* The steam exhaust hole of the safety valve must be kept away from the power socket and not blocked.



PLACEMENT OF INSTRUMENT

II. CONNECTING THE POWER SUPPLY

* The instrument must be grounded reliably, if the power socket does not have the ground terminal, it is required to ground the instrument with independent ground wire before powered on.
* Power supply: single-phase AC 220V*10%, 50Hz/60 Hz

Requirement for current intensity:

GR60DA/GR60DF/GR60DR20AGR85DA/GR85DF/GR85DR32A
GR100DA/GR100DF/GR100DR 32AGR110DA/GR110DF/GR110DR 32A

* Check if the voltage and current conform to the requirement before installation.
* Connect the power cord to air switch with power pack, of which, the red line connecting with live wire, green line with zero line and yellow/green line with earth wire.
* Please hang the steam exhaust hose above the surface of waste water tank or connect to waste water receiving pipeline directly , and take care to avoid soaking the steam exhaust hose into the water.

* Note:

The specification of power cord connected switch or protective switch should comply with current requirements on nameplate of machine.
No heavy article is allowed to place on power cord and the damage or exposure of power cord or loosening of output lead may cause fire or electric shock.

III. CLEANING

* Turn on the power, open the cover of sterilizer chamber, and then take out the accessories and the protective foams from the chamber. Clean the chamber and put the water plate and stainless steel baskets in.

* Note:

Clean the foam scraps inside the sterilizer chamber completely to avoid blocking the pipeline.

IV. SETTING

When shipped from the factory,the unit is set for an elevation of between 0 and 300m.If the elevation of the installation location is higher than 300m,please ask your dealer to change the setting to avoid affecting normal work of sterilization.

CHAPTER 3 OPERATION INSTRUCTION

I. BASIC STERILIZATION ILLUSTRATION & OPERATION INSTRUCTION

1. TURNING ON THE POWER
2. OPENING THE STERILIZER CHAMBER COVER
3. ADDING WATER
4. LOADING ARTICLES TO BE STERILIZED
5. CLOSING THE STERILIZER CHAMBER COVER
6. SELECTING STERILIZING PROGRAM
7. STARTING STERILIZATION
8. PROGRAM FINISHED & OPENING THE COVER
9. TAKING THE STERILIZED ARTICLES OUT
10. TURNING OFF THE POWER

1. TURNING ON THE POWER

* Turn on the power switch on the left side of the machine
* The system may start self-inspection automatically, and then enter the standby status when all the indicators on the panel times: *ST-BY* blinks. When the Lock lever is on LOCK, screen A will show current temp and screen B will indicate the latest stored sterilization program number, while the panel will show corresponding work flowchart of that sterilization program. If the cover of chamber is not firmly locked, screen B will flash *LID*.

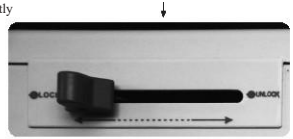
When chamber cover is unlocked blink three

* When the instrument is in standby status, if there is no operation within 30min, the instrument may enter the power down mode automatically, all the indicators except the LOCKED indicator will be off. Press any key to resume.

2. OPENING THE STERILIZER CHAMBER COVER

* While opening the cover, lightly press the middle of front end of chamber cover, and turn the lock lever to the right to UNLOCK position. At this time, the LOCKED indicator will be off and sterilizer will be disabled.
* Grab the handle and open the cover of chamber
* Note:

Press here lightly



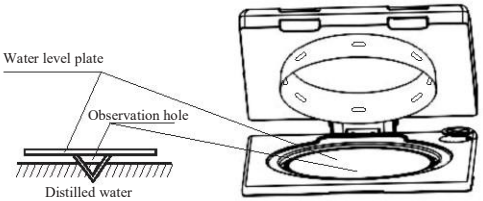
Do not open the chamber cover rudely to prevent seal ring from damage. During Lock lever operation, it is necessary to make sure that the instrument has been powered on and power switch is also on.

3. ADDING WATER

* Check and confirm if the drainage valve is turned off, otherwise the water in sterilization chamber or water tank may be discharged.
* The distilled water must be used inside the sterilizer chamber, well water, brine or hard water must be avoided to prevent the sterilizer chamber from corrosion, fouling and shortening the life of heater.

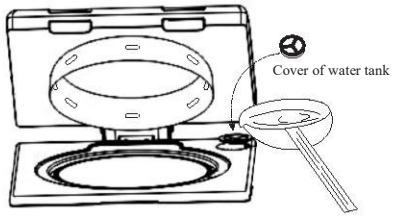
* In order to ensure the conductivity of filled water, do not use ultrapure water.

1) DA Series
* Add distilled water into the sterilizer chamber until the water flows into the observation hole in the middle of the water level plate. The water level shall not exceed the water plate.



* No need to pre-add water to the DA series water tank, bu the cooling water in the water tank may increase continuously when the instrument works continuously. when the water level is higher than the note "HIGH" , drain the water in the water tank.
* The water level inside the sterilizer chamber may decrease after each sterilizing. Care must be taken to compensate distilled water on time.
* If it is in a constant water shortage status, the heater may always be easy to dry scorch and then get rusted.

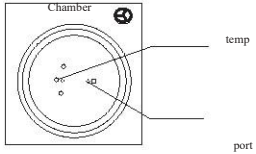
2) DF Series / DR Series
* Check if WATER indicator on display panel is on, when WATER indicator is off, the system will automatically start to feed water. When the water is short in tank, the instrument will show E11 and alarm.
* Check if the water level tube at rear right of instrument stays between LOW and HIGH.When the level is below LOW line, fully drain water in water tank and sterilization chamber, and add water until HIGH line.
* The water feed ladle with guide port will be used to add water to water tank and do not have water overflowed. In case of overflowing, dry it with cloth at once.



Add water to water tank

* The water level sensor should be regularly maintained, and it is recommended to frequently replace the water in sterilization chamber and water tank to prevent scale in water attaching to water level sensor and therefore affecting normal work of water level sensor.

