



THE SPA DRAGON



conforms to ANSI/UL Std 1563
certified to CSA Std C22.2 No. 218.1



Wireless Back Up Freeze Protection For Hot Tubs

User Manual

REV I - ENG

IMPORTANT SAFETY INSTRUCTIONS, READ AND FOLLOW ALL SAFETY INSTRUCTIONS:

Basic safety precautions should always be followed when installing and using this electrical equipment.



Warning: the spa has been supplied with a residual operating current not exceeding 6 mA. The GFCI must be tested before each use.



Warning: to avoid electric shock, do not install the heater when it is raining.



Warning: children should be supervised at all times around the appliance.



Warning: if the supply cord is damaged, it must be replaced by the manufacturer, its service agent, or similarly qualified persons in order to avoid a hazard.



Warning: to reduce the risk of electric shock, do not use an extension cord to connect unit to the electrical supply; use a properly located outlet.



Warning: risk of electric shock. Do not bury cord. Ensure the electrical cord is located away from lawn mowers, hedge trimmers, and other equipment. Reduce the risk of electric shock by replacing damaged cords immediately.



Warning: electric installations should fulfil the requirements of local standards.



Warning: intended as a back up heating system only to be used in the short time that your hot tub is malfunctioning to protect the plumbing/components from freezing. The heater is not intended to be used as a general purpose heater. Use heater supplied with the spa dragon as part of a back up system that is permanently mounted within the cabinet of your hot tub. Property damage or bodily injury due to fire and/or electrical shock may result if The Spa Dragon is misused. Caution: test the ground fault circuit interrupter before each time power is applied to the heater.



Danger – risk of injury:

Never run the system with a damaged cord. If the cord is damaged in any way:

- a) replace damaged cord immediately
- b) do not bury cord (unless in conduit)
- c) connect to a grounded, grounding type receptacle only



Install the spa dragon outdoor LED unit at least 12" (30cm) away from any metal surface of the hot tub.



When servicing the tub please make sure to disconnect power to avoid electrical shock.



Caution: shock hazard: help prevent bodily injury due to electric shock by only plugging the unit into a GFCI outlet.



Do not modify or disassemble any of the components of The Spa Dragon.



Do not insert any foreign objects into the heater.



Fire hazard: help prevent property damage due to fire



Ensure the heater included with The Spa Dragon is free of obstructions once installed and after every activation of the heating unit.



Ensure the heater is permanently mounted prior to operation.



To obtain a printed copy of these instructions please visit: www.thespadragon.com/instructions

SAVE THESE INSTRUCTIONS

MISES EN GARDE IMPORTANTES INSTRUCTIONS DE SÉCURITÉ, À LIRE ET À SUIVRE À LA LETTRE :

Des précautions de bases devraient toujours être prises lors de l'installation et de l'utilisation de cet équipement électrique.



Avertissement : le spa a été équipé d'un courant résiduel de fonctionnement qui n'excède pas 6 mA. Le disjoncteur de fuite de terre doit être testé avant chaque utilisation.



Avertissement : pour éviter les décharges électriques, ne pas installer le chauffe-eau lorsqu'il pleut.



Avertissement : les enfants devraient être supervisés en tout temps lorsqu'ils se trouvent près de l'appareil.



Avertissement : si le câble d'alimentation est endommagé, le fabricant, son agent de service ou une personne aux compétences équivalentes doit en effectuer le remplacement afin d'éviter les risques.



Avertissement : pour réduire le risque de décharge électrique, ne pas utiliser une rallonge électrique pour connecter l'unité à la prise électrique; utiliser une prise située au bon endroit.



Avertissement : risque de décharge électrique. Ne pas enfouir le câble. S'assurer que le câble électrique est situé loin des tondeuses, des tailleurs de haie et des autres équipements. Réduire le risque de décharge électrique en remplaçant les câbles endommagés immédiatement.



Avertissement : les installations électriques devraient respecter les exigences des normes locales.



Avertissement : peut être utilisé comme système de chauffage de remplacement exclusivement pour la courte période durant laquelle le spa fonctionne mal afin d'empêcher la plomberie et les composants de geler. Le chauffe-eau n'est pas fait pour être utilisé comme chauffage à usage général. Utiliser le chauffe-eau fourni avec le Spa du Dragon comme système de rechange, installé de façon permanente dans l'armoire de votre spa. Les dommages matériels et les blessures physiques causés par le feu ou une décharge électrique peuvent survenir si le Spa du Dragon n'est pas utilisé correctement. Attention : tester le circuit de défaut de masse avant chaque mise sous tension de l'appareil.



Danger — risque de blessure :

Ne jamais utiliser l'appareil si le câble d'alimentation est endommagé. Si le câble est endommagé de quelque façon :

- a) Remplacer le câble immédiatement
- b) Ne pas enfouir le câble (sauf s'il est dans un tuyau)
- c) Brancher uniquement à une prise de terre, de type mise à la terre



Installer l'unité extérieure avec DEL du spa à au moins 12 po (30 cm) de chaque surface en métal du spa



Lors de l'entretien du spa, s'assurer de le débrancher pour éviter les décharges électriques.



Attention : risque de choc; pour aider à prévenir les blessures causées par les décharges électriques, brancher l'unité dans une sortie de disjoncteur de fuite de terre.



Ne pas modifier ou démonter de composante du Spa du Dragon.



Ne pas insérer de corps étranger dans le chauffe-eau.



Risque d'incendie : pour aider à prévenir les dommages matériels liés au feu



S'assurer que le chauffe-eau inclus avec le Spa du Dragon n'est pas obstrué une fois qu'il est installé et à la suite de l'activation de l'unité de chauffage.



S'assurer que le chauffe-eau est installé de manière permanente avant l'utilisation.

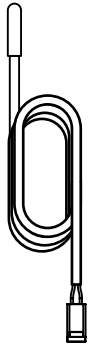


Pour obtenir une copie papier de ces instructions, veuillez visiter le : www.thespadragon.com/instructions

ENREGISTRER CES INSTRUCTIONS

Warnings	Page 1
What's In The Box	Page 4
What You'll Need	Page 4
Installation And Operation Guide	Page 5
Step #1 - Register and Connect The Spa Dragon	Page 5
Step #2 - Determine Proper Placement Of The Led Unit	Page 5
Step #3 - Drill A Mounting Hole For The Led Unit	Page 6
Step #4 - Attach The Led Unit	Page 6
Step #5 - Determine Proper Mounting Of The Temperature Sensor	Page 7
Step #6 - Determine Proper Mounting Of The Heater	Page 8
Step #7 - Install The Heater Unit	Page 9
Step #8 - Install The Temperature Sensor	Page 10
Step #9 - Connecting The Spa Dragon	Page 10
Step #10 - Power Installation Instructions	Page 11
Step #11 - Connect Power And Test GFCI	Page 14
Wiring Diagram	Page 15
Federal Communication Commission Interference Statement	Page 16
Innovation, Science And Economic Development Canada Statement	Page 16

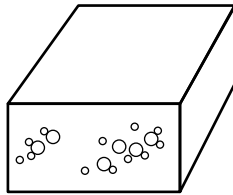
Temperature Sensor



Led Unit Power Wire



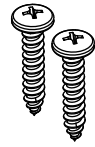
Foam Strip (Cut from packing foam)



#6 Screws (8)



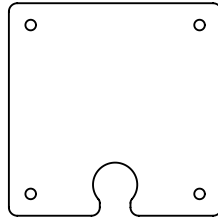
#10 Screws (4)



