



# IntelliTouch® Pool and Spa Control System Load Center and Power Center



## Installation Guide

IMPORTANT SAFETY INSTRUCTIONS  
READ AND FOLLOW ALL INSTRUCTIONS  
SAVE THESE INSTRUCTIONS



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## IMPORTANT SAFETY PRECAUTIONS



### Important Notice:

**Attention Installer:** This manual contains important information about the installation, operation and safe use of this product. This information should be given to the owner and/or operator of this equipment.

**⚠ WARNING** - Before installing this product, read and follow all warning notices and instructions which are included. Failure to follow safety warnings and instructions can result in severe injury, death, or property damage. Call (800) 831-7133 for additional free copies of these instructions.

**⚠ WARNING** - Water temperature in excess of 100 degrees Fahrenheit may be hazardous to your health. Prolonged immersion in hot water may induce hyperthermia. Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above normal body temperature of 98.6° F (37° C). The symptoms of hyperthermia include drowsiness, lethargy, dizziness, fainting, and an increase in the internal temperature of the body.

The effects of hyperthermia include: 1) Unawareness of impending danger. 2) Failure to perceive heat. 3) Failure to recognize the need to leave the spa. 4) Physical inability to exit the spa. 5) Fetal damage in pregnant women. 6) Unconsciousness resulting in danger of drowning.

**⚠ WARNING** - To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

**⚠ WARNING** - **The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia in hot tubs and spas.**

**⚠ WARNING** - Control System is intended to control heaters with built-in high limit circuits **ONLY**. Failure to do so may cause property damage or personal injury.


**⚠ WARNING** - Do not use this product to control an automatic pool cover. Swimmers may become entrapped underneath the cover.

**⚠ WARNING** - For units intended for use in other than single-family dwellings, a clearly labeled emergency switch shall be provided as part of the installation. The switch shall be readily accessible to the occupants and shall be installed at least 10 feet (3.05 m) away, adjacent to, and within sight of, the unit.

**⚠ CAUTION** - Except for listed spa-side remote controls, install a minimum of five (5) feet from the inside wall of the pool and spa.

## IMPORTANT SAFETY PRECAUTIONS (Continued)

### General Installation Information

1. All work must be performed by a licensed electrician, and must conform to all national, state, and local codes.
2. Install to provide drainage of compartment for electrical components.
3. If this system is used to control underwater lighting fixtures, a ground-fault interrupter (GFCI) must be provided for these fixtures. Conductors on the load side of the ground-fault circuit-interrupter shall **not** occupy conduit, junction boxes or enclosures containing other conductors unless such conductors are also protected by a ground-fault circuit-interrupter. Refer to local codes for details.
4. A terminal bar stamped  is located inside the supply terminal box. 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 (no smaller than 12 AWG or 3.3 mm). The bonding lug(s) provided on this unit are intended to connect a minimum of one No. 8 AWG for US installation and two No. 6 AWG for Canadian installations solid copper conductor between this unit and any metal equipment, metal enclosures or electrical equipment, metal water pipe, or conduit within 5 feet (1.5 m) of the unit.
5. 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 70.1987. The disconnecting means must be readily accessible to the tub occupant but installed at least 10 ft. (3.05 m) from the inside wall of the pool.
6. Supply conductor must be sized to support all loads. Maximum supply conductor current must be 125 Amps at 125 VAC or 63 Amps at 240 VAC.

### Read and Follow all Safety Instructions

This product is designed and manufactured for safe and reliable service when installed, operated and maintained according to the information and installation codes referred to in this manual.

This is a safety alert symbol. When you see this symbol in this manual or on the product, look for one of the following signal words; **DANGER**, **WARNING**, **CAUTION** and **NOTICE** and comply with the information. Be alert to the potential hazard. Ensure to read and comply with all of the warnings and cautions in this manual.



#### **DANGER! Risk of Electrical Shock or Electrocution!**

This product must be installed by a licensed electrician or qualified pool service persons.

Installations must comply with:



- The National Electric Code (NEC) or Canadian Electrical Code (CEC).
- All applicable local codes and ordinances.
- Always disconnect power at the circuit breaker before servicing the load center. Failure to do so could result in death or serious injury to installer, service person, pool users, or others due to electrical shock.
- Improper installation can create an electrical shock hazard that can result in death or serious injury.

## Technical Support

**Sanford, North Carolina** (8 A.M. to 5 P.M. ET.)

**Moorpark, California** (8 A.M. to 5 P.M. PS.)

**Phone:** (800) 831-7133

**Fax:** (800) 284-4151

## Web sites

<http://www.pentairpool.com> and [staritepool.com](http://www.staritepool.com)

## Download the IntelliTouch User's Guide (PDF) from the Web

[http://www.pentairpool.com/owners\\_manuals/controls/IntelliTouch\\_Pool\\_Spa\\_Cntrls\\_Instll\\_Guide.pdf](http://www.pentairpool.com/owners_manuals/controls/IntelliTouch_Pool_Spa_Cntrls_Instll_Guide.pdf)

## Related IntelliTouch Manuals

IntelliTouch Personality Kit User's Guide (P/N 520101)

IntelliTouch Expansion Center Kit User's Guide (P/N 520471)

IntelliTouch i-Link Protocol Interface Adapter User's Guide (P/N 520450)

ScreenLogic® User's Guide (P/N 520493)

ScreenLogic® Video & Lighting Protocol Adapter User's Guide (P/N 520936)

## Kit Contents

The following items are included in the Load Center or Power Center kit. If any item is missing or damaged in the kit, contact your authorized dealer, or contact Pentair Technical Support.

- IntelliTouch® Load Center or Power Center enclosure.
- Wiring Diagram Label - To affix to the inside front door (for models i5x and i10x).
- IntelliTouch Load Center or Power Center Installation Guide (this manual).

## About this Installation Guide

Use the information in this manual for installing the IntelliTouch Load Center and Power Center.

