



10303001/10303002/10303003

Aquilon
Chiller

User Manual

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For claims under the warranty please contact your local supplier. You may also send the instrument directly to manufacturer, enclosing the invoice copy and by giving reasons for the claim.

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II. Safety



IMPORTANT Safety Items to be Observed.

Safety Warnings

! DANGER (may cause serious damage to property and or casualties)

1. Please carefully read this User Manual prior to operating the instrument and observe the instructions on safe operation.
2. Ensure that only trained staff operate this instrument
3. The power source must be grounded reliably and away from any sources of electromagnetic interference.
4. Ensure that the instrument and its accessories are free of any potential defects.
5. Confirm that the voltage and frequency of the power supply matches the specified voltage and frequency specified prior to use.
6. Ensure the cover of the junction box is properly installed prior to operation.
7. Always wear applicable PPE whilst operating the instrument.
8. Place the instrument on a stable, dry, clean, antiskid, and fireproof surface.
9. Ensure there is sufficient ventilation gaps and spacing above and around the instrument
10. Ensure the instrument is stable and level and will not move due to vibration upon start-up.
11. Liquid must not enter the casing

! WARNING (may cause property damage or personal injury)

12. The working environment must be free of any flammable, explosive, volatile or corrosive substances.
13. Only accessories listed as 'optional accessories' for use, can guarantee operational safety.
14. Ensure handling and disposal of packaging is compliant to local environmental laws and regulations.

! ATTENTION (may affect operational performance or service life)

15. The instrument is de-energized only when the power cable is disconnected from the power source.
16. Ensure the instrument and its accessories are protected from external vibration.
17. The Company reserves the right to modify the design and technical data of the pump without notice.

18. Only accredited and qualified professional repair technicians can open the instrument or conduct required repairs. Persons performing repairs on the instrument other than those selected or approved by the Company shall operate to void any warranty contained hereinabove for the product
19. Do NOT operate this instrument immediately after transport, wait 1-2 days before operating. The instrument must be used in accordance with this User Manual.

2.1 After Sales Support

If problems are encountered or technical support is required when installing or using the instrument, please contact serviceusa@hollandgreenscience.com

The Company may provide technical assistance and information regarding the instrument or equipment or Service without charge at its sole discretion. Buyer assumes sole responsibility for any reliance on or use of such assistance and information, and the Company makes no warranty thereon.

Upon contact the following information is required:

- Product serial number (located on the instrument nameplate)
- Description of issue or problem
- Method and or operating steps you have undertaken towards resolution.
- Your contact details inclusive of telephone number and email address.