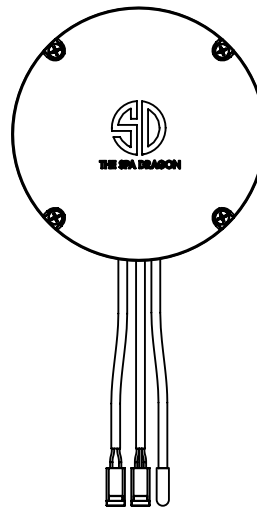
Supply Connection Safety Sticker



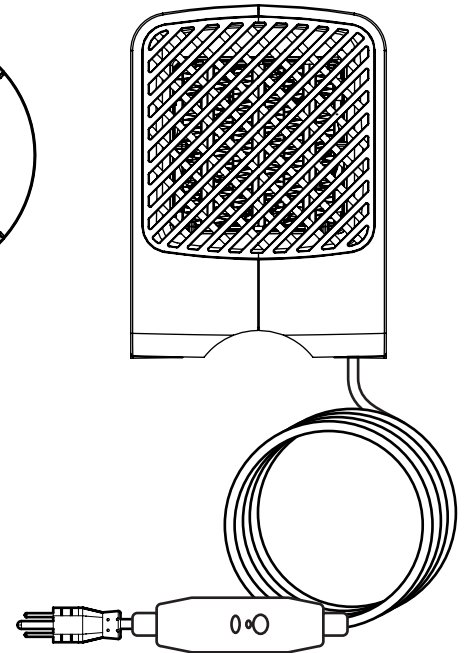
Sealing Plate



Led Unit

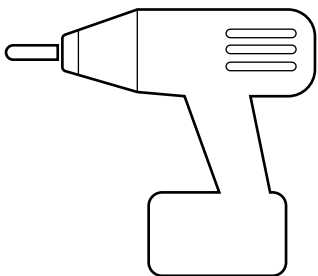


Heater Unit

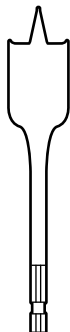


WHAT YOU'LL NEED

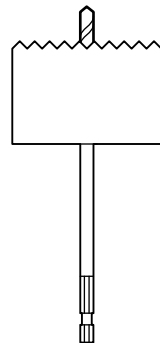
Drill



2" hole saw or spade bit



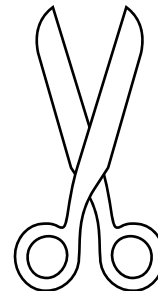
2-1/2" hole saw or spade bit



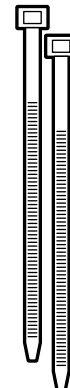
Phillips screw driver



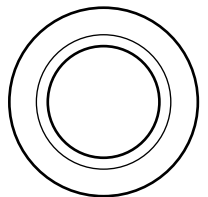
Scissors/wire cutters



Zip Ties (14")



Electrical tape



STEP #1 - REGISTER AND CONNECT THE SPA DRAGON

Register and configure The Spa Dragon by following the instructions in the Quick Start Guide included with The Spa Dragon. You can also access the Quick Start Guide online at:

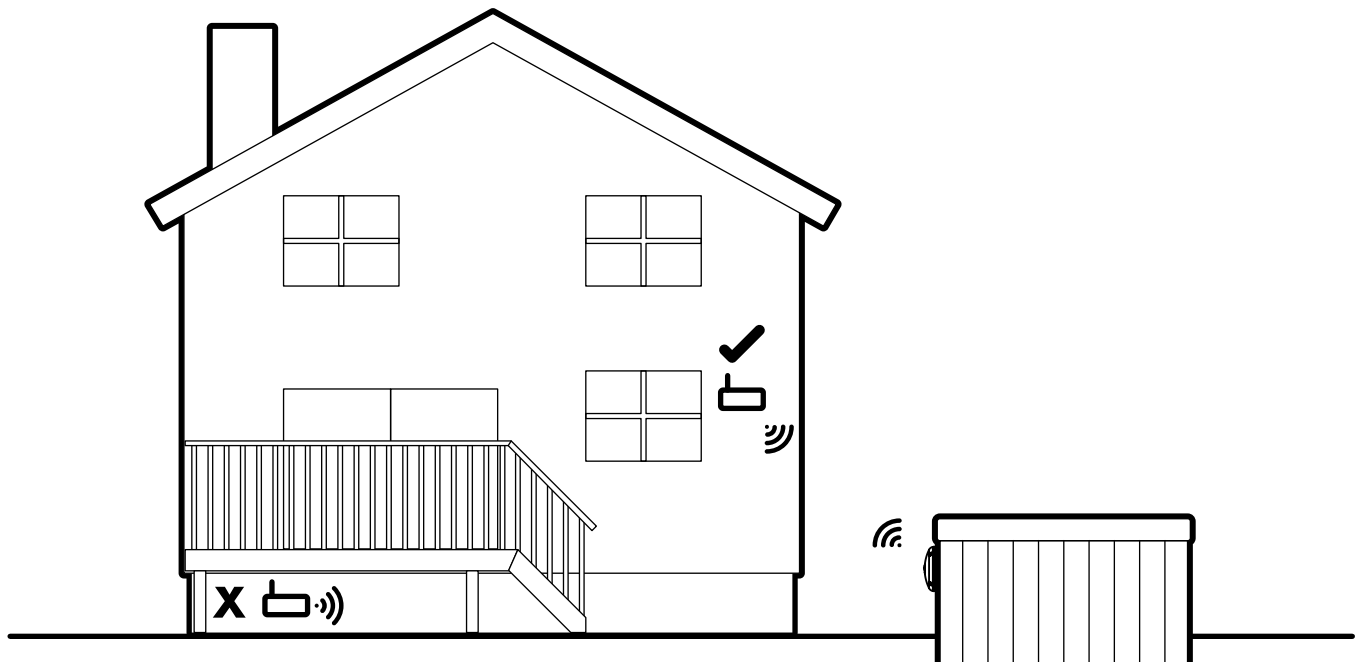
<https://www.TheSpaDragon.com/manual-quickstart>

STEP #2 - DETERMINE PROPER PLACEMENT OF THE LED UNIT

The Spa Dragon communicates with your home WiFi network in order to connect to The Spa Dragon server. As with all wireless links, the strength of the connection depends on several factors including the distance between the two units and the types of materials or obstructions between them.

For best performance the LED unit should be placed in a location where it has a strong connection to your WiFi Access Point. The following guidelines should help to ensure that The Spa Dragon has strong reliable wireless connections.

- i) If possible, your WiFi access point should be on the main floor or second floor of your house or apartment on the side closest to your hot tub. Avoid placing the WiFi access point in a basement or cellar as signal strength can be greatly reduced when passing through concrete walls.
- ii) In some cases you may require a WiFi extender. If so, place the extender near a window on the side of your house or apartment that is closest to your hot tub.
- iii) Do not place your WiFi access point or extender in an enclosed space that is surrounded by metal as this will effectively shield the wireless signals and prevent them from reaching the LED unit. Large metal objects between the extender and router or LED unit may greatly affect the signal strength.
- iv) Avoid placing the WiFi access point or extender close to electrical utilities such as electrical panels, large motors or fluorescent light fixtures as these can all generate significant amounts of electrical noise that may affect the performance of The Spa Dragon.



WARNING: Installation of LED unit—DO NOT plug the unit into a power cord until instructed.

NOTE: The unit has warning lights that are to be visible from within your house so make sure to mount the device on an outer side of the hot tub that is clearly visible from an area of your house.

STEP #3 - DRILL A MOUNTING HOLE FOR THE LED UNIT

FIG. 3.1. Make sure the area behind where you are planning your installation is free and clear of any plumbing, structure or components that could be damaged if drilled into and move chosen location if necessary.

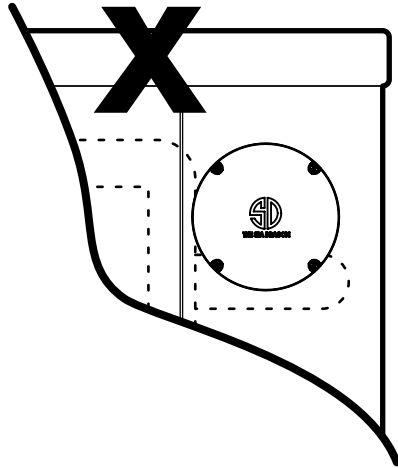


FIG. 3.2. Avoid attaching over decorative surface features that could impact sealing.

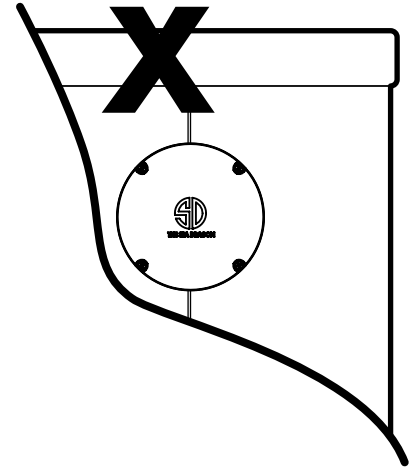


FIG. 3.3. Install the outdoor unit as far away from the main hot tub entry point as possible, into structural framing, 12" away from metal, and ensure visibility to the house. Where possible, outdoor units should be mounted at least 2 feet (60 cm) away from the pump motors in your hot tub as they may interfere with communications. Ideally install on corner so it does not interfere with cabinet panel removal.