- For information about installing the high power relays and the transformer refer to the IntelliTouch Personality Kit Installation Guide (P/N 520101).
- For additional IntelliTouch installation information, refer to the IntelliTouch Personality Kit Installation Guide (P/N 520101) and the IntelliTouch System User's Guide (P/N 520101).

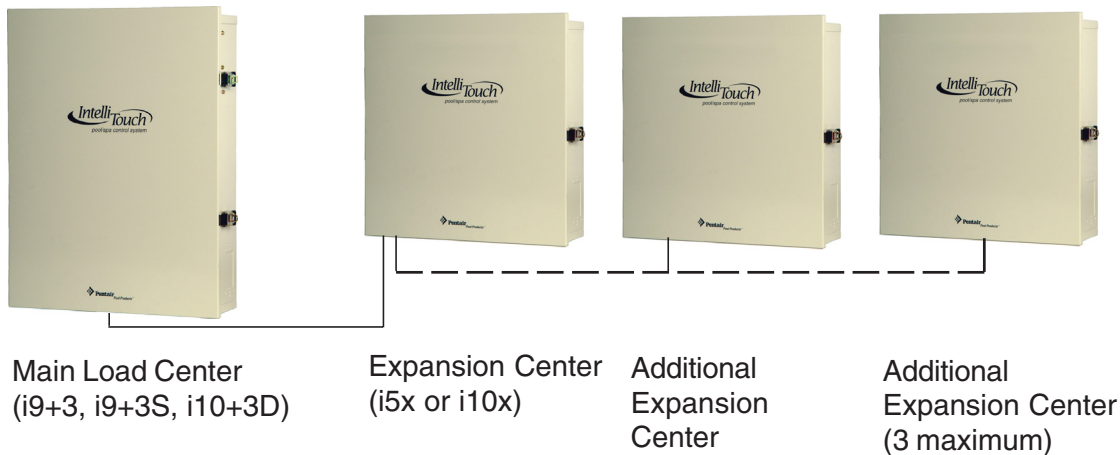
## Installation Summary

The recommended installation steps for the Load Center and Power Center are:

- 1 Review Conduit and Wiring procedures (page 7):** Install conduit and wiring to the Load Center or Power Center.
- 2 Review High Voltage Connection (page 8):** Review and Identify HIGH VOLTAGE locations in the Load Center or Power Center before connecting wires.
- 3 Install the Load center and Power Center (page 10):** Install the Load Center or Power Center.
- 4 Affixing the System Wiring Diagram Label (page 11):** Affix the wiring diagram on the inside of the front door of the enclosure (for models i5S, i9+3S, i10+3D only).

## Optional Expansion Enclosure

Expansion enclosures can support all of the same high voltage connections as the main load to the Load Center or Power Center. The Expansion enclosure supports the same COM port connections, and includes two actuators as the Load Center or Power Center. The Expansion enclosure can be expanded to include up to five actuators (with valve module P/N 520285). Refer to the IntelliTouch Expansion Kit Installation Guide (P/N 520471) for more information.





# Plumbing Requirements

It is important that the pool and spa plumbing system be in accordance with local codes and the Recommended Hydraulic Schematics (page 4, 5 and 6). Before starting, please review the diagrams and the following recommended guidelines:

- 1 The spa should be at or above the level of the pool.

If the spa is attached to the pool, provide a dam between the two bodies of water to allow the spa to overflow into the pool. If the spa is not attached to the pool, an overflow, sufficient in size to carry a full pump-flow, must be installed at the water level in the spa.

- 2 Plumb a three-port **Intake Valve** on the suction-side of the filter pump, so that the center port of the valve is connected to the pump inlet. Connect the spa suction to one side of the Intake Valve, and the pool suction to the other side.

- 3 Plumb a three-port **Return Valve** on the return-side of the heater, so that the return water will enter the valve through the center port.

Connect the spa return to one side of Return Valve, and the pool return to the other side.

- 4 If required, install a spa make-up line (consisting of a manual gate or ball valve for elevated spas, a check valve) to bypass the pool return line. This will enable some of the chemically-balanced water from the pool to cycle through the spa. The manual valve will allow the amount of bypass to be adjusted.

- 5 If the spa is to be constructed in concrete, special provision should be made at this time for the installation of the **Spa-Side remote Control**.

Select a convenient location in the deck or above water level in the spa wall (where the Spa-Side remote will not be submerged by the spa water), and install a 6 in. to 12 in. length of one inch PVC pipe to provide a receptacle for the Spa-Side remote. The pipe should be level and protrude beyond the finished surface of the spa. It will be cut back at a later at the installation time. Reduce the pipe size down to ½ in. or ¾ in. conduit, and run it to the proposed Load/Power Center location at the equipment pad. Use sweep elbows for turns.