4.LOADING ARTICLES TO BE STERILIZED



1*Take the stainless steel basket out, and put the articles to be sterilized into the basket;sensor
2*Put the basket back to the chamber of sterilizer
*Note:
Exhaust Do not block outlet or extrude the sensor in sterilization chamber, otherwise it may lead to abnormal work of instrument.Verify whether the water level plate is in place or not before putting the basket back into the sterilizer chamber, so that it will not be put on the heater directly.The load thermometer should be placed on water level plate and kept in sound.
* When plastic bag is used for sterilizing, please place the bag into the basket beforehand to avoid affecting the accuracy of temperature control of sterilizer.
* When sterilizing the waste processing bag, the bag must be opened to allow the steam to contact the articles to be sterilized adequately.
* When sterilizing the glassware like beaker, conical flask and test tube, the vessel must be put upside down or across. If the vessel can only be in vertical direction, put little water to the vessel before sterilizing.
* When sterilizing the liquids like chemical reagent or menstruum, care must be taken to the volume of liquid inside the container (3/4 of total volume of flask, and 1/2 of total volume of test tube), so that the liquid will not overflow from the container during sterilizing.
* The cover of container to be sterilized should be loosened for air exhaust to prevent container broken.
* During agar melting, the volume of container should be lower than 2L to prevent incomplete melting.
* The DURHAM TEST TUBE with over 6mm caliber should be used, otherwise air bubble may stay in the tube.

5. CLOSING THE STERILIZER CHAMBER COVER

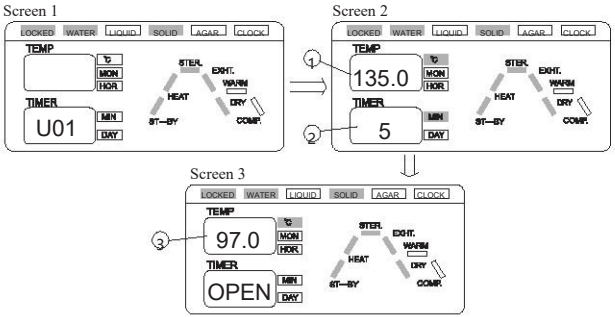
* Slightly press the middle of front end of chamber cover, slide the lock lever to the left to LOCK position so the system will trigger a warning tune and then the LOCKED indicator on display panel will be on.
* Note:
* Before closing the cover, check if there are objects on the surface of sealing ring of the cover and its contact part to avoid damaging the sealing ring that may result in steam leakage.
* The sterilizer will only start working until the LOCKED indicator is light; otherwise, the sterilizer will not be functional.

6. SELECTING STERILIZING PROGRAM

* DA Series / DF Series are designed with six basic program saved as U01, U02, U03, U04 , U05 and U06 before delivery.
* DR Series are designed with six basic working modes saved as U01, U02, U03, U04 , U05 and U06 before delivery.
* These basic working modes cannot be modified or deleted as well as the parameters of basic program, while, it allows the user to create new programs by selecting the above working modes or basic programs and modifying the parameters with maximum 20 programs (DA Series) or 60 programs (DA Series / DF Series) available including U01- U06.

(1) U01*Solid Mode

* Sterilizing flow: Heating → Sterilizing → Steam Exhaust → Release of Cooling Lock
* Application: solid sterilizing
* Press *DATA* button, the digital display A and B will display the detailed parameters once by three screens:

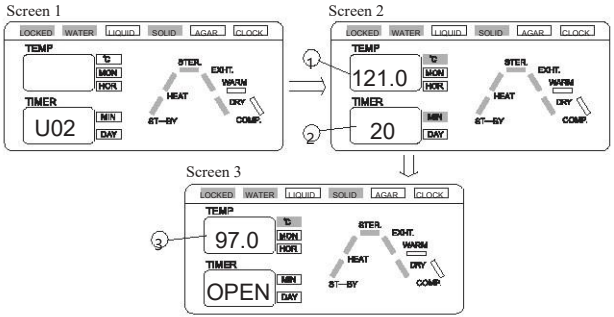


* U01 default parameters and the parameters scope of its newly generated program

Name	No.	Default Parameter	Parameters Range of New Program
Sterilizing Temperature	①	135℃	105-138℃
Sterilizing Time	②	5min	1min ~ 300min
Warming Temperature		No warming	No warming
OPEN Temperature	③	97℃	40 ℃-99℃

(2) U02-Solid Mode *only for DA Series / DF Series*

* Sterilizing flow: Heating → Sterilizing → Steam Exhaust → Release of Cooling Lock
* Application: solid sterilizing
* Press *DATA* button, the digital display A and B will display the detailed parameters once by three screens:

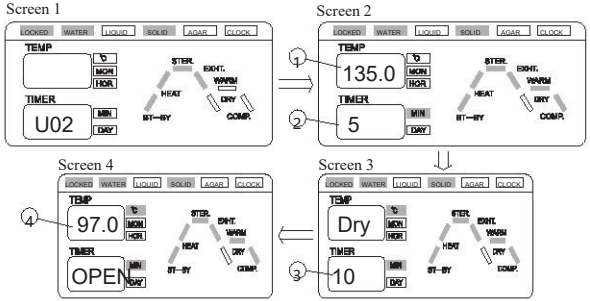


* U02 default parameters and the parameters scope of its newly generated program

Name	No.	Default Parameter	Parameters Range of New Program
Sterilizing Temperature	①	121℃	105-138℃
Sterilizing Time	②	20min	1min ~ 300min
Warming Temperature		No warming	No warming
OPEN Temperature	③	97℃	40℃~99℃

U02-Solid (with Drying) Mode*only for DR Series*

* Sterilization flow: Heating → Sterilization → Exhaust → Water Drainage → Drying → Release of Cooling Lock
* Application: Solid sterilization and then drying.
* Press *DATA* button, the digital display A and B will display the detailed parameters once by four screens:



* U02 default parameters and the parameters scope of its newly generated program

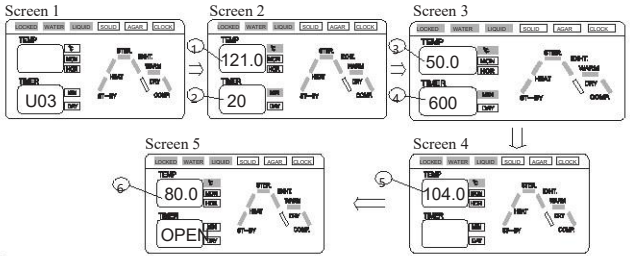
Name	No.	Default Parameter	Parameters Range of New Program
Sterilizing Temperature	∗①	135℃	105-138℃
Sterilizing Time	∗②	5min	1min ~ 300min
Warming Temperature		No warming	No warming
Drying Time	∗③	10 min	1min ~ 300 min
OPEN	∗④	97℃	40℃-99℃

(3) U03-Liquid(with warming) Mode

* Sterilizing flow: Heating → Sterilizing → Steam Exhaust → Warming → Release of Cooling Lock

