

# T7 Topside

# Installation Manual & User's Guide



#### **End User Disclaimer:**

United Spa Controls systems have absolutely no end user serviceable parts. United Spa Controls does not authorize attempts by the spa owner/user to install or repair/service any United Spa Controls products.

Non-qualified users should never open or remove the control box's cover, as this will expose dangerous voltage points and other serious risks.

Non-qualified users should not attempt to make changes to the topside's programming, as mis-programming can result in malfunction or possible damage.

Please contact your dealer or a locally licensed service center for service and technical support.

#### **Warranty Disclaimer:**

It is extremely important that any user read this user's guide in it's entirety before attempting to operate this United Spa Controls system. Any damage that may occur due to misuse may void the warranty. See warranty page for more information.

#### Safety Disclaimer:

When using this electrical equipment, basic safety precautions should always be followed. Read and follow the important safety instructions in the safety section before and during use.

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# **Safety**

#### **Important Safety Instructions:**

When using this electrical equipment, basic safety precautions should always be followed, including the following.

#### Read and follow all instructions!

1. **Warning:** Children should not use spas or hot tubs without adult supervision

**AVERTISSEMENT:** NE PAS LAISSER LES ENFANTS UTILISER UNE CUVE DE RELAXATION SANS SURVEILLANCE

2. **Warning:** Do not use the spa unless all suction guards are installed to prevent body and hair entrapment

AVERTISSEMENT: POUR ÉVITER QUE LES CHEVEUX OU UNE PARTIE DU CORPS PUISSENT ÊTRE ASPIRÉS, NE PAS UTILISER UNE CUVE DE RELAXATION SI LES GRILLES DE PRISE D'ASPIRATION NE SONT PAS TOUTES EN PLACE.

3. **Warning:** People using medication and/or having an adverse medical history should consult a physician before using a spa or hot tub

**AVERTISSEMENT:** LES PERSONNES QUI PRENNENT DES MÉDICAMENTS OU ONT DES PROBLÈMES DE SANTÉ DEVRAIENT CONSULTER UN MÉDECIN AVANT D'UTILISER UNE DE RELAXATION

 Warning: People with inpectious diseases should not use a spa or hot tub

AVERTISSEMENT: LES PERSONNES ATTEINTES DE MALADIES INFECTIEUSES NE DEVRAIENT PAS UTILISER UNE CUVE DE RELACATION

5. **Warning:** To avoid injury exercise care when entering or exiting the spa or hot tub

AVERTISSEMENT: POUR ÉVITER DES BLESSURES, USER DE PRUDENCE EN ENTRANT DANS UNE CUVE DE RELAXATION ET EN SORTANT

6. **Warning:** Do not use drugs or alcohol before or during the use of a spa or hot tub to avoid unconsciousness and possible drowning

AVERTISSEMENT: POUR ÉVITER L'ÉVANOUISSEMENT ET LA NOYADE ÉVENTUELLE, NE PRENDRE NI ALCOOL AVANT D'UTILISER UNE CUVE DE RELAXATION NI QUAND ON S'Y TROUVE

7. **Warning:** Pregnant or possibly pregnant women should consult a physician before using a spa or hot tub

**AVERTISSEMENT:** LES FEMMES ENCEINTES, QUE LEUR GROSSESSE SOIT CONFIRMÉE OU NON, DEVRAIENT CONSULTER UN MÉDECIN AVANT D'UTILISER UNE CUVE DE RELAXATION

8. **Warning:** Water temperature in excess of 100°F (38°C) may be injurious to your health.

**AVERTISSEMENT:** IL PEUT ÊTRE DANGEREUX POUR LA SANTÉ DE SE PLONGER DANS DE L'EAU À PLUS DE 38° C (100° F)

9. **Warning:** Before entering a spa or hot tub measure the water temperature with an accurate thermometer

**AVERTISSEMENT:** AVANT D'UTILISER UNE CUVE DE RELAXATION MESURER LA TEMPÉRATURE DE L'EAU À L'AIDE D'UN THERMOMÈTRE PRÉCIS

 Warning: Do not use a spa or hot tub immediately following strenuous exercise

# Safety

**AVERTISSEMENT:** NE PAS UTILISER UNE CUVE DE RELAXATION IMMÉDIATEMENT APRÈS UN EXERCICE FATIGANT

11. **Warning:** Prolonged immersion in a spa or hot tub may be injurious to your health