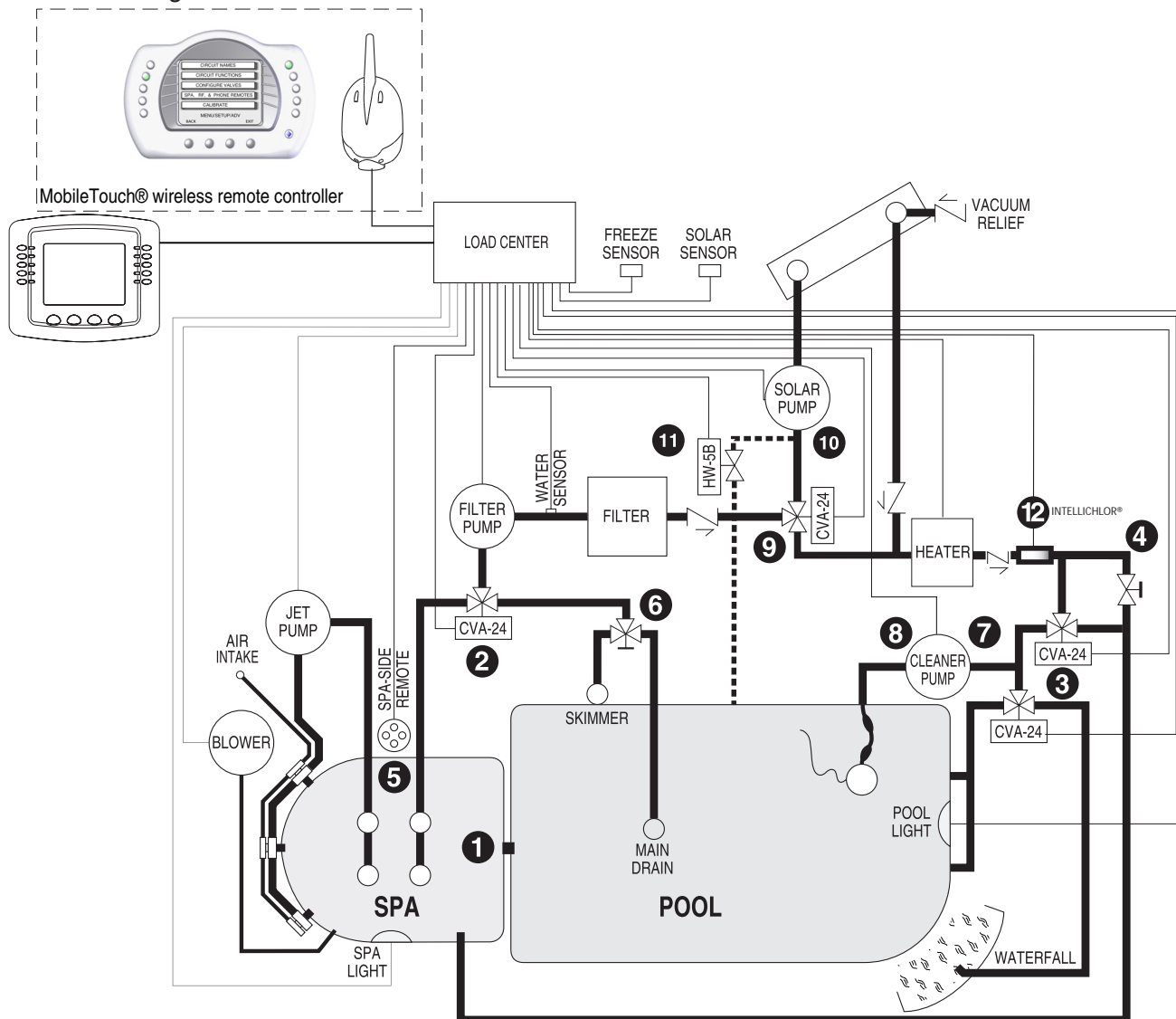
**The Spa-Side remote will not be installed until the spa construction is completed.**

- 6 For systems which incorporate a skimmer, it is possible to balance the amount of suction between the skimmer and main drain for maintenance purposes. This is easily accomplished by installing a manual three-port mixing valve at the suction line. Plumb one port to the skimmer and the other to the main drain.
- 7 If a “non-booster pump” pressure-side pool cleaner is being used, plumb a manual three-port valve between the filter pump and filter, with the third port plumbed to the pool cleaner line, and install a motorized two-port **Pool Cleaner Valve** at this line. The motorized valve will automatically open whenever the Control System activates the pool cleaner.
- 8 If a booster pump pool cleaner is being used, plumb the booster pump so that its suction-side is connected to the pool return, after the heater, and as close to the ground as practical.

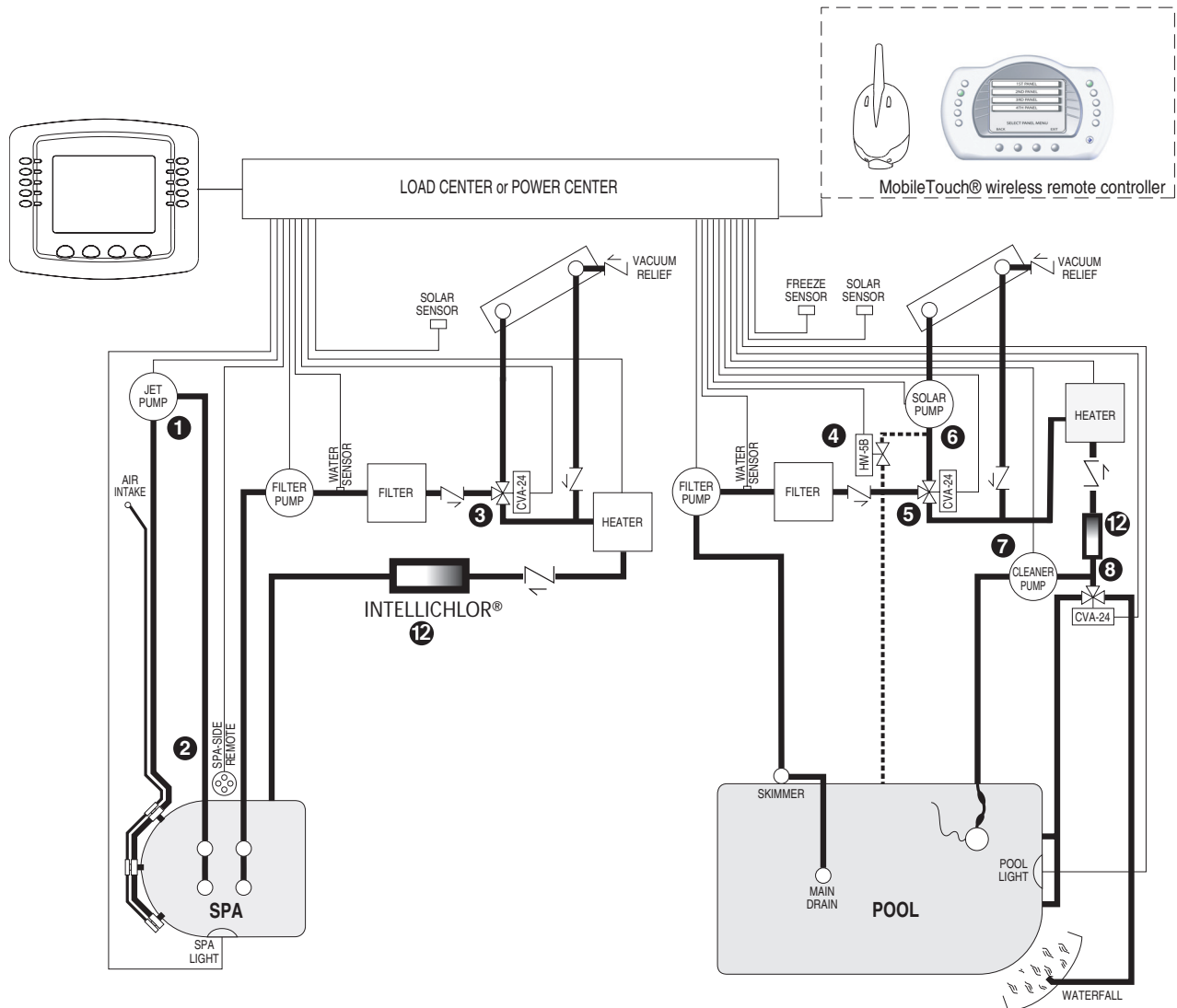
- 9 Plumb the solar feed and return lines between the filter and the heater. Install a three-port valve at the feed line. Use a Pentair solar valve (model SOL-2T), to allow automatic draining of the panels.
- 10 A solar booster pump should be used when the distance to the panels exceed 200 ft., or the panels are elevated higher than 25 ft.
- 11 Glazed solar panels require a drain valve (model HW-5B) to allow draining of the panels. This prevents damage from overheating water. Install a drain valve at the solar feed line and connect to the pool fill line.
- 12 **Salt Chlorine Generator (SCG):** IntelliChlor® IC40 or IC20 salt chlorine generator cell with check valve at the heater output. Refer to IntelliChlor User's Guide (P/N 520589) for plumbing requirements.

