Installation and Safety Manual

For all UL listed control systems manufactured by Balboa Instruments, Inc.

Balboa Instruments, Inc.
ISO 9001
A6159

Balboa Instruments Incorporated

balboa-instruments.com

Installation and Safety Manual

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Customer record

Model: _____

Serial Number: _____

Date of Purchase: _____

Dealer: _____

Address: _____

Phone Number: _____

Electrical (see manufacturing label):

Volts: _____

Amps: _____

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS

When installing and using this electrical equipment, basic safety precautions should always be followed, including:

1. **WARNING:** To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.
2. **INSTALLATION:** Install to provide drainage away from electrical equipment enclosure. Install to permit access for servicing and ventilation.
3. **ELECTRICAL SUPPLY:** The electrical supply for this product must include a suitably rated switch or circuit breaker to open all ungrounded supply conductors to comply with section 422-20 of the National Electrical Code, ANSI/NFPA. The disconnect must be readily accessible and visible to the spa occupant but installed at least 5 feet (1.5m), measured horizontally from the pool or spa water.
4. **TO REDUCE THE RISK OF INJURY:**

- The water in a spa should never exceed 104°F (40°C). Water temperatures between 100°F (38°C) and 104°F (40°C) are considered safe for a healthy adult. Lower water temperatures are recommended for extended use (exceeding 10-15 minutes) and for young children.
- Since excessive water temperatures have a high potential for causing fetal damage during the early months of pregnancy, pregnant or possibly pregnant women should limit spa water temperatures to 100°F (38°C).
- Before entering a spa, the user should measure the water temperature with an accurate thermometer since the tolerance of water temperature-regulating devices may vary as much as ±5°F (2°C).
- See operator's manual on how to adjust the temperature of the spa.
- The use of alcohol, drugs, or medication before or during spa use may lead to unconsciousness with the possibility of drowning.
- Persons suffering from obesity or who have a medical history of heart disease, low or high blood pressure, circulatory system problems, or diabetes should consult a physician before using a spa.
- Persons using medication should consult a physician before using a spa since some medication may induce drowsiness, affect heart rate, blood pressure, and/or circulation.
- Long exposure may cause HYPERTHERMIA (elevated body temperature). Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 98.6°F. The symptoms include dizziness, fainting, drowsiness, lethargy, and an increase in the internal temperature of the body. The effects of hyperthermia include (1) unawareness of impending hazard, (2) failure to perceive heat, (3) failure to recognize the need to exit the spa, (4) physical inability to exit the spa, (5) fetal damage in pregnant women, and (6) unconsciousness, resulting in a danger of drowning.
- **WARNING:** The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia in spas.
- Maintain the proper pH level, total dissolved solids level, total alkalinity level, and sanitizer level of the water as recommended by the water chemistry companies.

CSA SAFETY INFORMATION
(Canadian Standards Association)

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

1. READ AND FOLLOW ALL INSTRUCTIONS.
2. A green colored terminal or a terminal marked G, GR, Ground, Grounding, or the ⏚ symbol* is located inside the supply terminal box or compartment. To reduce the risk of electric shock, this terminal must be connected to the grounding means provided in the electric supply service panel with a continuous copper wire equivalent in size to the circuit conductors supplying this equipment.

   * IEC Publication 417, Symbol 5019.
3. At least two lugs marked "BONDING LUGS" are provided on the external surface or on the inside of the supply terminal box/compartment. To reduce the risk of electric shock, connect the local common bonding grid in the area of the hot tub or spa to these terminals with an insulated or bare copper conductor not smaller than No. 6 AWG.
4. All field-installed metal components such as rails, ladders, drains or other similar hardware within 3m of the spa or hot tub shall be bonded to the equipment grounding bus with copper conductors not smaller than No. 6 AWG.
5. **SAVE THESE INSTRUCTIONS.**

- **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.
- **WARNING:** People using medications 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 USE CUVE DE RELAXATION.
- **WARNING:** People with infectious diseases should not use a spa or hot tub.
- **AVERTISSEMENT:** LES PERSONNES ATTEINTES DE MALADIES INFECTIEUSES NE DEVRAIENT PAS UTILISER UNE CUVE DE RELAXATION.
- **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 E SORTANT.
- **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'EVANOUISSEMENT ET LA NOYADE ÉVENTUELLE, NE PRENDRE NI DROGUE NI ALCOOL AVANT D'UTILISER UNE CUVE DE RELAXATION NI QUAND ON S'Y TROUVE.
- **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.
- **WARNING:** Water temperature in excess of 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.
- **WARNING:** Before entering the 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.
- **AVERTISSEMENT:** NE PAS UTILISER UNE CUVE DE RELAXATION IMMEDIATEMENT APRÈS UN EXERCICE SATIGANT.
- **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.

- **WARNING:** Do not permit electrical appliances (such as a light, telephone, radio or television) within 1.5m of this spa or hot tub.
- **AVERTISSEMENT:** NE PAS PLACER D'APPAREIL ÉLECTRIQUE (LUMINAIRE, TÉLÉPHONE, RADIO, TÉLÉVISEUR, ETC.) À MOINS DE 1.5M DE CETTE CUVE DE RELAXATION.
- **CAUTION:** Maintain water chemistry in accordance with manufacturer's instructions.
- **ATTENTION:** LA TENEUR DE L'EAU EN MATIERÈS DISSOUTES DOIT ÊTRE CONFORME AUX DIRECTIVES DU FABRICANT.