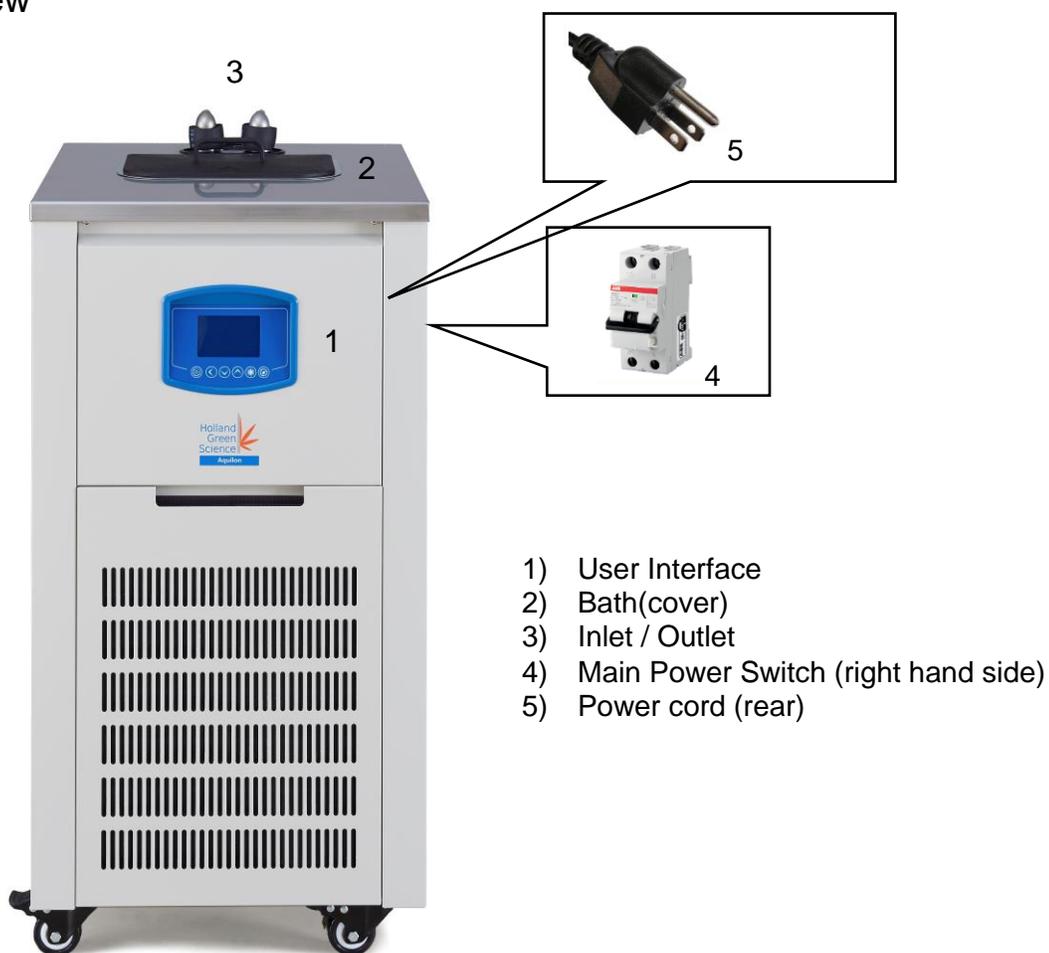
III. Aquilon Introduction

The Aquilon recirculating chillers feature PID temperature controllers to provide accurate and reliable temperature control and cooling. They are designed for continuous, reliable operation

When the liquid is not in use, the liquid should be discharged.

Included are alarm functions such as, timing and over-temperature protection.
A Pt100 platinum resistance sensor is used as the temperature sensing element.

Overview



- 1) User Interface
- 2) Bath(cover)
- 3) Inlet / Outlet
- 4) Main Power Switch (right hand side)
- 5) Power cord (rear)

IV. Technical Specifications

Model		10303001	10303002	10303003
Product Name		Aquilon Min	Aquilon	Aquilon Max
Reservoir volume(L)		5.2	13	25
Refrigeration Performance	Process temperature (°C)	- 20°C~20°C		
	Ambient Temperature (°C)	≤30		
	Ambient relative humidity (%RH)	≤65		
	Temperature stability (°C)	±0.5°C	±2°C	
	Cooling capacity at 10°C (W)	800	1500	2500
	Refrigerant	R404A	R410A	
Electrical performance	Power Consumption (W)	600	1300	1600
	Sensor	PT100		
	Controller Display Type	LCD		
	Safety protection	Compressor delay protection, machine leakage, over-current, over-voltage protection		
	Power	AC120V/60HZ		AC220V±10%/60HZ
Pump	Power Consumption (W)	30	60	
	Maximum flow (L/min)	6	17	
	Maximum lift (m)	9	15	
	Pump Pressure (psi)	13	21.76	
	Liquid inlet and outlet pipe diameter (mm)	φ10	φ12	
Dimensions (mm)		315*455*625	400*500*795	450*600*875
Altitude (m)		<2000	<2000	<2000

V. Proper Use

The instrument is designed for non-residential use and to be used in conjunction only with accessories recommended within this manual and by the manufacturer.

VI. Inspection

Unpack the equipment carefully and check for any damage which may have arisen during transport. In the event of identified damage, please contact

serviceusa@hollandgreenscience.com

The package includes the following items

Item Description	Quantity
Main Unit	1
Hose	1

	<p>CAUTION:</p> <p>If there is any visible damage to the instrument, please do not connect the instrument to a power supply.</p>	
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VII. Operating Instructions

Preparation and Precautions Prior to Use

- a. The instrument must be placed on a flat and level surface composed of non-combustible materials.
- b. 300mm (minimum) of clearance is required around the instrument to ensure the front and back ventilation grilles are well ventilated.
- c. This instrument is equipped with a compressor. If the instrument is transported, do NOT operate immediately. Stand in the correct position or location and wait 1 to 2 days prior to operating.
- d. When filling the liquid tank, ensure liquid does not enter the instrument casing.
- e. The liquid must cover the evaporator.
- f. Use an appropriate liquid for desired temperature range
- g. When the liquid is water, pay close attention to the temperature set point to prevent Icing
- h. Do not mix liquids
- i. **DANGER!** Do NOT use flammable liquids. Use of such is classified as 'improper use' of the instrument.
- j. Tighten hose connections securely.
- k. During continuous operation, the connection between the bath cover and the circulation pump may become very cold. When touching these areas ensure suitable PPE is being worn.
- l. Do not transport the instrument with liquid inside the tank due to the potential of liquid ingress into the instrument.
- m. **Use only clean liquids** to prevent sediment or solids from entering the cooling system and damaging the instrument.