## Equipment Location

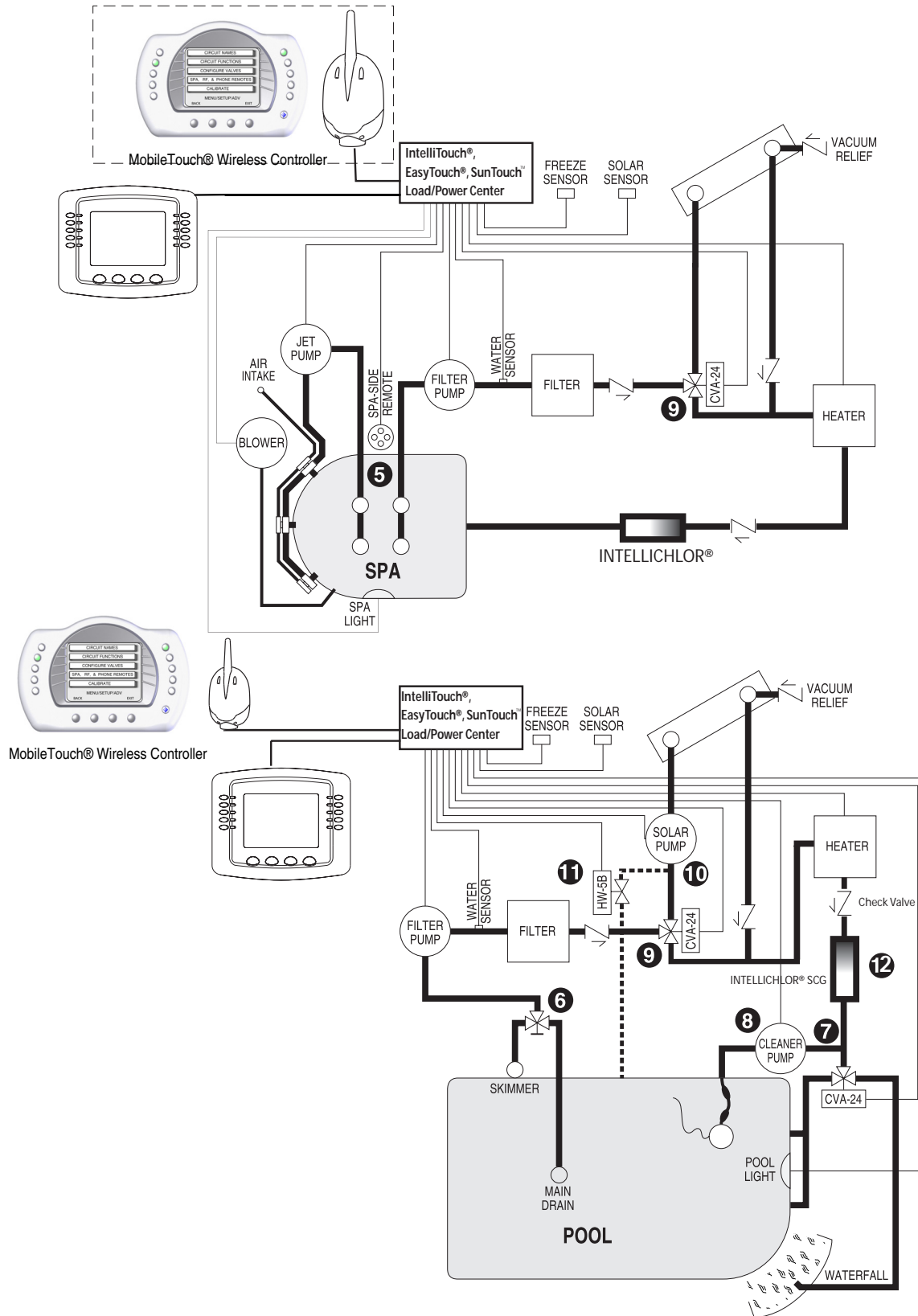
All equipment, with the exception of the Spa-Side remote, must be located at least 10 ft. from the water's edge.