HYPERTHERMIA

Prolonged immersion in hot water may induce hyperthermia. A description of the causes, symptoms, and effects of hyperthermia are as follows:

- Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 37°C. The symptoms of hyperthermia include drowsiness, lethargy, and an increase in the internal temperature of the body. The effects of hyperthermia include:

  a. Unawareness of impending hazard;
  b. failure to perceive heat;
  c. failure to recognize the need to exit spa;
  d. physical inability to exit spa;
  e. fetal damage in pregnant women; and
  f. unconsciousness and danger of drowning.

- **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 CONSIDÈRABLEMENT LES RISQUES D'HYPERTHERMIE MORTELLE DANS UNE CUVE DE RELAXATION.

DO'S AND DON'TS

- DO test water temperature with your hand before entering to be sure that it's comfortable.
- DO change the water when it becomes sudsy.
- DO keep the spa cover closed when the spa is not in use. This is also the key to economical spa operation.
- **SAVE THESE INSTRUCTIONS.**

INSTALLATION AND HOOK-UP INSTRUCTIONS

BEFORE ATTEMPTING TO HOOK-UP OR USE YOUR CONTROL, PLEASE READ THROUGH THESE INSTRUCTIONS AND FOLLOW THE WIRING DIAGRAM ON THE SYSTEM FOR PROPER CONNECTIONS.

POSITIONING YOUR CONTROL

Because your control is completely self-contained, you can locate it just about anywhere you wish... on a deck, patio or even indoors. Just be sure to position it above ground, in an area with good drainage, and on a level, continuous surface that contacts the bottom of the control fully. Locate your control so that equipment is above grade and not subject to flooding. WATER SHOULD ALWAYS DRAIN AWAY FROM THE CONTROL.

SAFETY DEVICES

Your control is equipped with the following safety features:

1. A water flow sensor detect that prevents the heater from activating until there is sufficient water flow, thus preventing "dry firing" of the heater.
2. Automatic spa shutdown timers that shut off the spa's jet pump(s), blower and light after a period of operation.
3. An electronic regulating sensor that automatically shuts off the spa if the spa temperature exceeds 112°F. This condition is reset by reducing the spa water temperature to below 110°F. There is an additional sensor located in the heater well which turns the spa off if the temperature exceeds 118°F. This condition may be reset by reducing the temperature to below 110°F, then pressing the appropriate pad (see operator's manual) on the spa side control.

Note: This control will not perform properly unless all safety devices are properly installed. Failure to do so may result in serious injury or death.

ELECTRICAL REQUIREMENTS

The manufacturing label provides the power requirements for your control. WE RECOMMEND THAT ONLY A LICENSED AND BONDED ELECTRICIAN DO THE INITIAL SYSTEM HOOK-UP AND ANY SUBSEQUENT SERVICE.

Electrical requirements are as follows:

Note: As of January 1, 1994, the National Electrical Code requires a GFCI (Ground Fault Circuit Interrupter) on all spa installations.

240 VAC dedicated unit (single service, 5.5kW max. heater):

- Hardwire only.
- 240 VAC - 40A, 3 or 4 wire (including ground), #6 AWG copper wire (single phase 60 Hz).
- Supply conductor minimum ampacity: 50A
- Circuit breaker or fuse rating: 50A

240 VAC dedicated unit (2 services, 10.5 kW max. heater)

- Hardwire only.

Heater service requirements:

- 240 VAC - 40A, 3 wire (including ground), #6 AWG copper wire, single phase 60 Hz
- Supply conductor minimum ampacity: 50A
- Circuit breaker or fuse rating: 50A.

Control/motor service requirements:

- 240 VAC - 24A, 3 or 4 wire (including ground), #10 AWG copper wire, single phase 60 Hz
- Supply conductor minimum ampacity: 30A
- Circuit breaker or fuse rating: 30A

240 VAC dedicated unit (gas heater)

- Permanently connected.
- 240 VAC, 28 Amps, 60 Hz, 3 or 4 wire (including the ground)
- Minimum supply conductor ampacity: 40A
- Circuit breaker or fuse rating: 40A

Convertible unit

(See conversion instructions on page 6.)

- Hardwire only.

240 VAC Configuration - 40A, 4 wire (including ground), #6 AWG copper wire, single phase 60 Hz

- Supply conductor minimum ampacity: 50A
- Circuit breaker or fuse rating: 50A

120 VAC Configuration - 16A, 3 wire (including ground), #12 AWG copper wire, single phase 60 Hz

- Supply conductor ampacity: 20A
- Circuit breaker or fuse rating: 20A

ELECTRICAL HOOK-UP INSTRUCTIONS

Have a licensed electrician run the required 120/240 VAC power line to the control installation site. This connection is designed to mate with a trade size 1" conduit body, access fitting.

NOTE: DO NOT TURN ON ELECTRICAL POWER TO YOUR CONTROL UNTIL ALL INSTRUCTIONS HAVE BEEN COMPLETED.

To hook-up your control, follow these instructions:

Note: This system is provided with two mounting brackets. These brackets can be mounted to either concrete or wood. Make sure the area chosen is very stable and level.

1. Locate the control in an appropriate location (see item 2 of "Important Safety Instructions"). The location must be installed at least 5 feet, measured horizontally, from the pool or spa water.

   a. Concrete mounting

      1. Place the system in position to be mounted.
      2. Using the "L" bracket, mark four location holes to be drilled.
      3. Use 4 each, 1/4"-20-x 2" concrete anchor bolts or 4 each, 1/4" x 2" lag bolts.
      4. Drill holes in concrete (4 places).
      5. Insert the appropriate anchors.
      6. Align the system to be mounted.
      7. Screw the system down and secure tightly (see Figure 1).