* Application: liquid sterilizing, it may enter automatic warming after sterilization to avoid concretion (e.g. sterilizing of agarose medium)

* Press *DATA* button, the digital display A and B will display the detailed parameters once by five screens:



* U03 default parameters and the parameters scope of its newly generated program

Name	No.	Default Parameter	Parameters Range of New Program
Sterilizing Temperature	∗①	121℃	105-138℃
Sterilizing Time	∗②	20min	1min ~ 300min
Warming Temperature	∗③	50℃	45℃~60℃
Warming Time	∗④	600 min	1min ~ 9999 min
exhaust temperature	∗⑤	104℃	73~104℃
OPEN temperature	∗⑥	80℃	40-80℃

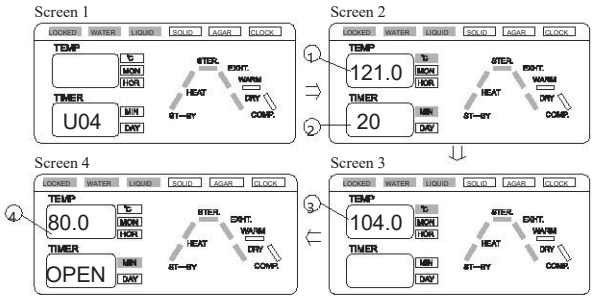
* Note:
The liquid mode may pre-cool the sterilization chamber and articles by setting exhaust temp to prevent excessive pressure drop in the course of exhaust leading to overflowing of load fluid.

(4) U04-Liquid Mode

* Sterilizing flow: Heating → Sterilizing → Precooling → Steam Exhaust → Release of Cooling Lock

* Application: liquid sterilizing, no warming after sterilization (such as water, menstruum, chemical reagent and liquid chemicals)

* Press *DATA* button, the digital display A and B will display the detailed parameters once by four screens:

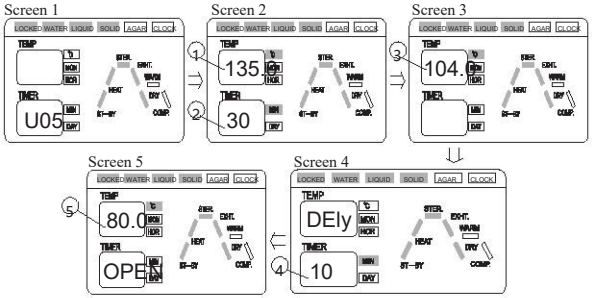


* U04 default parameters and the parameters scope of its newly generated program

Name	No.	Default Parameter	Parameters Range of New Program
Sterilizing Temperature	✻①	121℃	105~138℃
Sterilizing Time	✻②	20min	1min ~ 300min
exhaust temperature	✻③	104℃	73~104℃
Warming Temperature		No warming	No warming
OPEN temperature	✻④	80℃	40-80℃

(5) U05-Waste sterilization Mode

* Sterilizing flow: Heating →Sterilizing → Precooling → Steam Exhaust → Release of Cooling Lock
* Application: Sterilization of waste, including solid, liquid or solid & liquid mixture
* Press *DATA* button, the digital display A and B will display the detailed parameters once by five screens:



* U05 default parameters and the parameters scope of its newly generated program

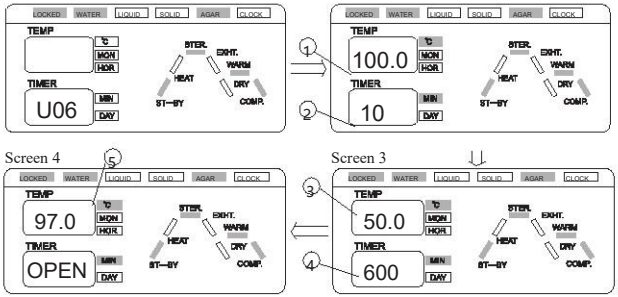
Name	No.	Default Parameter	Parameters Range of New Program
Sterilizing Temperature	✻①	135℃	105~138℃
Sterilizing Time	✻②	30min	1min ~ 300min
exhaust temperature	✻③	104℃	73~104℃
Warming Temperature		No warming	No warming
DELY Time	✻④	10min	0min ~ 15min
OPEN temperature	✻⑥	80℃	40~99℃

* Note:
DELY Time: It means that it will prolong the airpurgeing time to obtain sufficient saturated steam, but overlong DELY time may lead to water shortage in subsequent sterilization stage.

(6) U06 - Agar Mode

* Sterilizing flow: Heating →Melting → Warming →Release of Cooling Lock
* Application: agar melting and warming
* Press *DATA* button, the digital display A and B will display the detailed parameters once by four screens:

Screen 1Screen 2



* U06 default parameters and the parameters scope of its newly generated program

Name	No.	Default Parameter	Parameters Range of New Program
Melting Temperature	✻①	100℃	60~100℃
Melting Time	✻②	10min	1min ~ 300min
Warming Temperature	✻③	50℃	45~60℃
Warming Time	✻④	600min	1min ~9999min
OPEN Temperature	✻⑤	97℃	40~99℃

* Note:
For safety purpose, the cover is designed to be opened only when temp in chamber is lower than set OPEN temp. In case the load thermometer is fitted, the cover could only be opened when the temp in chamber and load temp are both lower than the set OPEN temp.

7. STARTING STERILIZATION

1)The newly saved program will be displayed automatically at the start, press *START*button to use this program directly.
2)To use other saved programs: under standby status, press *UP* or *DOWN* button once, the program number will increase or decrease by 1 from the current number. For example, the current program number is U10, press *UP* button once, the program number will be U11, or press *DOWN* once, the program number will be U09; you can press and hold the *UP* or *Down* button to increase or decrease the number quickly by 10 units. When the button is released, it will display the detailed parameters of current program by two or five screens automatically. Select the proper program and press *START* to start working.
3) Modify or set new programs and start:
* Set new programs: Press *UP* or *DOWN* to find the program of the desired mode U01 * U06, and then press *SET/ENT* button to enter the parameters modification screen (See Chapter 3 Operation Instruction Part II - Creating, Modifying and Deleting the Program for details); After modification, press *SET/ENT* again to save and press *START* to start working, or press *START* to start working directly after modification without saving.
* Modify the saved programs: Press *UP* or *DOWN* to find the program of the desired mode, except U01 * U06, and then press *SET/ENT* button to enter the parameters modification screen (See Chapter 3 Operation Instruction Part II * Creating, Modifying and Deleting the Program for details); After modification, press *SET/ENT* again to save and press *START* to start working, or press *START* to start working directly after modification without saving.
4) Auto startup (See Chapter 3 Operation Instruction Part III - Clock Checking and Calibration and Part IV - Setting Auto Startup Timer for details)
* Note:
For the avoidance of misoperation, the START and STOP buttons are designed with delay response function so it could only work when pressed and held for 2s or more.
When the printer is installed and set to be enabled in administrator menu, it will print the record of the whole sterilization process.