Recommended Hydraulic Schematic for Shared Equipment System



Recommended Hydraulic Schematic for Dual Equipment System



Recommended Hydraulic Schematic for Single Body System

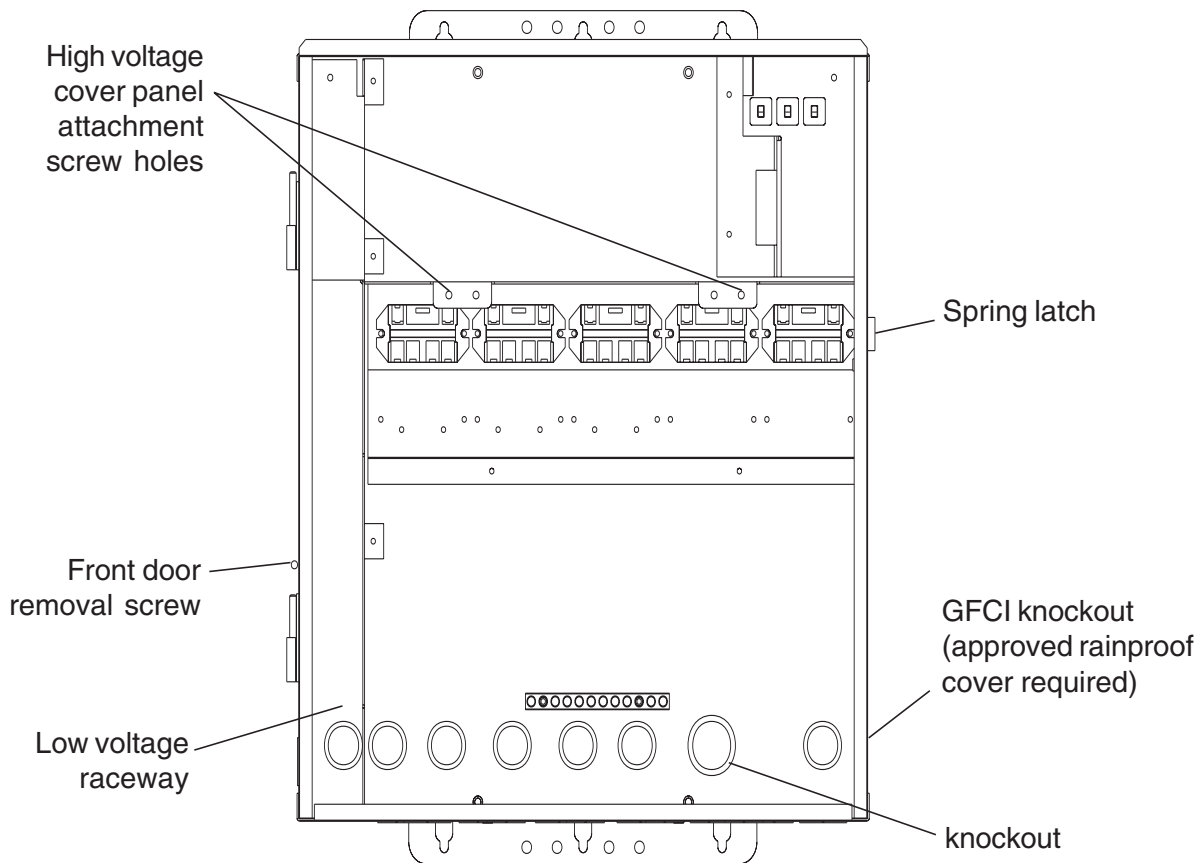
# Installing Conduit and Wire

Before installing the Load Center or Power Center, read the following information:

- Run the appropriate size conduit from power source to the Load Center or Power Center enclosure.
- The Load Center or Power Center enclosure must be located a minimum of 10 ft. from the inside wall of pool or spa. Supply cable to the Load Center or Power Center must have a supply conductor current minimum of 60 AMP.
- Supply circuit must be protected by suitable breaker rated no higher than 125 AMP.
- **Load Center installation only:** Pull wires from the power source and secure to supply side of circuit breaker base. Run the appropriate conduit and wire from the Load Center to the equipment.

## Power Center Parts Overview

The Power Center enclosure main parts are shown below.