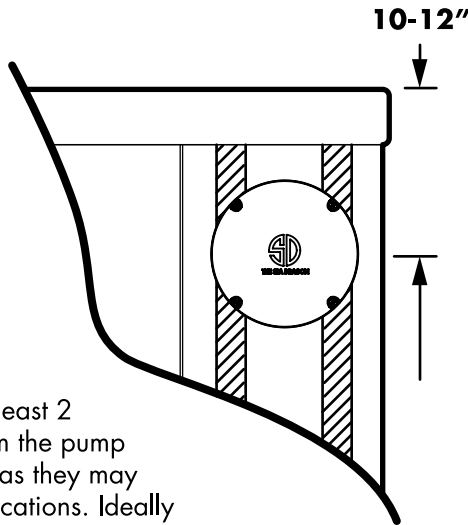
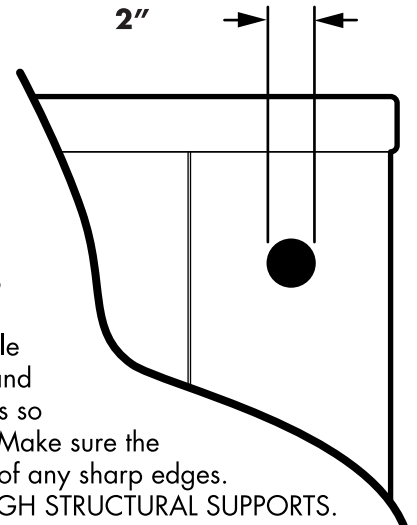
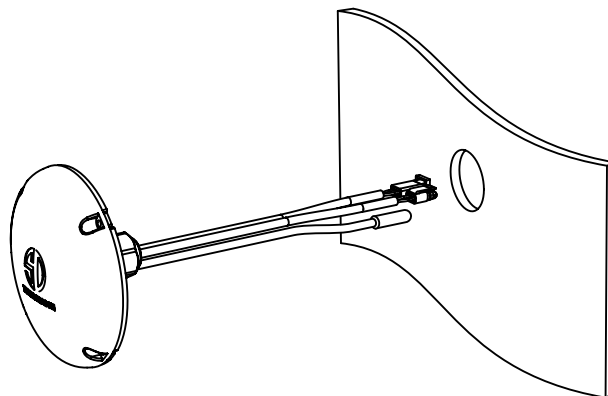


FIG. 3.4. Use a 2" hole saw or spade bit to drill a hole in the exterior panel of the hot tub (if there are insulating panels behind the outer hot tub panel, re-mount the hot tub panel and drill a hole into the exterior panel and interior insulating panels so that they are lined up). Make sure the hole is clean and clear of any sharp edges. DO NOT DRILL THROUGH STRUCTURAL SUPPORTS.



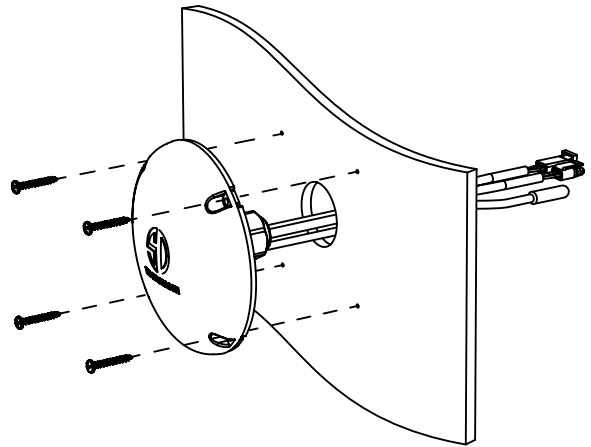
STEP #4 - ATTACH THE LED UNIT

Feed the temperature probe and power pigtailed into the hole. The third wire is an air temperature sensor and must be fed into the hot tub cabinet as well.



Depending on your hot tub panel material, consider pre-drilling the mounting screw holes using the LED unit as a template to mark the holes. Attach the LED unit to the hot tub panel with 4 #6 screws using the mounting holes. Be sure to completely cover the 2" hole and do not pinch any of the wires. Do not over tighten the screws as you may damage the mounting holes.

TIP: Use a screw driver to hand tighten the final few turns so you don't break the light.



STEP #5 - DETERMINE PROPER MOUNTING OF THE TEMPERATURE SENSOR

Review your system to install the temperature sensor preferably on the discharge side of the heater. If unsure of the water flow direction look for the pump and check the connection point. The pump has an inlet, highlighted in FIG 5.1 and outlet, highlighted in FIG 5.2. Chose a sensor placement option accordingly.

FIG. 5.1. Sensor placement option 1

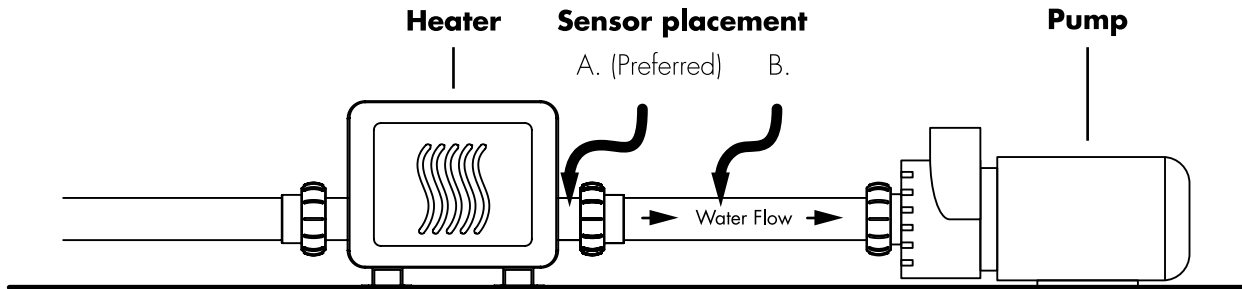
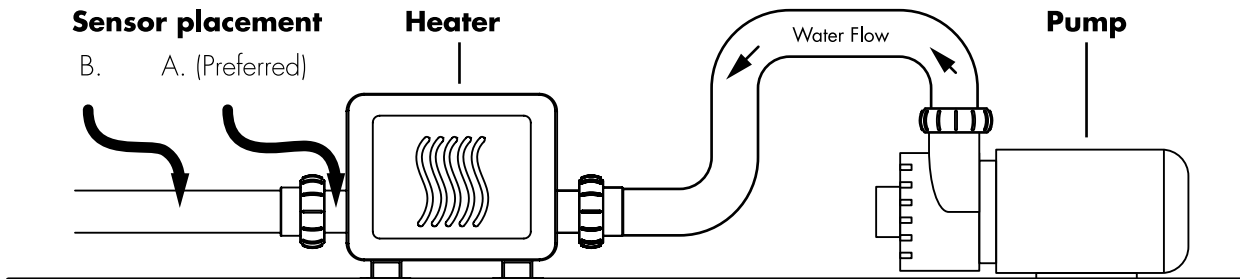


FIG. 5.2. Sensor placement option 2



If there isn't space between the heater union, the probe can be attached to the PVC plumbing. NOTE: the probe may need to be removed when loosening/tightening the heater union connection.

STEP #6 - DETERMINE PROPER MOUNTING OF THE HEATER

CAUTION: This electrical unit may come into contact with water if the hot tub malfunctions, thus unit **MUST** be powered by plugging it into a GFCI protected outlet. Failure to do so could lead to shock or death.

IMPORTANT: All installation locations are to be installed with enough space to prevent anything from burning or melting.

IMPORTANT: To ensure proper operation of safety controls: **DO NOT** install with exhaust grille pointing up or down.

IMPORTANT: The mounting location should position the heater so that the air intake and exhaust grilles are unobstructed and minimum clearances (shown in FIG. 6.2) are maintained. Heated air from the heater may damage interior components or the hot tub structure itself. Always maintain a clearance of 10" (25cm) between heater exhaust and nearest surface.