8. PROGRAM FINISHED & OPENING THE COVER

* When the set sterilizing time , melting time or drying time is up, the system will send out a sound alarm.
* When all the programs have been finished and the temperature is lower than the OPEN temperature(If the load thermometer is fitted, when the temp in chamber and load temp are both lower than the set OPEN temp.) , the *COMP.* letter will blink. The system will send out five long sounds to indicate the accomplishment of sterilizing.
* If the temperature is lower than 40*, the system returns to the standby status, it is then safe to open the cover.
* Note:
Never press the *STOP* button casually to stop the running program during sterilizing of liquids to avoid the liquid overflowing into the sterilizer chamber and even blocking the valve and pipelines.

9. TAKING THE STERILIZED ARTICLES OUT

* Always wear the heat insulation gloves when taking articles after sterilizing out of the sterilizer chamber, and wait until the steam disperses before reaching into the sterilizer chamber.
* When sterilizing the liquids, verify the temperature is low enough before taking it out to avoid scald due to low cooling speed of liquid.
* In case of providing and enabling load thermometer, it is possible to press OBJECT TEMP button to check actual temp of liquid. When taking out of sterilized articles, the load thermometer should be soundly placed on water level plate.

10. TURNING OFF THE POWER

* Power must be switched off when the work has been finished or the instrument will not be used for a long period of time.
* DF Series / DR Series: When sterilization is completed of a day, it is recommended to drain out all water in sterilization chamber and water tank.
* DA Series: When sterilization is completed of a day, it is recommended to drain out all water in sterilization chamber.

II. CREATING, MODIFYING, DELETING THE PROGRAM

Press the *UP* or *DOWN* button to find the program of the desired mode U01~U06, and then press *SET/ENT* to enter the parameters modification screen. Press *UP* or *DOWN* to adjust the setting . It will increase or decrease by one unit at each time the button is pressed, once the button is pressed and held, the value will increase or decrease by ten units until it reaches the upper limit or the lower limit. Press the *SET/ENT* button again, the setting or modification will be saved permanently even if power failure. If you do not want to save the modification, before pressing the *SET/ENT* button the second time, press *DATA* button to return to the standby status or press the *START* button to start sterilizing without saving the modification.

1) When the sterilizing temperature, *STER.* letter and the sterilizing status indicator on the screen A blink ,it indicates that it is ready to modify the sterilizing temperature.Press the *NEXT* button,when the sterilizing time, *STER.* letter and the sterilizing status indicator on the screen B blink ,it indicates that it is ready to modify the sterilizing time.

2) Press the *NEXT* button, when the temperature 97.0*(U01,U02,U06 and theirs newly generated program) or 80.0*(U03,U04,U05 and theirs newly generated program) on the screen A blinks and screen B display *OPEN*,it indicates that it is ready to modify the cooling lock OPEN temperature.

3) Press the *NEXT* button, when *Dry* letter on screen A, the drying time *10* on screen B blink, it indicates that it is ready to modify the drying time.

4) Press the *NEXT* button, when the warming temperature, *WARM* letter and the warming status indicator on the screen A blink ,it indicates that it is ready to modify the warming temperature. Press the *NEXT* button, when the warming time, *WARM* letter and the warming status indicator on screen B blink ,it indicates that it is ready to modify the warming time.

5) Press the *NEXT* button, when the temperature *104.0*, *EXHT.* letter and steam exhaust status indicator on screen B blink,it indicates that it is ready to modify the steam exhaust temperature.

6) Press *NEXT* button , when *DELY* letter on screen A, the delay time *10* on screen B blink, it indicates that it is ready to modify the delay time.

7) Press *NEXT* button , when the melting temperature, *HEAT* letter and the heating status indicator on screen A blink, it indicates that it is ready to modify the melting temperature.Press the *NEXT* button, the melting time *10*, *HEAT* letter and the heating status indicator on the screen B blink ,it indicates that it is ready to modify the melting time.

* Note:
The parameters of programs can only be modified under standby status, and the set parameters cannot be changed during sterilizing.
Press the *NEXT* button at each time, the parameters of basic programs and the newly generated program from which will be modified by the following sequence:

GR60DF/GR60DA/ GR85DF/ GR85DA/ GR110DF/ GR110DA

Program	Set/Ent	Next	Next	Next	Next	Next	Next
U01&its generated programs	Display A:Sterilizing temperature	Display B:Sterilizing time	Display A:OPEN temp	Repeat			
U02&its generated programs	Display A:Sterilizing temperature	Display B:Sterilizing time	Display A:OPEN temp	Repeat			
U03&its generated programs	Display A:Sterilizing temperature	Display B:Sterilizing time	Display A:Warming temp	Display B:Warming time	Display A:Exhaust temp	Display A:OPEN temp	Repeat
U04&its generated programs	Display A:Sterilizing temperature	Display B:Sterilizing time	Display A:Exhaust temp	Display A:OPEN temp	Repeat		
U05&its generated programs	Display A:Sterilizing temperature	Display B:Sterilizing time	Display A:Exhaust temp	Display B:DELY time	Display A:OPEN temp	Repeat	
U06&its generated programs	Display A:Sterilizing temperature	Display B:Melting time	Display A:Warming temp	Display B:Warming time	Display A:OPEN temp	Repeat	

GR60DR/GR85DR/GR110DR

Program	Set/Ent	Next	Next	Next	Next	Next	Next
U01&its generated programs	Display A:Sterilizing temperature	Display B:Sterilizing time	Display A:OPEN temp	Repeat			
U02&its generated programs	Display A:Sterilizing temperature	Display B:Sterilizing time	Display A:Drying time	Display A:OPEN temp	Repeat		
U03&its generated programs	Display A:Sterilizing temperature	Display B:Sterilizing time	Display A:Warming temp	Display B:Warming time	Display A:Exhaust temp	Display A:OPEN temp	Repeat
U04&its generated programs	Display A:Sterilizing temperature	Display B:Sterilizing time	Display A:Exhaust temp	Display A:OPEN temp	Repeat		
U05&its generated programs	Display A:Sterilizing temperature	Display B:Sterilizing time	Display A:Exhaust temp	Display B:DELY time	Display A:OPEN temp	Repeat	
U06&its generated programs	Display A:Melting temperature	Display B:Melting time	Display A:Warming temp	Display B:Warming time	Display A:OPEN temp	Repeat	

2. DELETING THE PROGRAM

* Select the program to be deleted, and press and hold the *FUNC* & *STOP* button at the same time to delete the current program.
* These six basic programs ,U01-U06,cannot be modified or deleted.