**Power Center**

## High Voltage Connections

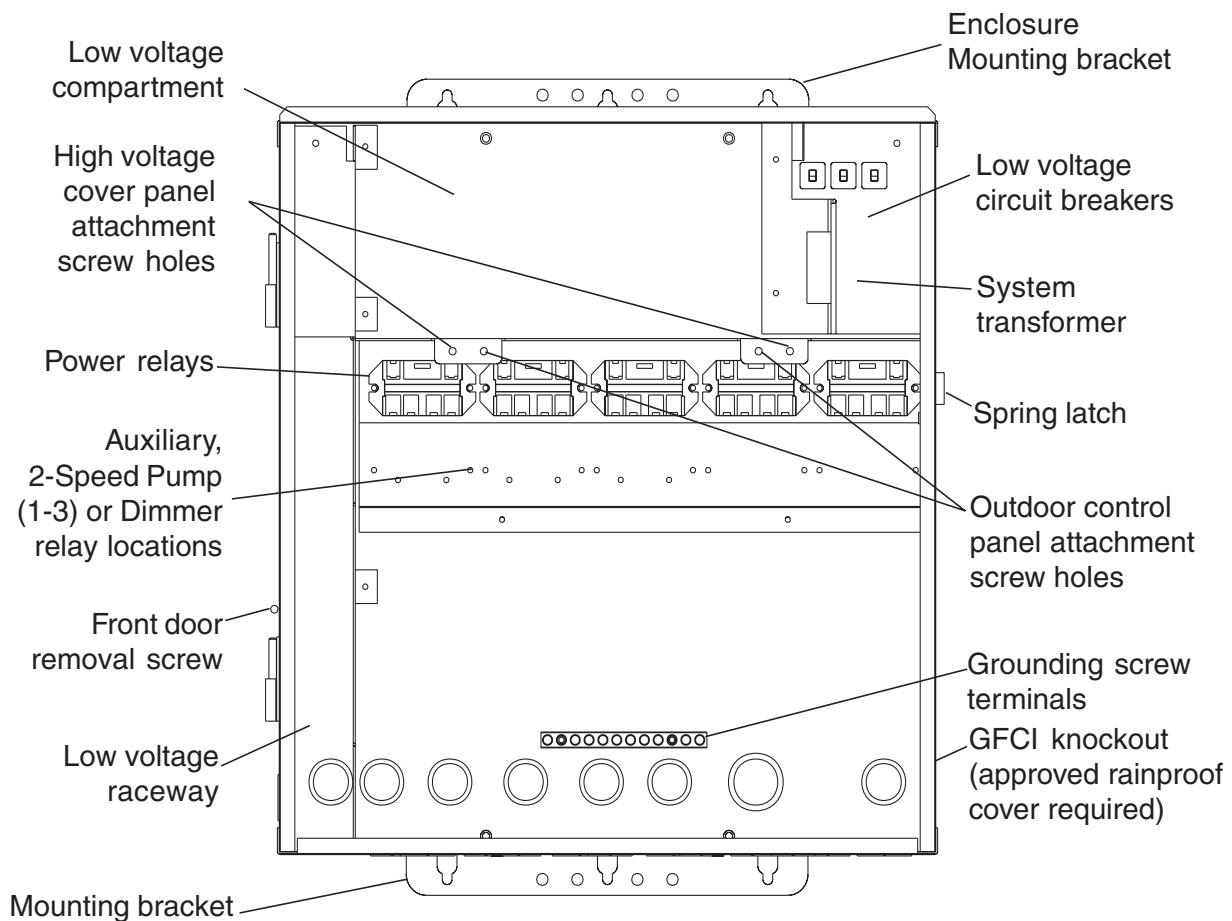
**⚠ WARNING** - It is required that the main power into the home be switched OFF at the main circuit breaker box whenever the high voltage cover-panel is removed. The main power must also be switched OFF to access the Power/Load Center enclosure low voltage raceway.

## Power Center and Load Center Description

Power Center and Load Center enclosures are identical with the exception of the circuit breaker base (Sub-panel). For details, refer to the Load Center illustration (page 9). Not shown is the high voltage cover-panel and the front door. See the WARNING information above before opening the cover-panel.

### Power Center (without Sub-panel)

The Power Center connects to an electrical circuit breaker panel (Sub-panel) installed at the equipment pad. The AC power is provided from the Main-panel (located at the house) to the Sub-panel. The Power Center should be installed next to the Sub-panel.

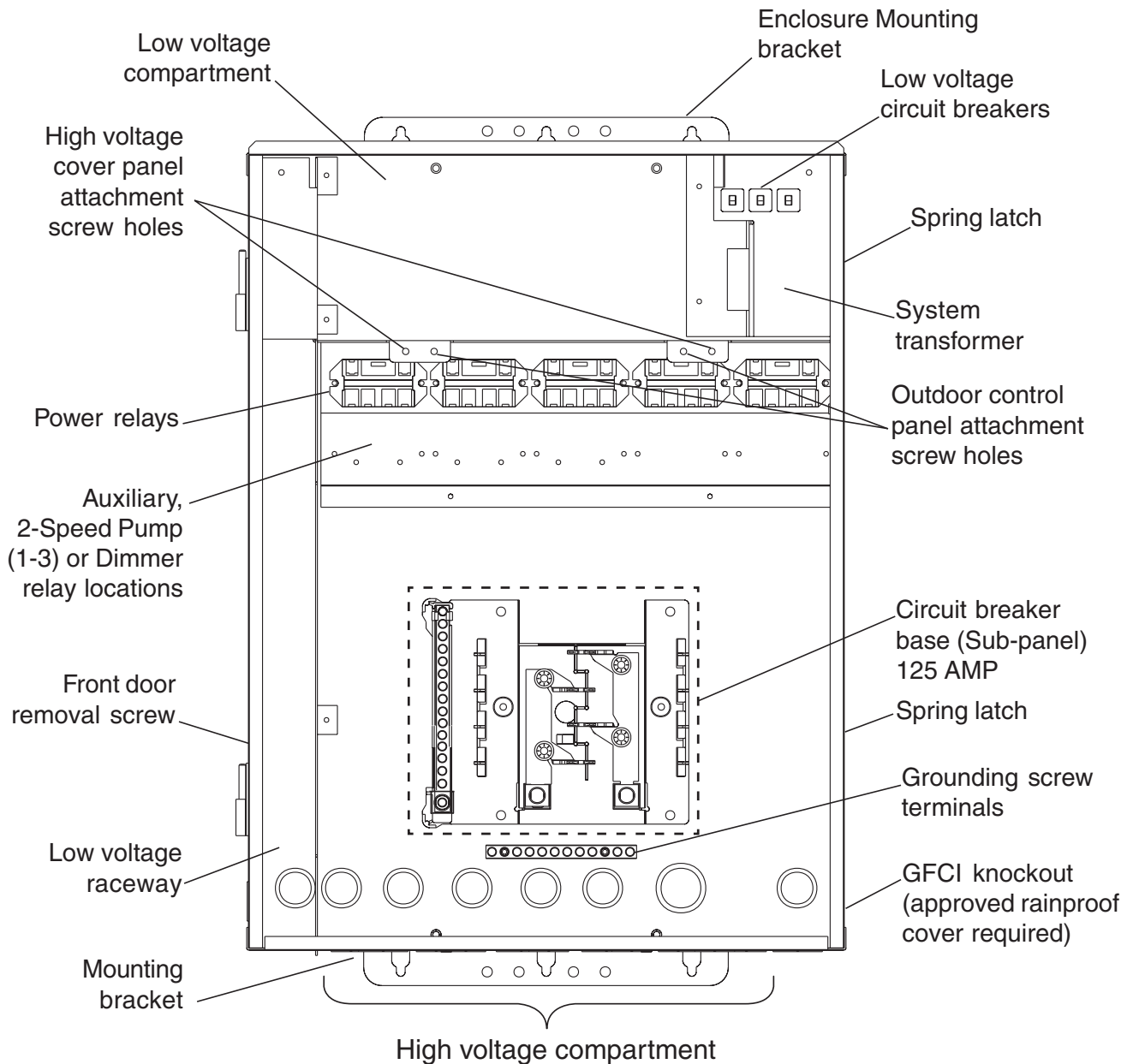


**Power Center Enclosure  
(17" H x 17" W x 4.8" D)**

## Load Center (with built-in Sub-panel)

The Load Center must be installed at the equipment pad. The AC power for the Load Center is provided from the main-panel located at the house.