7.1 User Interface



- **TEMP:** Displays the measured temperature value. To set the desired temperature, press the **SETTINGS** key until the **TEMP SET** value flashes. Press the setting key again to confirm the parameter.
- **SET:** Displays the desired temperature value set manually.
- **RUN:** Indicates that the chiller is operating.
- **Cooling Indicator:** Indicates chiller is cooling.
- **Circulation Indicator:** Indicates pump is operating.
- **TIME:** Displays the set running time; this value counts down to zero and operation stops. To set a timer, press the **SETTINGS** key. When the **TIME** value flashes, enter the desired time using they arrow keys. Leave at zero if a timer is not needed.
- **Silence Indicator:** Indicates a silenced alarm.
- **Alarm Indicator:** Indicates an alarm.



Settings: Used for manually setting values and parameters.



Left Arrow: Shifts to the numbers on the left to set the desired value.



Down Arrow: One push will decrease 1 digit; A long press will decrease digits faster.



Up Arrow: One push will increase 1 digit; A long press will increase digits faster.



Cooling Key: Press and hold the key for more than 4 seconds to control the start/stop of the cooling function.



Circulation Key: Press to start/stop the circulation function.

7.2 Startup

Connect the power according to the power outlet.

Turn on the instrument at the main switch. The display shows the initialization sequence before the instrument is ready to use.

NOTE: Every time you turn on the instrument it will beep intermittently, the icon of visual alarm and the word “end” will appear on the display.

7.3 Setting of parameters

Temperature Setting

When the instrument is switched on, press the  button one time, and the set temperature value will start to flash. Set the desired temperature value with  or  keys

The  button allows for movement between the digits.

Confirm the set value with another press of  button.

Time Settings

Press the  button.

The last value of the set time (timer) will start to flash. Set the desired value (hh:mm) by pressing  or  keys. The  button allows for movement between the digits.

Confirm the set value with another press of  button.

NOTE: the value “00:00” indicates the operating mode is continuous, once you start with the START / STOP button, the system will continue maintaining the set temperature until it is stopped manually.

If you set the timer, such as one hour, the instrument will reach the set temperature and maintain it for one hour.

7.4 Start / Stop Cooling Operation

Before the refrigeration is turned on, please press



key to let the liquid circulate in the pipeline in advance.

After setting the operating parameters, press



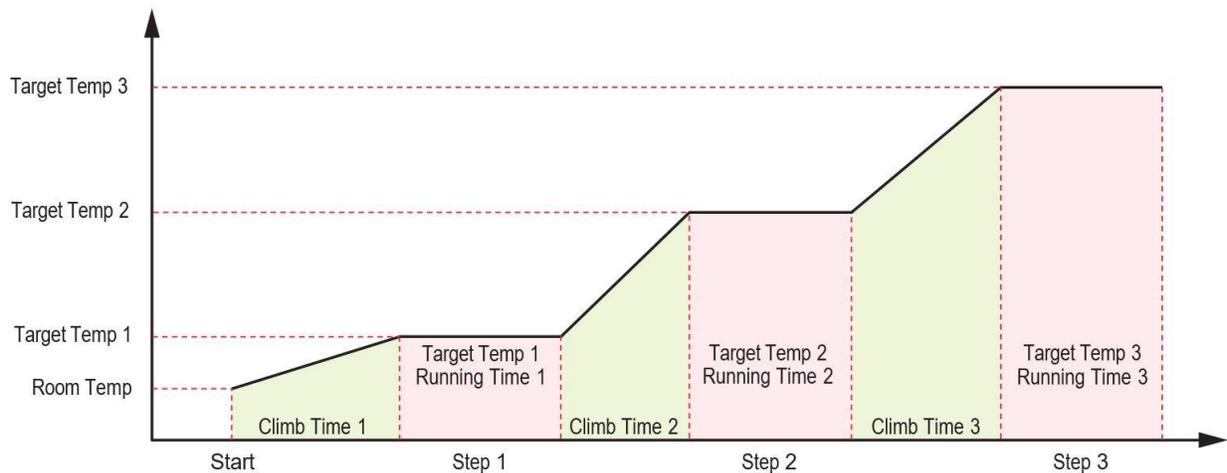
button for 4 to 5 seconds to start the cooling process.