3. SETTING THE STERILIZING TIME

* Some articles (such as liquid) have higher thermal inertia, so for obtaining better sterilization effect, it is recommended to use load thermometer. In case of not providing load thermometer, it is necessary to compensate it based on normal sterilization time.
It is required to delay the sterilizing time of liquid, i.e. the set sterilizing time shall be delayed:

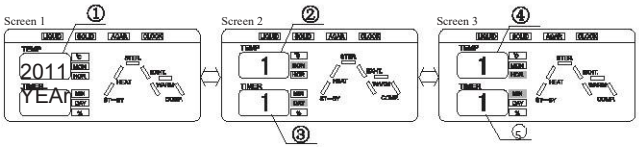
For example, if the volume of water in the flask is 3L, when the internal temperature of the sterilizer chamber reaches the set value, another 33 minutes shall be required for the water in the flask to reach this temperature, therefore, the sterilizing time must be set to 53 minutes.
Actual required sterilizing time (53min) = Delay time (33min) + Normal sterilizing time (20min)

Sterilizing Delay Time Reference Value (Every Flask)	
Liquid Volume	Delay Time
3L	33 min
2L	24 min
1L	16 min

* Where load thermometer is provided and enabled, the temp of sterilization chamber will reach set sterilization temp, but the timer of sterilization won't start to count backward. The timer of sterilization could only start when the article really comes to set sterilization temp.
* When waste processing bag is used for sterilizing, 300~500ml water will be helpful to shorten the delay time of temperature-rise period.
* When sterilizing the plastic products, the sterilizing time shall be delayed adequately due to the slow heat conduction of plastic products.

III. CLOCK CHECKING AND CALIBRATION

* Under standby status, press *FUNC* and *NEXT* buttons together to enter the clock checking and calibration mode F05, with the digital display A and B showing the currently parameters automatically by sequence:



* F05 Default parameter & parameter adjustable range

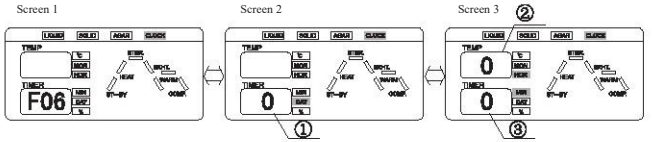
Name	No.	Default Parameter	Adjustable Range
Year	①	2011	
Month	②	1	1*12
Day	③	1	1*31
Hour	④	1	0*23
Minute	⑤	1	0*59

1) After setting the time, press *DATA* button to exit.
2) If the time is not set properly, press *SET/ENT* button to enter the parameters modification status: the time on the screen A and *Year* on the screen B blink to indicate that it is ready for modification. Press *UP* or *DOWN* button to adjust.
3) Press *NEXT* button ,the time and month indicators on the screen A blink to indicate that it is ready for modification. Press *UP* or *DOWN* button to increase or decrease the display value by 1 month at one press; Press and hold the button to increase or decrease the display value by 10 units, and then it stops at 12 (or 1) once it exceeds the maximum value 12 (the minimum value 1).
4) Press *NEXT* button, the time and day indicators on the digital display B blink to indicate that it is ready for modification. Press *UP* or *DOWN* to increase or decrease the display value by 1 day at one press. Press and hold the button to increase or decrease the display value by 10 units, and then it stops at 31 (or 1) once it exceeds the maximum value 31 (the minimum value 1).
5) Press *NEXT* button again, the time and hour indicators on the digital display A blink to indicate that it is ready for modification. Press *UP* or *DOWN* to increase or decrease the display value by 1 hour at one press. Press and hold the button to increase or decrease the display value by 10 units, and then it stops at 23 (or 0) once exceeds the maximum value 23 (the minimum value 0).

6) Press *NEXT* button again, the time and minute indicators on the digital display B blink to indicate that it is ready for modification. Press *UP* or *DOWN* to increase or decrease the display value by 1 minute at one press. Press and hold the button to increase or decrease the display value by 10 units, and then it stops at 59 (or 0) once exceeds the maximum value 59 (the minimum value 0).
7) Press *SET/ ENT* button to save the set or modified parameter permanently, which will not be lost even in case of power off. To exit without saving the modification, press the *DATA* button to return to the standby status before pressing the *SET/ ENT* button the second time.

IV. SETTING AUTO STARTUP TIMER

1) Under clock checking and calibration mode (F05), press *FUNC* and *NEXT* buttons together to enter the auto startup timer mode *F06*, with the digital display A and B showing the currently parameters automatically by sequence:



* F06 Default parameter & parameter adjustable range

Name	No.	Default Parameter	Adjustable Range
Delay Day	①	0	0-6
Startup Time	②	0	0-23
Startup Time	③	0	0-59

2) After setting the delay time, press *DATA* button to exit.
3) If the time is not set properly, press *SET/ENT* button to enter the parameters modification status:
The digital display B (delay day) blinks to indicate that it is ready for modification. Press *UP* or *DOWN* to increase or decrease the display value by 1 day at one press, with the maximum 6 days and minimum 0 day delay available.
4) Press *NEXT* button, the digital display A (hour) blinks to indicate that it is ready for modification. Press *UP* or *DOWN* to increase or decrease the display value by 1 hour at one press; press and hold the button to increase or decrease the display value by 10 units, and then it stops at 23 (or 0) once it exceeds the maximum value 23 (the minimum value 0).

5) Press *NEXT* button again, the digital display B (minute) blinks to indicate that it is ready for modification. Press *UP* or *DOWN* to increase or decrease the display value by 1 minute at one press. Press and hold the button to increase or decrease the display value by 10 units, and then it stops at 59 (or 0) once it exceeds the maximum value 59 (the minimum value 0).
6) For example:
(1) If it is planned to start up the machine at 6:30 pm, please set the time as follows: delay day=0, hour=18, minute=30.
(2) If it is planned to start up the machine at 6:00 am next morning, please set the time as follows: delay day=1, hour=6, minute=0.
7) Press *SET/ENT* button to save the modified data, and the *Clock* indicator is on. Press *DATA* button, it will display the specific parameters of current program.
8) Press *START* button, the timer starts working, and *CLOCK* and *ST-BY* indicators blink. Otherwise, if *START* button is not pressed, the machine will not start working automatically although the time has been preset.
9) Cancel the auto startup timer setting: Enter the timer setting mode F06 again to modify all delay time to 0 or turn off the power to disable the auto startup timer setting.