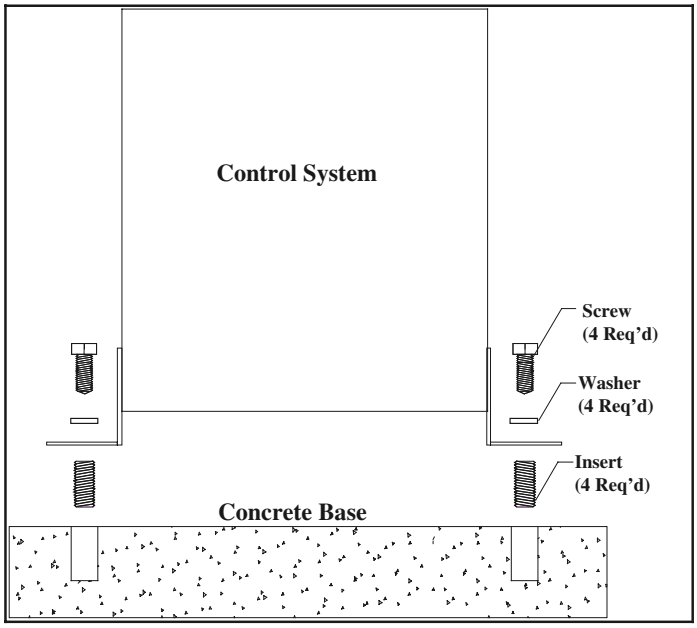

Figure 1: Concrete mount

   b. Wood mounting

      1. Place the system in position to be mounted.
      2. Using the "L" bracket, mark four location holes to be drilled.
      3. Use 4 each, 1/4" x 2" lag bolts and 4 each, 1/4" washers.
      4. Drill 4 each, 3/16" dia. pilot holes 2" deep.
      5. Align the system to be mounted.
      6. Screw the system down and secure it tightly (see Figure 2).

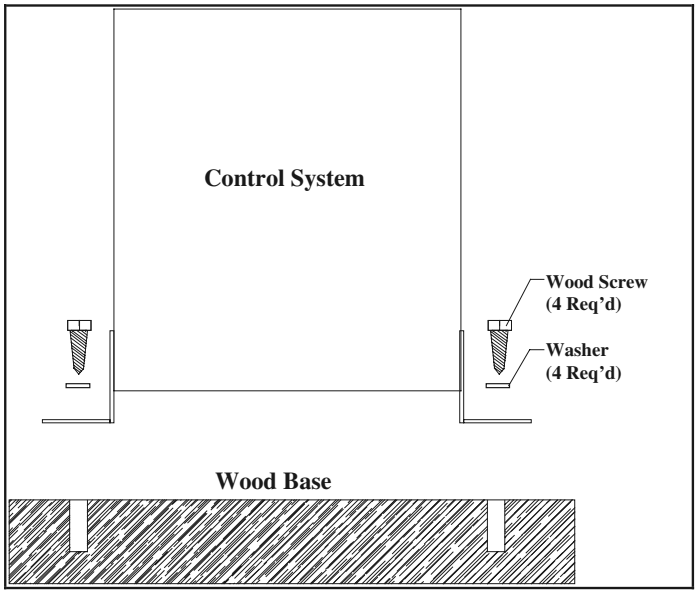

Figure 2: Wood mount

2. Loosen the screw(s) on the cover of the equipment control box to open the front cover of the enclosure to allow access to the equipment system terminal block.

Note: Route all wires through a proper electrical conduit to the appropriate location.

3. Feed the three or four power input wires through the access fitting and into the hole provided until the wires come out in the equipment enclosure.

4. Connect the three or four power input wires to the equipment system terminal block as indicated on the wiring diagram in the equipment can. (If the control has two separate services follow steps 2-3 for the second service.)

5. Make all the appropriate connections to the pump(s), blower, light, ozone generator and heater terminals using the table below.

Output device

AWG min. Copper Only	Amperes Max.
20-18	5
16	10
14	15
12	20
10	25

Table 1: Minimum gauges

Note: Wire sizes are predicated on units intended for continuous duty based on Table 310-16 of the National Electrical Code, ANSI/NFPA 70, using 60°C ampacities for circuits rated 100 amperes or less and 75°C ampacities for circuits rated more than 100 amperes.

6. Install flow switch or pressure switch wire onto the (N.O. & C) terminals of the pressure switch. Always route pressure switch wire away from high voltage wires. Note: If using a gas heater, omit this step and follow Application Note 3 (Gas Heater Interface).

7. Install the water temperature sensor (3/8" dia. housing) using the fitting provided or use a suitable water-tight fitting in an appropriate location. The location should enable you to take an accurate reading of the tub temperature. See Application Note 1 (Water Temperature Sensor Installation instructions).

8. Install the high-limit sensor (1/4" dia. housing) in the heater well to provide high-limit and freeze protection. See Application Note 2 (High-limit Sensor Installation instructions).

9. Install the topside panel in an appropriate location so that the backside of the panel is not exposed to moisture. Always route panel wire away from high voltage wires. See Application Note 4 (Topside Panel Installation).

10. Close the equipment enclosure and re-tighten the securing screw(s).

11. Make all appropriate bonding connections. Use a minimum #8 AWG solid copper wire to connect from the heater, pump(s), ozone generator, and any other metal equipment, metal water pipe, or conduit within 5 feet of the unit to the bonding bar on the control box.