7.5 Programming a Multi-step program

Many applications, for example, materials testing, quality assurance, environmental simulation and etc, require precise, multi-temperature (heating or cooling) testings.

The LCD controller allows the user to easily program up to 8 multi-step (multi-temperature) programs with up to 8 steps (temperature and run time) per program. Each program can be cycled from 1 to 99 times.

The following chart shows a 3-step program: step 1 is 25°C for 60 minutes, step 2 is 99°C for 45 minutes, and step 3 is 199°C for 99 minutes.



Target temp: The temperature you want it to run as planned (Input/set temperature).

Climb time: The time it takes to reach your target temperature setting. The temperature rise rate will be controlled automatically based on the controller's settings. The step's run time will not start counting down until the chamber reaches ± 0.5 °C/°F of the set temperature.

Running time: The time you want the chamber to run at the set temperature. The controller automatically launches the next step when time runs out unless it is the last step in the program then the unit shuts down and the audible and visual alarm goes off.

Programs

- PROG 0 - Fixed Value and Time
- PROG 1 - Multi-step, Step 1 to Step 8
- PROG 2 - Multi-step, Step 1 to Step 8
- PROG 3 - Multi-step, Step 1 to Step 8
- PROG 4 - Multi-step, Step 1 to Step 8
- PROG 5 - Multi-step, Step 1 to Step 8
- PROG 6 - Multi-step, Step 1 to Step 8
- PROG 7 - Multi-step, Step 1 to Step 8
- PROG 8 - Multi-step, Step 1 to Step 8

7.5.1 Turning On/Off Multi-step Programs

STEP 1: Enter Level 4 of controller internal parameters



- Press the SETTING and SHIFT keys for 3 seconds to enter the controller's internal parameter settings.
- Time area will change and first digit will blink.

STEP 2: Enter Level 4 code. LK=8286



- Press the INCREASE key to enter the first code digit. Press the SHIFT key to move to the second code digit. The digit will blink. Press the INCREASE key to enter the second code digit.
- Follow the same procedure for the third and fourth code digits.

STEP 3: Change parameter Mo



- Press the INCREASE or DECREASE key to change the first digit.
- Mo=0000 Default value single-step program, Mo=0001 multi-step programs.

STEP 4: Set the parameter and return to standard state



- Press the SETTING key 1 time to set parameter Mo and return to standard state.



- Upon changing to multi-step programs, the controller screen will change to PROG 1.

When initializing the unit for the first time, the user needs to set the temperature and time for each step in a program.

7.5.2 Program a Multi-step Program

Units are shipped with the controller initially set to PROG 1 when a multi-step program is turned on. If a multi-step program is turned off and later turned on, the last program run or selected will be displayed.

STEP 1: Select a program number to set up



- Press the SETTING key for 3 seconds. “PROG 1” will initially blink. Then the number will blink.



- Press the INCREASE key to select the program number to program.



- Press the SETTING key to start the programming process.
- STEP 1 will appear. “End” in TIME area will change to run time digits. PROG and the tenths temperature value will blink.
- Note: Units are shipped with all steps in each program set to zero temperature and zero run time.

STEP 2: Set the STEP temperature



- Press the INCREASE or DECREASE key to enter the tenths temperature value.



- Press the SHIFT key to move to the next parameter digits. Each move will cause parameter to blink.
- Use INCREASE or DECREASE key to set each temperature value.



- Press the SETTING key to accept temperature setpoint. The first TIME digit will blink.

STEP 3: Set the STEP run time



- Use INCREASE or DECREASE key to set each minute and hour value.
- Press the SHIFT key to move to the next parameter digits.



- Press the SETTING key to accept the run time.
- The next program step will appear. The tens temperature value will blink.

STEP 4: Repeat Steps 2 and 3 for each program step



- Upon setting all the steps, the controller will return to multi-step program standard state.

Note: Leave temperature and run time at zero for the steps not needed in the program.

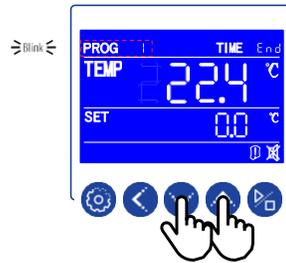
7.5.3 Select a multi-step program to run

STEP 1: Press SETTING key

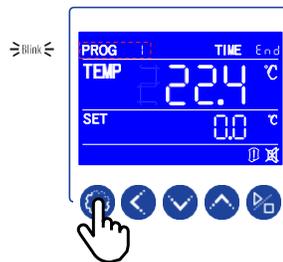


- Press the SETTING key one time. The “PROG” area will blink.