* Note:
The clock shall be calibrated before setting the auto startup timer. Incorrect clock or auto startup timer setting may not allow you to achieve the sterilized products at the desired time.
Auto startup timer must be reset after each use.

CHAPTER 4 MAINTENANCE,CARE & MANAGEMENT

* Note: Before repair and maintenance, it is required to shut down the power, and such work could only be done after sterilization chamber is cooled down.

I.MAINTENANCE

1. WATER CHANGE AND CLEANING OF WATER TANK

1*Water change
* The water in tank should be at least changed once every week; Frequent change of water is helpful for preventing pipe clogging and fittings aging and improving the service life of instrument.
* Ues the Silicone tube to connect the drain port of the tank to the water collector or sewer, and then open the drain valve to drain the water in the tank
* Note: If the sterilizer will not be used for a long period of time or need to transport, the water in the water tank must be emptied.
2) Cleaning of water tank
* Screw off screws on the right side board, take off the right side board, drain the water in water tank and then screw off the cover on manhole of water tank, take off the sealing plug to wipe inside of tank with clean cloth and remove scale and other contaminants.
* Put hot water of 60*-80* (free of any detergents) into the tank, and then drain it. Clean the tank again if necessary.
* Install the sealing plug, lock the cover of the tank and right side board

2. WATER CHANGE AND CLEANING OF STERILIZER CHAMBER

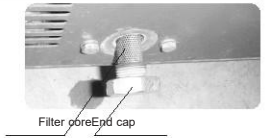
1) Water change for sterilization chamber
* Repeated use of water in sterilization chamber will result in chamber corrosion and pipe clogging, so it is recommended to replace water every day.
* For draining, connect one end of drain pipe to the drain port of sterilization chamber and place the other end in water collector. Open the drain valve to discharge water and close valve anticlockwise after fully drained.
* Note:
If the sterilizer will not be used for a long period of time or need to transport, the water in the sterilizer chamber must be emptied.

2) Cleaning of sterilization chamber
* Despite of existence of mesh filter in water tank and pipe, the scraps of object may also lead to failure of valve and pipe clogging or attach to heater so as to reduce the service life of heater. Therefore, the water scale, paper scrap or foreign matters in sterilization chamber should be firstly removed.
* Clean the bottom of sterilization chamber with a brush with handle moderately to prevent damage of heater and temp control switch.

* Clean the sterilization chamber with wet soft cloth and then rinse it with hot water (without any cleaning agent).
* It is recommended to clean once a week.

3. CLEANING OF WATER FEEDING AND DRAIN FILTER CORE

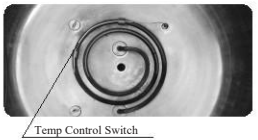
* The water feeding filter and drain filter is located in the middle of rear lower part of instrument so it is required to turn off the end cap first and take out filter core for cleaning with fresh water, then recover the filter core and lock the cap.



* It is recommended to clean once three months.
* Water feeding filter and drain filter are available for DR series, drain filter is available for DF series

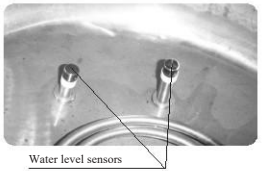
4. CLEANING & MAINTENANCE OF HEATER

* Take out the water level plate and check whether the surface of heater is clean or not; Otherwise, wash with soft brush and rinse, and then empty the dirty water.
* Care must be taken to avoid moving or destroying the temperature control switch during cleaning.
* It is recommended to clean once a month.



5. CLEANING OF WATER LEVEL SENSOR

* High and low water level sensor are available for DF series / DR series, low water level sensor is available for DA series. Water level sensor should be kept clean. Any stain attaching on surface of water level sensor will be possible to lead to false alarm or even work interruption.
* It is recommended to clean it with soft cloth every week to remove stain on its surface.



6. CLEANING THE INSTRUMENT SURFACE

* Wipe external surface of instrument with soft cloth lightly and it is allowed to use a small amount of neutral cleaning agent to remove ingrained stain and then clean it with dry cloth.

* Do not clean surface of instrument with phenol or paint thinner to avoid damaging the surface of instrument or loosening the paint.

7. OTHERS

1) Replacement of air filter core
* Open the sideboard on the left and find the white column fitting (i.e. filter core) at the right side connecting with the blower, then turn it clockwise with hand to take off the filter core. When the filter core surface is attached

material, the filter core should be replaced.
* Air filter is available for DR series
2) Maintenance of sealing ring
* Check if the sealing ring is broken and replace it immediately if broken.
* Regularly clean the surface of sealing ring to remove stains. Small amount of cleaning agent may be used for cleaning and wipe the surface with wet cloth.

II. TEST AND CARE

1. CHECKING THE LEAKAGE PROTECTION SWITCH

* Press the leakage protection switch to test the button, if the switch trips, it shall be normal, otherwise, turn off the power switch and contact the dealer.
* Press the reset switch, and turn the switch back to the upturned position, and then wire up the instrument.
* Check at least once six months.

2. CHECKING THE SAFETY VALVE

* Enter into the administrator menu and press UP or DOWN button to choose safety valve test program and press SET/ENT to enter the submenu. After that, press UP or DOWN to choose *yes* which represents the selection of safety valve test program, and another press of SET/ENT will exit the menu.
* Upon this set, the instrument will come into safety valve test conditions. Screen B will show TEST and press and hold START button will trigger the test, then TEST indicator flashes and the test may be cancelled by press of STOP button.
* When the temp increases to 143-148*, and pressure rises to 0.29-0. 32Mpa, the safety valve will start to exhaust. At this time, the pressure will not rise any more or slowly reduce, this means the safety valve works normally.
* If the safety valve doesn't start to exhaust when temp exceeds 148*, it indicates that the safety valve is not normally working. Please stop the test immediately and contact with the dealer.
* Press STOP button to stop test, the screen will display E03. It' s normal and please press STOP button again to come back to standby status.