12. If using a gas heater, also see Application Note 3 (Gas Heater Interface).

13. Electrical hook-up is now complete.

CONVERSION INSTRUCTIONS

(For 120/240 VAC convertible units only.)

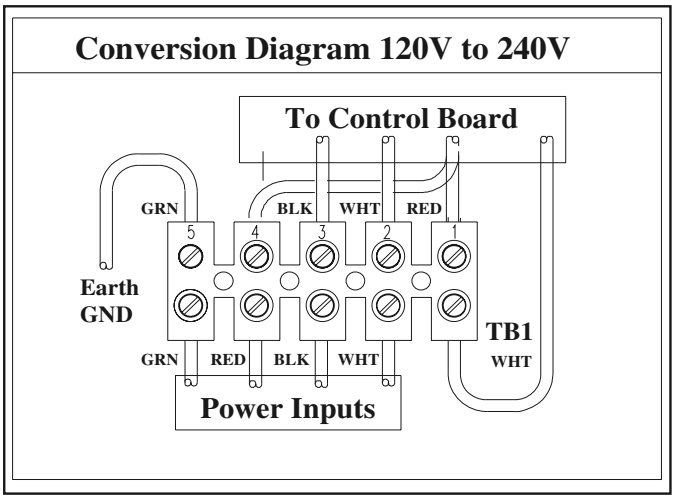

Figure 3: 120V to 240V Conversion diagram

1. Conversion must be performed by a qualified, licensed electrician. Hardwire only.

2. Disconnect from power.

3. Move red wire (TB1-1) to (TB1-4) as indicated by dashed lines.

4, Move jumper J9 or J8 (depending on type of board) on the control board to the 20A position.

WATER TEMPERATURE SENSOR INSTALLATION

APPLICATION NOTE 1
Doc. #DA010 Rev. 2 05/13/1996

INTRODUCTION

This application note specifies procedures to properly install a water temperature sensor into a spa equipped with a Balboa control system.

INSTALLATION

CAUTION: Always route sensor wires away from high voltage wires.

Installation of a Balboa sensor mount (PN 30385):

NOTE: Mount the sensor where water is actively moving when heater is on and where occupants will not lay against it.

1. Drill a 1.0" diameter hole through spa wall, approximately 8-10" below water level.
2. Install Balboa sensor mount body from the inside of the spa using silicone as sealant. Make sure contents of silicone are compatible with polycarbonate materials, such as GE RTV6800 series or equivalent (i.e. does not contain methylethylketone, acetic acid, etc.). See Figure 1.

WARNING: Using any silicone other than those in the GE RTV6800 series can result in a cracked sensor mount.

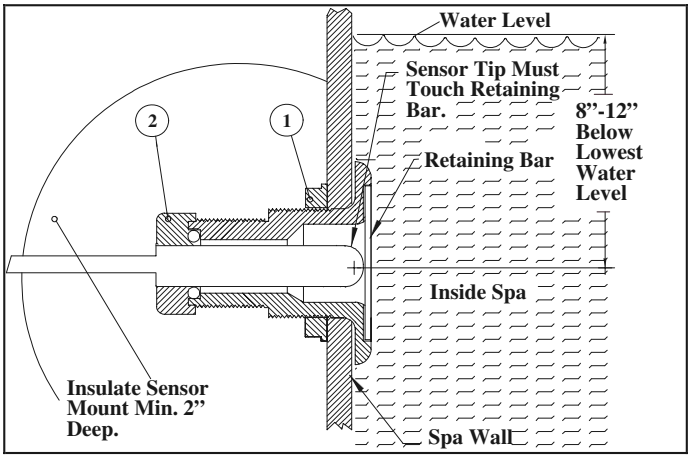

Figure 1: Balboa sensor mount assembly

3. Install the "flange nut" (#1) and tighten.
4. Insert the sensor into the sensor mount. Make sure the sensor tip touches the retaining bar.
5. Tighten the "water tight cap" (#2) to securely retain sensor.
6. Insulate back of sensor mount completely with spray foam insulating material. The density of the foam should be 1.75±.25 lb./cu. ft. or greater.

Installation of a Heyco sensor mount:

1. A Heyco brand sensor mount may be installed in either of the following locations:
   a. Option A: Drill and tap 1/2 NPT in the desired location of the spa wall (preferably somewhere in the filter bucket) 8" below water level. See Figure 2.
   b. Option B: Drill a .825" (53/64") dia. hole through the spa wall (same location as option A). Follow step #2, and then tighten the Heyco locknut (#4) (p/n #8463 or #8464) as shown in Figure 2.

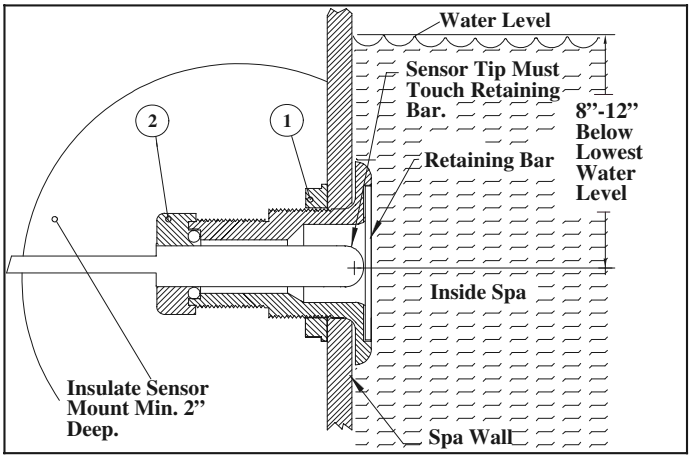

Figure 2: Threaded or non-threaded mounting (spa wall)

c. Option C: In any pipe of the pump's inlet:

- Install into a plastic tee 1 1/2" x 1 1/2" x
- 1/2" or 2" x 2" x 1/2". See Figure 3.
- **CAUTION:** This choice of location may cause the spa to cycle on and off (for heat demand) too frequently due to the water in the piping cooling off at a much faster rate than the spa itself.