IMPORTANT: Avoid structural damage to plumbing and component system. Do not use screws to attach heating unit to ANY plumbing, components or shell structure of the hot tub.

FIG. 6.1. Choose a location for the Heater unit that works best for your hot tub. First, you must ensure the temperature sensor can reach the desired installation location as identified in the previous step #6. Also, you will need to run power to the LED unit from the Heater unit so it's important to check the overall length and routing plan is sufficient. Be sure to route the wires away from the pump, and any other internal components that could damage the wires. Finally trace your routing path along structural members of the hot tub and use zip ties or other wire management hardware to secure the wires. This will prevent any unintentional damage to the wires during servicing or reinstallation of the access panel.

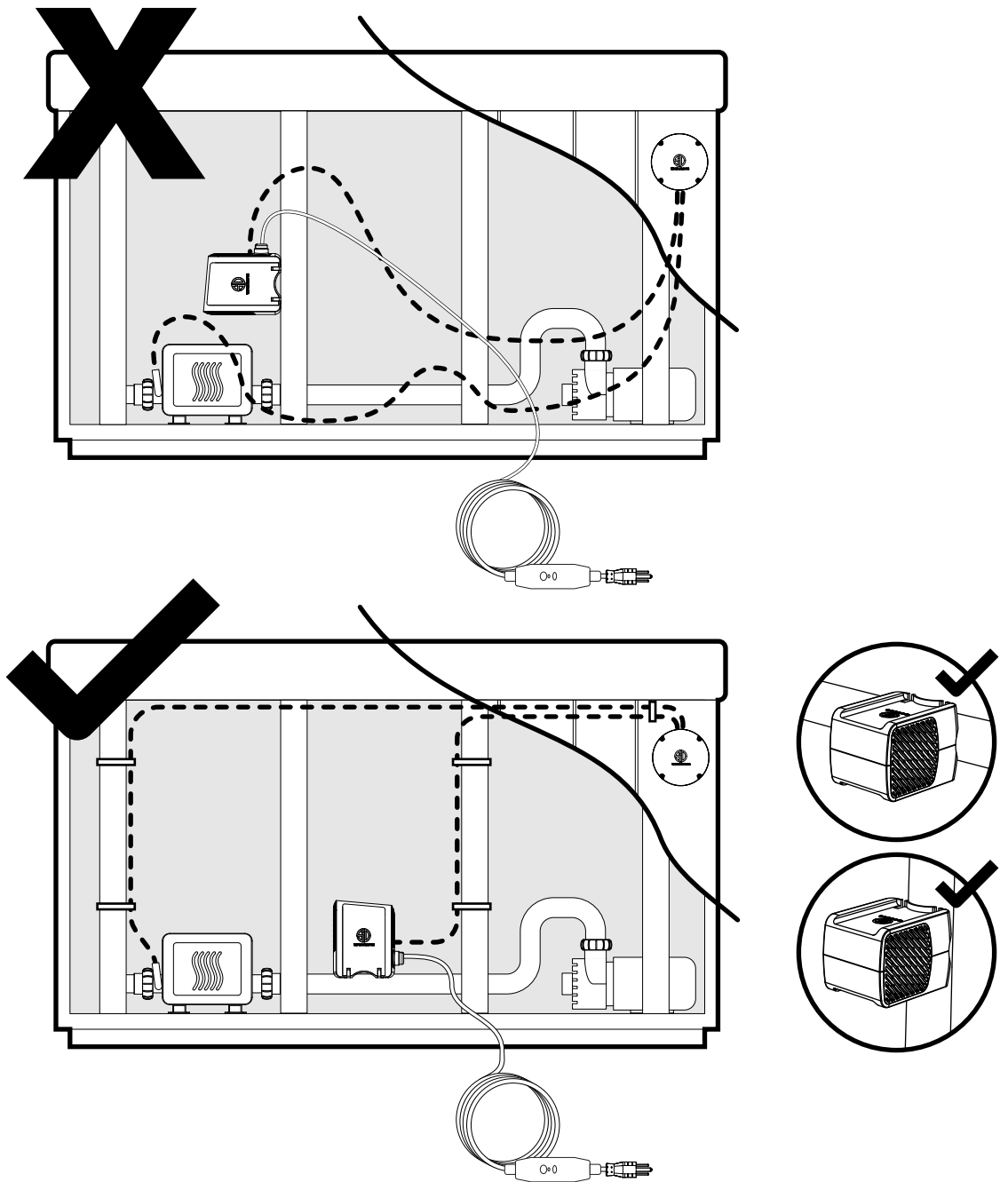
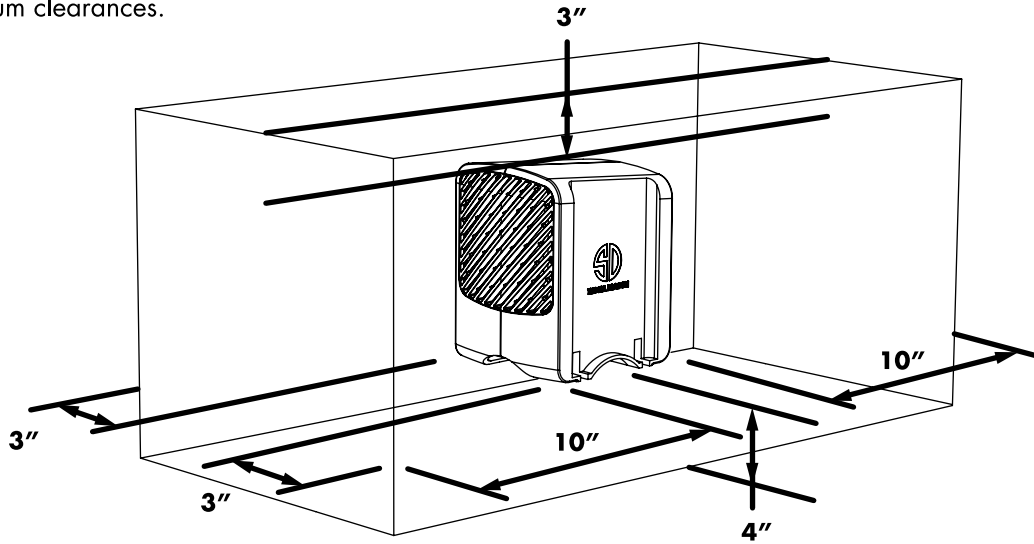


FIG. 6.2. Minimum clearances.



STEP #7 - INSTALL THE HEATER UNIT

Recommended installation locations pointing towards main components of hot tub (computer/heater/pumps) are:

- (1) attached to the 2" plumbing, inline, using the included zip ties as per FIG. 7.1.
- (2) attached to the 2" plumbing, perpendicular, using the included zip ties as per FIG. 7.2.
- (3) Screwed down to the floor of the tub, or to a base, or attached to the framing of the tub using the included #10 wood screws as per FIG. 7.3.

FIG. 7.1. Inline on plumbing

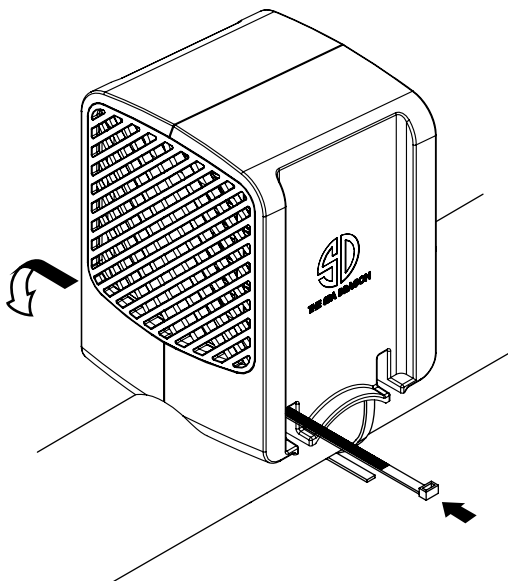


FIG. 7.2. Perpendicular on plumbing (Criss-Cross zip ties on underside of plumbing)