3. REPLACEMENT OF SEALING RING

* Open the sterilization chamber cover.
* Insert the slotted screwdriver into lower part of locking ring and slightly lift it upward to take out the worn washer and locking ring from worn sealing ring.
* Remove stains on locking ring and the part in the chamber contacting with Sealing ring with cloth.
* Place the locking ring on groove bottom on new sealing ring and slowly press the sealing ring to external edge of sterilization chamber until fully embedded. In case the locking ring is out, press it back to fixed groove with soft plug. When the sealing ring is fully in place, its upper edge will be slightly lower than external edge of sterilization chamber and the lower edge of it will contact with metal surface of the seat. Slightly press the surface of sealing ring with hand to keep it smooth. The cover of chamber will be hard to be closed for unsmooth surface of sealing ring.
* Operate the instrument in a conventional way and observe the air-tightness of sealing ring.

4. HOW TO DISMANTLE THE LEFT AND RIGHT SIDEBOARDS

* The left and right side boards of instrument are dismountable for the convenience of maintenance.
* The locking bolts for side boards are on the bottom of instrument, which could be screwed off by hand or tool.
* The printer (optional) is fixed on the left side board so the wire of printer should be pulled off first during dismantling the left side board and prevented from damaging.

5. HOW TO RELEASE THE INTERLOCK

* In case of power failure during the operation of instrument, the cover of chamber has to be opened so it is required to firstly confirm the reading of pressure gauge is at *0Mpa* and the temp of chamber is lower than cooling lock OPEN temp, then open the left side board.
* Grab the handle on lower end of electromagnetic lock at top right and slightly pull it down, the lock will be released and then the cover of chamber may be opened.

III. SETTING OF ADMINISTRATOR

* Under standby condition, press and hold FUNC and DATA buttons, then screen A will show *0000* Among these, the first *0* flashing means it is. changeable. And press of UP or DOWN button may adjust the first digit to *6*, and then press NEXT button. At this time, the second *0* flashing means it is changeable. By analogy, you could input password and press SET/ENT button for confirmation to enter into parameter modification menu.
* In this menu, screen A will show P001 and screen B will display corresponding parameters so that you could press UP or DOWN button to change. After change, press SET/ENT button to save and exit, or press DATA button to quit. Choosing the NEXT button, screen A will show the next setting menu or press and hold the NEXT button until the desired menu to be changed appears.

* Administrator menu

P001 Printer enabled or not: Yes refers to printer enabled that could print various status data automatically during operation, and no means printer disabled.
P002 Load thermometer enabled or not: Yes indicates enabled and no means disabled.
P003 Setting of pressure unit: 1: Kpa; 2: bar; 3: psi; 4: no means no this optional accessory or pressure sensor disabled.
P004 Display of printing date: 0: DDMMYY; 1: YYMMDD
P005 Printing language: 0: English; 1: Chinese
P006 Safety valve test: yes for enabled; no for disabled
P007 Chamber temp sensor*s temp compensation: the temp compensation scope is -5--+5; screen B will show temp compensation value and press of UP or DOWN button may adjust the value.
P008 Load temp sensor*s temp compensation: the temp compensation scope is -5--+5; screen B will show temp compensation value and press of UP or DOWN button may adjust the value.
P009 Setting of max working temp: The temp range is 135-145* and press of UP or DOWN button may adjust the max temp for safety valve test.
P010 Setting of local altitude: the UP or DOWN button may be used for adjusting the altitude and every press of this button will increase or decrease one unit and pressing and holding it will be 10 units increase or decrease until the upper limit of 3000m or lower limit of 0.
P011 Boiling point temp corresponding to altitude: after setting of altitude, press NEXT button and local boiling point will be shown, and the value of 99.8 on the screen represents the boiling point 99.8*.
P012 Cooling fan enabled or not: yes means enabled and no for disabled.
P013 Button sound switch: yes means enabled and no for disabled.
P014 Display of software version: no change available
P015 Setting of exhaust temp in solid mode:The temp range is 105-135*, press the Up or Down button to adjust.

CHAPTER 5 TROUBLESHOOTING

* The automatic control system of the sterilizer monitors the real time operation of the instrument. Whenever any failure occurs, the system may send out alarm and display the error code, then, please press the STOP button and turn off the power, check the error code and handle on time.
* For the purpose of safety, the cover of sterilization chamber could only be opened when no pressure exists in the chamber and its temp is lower than cooling lock OPEN temp.

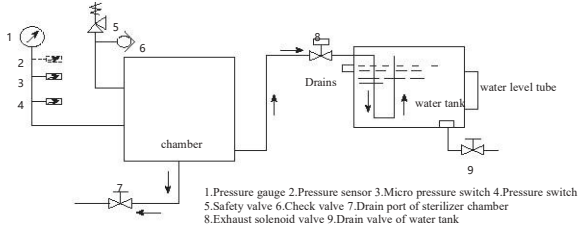
Error Code/ Symptom of Failure	Possible Causes	Troubleshooting Method
E01	The cover of sterilizer chamber is not secured	Check if the lock lever is properly closed
E02	heater is burnt	Contact the local dealer
E03	Heater dry scorch	Add water to the chamber until the water flows into the observation hole or WATER indicator is on
	Safety valve or pressure switch is not functional and lead to pressure builds up excessively	Replace the safety valve or pressure switch
	Out of control of temp leading to overpressure in chamber	main board or temp sensor failed
E04	Abnormal fluctuation of power results in abnormal change of temp	Whether the power supply is between 198V and 242V
E05	Solenoid valve jammad by contaminants leads to abnormal work of exhaust valve	Contact the local dealer to change the steam exhaust valve
E06	Chamber temperature sensor comes off the circuit board	Plug the temperature sensor in place
	Chamber temperature sensor is not functional	Replace the temperature sensor
E07	Plug or joint of chamber temperature sensor is short-circuited	Contact the local dealer to replace the temperature sensor
E08	Temperature in the chamber when start working is higher than the boiling point	Wait until the temperature falls down before restart
E09	Improper setting of the startup timer	Reset the timer
E10	Power failure in the course of sterilization	Resterilize
E11	Water shortage in water tank	Add water to water tank
E12	Failure of micro-pressure switch	Replace the switch
E13	Failure of drying temp controller	Contact the local dealer

E14	Failure of heating system or temperature control system	Contact the local dealer
E15	Water level of sterilization chamber is too low	Add water to chamber
E16	Load temperature sensor comes off the circuit board	Plug the temperature sensor in place
	Load temperature sensor is not functional	Replace the temperature sensor
E17	Plug or joint of load temperature sensor is short-circuited	Contact the local dealer to replace the temperature sensor
E18	Over high pressure in sterilization chamber	Stop working and contact the local dealer
E19	Contamination of water level sensor	Wipe the two water level sensors with clean cloth
E20	Safety valve test circuit failed.	Contact the local dealer
	Reset switch is not pressed	Press the reset switch
Leakage protection switch trips	Electric leakage, short-circuit or over-current with the instrument	Contact the local dealer