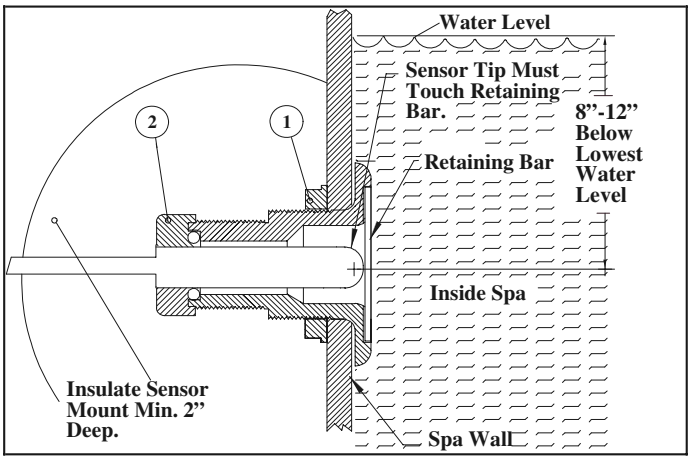

Figure 3: Plastic tee mounting

2. Install the Heyco (#3231 or 3232) sensor mount into the desired location. To prevent water leakage, use Teflon tape, silicone, or a polyurethane sealant. Do not use a petroleum-based sealant. For non-threaded applications, use silicone only.

3. Loosen the domed sealing nut (#1) of the fitting (#3).

4. Refer to the appropriate figure for the type of installation chosen.

   a. Threaded or non-threaded mounting (spa wall) - Figure 2: Insert the water sensor (#2) into the fitting (#3) until the sensor extends 1/2" beyond the face of the fitting.

   b. Plastic tee mounting - Figure 3: Insert the water sensor (#2) into the fitting (#3) until the cable end of the sensor is flush with the domed sealing nut (#1).

5. Tighten the domed sealing nut (#1) onto the fitting (#3).

6. Make sure water is not leaking from the fitting.

HIGH-LIMIT SENSOR INSTALLATION

APPLICATION NOTE 2
Doc. #DA020 Rev. 2 12/01/1995

INTRODUCTION

This application note specifies procedures to properly install a high-limit sensor into a spa equipped with a Balboa control system.

INSTALLATION

For units using an electric heater:

NOTE: Mount the sensor where water is actively moving when heater is on and where occupants will not lay against it.

A. Thermal well located outside heater housing:

1. Locate the heater's thermal well cover (#1) and loosen the #10-32 nut (#2). See Figure 1 below.

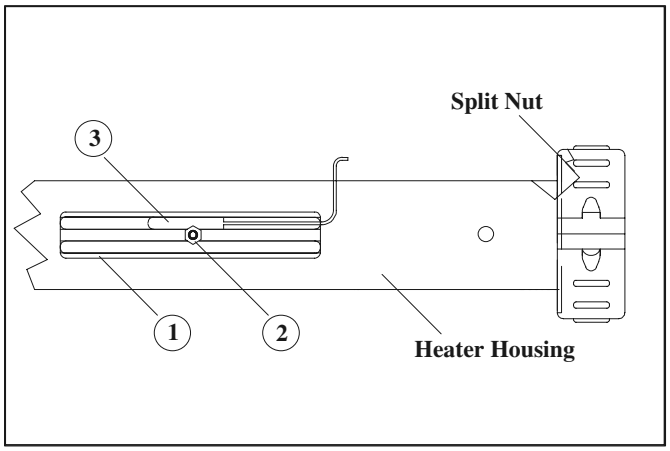

Figure 1: Typical high-limit sensor location for electric heaters

2. Insert the 1/4" x 1 1/2" high-limit sensor (#3) into the heater's thermal well cover (#1) as shown. (Make sure to slide the sensor halfway down the thermal well.)
3. Tighten the #10-32 nut (#2).

B. Thermal well located inside heater housing:

1. Remove the heater's enclosure to expose the thermal well. See figure 2.

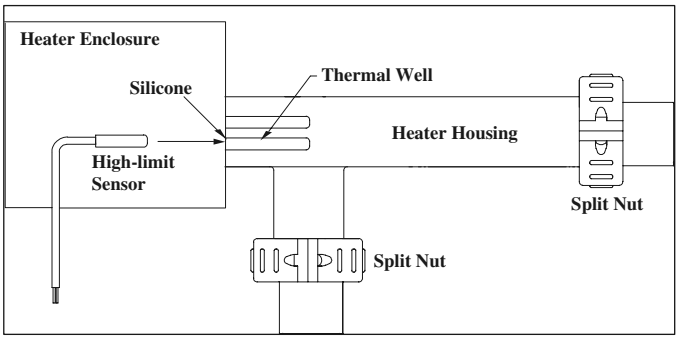

Figure 2: Thermal well inside heater housing

2. Feed the high-limit sensor through any open hole in the heater's enclosure or drill a 1/4" hole in the enclosure.
3. Insert the high-limit sensor all the way into the thermal well until it reaches the end of the thermal well. See Figure 2.
4. Plug the high-limit sensor wire with any type of silicone to provide strain relief. See Figure 2.
5. Put the heater's enclosure back in place.