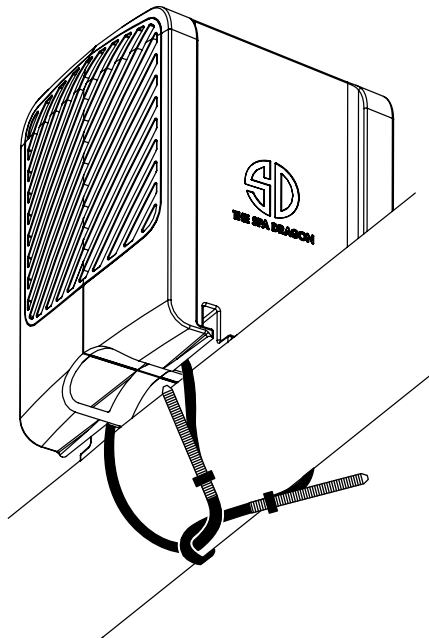
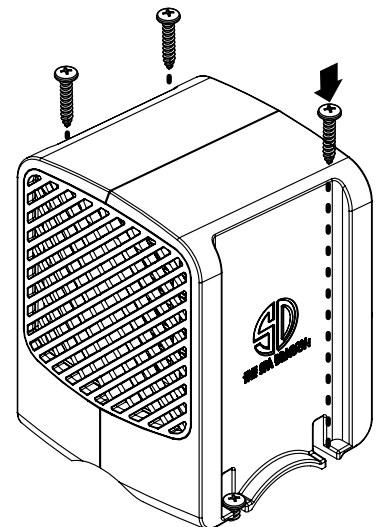


FIG. 7.3. Framing or panels



Note: The heater must be mounted a minimum of 4 inches from the base of the hot tub *as required by UL/CSA standards*

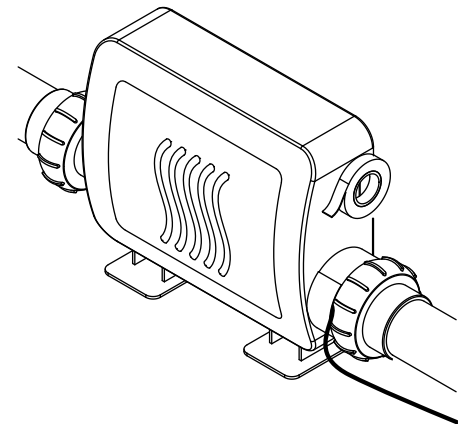
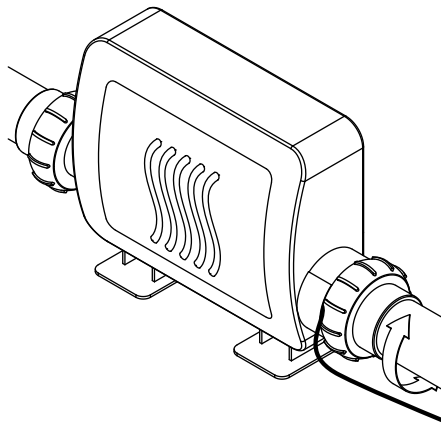
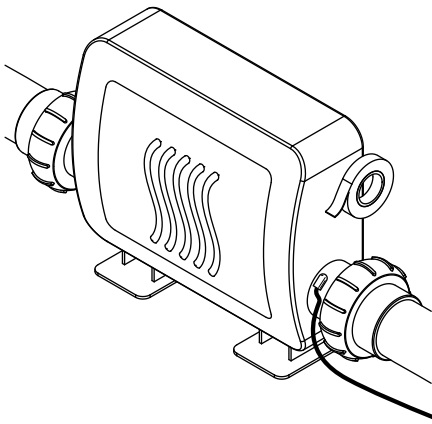
STEP #8 - INSTALL THE TEMPERATURE SENSOR

The temperature probe is designed to be placed against the heater cylinder (FIG. 8.1) to get an accurate reading of the water temperature of the hot tub water. The probe should be against the metal heater cylinder and covered with foam so that the probe is not affected by the internal cabinet temperature fluctuations. Cut a 2" x 2" strip from the packaging foam for use in FIG. 8.2. Feed the temperature probe into the hot tub cabinet, cover the probe with the foam strip, and use electrical tape to secure the tip of the probe to the heater cylinder (FIG. 8.3).

FIG. 8.1. Position temperature sensor on exposed heater cylinder and secure with electrical tape.

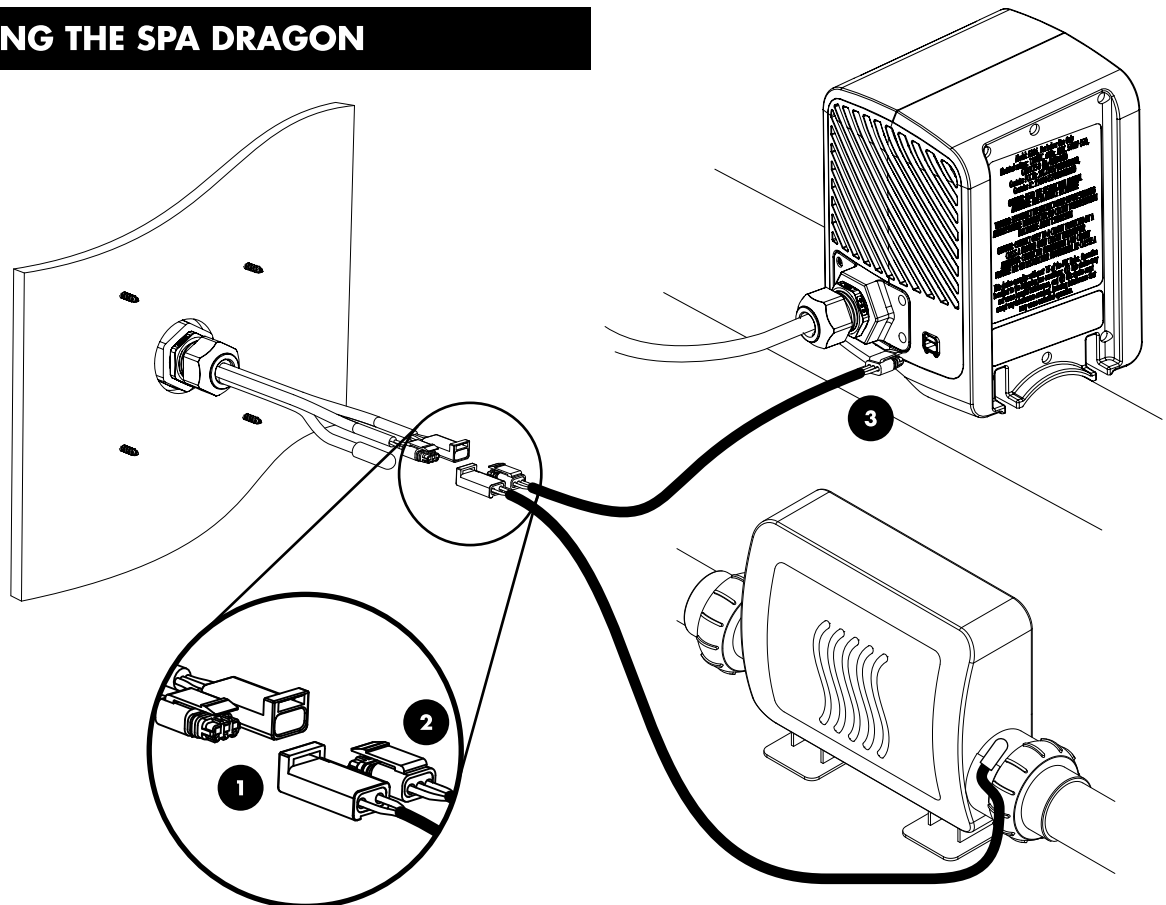
FIG. 8.2. Cover the temperature sensor with the foam strip.

FIG. 8.3. Use electrical tape or a zip tie to secure the foam strip and temperature sensor.



STEP #9 - CONNECTING THE SPA DRAGON

FIG. 9.1. Note the LED unit has a two-wire (1) and a three-wire (2) connection pigtail that corresponds to the temperature sensor and LED unit power inlet. Using the supplied wires, connect the temperature sensor to the LED unit followed by the power inlet to the LED unit, and finally the power inlet wire to the Heater unit (3). Carefully manage the wires according to your predetermined route to prevent damage to the system.