STEP 2: Select program number



- Press the INCREASE or DECREASE to select program number.



- Press the SETTING key to confirm the program to run.

STEP 3: Press RUN key



- Press the RUN key for 2 seconds to start the program. STEP area, RUN, HEAT, and run time will illuminate.

7.5.4 Set up Program Cycling

This function only applies to multi-step programs.

Units are shipped with program cycling set to 1, parameter Cy=0001.

STEP 1: Ensure the multi-step program function is turned on. See “7.5.1 Turning On/Off Multi-step Programs”.

STEP 2: Select program (1 - 8) to run multiple cycles. See “7.5.3 Select a Multi-step Program to Run”.

STEP 3: Enter Level 1 of controller internal parameters.



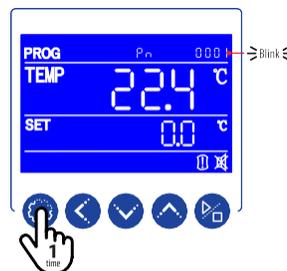
- Press the SETTING and SHIFT keys for 3 seconds to enter the controller’s internal parameter settings. Time area will change and first digit will blink.

STEP 4: Press SETTING key



- Press the SETTING key to enter Level 1 parameters.
- Note: When entering the controller’s internal parameters, Level 1, LK= 0000 will always come up first.

STEP 5: Scroll to parameter Cy



- Press the SETTING key 1 time to scroll through parameters until the parameter Cy appears.



- Press the INCREASE key to enter the first cycle value. Press the SHIFT key to move to the second cycle digit. Digit will blink. Press the INCREASE key to enter the second cycle value.
- Note: Parameter Cy range: 0001 to 0099

STEP 6: Set parameter and return to multi-step program standard state.



- Press the SETTING key 2 times to set parameter Cy and return to the multi-step program standard state.

7.5.5 Set up a RUN delay

The controller allows the user to delay the start of a program for up to 99 hours and 59 minutes. Once the delay times out, the program will start operation.

Single-step Programs

STEP 1: Enter Level 1 of controller internal parameters



- Press the SETTING and SHIFT keys for 3 seconds to enter the controller's internal parameter settings. Time area will change and first digit will blink.

STEP 2: Press SETTING key



- Press the SETTING key to enter Level 1 parameters.

STEP 3: Set parameter and return to multi-step program standard state.



- Press the INCREASE key to enter the first time value. Press the SHIFT key to move to the second time digit. Digit will blink. Press the INCREASE key to enter the second time value.



- Press the SETTING key 1 time to set parameter dy and return to fixed value program standard state.

Multi-step Programs

STEP 1: Ensure the multi-step program function is turned on. See “7.5.1 Turning On/Off Multi-step Programs”.

STEP 2: Select program (1 - 8) to run multiple cycles. See “7.5.3 Select a Multi-step Program to Run”.

STEP 3: Enter Level 1 of controller internal parameters



- Press the SETTING and SHIFT keys for 3 seconds to enter the controller’s internal parameter settings. The Time area will change and first digit will blink.

STEP 4: Press the SETTING key



- Press the SETTING key to enter Level 1 parameters.

STEP 5: Scroll to parameter dy



- Press the SETTING key 2 times to scroll through parameters until the parameter dy appears.



- Press the INCREASE key to enter the first time value. Press the SHIFT key to move to the second cycle digit. Digit will blink. Press the INCREASE key to enter the second time value.

STEP 6: Set parameter and return to multi-step program standard state.



- Press the SETTING key 1 time to set parameter dy and return to the multi-step program standard state.

7.5.6 Changing Power-up Mode

Units are shipped with power-up mode set to 2. The controller starts running from the last power-off. Parameter Po = 0002.

STEP 1: Enter Level 2 code. LK=0003



- Press the INCREASE key to enter the code digit.



- Press the SETTING key to enter the Level 2 controller parameters.

STEP 2: Scroll to parameter Po



- The tm parameter will appear. Press the SETTING key 1 time to scroll through parameters until the parameter Po appears.