C. No thermal well cover:

1. Locate and place the 1/4" x 1 1/2" high-limit sensor (#1) on the heater (#2). See Figure 3.

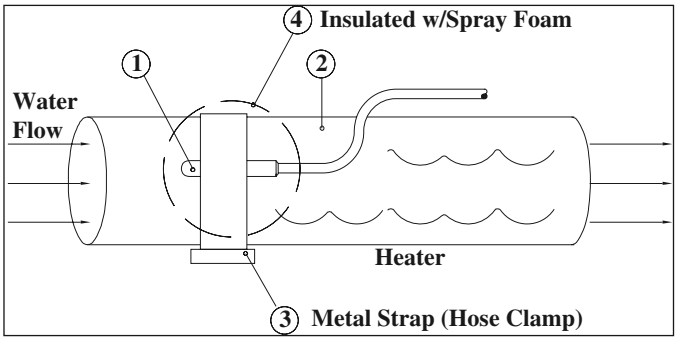

Figure 3: No thermal well cover

2. Use a 3" dia. metal strap (#3) and wrap the high-limit sensor in place.
3. Insulate the high-limit sensor completely with spray foam insulating material (#4). The density of the foam should be 1.75±.25 lb./cu. ft. or greater.

For units using a gas heater:

CAUTION: Do not deactivate or tamper with the gas heater's factory installed high limit.

Use the Balboa high-limit sensor (1/4" x 1 1/2") as a secondary high-limit/freeze in addition to the high-limit sensor already in the gas heater.

Follow the instructions below:

1. A Heyco brand high-limit/freeze sensor mount may be installed in any pipe of the heater's water outlet. The following are the plastic tee sizes which may be installed: 1 1/2" x 1 1/2" x 1/2" or 2" x 2" x 1/2"

2. Install the Heyco high-limit/freeze sensor mount (#3231 or 3232) into the tee location. To prevent water leakage, use Teflon tape, silicone, or a polyurethane sealant. **Do not use a petroleum-based sealant!**

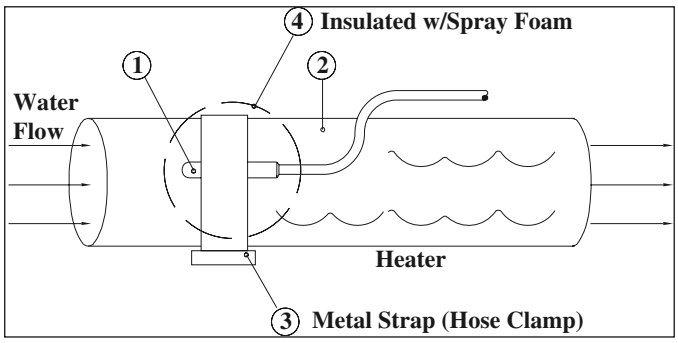

Figure 4: Plastic tee mounting

3. Loosen the domed sealing nut (#1) of the Heyco fitting (#3).

4. See Figure 4, Plastic tee mounting. Insert the high-limit/freeze sensor (#2) into the fitting (#3) until the cable end of the sensor is flush with the domed sealing nut (#1).

5. Tighten the domed sealing nut (#1) onto the fitting (#3). Make sure water is not leaking into the fitting.

GAS HEATER INTERFACE

APPLICATION NOTE 3
Doc. #DA030 Rev. 5 02/06/1997

INTRODUCTION

This application note specifies procedures to properly install a gas heater interface into a spa equipped with a Balboa control system. The gas heater used must be UL listed with an integral flow/pressure switch.

Note: This will require a special "gas" board. It will allow the pump low to run for an extended period of time after the heater turns off in order to mimic the function of a fireman's switch. Contact Balboa for more information.

INSTALLATION

Note: Do not remove any existing wires, sensors, or equipment from the gas heater.

Gas heater rating: 800VA pilot duty max.

1. Install a Balboa water temperature sensor. according to the instructions in Application Note 1.
2. A secondary high-limit/freeze sensor is required. Install a Balboa high-limit/freeze sensor according to the instructions in Application Note 2.

Note: If the heater has an electronic thermostat, then a Balboa system designed specifically for use with gas heaters with electronic thermostats should be ordered. In this case, the two heater wires will have 240 VAC output when the heater is enabled and will power up the entire gas heater. Run these two wires directly to the power input of the gas heater. In this case, turn the thermostat of the gas heater all the way up and proceed to step 4.

3. Turn the thermostat of the gas heater down all the way and wire two heater wires from the control system in parallel with the gas heater thermostat wires by using an appropriately sized wire nut. See Figures 1 and 2 below. (See Application Note 3A or 3B if re-wiring an electric heater compatible system.)