The above chart covers the simple problems, if you can not handle them by yourselves please contact the local dealer and provide the following information:
1)Model and serial number of machine
2)Broken part and symptom of failure(or Error code)
3)Opernational information(including sterilizing articles)
4)Purchasing date of machine

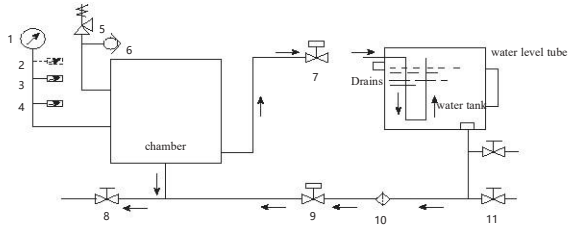
CHAPTER 6 DIAGRAM OF PIPELINE & INTERFACE

I.PIPELINE FOR GR60DA/GR85DA/GR100DA/GR110DA



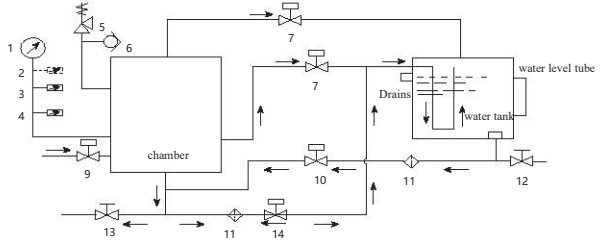
1.Pressure gauge 2.Pressure sensor 3.Micro pressure switch 4.Pressure switch 5.Safety valve 6.Check valve 7.Drain port of sterilizer chamber 8.Exhaust solenoid valve 9.Drain valve of water tank

II.PIPELINE FOR GR60DF/GR85DF/GR100DF/GR110DF



1.Pressure gauge 2.Pressure sensor 3.Micro pressure switch 4.Pressure switch 5.Safety valve 6.Check valve 7.Exhaust solenoid valve 8.Drain port of sterilizer chamber 9.Inlet solenoid valve 10.Filter 11.Drain valve of water tank

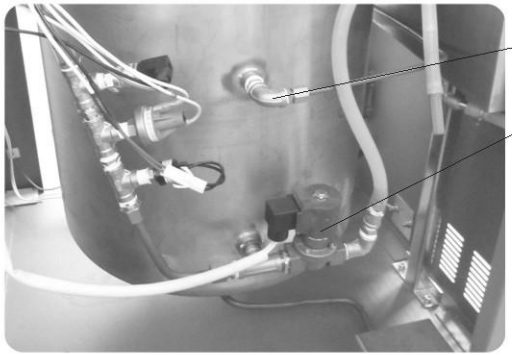
III.PIPELINE FOR GR60DR/GR85DR/GR100DR/GR110DR



1.Pressure gauge 2.Pressure sensor 3.Micro pressure switch 4.Pressure switch 5.Safety valve 6.Check valve 7.Solenoid valve on the top 8.Exhaust solenoid valve 9.Drying solenoid valve 10.Inlet solenoid valve 11.Filter 12.Drain valve of water tank 13.Drain port of sterilizer chamber 14.Return solenoid valve

IV. INTERFACE DIAGRAM

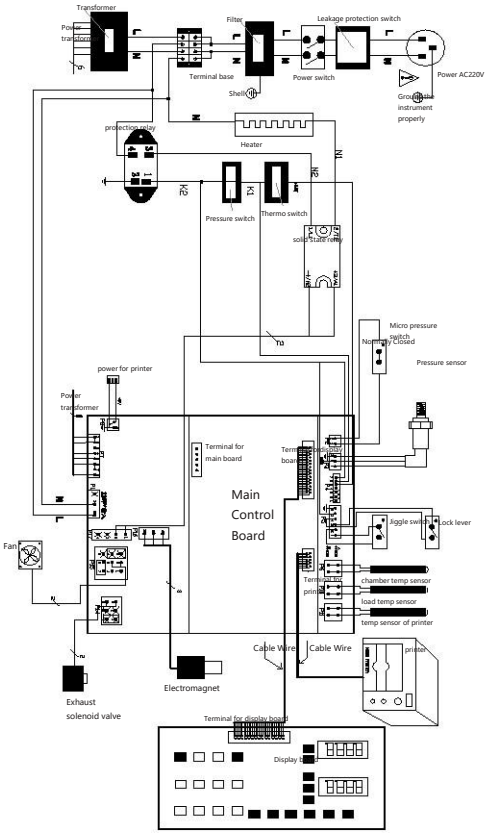
Left view



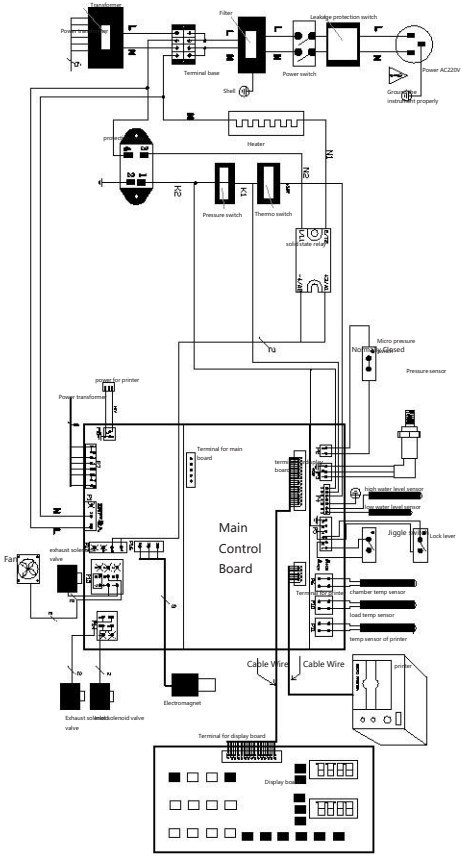
Right view

CHAPTER 7 WIRING DIDAGRAM

I. WIRING DIAGRAM FOR GR60DA/GR85DA/GR100DA/GR110DA



II. WIRING DIAGRAM FOR GR60DF/GR85DF/GR100DF/GR110DF



III.WIRING DIAGRAM FOR GR60DR/GR85DR/GR100DR/GR110DR