**AVERTISSEMENT:** L'UTILISATION PROLONGÉE D'UNE CUVE DE RELAXATION PEUT ÊTRE DANGEREUSE POUR LA SANTÉ

12. **Warning:** Do not permit electric appliances (such as a light, telephone, radio, or television) within 5 feet (1.5 m) of this spa or hot tub

**AVERTISSEMENT:** NE PAS PLACER D'APPAREIL ÉLECTRIQUE (LUMINAIRE, TÉLÉPHONE, RADIO, TÉLÉVISEUR, ETC) À MOINS DE 1.5M (5 FEET) DE CETTE CUVE DE RELAXATION

 Caution: Maintain water chemistry in accordance with manufacturer's instruction

**ATTENTION**: LA TENEUR DE L'EAU EN MATIÈRES DISSOUTES DOIT ÊTRE CONFORME AUX DIRECTIVES DU FABRICANT

14. Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 98.6°F (37°C). The symptoms of hyperthermia include drowsiness, lethargy, and an increase in the internal temperature of the body.

Effects: 1- Unawareness of impending hazard.

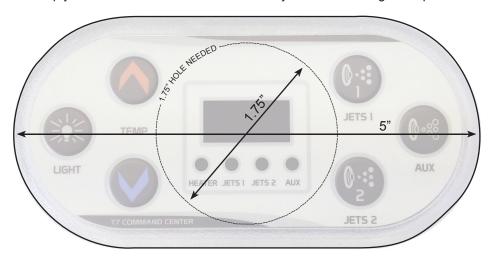
- 2- Fetal damage in pregnant women.
- 3- Failure to recognize the need to exit spa.
- 4- Physical inability to exit spa.
- 5- Unconsciousness and danger of drowning.
- 6- Failure to perceive heat.
- 15. **Warning:** The use of alcohol or drugs can greatly increase the risk of fatal hyperthermia in hot tubs and spas

**AVERTISSEMENT:** LA CONSOMMATION D'ALCOOL OU DE DROGUE AUGMENTE CONSIDÉRABLEMENT LES RISQUES D'HYPERTHERMIEMORTELLE DANS UNE CUVE DE RELAXATION

# **T7 Topside Installation**

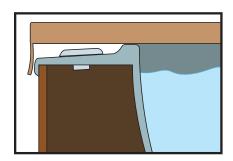
#### **Topside Installation Preparation**

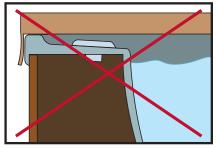
The T7 topside control requires a 1.75" hole in the shell of the hot tub to be installed. If you don't already have a hole that is 1.75" in diameter, you can use a 1.75" (1 3/4") hole saw to make the hole needed for installation. Simply drill the hole in the center of where you'll be installing the topside.



#### **Topside Installation Location**

The T7 topside should be installed on an outward facing edge of the hot tub, so that it is not subject to trapped steam and moisture under the cover. Failure to do so may result in the need to prematurely replace the graphic decal assembly on the face of the topside control.





# **About The T7 Topside**

#### **Topside Control Installation**

Once ready to install, plug one end of the topside cable into the back of the T7 topside control, and snake the topside cable through the cutout in the spa's shell and down to the control box. Then plug the opposite end of the topside cable into the topside receptacle on the control box.

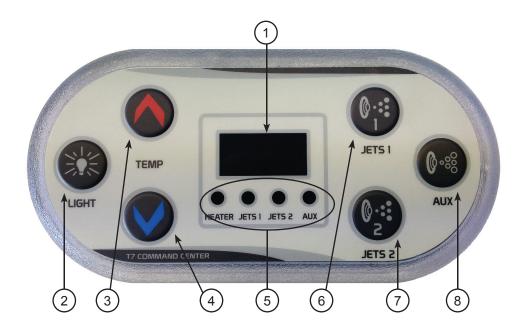
Simply affix the topside to the hot tub by peeling off the paper over the adhesive back of the topside and press it firmly into place, slowly pressing all around the perimeter of the topside firmly to assure a firm bond.

**NOTE:** Do NOT connect/disconnect the T7 topside while the control box has power going to it. Always make sure the power is shut off at the breaker before removing/installing a topside, as to avoid damaging the electronics.

# **Using The T7 Topside**

#### The T7 Topside

You will be using the T7 topside to operate your United Spas C5 Series control box. The T7 is pictured below, with the descriptions of the items that will be referenced throughout this user's guide.