**Note:** Up to three additional Expansion Centers (i5x or i10x) can be added to a base Power/Load Center: i9+3, i9+3S, i10+3D. For more information about using multiple Power/Load Center, refer to the IntelliTouch Systems User's Guide (P/N 520102) and the IntelliTouch Installation Guide (P/N 520101).



**Load Center Enclosure  
(23" H x 17" W x 4.8" D)**

## Installing the Load Center and Power Center

**⚠ WARNING** - It is required that the main power into the home be switched OFF at the main circuit breaker box whenever the high voltage cover-panel is removed. The main power must also be switched OFF to access the Power/Load Center enclosure low voltage raceway.

Before installing the Power Center or Load Center enclosure note the following information:

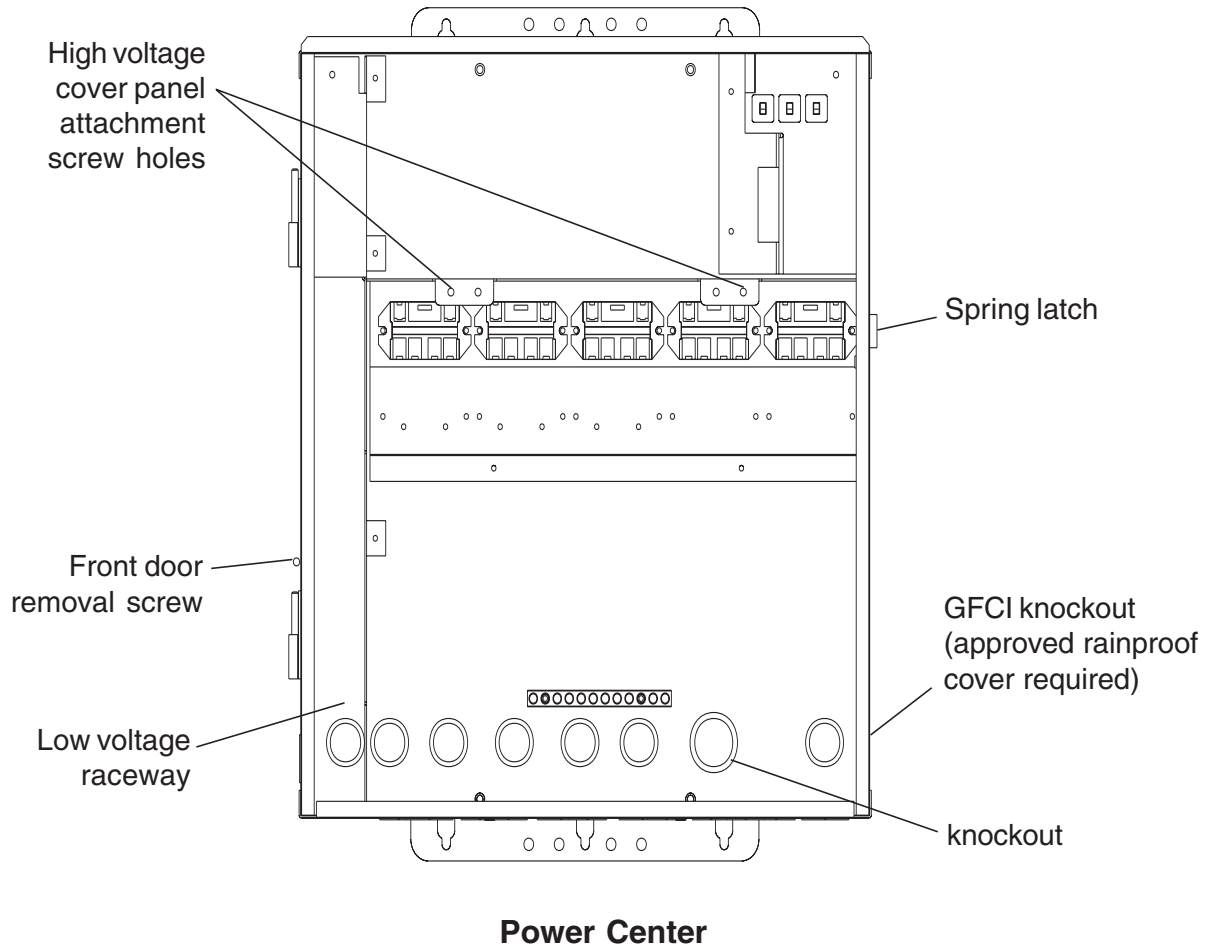
- All electrical equipment, except for UL Listed spa-side remote switches, must be installed at least five (5) feet from pool and/or spa, and comply with all national, state, and local codes (UL Listed spa-side remote switches may be installed at near waterline).
- **Power Center only:** Install an electrical supply panel with a separate circuit breaker for each load. The IntelliTouch Power Center does not include a built-in circuit breaker compartment.
- Motors should have built-in thermal protection.
- The enclosure provides grounding screw terminals for grounding all equipment. All equipment including the enclosure must be bonded to earth ground.
- Install the enclosure so that drainage is provided for all electrical components.
- Install the enclosure no less than five (5) feet from pool or spa. Upper and lower brackets are provided to mount the enclosure to a vertical surface.