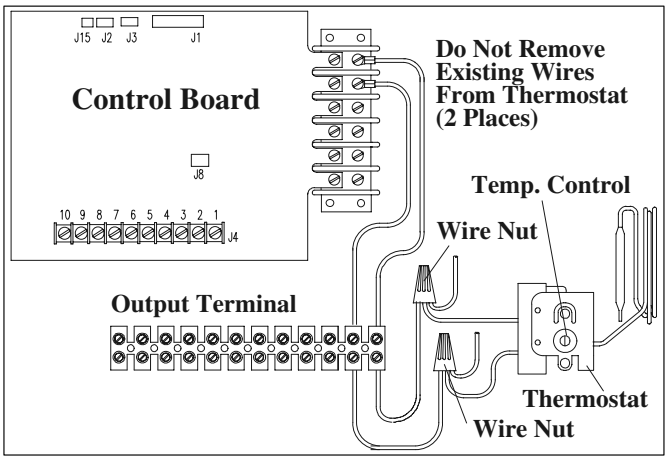

Figure 1: Gas heater interface (option 1)

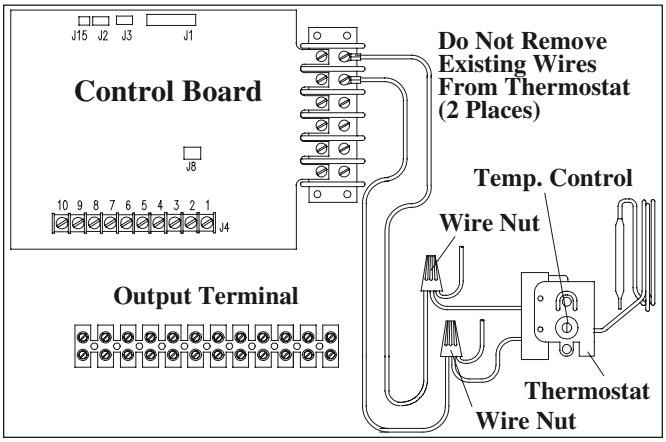

Figure 2: Gas heater interface (option 2)

4. Fill the spa to the suggested water level.

Note: DO NOT turn on the system until all wires are properly connected and the spa is properly filled with water.

5. Power up the control system.
6. Set the temperature of the spa to the max. set temp. so that the control system calls for heat. Refer to the spa's owner's manual for operating procedures.
7. Check that the pump comes on and is properly primed.

TOPSIDE PANEL INSTALLATION

APPLICATION NOTE 4
Doc. #DA040 Rev. 1 01/12/1995

INTRODUCTION

This application note specifies procedures to properly install a topside panel into a spa equipped with a Balboa control system.

INSTALLATION

Note: Do not submerge the topside panel into the water.

1. Find an appropriate location in which to install the topside panel. The surface should be clean and flat so that the adhesive on the back of the panel will adhere well. Mount in location with proper drainage. Make sure the cable is long enough to reach the control system.
2. Use a router (or appropriate tool) to cut a rectangle for the topside panel as follows:
   a. 2 1/4" x 6 3/8" for Euro 5 and 8 panels (Deluxe, Standard, Analog, 3-button Duplex, and Digital Duplex)
   b. 1 5/16" x 3 9/16" for Euro 2 panel (1-button and 2-button Duplex, Auxiliary, 3-digit)
3. Make sure the surface around the rectangular opening is clean.
4. If the control system enclosure is positioned outside of the spa, install a conduit for the panel cable as shown in Figure 1. Use fish tape or other appropriate device to pull the panel cable through the conduit.
5. Peel the thin paper backing away from the adhesive on the back of the panel. (The adhesive should be exposed.)
6. Place the topside panel in the rectangular opening. Make sure the panel is set for easy viewing by the spa user.
7. Route the cable through the opening provided in the enclosure.
8. Plug the panel cable into the control system board.

Figures 1 - 3 below are locations we typically recommend for panel placement.