- LED Display
- 2 Light Button
- 3 Temp Up Button
- 4 Temp Down Button
- 5 Indicator Lights
- 6 Jets-1 Button
- 7 Jets-2 Button
- Aux Button

Α

h

#### **T7 Topside Configuration**

Once the control box and topside have been properly installed, you can power up the unit and program the topside for the control's desired equipment and operational configuration.

#### **Upon Power-Up**

Whenever the T7 topside is powered on, the unit will briefly flash between 'T7' and the current software version by showing an 'S' followed by a number (Example: 'S04') while it starts up. All configurable settings are saved to permanent memory, the only thing that needs to be set upon power-up of a T7 topside that has already been configured previously is the time until the next filtration cycle start (which defaults to 1 hour).

#### **T7 Topside Configuration Codes**

There are five codes that can be configured. Each code has a number of options the code can be set to. By default, all codes are set to their first option (Option 1).

Use the code chart on the next page to figure out which options you'll need to set for each code for the hot tub the control is being installed into.

Once you know what options all the codes should be set to, turn to the pages that follow for instructions on entering the configuration programming mode, and how to select the different options for each code.

#### **T7 Configuration Code Chart**

Code 1: Jet-1 Button Configuration

Option 1: Jet-1 button operates Hi-Speed Pump-1

Option 2: Jet-1 button operates Lo-Speed and Hi-Speed Pump-1

Code 2: Jet-2 Button Configuration

Option 1: Jet-2 button operates Lo-Speed Pump-1 Option 2: Jet-2 button operates Hi-Speed Pump-2

Option 3: Jet-2 button operates Lo-Speed and Hi-Speed Pump-2

Code 3: Aux Button Configuration

Option 1: Aux button used only for programming Option 2: Aux button used for Air Blower w/ Purge\* Option 3: Aux button used for Air Blower (no Purge) Option 4: Aux button operates Hi-Speed Pump-3

Code 4: Power (Amperage) Configuration

Option 1: 50A Operation (No heat with Aux)
Option 2: 60A Operation (No power restriction)
Option 3: 50A Operation (No heat with P-2)

Option 4: 40A Operation (No heat with P-2, and Aux)
Option 5: 20A 120V Operation or 30A 240V Operation
(No heat with anything other then P-1 Lo-Speed)

#### **Code 5**: Heater Operation

Option 1: Electric Heater operates with Lo-Speed Pump-1 Option 2: Electric Heater operates with Circulation Pump

Option 3: No longer used \*\*

Option 4: Electric Heater operates with Timed Circulation Pump \*\*\*

- \* The Air Blower will engage (purge) for a minute during filtration to push any stale water out of the blower's plumbing and back into the spa for filtration.
- \*\* On newer units, this option is no longer selectable.
- \*\*\* When setting Code 5 to Option 4 it is important to make sure that Pump-1 is wired as a single speed (Hi-Speed) pump and not connected to the red (Lo-Speed) wire. In addition the Circulation Pump cord will need to be reconfigured to use the receptacles red wire for the power line going to the circulation pump.

#### **Conflicting Codes**

You may notice, when programming the topside that certain codes may not be visible/selectable. This means you have another code set to an option that conflicts with the missing option. So if you program the topside to use an air blower or third pump on the Aux button, you will no longer see the code option allowing the Jets-2 button to operate Lo-Speed of Pump-2 (since those functions all use the same relay). Likewise, you will not be able to set Code 5 to Option 4 if Code 1 is set to Option 2 and/or Code 2 is set to Option 1.

#### **Entering The T7 Topside's Programming Mode**

Once you've gone over the code chart and have chosen the options you want to set for each code, follow these instructions for entering the programming mode and setting the options. There is a 15 second time-out delay, so taking longer then 15 seconds between steps will cause the topside to time-out and resume normal operation.

Step 1
Press and hold



for 6 seconds, until display reads



Step 2

Then lift your finger and press



for another 6 seconds, until the

display reads



**AUX** 





to see the first code



Code 1 - Option 1

#### **Changing The T7 Topside's Configuration Codes**

Once you have entered the programming mode, you will have Code 1 and the Option it is set to on the display. This is displayed as 'C-O', where C is the current Code, and the O is the currently selected/enabled Option for that code. While in programming mode the same 15 second time-out applies, if you take longer then 15 seconds to change a



code's selected option or cycle through to the next code, all settings will be saved and the topside will time-out and resume normal operation.