STEP 3: Change parameter Po



- Press the DECREASE key to change the first digit.
- Po=0000 The controller is in a stopped state after power-on and the user must start the operation by pressing the START/STOP button for 2 seconds.
- Po=0001 The controller automatically starts the step operation after power-on.
- Po=0002 The controller starts running from the last power-off.

STEP 4: Set parameter and return to standard state.



- Press the SETTING key 4 times to set parameter Po and return to standard state.

7.6 Internal Parameter Settings Overview

7.6.1 The process of changing a parameter value

STEP 1



- Press and hold the SETTING and shift keys for 3 seconds to view the controller's internal parameters.

STEP 2



- Press the increase key to change the first digit value. Value will blink as it is being set.
- Press the shift key to move to the next parameter digits. Each move will cause the digit to blink.

STEP 3



- Press the SETTING key once entering the required code for the parameter level you want to change.

STEP 4



- The first available function parameter within the level will appear. Press the increase key to change the first digit value. Value will blink as it is being set.
- Press the shift key to move to the next parameter digits. Each move will cause the digit to blink.

STEP 5



- Press the SETTING key once entering the parameter value.
- The next parameter will appear, or the controller will return to the standard state.

Level 1

LK = 0000

PROMPT	FUNCTION NAME	FUNCTION RANGE	EXPLANATION	INITIAL VALUE
Pn Pn	Working Group	0 – 8	For multi-step program control only, set up a working group for instrument operation. When Pn is set to 0, group 0 is fixed value (single-step) control.	
Cy Cy	No. of Cycles	0 – 99	Controls number of times a multi-step program runs. When Cy is 0 , the instrument has been running between the work groups. When Cy IS NOT 0 , the instrument will automatically stop after cycling Cy times in the work group. The value will automatically return to 1 after shutdown.	0001
dy dy	Run Delay	00:00 – 99:59 (hh:mm)	00:00 - No delay. Other values - Start of a program will be delayed dy time after pressing the RUN key.	00:00

Level 2

LK = 0003

PROMPT	FUNCTION NAME	FUNCTION RANGE	EXPLANATION	INITIAL VALUE
tM tM	Maximum Allowable Temperature Setting	Set within the measuring range	Stop heating and alarm when the maximum temperature is exceeded	200.0
Po Po	Power-up Mode	0 – 2	Po=0000 : Controller is in a stopped state after power-on. User must start the operation by pressing the RUN/STOP button for 3 seconds. Po=0001 : Controller automatically starts the step operation after power-on. Po=0002 : Controller starts running from the last power-off.	0002
AL AL	Alarm Setting	0 – Full Range	Alarm illuminates with audible output (and HOLD function) when the temperature exceeds the Setpoint+ AL value.	003.0
Pb Pb	Zero Adjustment (Intercept)	-100.0 – 100.0	When the zero error of the meter is large and the full-scale error is small, adjust this value. Generally, PT100 rarely adjusts this value.	000.0
PK PK	Full Scale Adjustment (Slope)	-1000 – 1000	When the zero error of the meter is small and the full-scale error is large, adjust the value. PK=4000 x (mercury thermometer value-display value)/display value, generally PT100 first adjust this value.	0000
PA PA	Ambient Temperature Correction	-80 – 80	When there is an error between the actual ambient temperature and the controller display ambient temperature, adjust the value	000.0

Level 4

LK = 8286

PROMPT	FUNCTION NAME	FUNCTION RANGE	EXPLANATION	INITIAL VALUE
Mo Mo	Program Type Selection	0 – 1	Mo=0000 : Fixed Value (Single-step Program) Mo=0001 : Multi-step Program	0000

VIII. Troubleshooting

Problem	Causes	Solution
No power	The power cord is unplugged or not plugged in correctly	Reinsert
	Tripped Breaker	Reset once, if a further trip occurs, contact serviceusa@hollandgreenscience.com

IX. Maintenance and Cleaning

Keep the instrument dry and clean in routine operations.

Clean the outer surface with a non-abrasive cleanser and only connect the power supply when the entire instrument surface is dry.

If liquid or moist solids enter the instrument, please immediately disconnect the power supply and contact serviceusa@hollandgreenscience.com

- Surface stains on the instrument should be cleaned only with a clean, soft rag and detergent.
- The power must be disconnected before any maintenance or cleaning.
- Do not clean the instrument with any corrosive cleaning solutions.
- If the instrument is left unused for a long period, switch 'OFF' the power and store it on a dry, clean, level, and stable surface at normal temperature.



Caution!

Before any Maintenance or Inspection, the Power Cable MUST be removed from the power socket.