STEP #10 - POWER INSTALLATION INSTRUCTIONS

Only the manufacturer recommended power cord and GFCI should be used for cord connected installations. Only plug the cord into a dedicated 120V/15 amp receptacle after following the steps below.

Electrical installation should be performed by a qualified, licensed electrician.

The Spa Dragon comes equipped with a 15' GFCI power cable as required by UL/CSA standards. When it's time to power up, simply route the power cable from the selected mounting location in the hot tub cabinet to your power receptacle. It's important to route the cable ensuring the overall water seal of the hot tub cabinet remains intact. Depending on your specific installation, select one of the following options and proceed with the instructions.

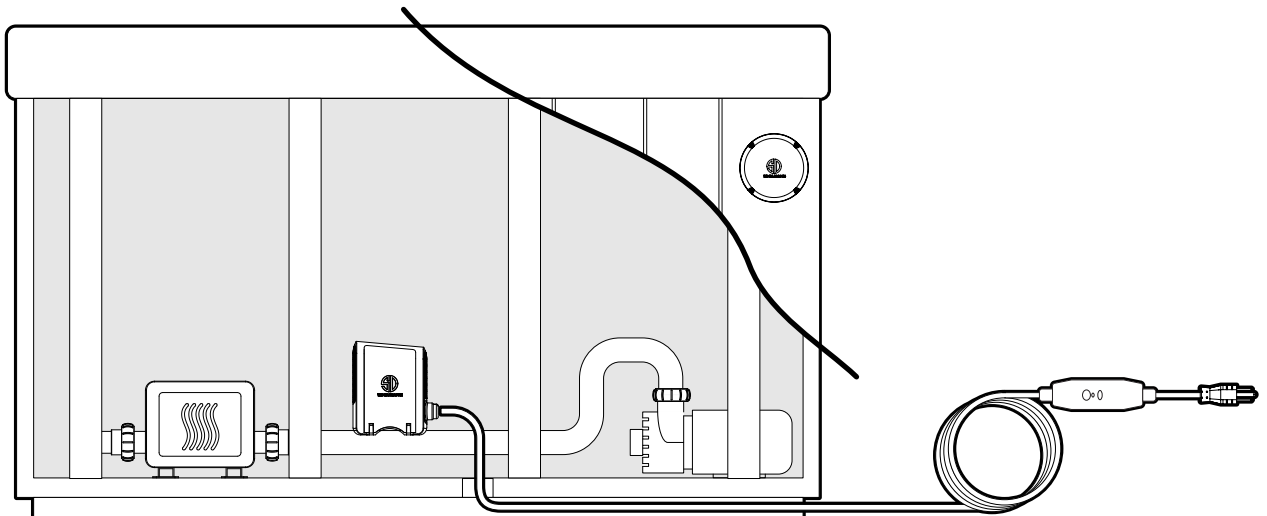


Warning: The cord from The Spa Dragon hot tub is a potential tripping hazard. Please ensure that the cord is properly secured and out of the way to avoid any accidents. Keep the area around the hot tub clear of any obstacles to maintain a safe environment.

Option 1. Route the power cable through the bottom of the hot tub

Warning: Make sure the cord is unplugged from the wall socket prior to proceeding with the following steps.

1. Remove cabinet service panel. (Consult the instruction manual of your hot tub if unsure how to remove the service panel)
2. Starting inside the hot tub cavity route the cable downward through the bottom of the hot tub and toward the receptacle.
3. Depending on your hot tub model you may need to disconnect the power cable at the Heater unit to facilitate routing. If you need to disconnect and reconnect, proceed with these instructions otherwise skip to step 12. (Reference FIG 10.4)
4. Remove terminal cover screws. (1).
5. Loosen cable gland nut. (2)
6. Slide the terminal cover (3) and the strain relief (4) along the cable.
7. Undo the terminal screws (5) to disconnect the wires.
8. Remove strain relief and terminal cover.
9. Starting outside the hot tub with the bare wire end, route the cable to the heater unit.
10. Reverse steps to reinstall the strain relief and terminal cover, keep the gland loose until after the wires are reconnected.
11. Connect line (hot), neutral, and ground wires to corresponding terminals (refer to FIG.10.5 if unsure) and tighten the gland.
12. Within the hot tub cabinet, route the power cable along structural members away from any components that could pinch or damage the cable and use cable management hardware such as zip ties and/or wire clamps as appropriate for your installation.
13. Reinstall hot tub service panel.

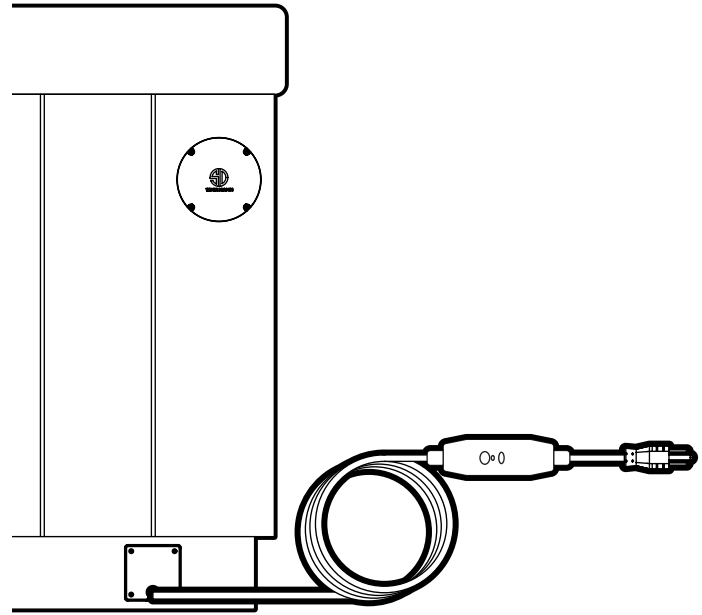


Option 2. Route the power cable through the hot tub base.
(Reference FIG. 10.1, FIG. 10.2, FIG. 10.3)

Warning: Make sure the cord is unplugged from the wall socket prior to proceeding with the following steps.

In some cases you may need to disconnect the power cable at the heater. Refer to FIG. 10.4, 10.5 for instructions on how to do so.

1. Remove cabinet service panel. (Consult the instruction manual of your hot tub if unsure how to remove the service panel)
2. Mount the heater unit according to Step 6,7.
3. Within the hot tub cabinet, route the power cable along structural members away from any components that could pinch or damage the cable and use cable management hardware such as zip ties and/or wire clamps as appropriate for your installation.
4. Follow the steps in FIG. 10.1 to drill a hole in the base.
5. Route the GFCI cable end through the opening in the base and install the sealing plate onto the cable. (Refer to FIG. 10.2)
6. Install the sealing plate onto the hot tub base. (Refer to FIG. 10.3)
7. Finally, reinstall the cabinet service panel onto the hot tub ensuring not to pinch or disconnect any of the cords/probes.



To install the power cable sealing plate, follow the steps below.

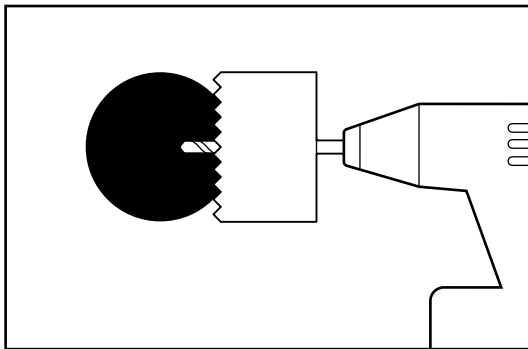


FIG. 10.1. Using a 2-1/2" hole saw, make a hole in the hot tub base. Chose a location that is not obstructed on the inside by critical components such as structural supports, plumbing, computer, and pump, etc.