#### While in Programming Mode

Press



to change the selected Option of the displayed Code

Press



to cycle to the next Code

Or press



to save all settings and exit Programming Mode

#### **T7 User Settings Menu**

The T7's user settings menu is home to all of the user configurable settings of the T7 topside. The Heating Mode setting is the first setting in the user settings menu. See the following page for a full menu tree.

Later in this section the individual settings will be explained in further detail. What follows are general instructions on getting into, maneuvering, and making and saving changes to these settings, which will be referenced throughout this section.

#### **Entering the User Settings Menu**

Step 1
Press and hold



**AUX** 

for 6 seconds until display reads



Step 2
Then lift your finger, and press



to see the first setting.

#### **Using the User Settings Menu**

Press



to cycle through the different settings

**Press** 



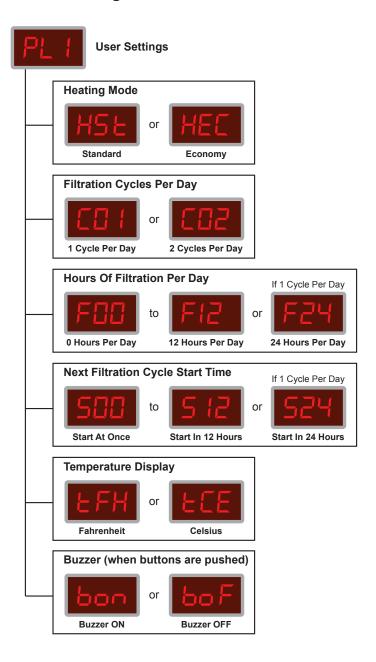
to cycle through the displayed setting's options

Press



to save your settings and exit - or - let the topside timeout and save the settings and return to the temperature display on its own (in about 15 seconds).

#### **T7 User Settings Menu Tree**



#### T7 Heating Modes: 'Standard' and 'Economy'

The T7 is set by default to operate in 'Standard' heating mode. This means that when the temperature of the water in the spa drops below the set temperature, the control automatically start heating, bringing Lo-Speed of Pump-1 (if there is no 24 hour Circulation Pump) on as necessary. If there is a Circulation Pump, but control has been set/wired for timed operation, then the control will automatically bring it on as needed for heat. When the control is heating, the 'Heat' indicator light will be lit, and the display will flash between the current temperature and 'HEt'

The T7 can also be set to operate in 'Economy' heating mode, where the heater will only maintain the set temperature when Lo-Speed of Pump-1 is manually activated (if there is no Circulation Pump), or during filtration cycles. In 'Economy' mode, if the current temperature falls below the set heat temperature, the 'Heat' indicator light will flash to let you know that the unit would be heating if not in Economy Mode.

**Note:** If you have a Circulation Pump that operates 24 hours a day, economy mode will not effect heating behavior, and the control will continue to heat as needed to maintain the set temperature.

#### **T7 Filtration Cycle Operation**

By default, the T7 topside will call for the control to filter the spa a total of 4 hours a day, split into two filtration cycles. It is during these filtration cycles that the control will run the spa's ozonator, if one is installed. The first 2 hour filtration cycle will start 1 hour after power is first supplied to the control. It is possible to change the number of filtration cycles a day (between 1 or 2), the number of total hours of filtration a day, and the start time of the next cycle. When cycling twice a day the next cycle will start 12 hours from the start of the previous cycle, and when cycling once a day the next cycle will start 24 hours after the previous cycle. Should the unit lose power, upon reset it will remember the number of filtration cycles and duration, but default the start time of the next cycle to 1 hour after power is restored. During filtration cycles, the display will flash between the current temperature and 'FC' to indicate a filtration cycle is in progress.

#### **Changing Filtration Cycle Settings**

The filtration settings can be changed by following the instructions on entering and changing settings in the T7's user settings menu found earlier in this section. What follows is a description of what the filtration related settings are and the options you can select for each of those settings:

Filtration Cycles Per Day [COI or CO2]:

The number of filtration cycles per day. You can select between 1 cycle a day, or two cycles per day.

Hours Of Filtration Per Day [F00/F02/F04/F08/F08/F08/F08 or F00 - F24]: The total number of hours the control should filter per day. If the T7 set to the default of 2 cycles per day, any even number of hours 0 through 12 may be selected. If the T7 is set for 1 cycle a day, 0 through 24 hours of filtration may be selected.