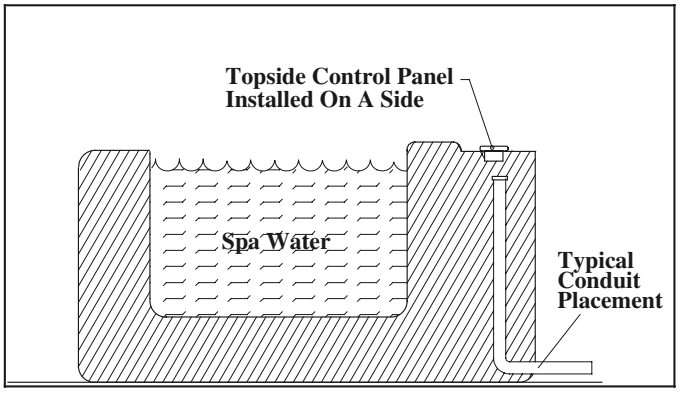

Figure 1: Above-ground/in-ground spa panel placement

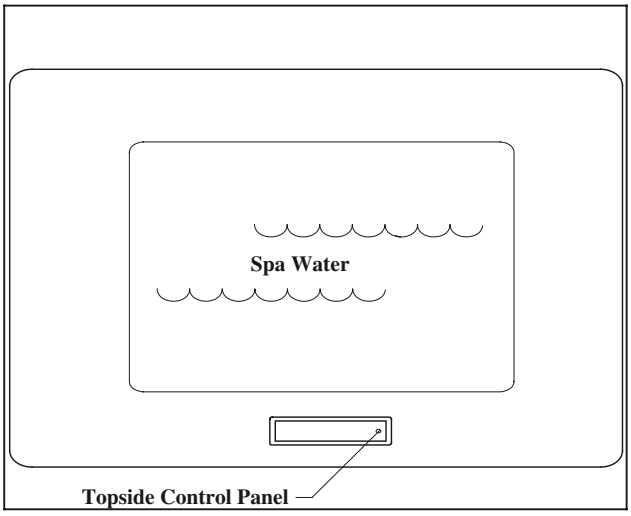

Figure 2: Above-ground spa panel placement

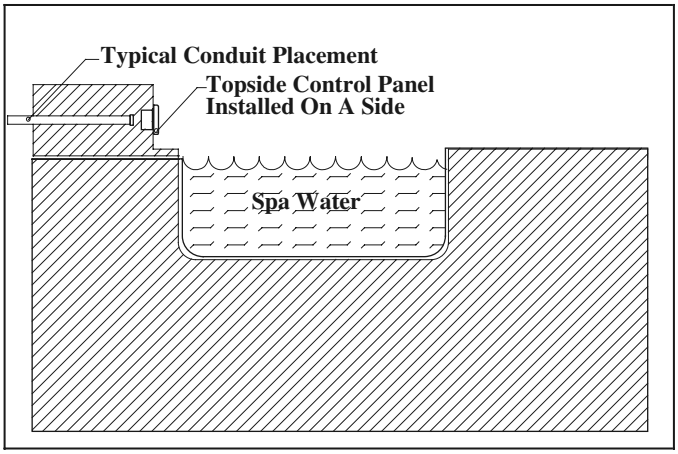

Figure 3: In-ground spa panel placement

G.F.C.I (Ground-Fault-Circuit-Interrupter)

APPLICATION NOTE 5
Doc. #DA050 11/01/1994

INTRODUCTION

This application note specifies procedures to properly install a G.F.C.I. (Ground Fault Circuit Interrupter) into a spa equipped with a Balboa control system.

NOTICE: As of January 1, 1994, the National Electrical Code (Article 680-42) requires that all spas, hot tubs, and associated electrical components shall be protected by Ground Fault Circuit Interrupters.

INSTALLATION

1. Follow the wiring diagram suggested for G.F.C.I. hook-up. See figure 1.
2. All conductors except the green ground must be routed through the G.F.C.I., including the neutral. Never bypass the neutral line. If the neutral line is bypassed, then the current will be imbalanced and cause the G.F.C.I. to trip.

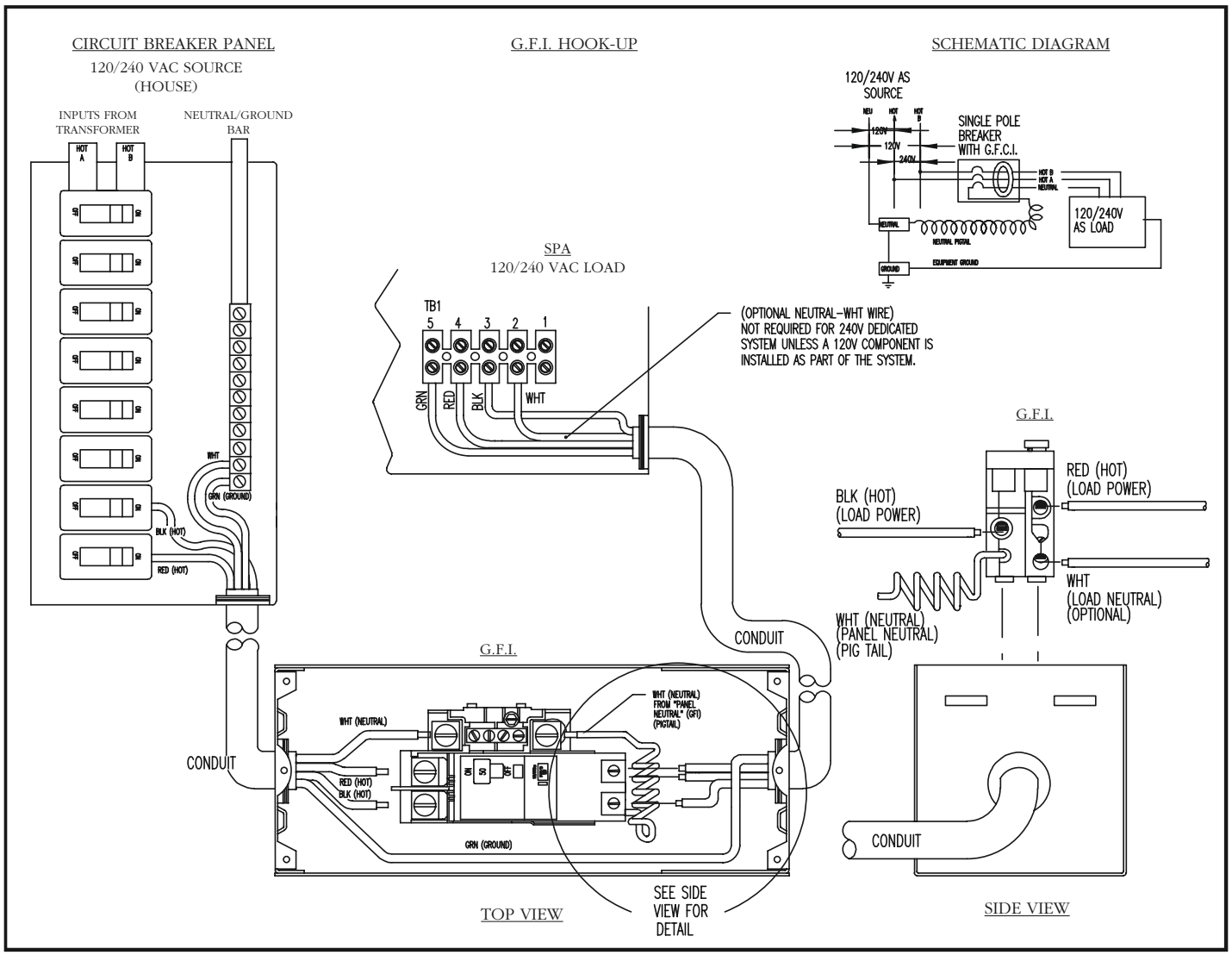

Figure 1

P/N DM900 Revision D 04/10/2006

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