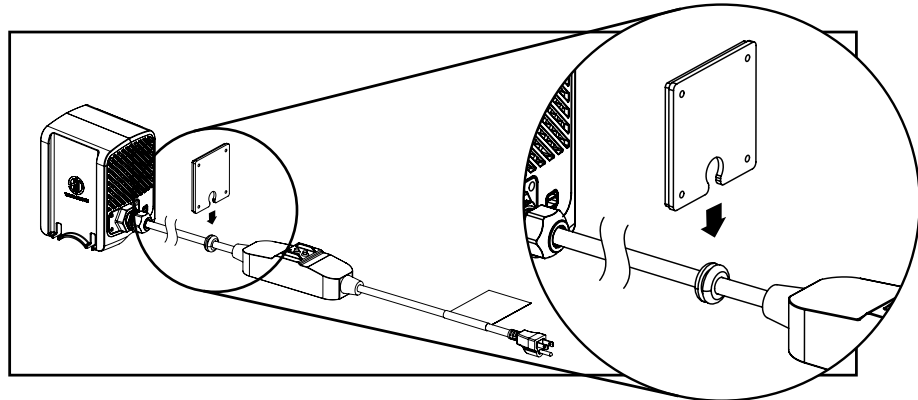


FIG. 10.2. Slide the cable sealing plate onto the grommet which has been pre-installed on the power cord. You'll need to slide the grommet to the desired position before installing the sealing plate.

FIG. 10.3. Run the cable through the opening and using the #6 screws supplied, install the sealing plate. Depending on your hot tub facade material, consider predrilling the mounting holes using the plate as a template to mark your holes.

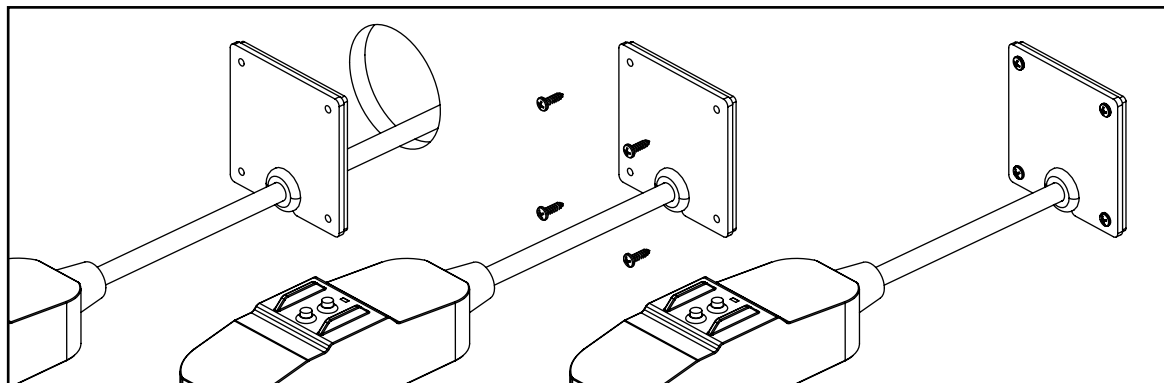


FIG. 10.4. For the options listed, you may need to access the terminal connections to facilitate routing. Below are the key components you'll need to work with.

- 1 Terminal cover screws
- 2 Cable gland nut
- 3 Terminal cover
- 4 Strain relief
- 5 Terminal screws

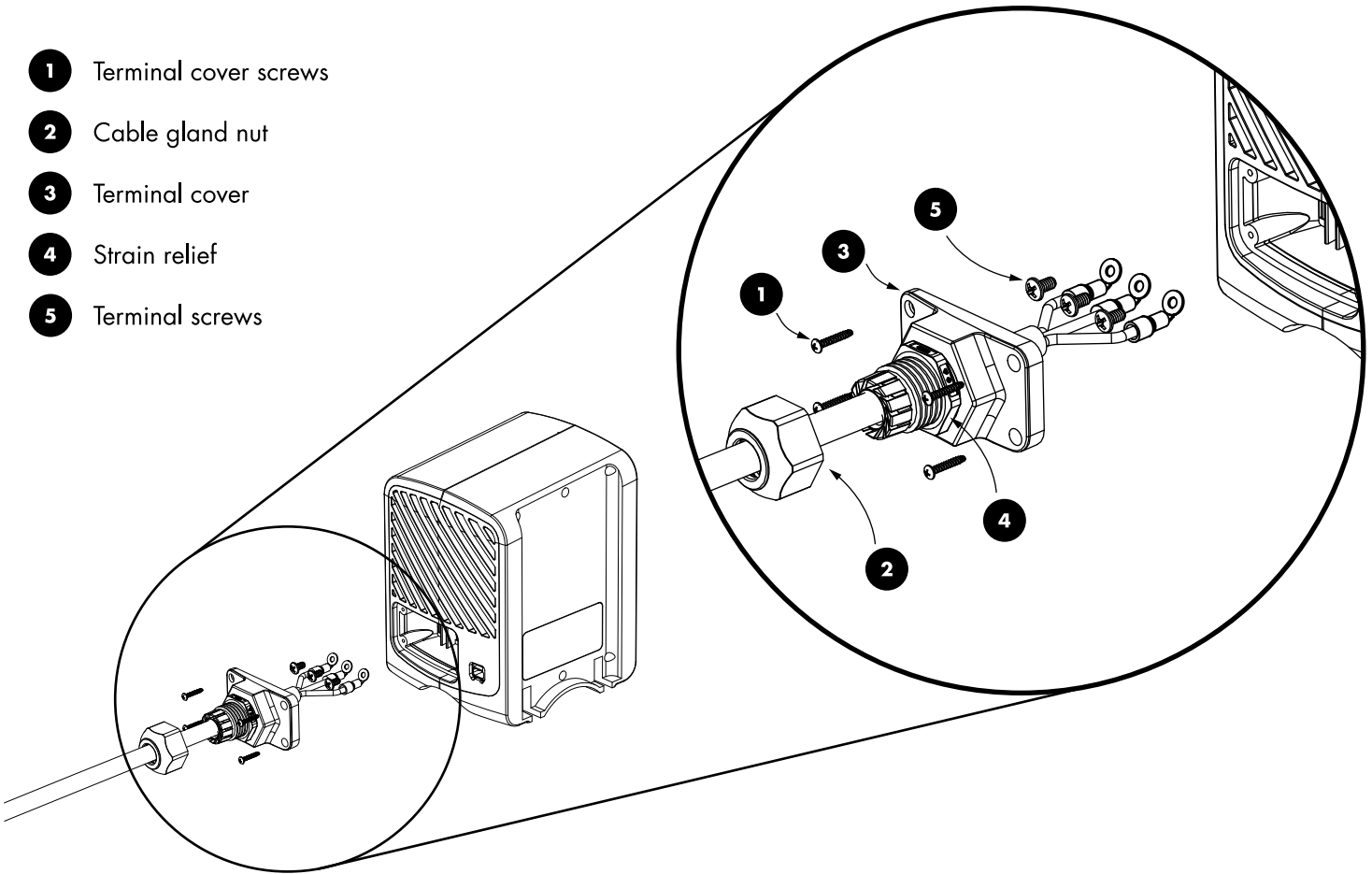
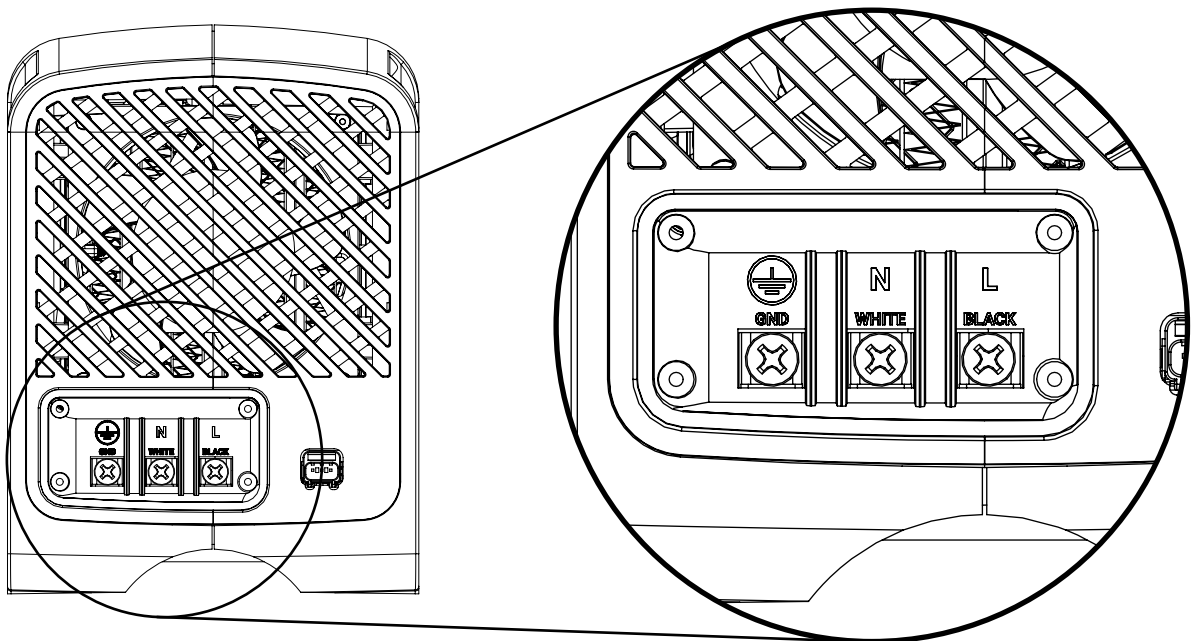