Next Filtration Cycle Start Time [500 -512 or 500 - 524]:

The number of hours until the next filtration cycle starts. If the T7 set to the default of 2 cycles per day, 0 through 12 may be selected. If the T7 is set for 1 cycle a day, 0 through 24 hours may be selected.

#### **Changing the Temperature Display Setting**

The T7 topside can display the temperature in either Fahrenheit or Celsius. The default setting is Fahrenheit, which can be toggled to Celsius.

#### **Changing the Buzzer Setting**

By default the T7 topside will sound an internal buzzer when a button press is registered. Simply toggle this code off to disable the buzzer.

#### Setting the Temperature

The temperature may be set to heat the spa water between  $40^{\circ}F$  ( $4^{\circ}C$ ) and  $104^{\circ}F$  ( $40^{\circ}C$ ).





or



displays the currently set temperature for approximately 4 seconds.

#### While the currently set temperature is being displayed:

Press



to increase the set temperature. You can press and release right away to raise the setting incrementally by one degree, or keep the button pressed to scroll through higher temperature settings and release the button once the desired temperature is displayed.

Press



to increase the set temperature. You can press and release right away to raise the setting incrementally by one degree, or keep the button pressed to scroll through higher temperature settings and release the button once the desired temperature is displayed.

#### When the control is heating...

When the control is heating, the heater indicator light under the display will be lit, and the display will flash between the current temperature and 'HEt' as shown. If the indicator light is flashing, this indicates the control would be heating, but is currently set to economy mode.

#### **Operating Pump-1**

The operation of Pump-1 depends on the configuration of your control:

#### **Pump-1 Operation on Single Pump Systems**



to toggle Hi-Speed between On/Off. (Will override Lo-Speed, if on)

JETS 1



to toggle Lo-Speed between On/Off. (Will override Hi-Speed, if on)

JETS 2

#### Pump-1 Operation on Dual (or Triple) Pump Systems



to toggle between Lo-Speed/Hi-Speed/Off.

Whenever Hi-Speed of Pump-1 is running the 'Jets-1' indicator light will be lit. Likewise, whenever Lo-Speed of Pump-1 is running the 'Jets-1' indicator light will flash.

Pump-1 will automatically shut off after 30 minutes of operation when turned on manually. Should a system that uses Pump-1 for heating/filtration enter a heat or filtration cycle during manual operation of Pump-1, the pump will continue low speed operation until the cycle is complete.

#### **Operating Pump-2 (If Applicable)**

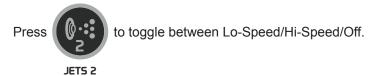
If your control is configured for a secondary pump, it's operation depends on if it's configured to run a single speed Pump-2, or dual speed Pump-2:

#### Single Speed Pump-2 Operation



#### **Dual Speed Pump-2 Operation**

JETS 2



In the Single Speed Pump-2 configuration the 'Jets-2' indicator light will be lit when Pump-2 is on. In the Dual Speed Pump-2 configuration, when Hi-Speed is running the 'Jets-2' indicator light will be lit. Likewise, whenever Lo-Speed of Pump-2 is running the 'Jets-2' indicator light will flash.

Pump-2 will automatically shut off after 30 minutes of operation.

#### Operating Aux (Pump-3/Air Blower - If Applicable)

If your control is configured to operate an auxiliary component, its operation is identical, whether it is configured to run a single speed Pump-3, or an Air Blower:



Whenever Aux is active, the 'Aux' indicator light will be lit.

Aux will automatically shut off after 30 minutes of operation.

#### Operating the Spa Light

To operate the spa light, simply press



to toggle between On/Off.

The light will automatically shut-off after 4 hours of operation.

**Note:** If your spa also has a United Spas Multi-Function LED Light installed in it, you can simply turn the light off and on again within 3 seconds to cycle to the next color function. Almost any spa using an industry standard 12V light harness can be upgraded to a United Spas Multi-Function LED Light. For more information, please contact your local dealer or serviceman for more information.

# **Standard Display & Error Messages**

**Filtration Cycle** - A filtration cycle is currently in progress. This flashing message will disappear on its own once the current filtration cycle completes.



**Heat** - The spa is heating. This message will disappear once the heater shuts off.



**Freeze Protection** - One of the sensors is reading under 45°F/8°C. Lo-Speed Pump-1 cannot be shut off, and no other equipment will function until the sensors read that the water has risen to at least 48°F/9°C. Once that happens, this message will disappear.



**Software Overheat** - The temperature sensor is reading over 113°F/45°C. Once the temperature drops to at least 103°F/39°C press and hold the Temp Down button for 10 seconds to reset.



Hardware Overheat - The hi-limit sensor is reading over 116°F/46°C. Once the temperature drops to at least 103°F/39°C press and hold the Temp Down button for 10 seconds to reset. Until the unit reaches 103°F/39°C Lo-Speed Pump-1 will be kept running in attempt to evenly distribute the build-up of heat.



**Temperature Sensor Error** - The temperature sensor is malfunctioning, or not properly connected. Reconnect or replace temperature sensor as needed.



**Hi-Limit Sensor Error** - The hi-limit sensor is malfunctioning, or not properly connected. Reconnect or replace temperature sensor as needed.



**Flow Error** - The pressure switch is not registering enough flow for safe heater operation. Check pressure switch and pump/plumbing/water flow.





#### **United Spa Controls One Year Limited Warranty**

United Spa Controls warrants, to the original purchaser, the spa control equipment against defects in materials or workmanship for a period of fourteen months from date of manufacture. The obligation of this warranty shall be limited to repairing or replacing the part, which in the opinion of the company shall be proved defective in materials or workmanship. This limited warranty does not include the limitations described below.

**Limitations of Coverage:** This warranty does not cover failures due to: damage, freezing, power failure, power reduction, unusual atmospheric conditions, rust or corrosion, repairs necessary because of operator negligence, improper re-packaging, and damage incurred in shipping. This warranty does not cover thermostat calibration, plumbing, and expendable items (gaskets, o-rings, filter cartridges).

Acts Invalidating Warranty: This warranty shall be invalid if this equipment has been subjected to alterations, misuse or abuse, improper water chemistry, improper handling, improper installation, repairs (or attempted repairs) which in United Spa Controls' judgment adversely affects the product's performance/reliability, or if the equipment is used for commercial purposes (used for other than single family household purposes). Misuse and abuse shall include application, installation, or operation outside of the environment and limitations for which it was designed. This warranty shall also be invalid if the spa equipment is damaged by earth or ground fill movement, fire, flood, wind, lightning, by act of God, accident, or by intentional, reckless, or negligent acts of any person.

Warranty Performance: All warranty service and/or replacement of parts must be performed by an individual or service company that has been authorized by United Spa Controls. If within the warranty period, any such products shall prove defective, it shall be replaced at United Spa Controls' option as follows: 1) The original retail purchaser shall first contact the point of purchase or the installing dealer, as soon as possible after discovery of the defect, but in no event later than the expiration date of this warranty. Processing claims should be initiated by the point of purchase or the installing dealer. 2) A Return Merchandise Authorization (RMA) form must be completed and submitted to United Spa Controls by the point of purchase or the installing dealer. 3) United Spa Controls will issue an RMA for eligible items that are not out of their warranty period. 4) Defective items may then be packaged along with note that contains the issued RMA number and return shipping information in a box marked with the issued RMA number and shipped to: United Spa Controls, 5614 E La Palma Ave, Anaheim, CA 9287. The customer must pay for all shipping charges and no product shall be returned to United Spa Controls without prior consent. 5) After receipt of the products, supporting documents, and verification of the nature and cause of the defect, United Spa Controls will replace or repair the defective product or issue warranty credit for eligible items at United Spa Controls' option.

Removal charges, re-installation charges, any other associated labor, and freight charges to and from United Spa Controls of the failed part shall be the purchaser's responsibility. Any warranty replacement or repair shall be subject to the terms and condition of this warranty for the remainder of the original period of coverage. United Spa Controls reserves the right to inspect any malfunction or defect on location.

Disclaimers, Legal Remedies: This warranty is limited and shall be in lieu of all other warranties, expressed or implied, including but not limited to, any implied warranty or merchantability or fitness for a particular purpose. There are no other warranties that extend beyond the description of the face hereof. In no event shall United Spa Controls be liable for labor or material charges in connection with removal or replacement of the defective products. United Spa Controls is not liable for the incidental or consequential damages, loss of profit, loss of time, inconvenience and incidental expenses. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary state to state. United Spa Controls reserve the right to change its warranty at any time.

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