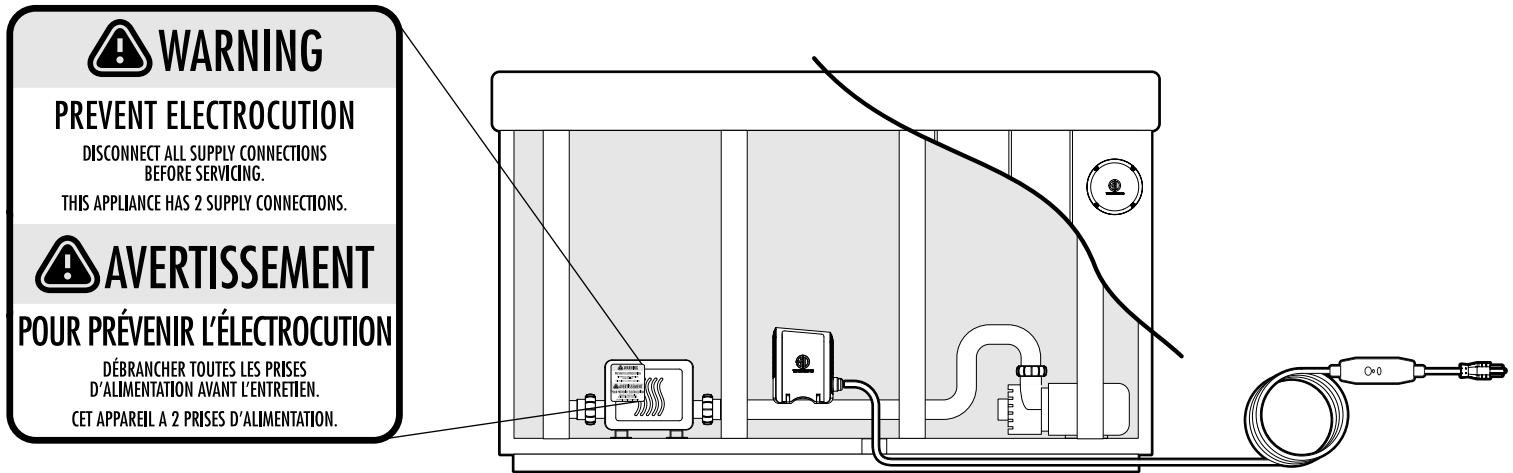
FIG. 10.5. When reconnecting the wires, take extra care in connecting the wires to the correct terminals which are clearly labeled starting from the left "GND" (ground, green), "N" (neutral, white), and "L" (line, black).



Be sure to re-install the terminal cover and attach it to the heater with the screws provided. Once the terminal cover is in place, tighten the cable gland nut until it is snug (do not over tighten).

Adding The Spa Dragon to your hot tub means you now have 2 supply connections. You must add the Supply Connections Safety Sticker as required by UL/CSA standards. The sticker will warn anyone who is servicing the hot tub to disconnect both power supply connections before proceeding.

Apply the warning sticker supplied with the instruction manual on to the spa pack after installation of The Spa Dragon unit.



STEP #11 - CONNECT POWER AND TEST GFCI

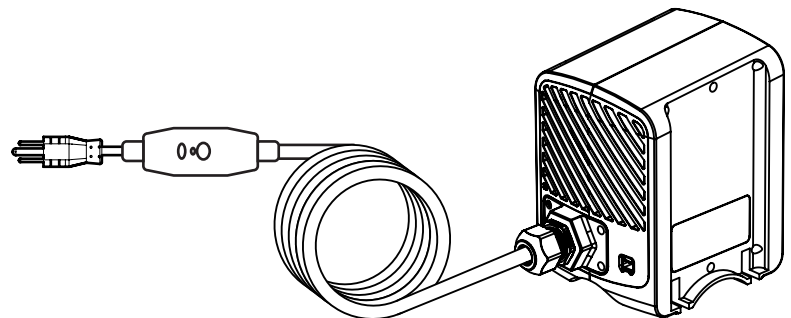
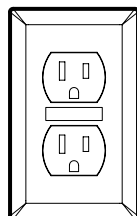
WARNING: RISK OF ELECTRIC SHOCK. The GFCI plug must be tested before each use. Do not use if GFCI test fails.

1. Insert the plug into the power outlet.
2. Press the "RESET" button, the indicator light turns red.
3. Press the "TEST" button, the indicator light turns off.
4. Press the "RESET" button, the indicator light turns red; the heater is ready to use



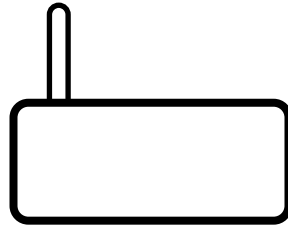
WARNING:
 Connect to a grounded, grounding type receptacle only (GFCI).

Look for the reset button.



Note: When power installation is complete and the light on the LED unit is solid green, the system is set and ready to go!

Router



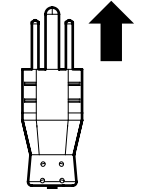
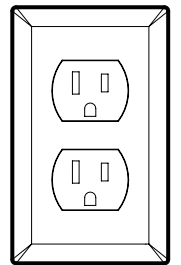
LED Unit



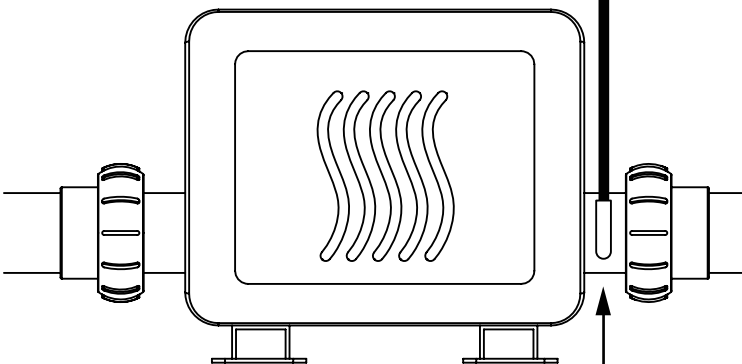
Air Temperature Sensor



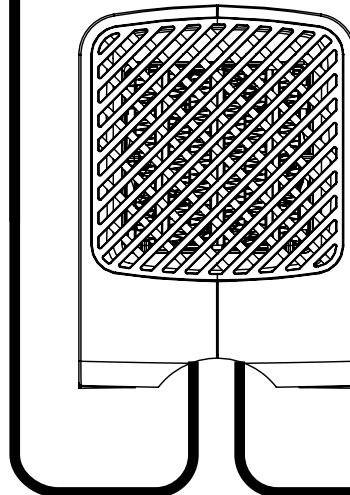
GFCI



Water Heater



Heater Unit



Temperature Sensor



FCC
Supplier's Declaration of Conformity
47 CFR § 2.1077 Compliance Information
Unique Identifier: A106, A108
Responsible Party – **TBD**
The Spa Dragon Corp
675 Industrial Ave., Ottawa, Ontario, K1G 0Z1
www.thespadragon.com

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation



CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Radiation exposure statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

INNOVATION, SCIENCE AND ECONOMIC DEVELOPMENT CANADA STATEMENT

This device complies with ICES-003 of the Innovation, Science and Economic Development Canada Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement

Radiation exposure statement

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

Déclaration d'exposition aux radiations

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps. Le PEN peut être utilisé avec une distance de séparation de 0 cm entre le stylo et votre corps.