### Installing the Enclosure

To install the Power Center or Load Center enclosure:

1. Unpack the Power Center or Load Center from the shipping box.
2. Unlatch the front door spring latches, and open the front door.
3. Remove the front door screw located above the lower hinge. Remove the front door from the hinges.
4. Remove the screws securing the high voltage cover-panel. Remove the cover-panel from the enclosure.
5. Remove the enclosure knockouts:
  - Low voltage raceway: Located on the left side of the enclosure.
  - High voltage compartment: Located underneath the front of the enclosure.
6. When finished, reverse procedures for steps 4, 3, and 2.





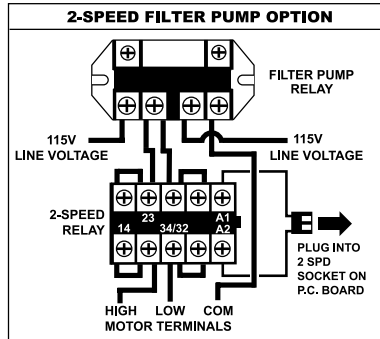
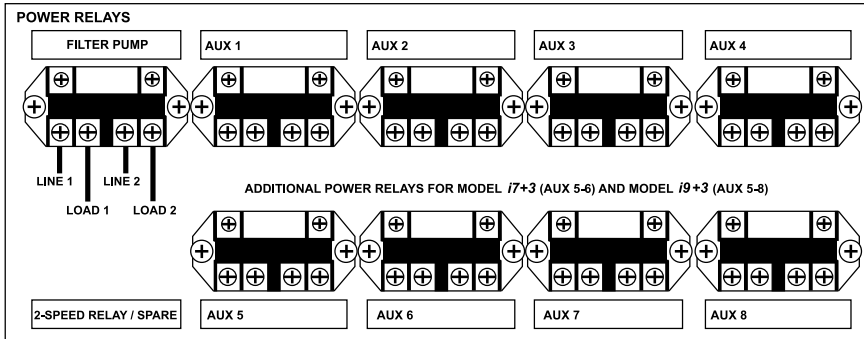
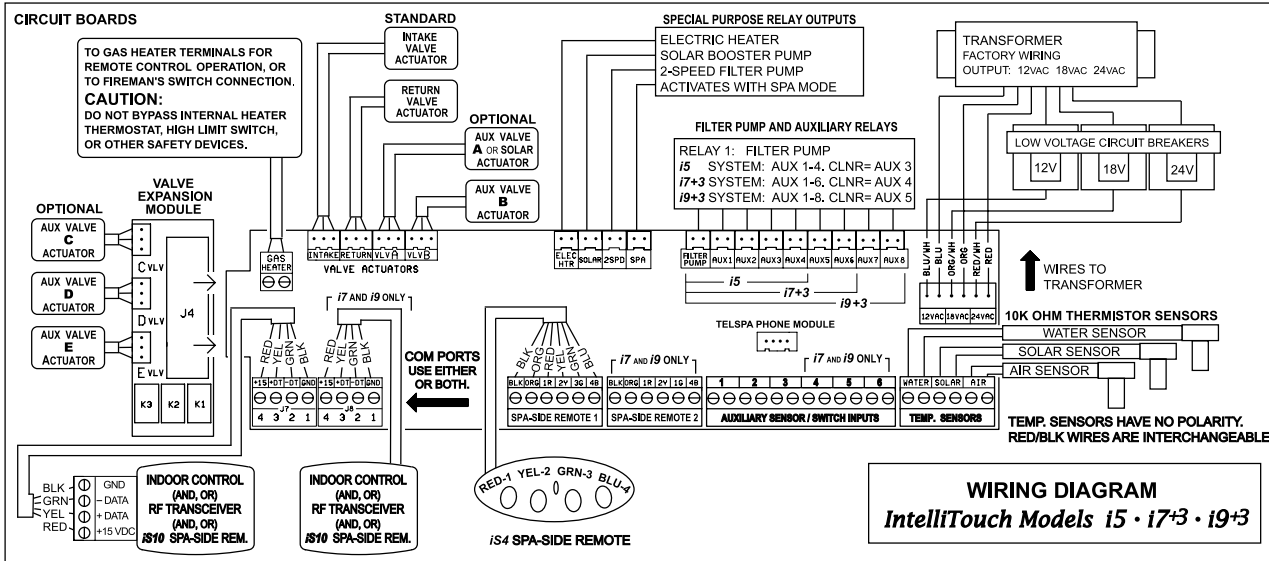
## Affixing the System Wiring Diagram Label

To affix the wiring diagram label on the enclosure inside front door:

1. Open the enclosure front door.
2. Peel the backing off the wiring diagram label.
3. Position the label in middle of the inside of the front door. Apply even pressure on the surface of the label to secure in place.



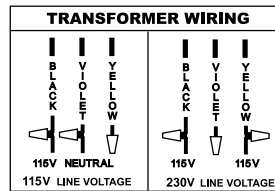
**WARNING PREVENT ELECTROCUTION** DISCONNECT ALL CONNECTIONS BEFORE SERVICING THIS UNIT. THIS APPLIANCE HAS UP TO 11 SUPPLY CONNECTIONS.  
 INSTALL AT LEAST 5 FEET FROM INSIDE WALL OF SPA OR POOL



**RAINPROOF (TYPE 3R) CONTROL PANEL. FOR INDOOR OR OUTDOOR USE.**  
 SUITABLE FOR SWIMMING POOL/SPA APPLICATIONS  
 120V 125 AMP OR 240V 63 AMP MAX. SINGLE PHASE.  
 60 - 75°C. MIN. INSULATION  
 SHORT CIRCUIT RATING: 5000 SYMMETRICAL AMPERES.  
 TRANSFORMER INPUT: 120V., 2A., 50/60Hz;  
 240V., 2 WIRES, 1A., 50/60Hz.

RELAY CONTACT OUTPUT	
General: 25A, 277VAC	
PUMP	LIGHT
1.5 HP 120 VAC	1.5 KW 120 VAC TUNGSTEN
3 HP 277 VAC	4.8 KW 240 VAC TUNGSTEN
20 FLA/120 LRA, 120 VAC	20A, 277 VAC BALLAST
17 FLA/102 LRA, 277 VAC	

**PREVENT WATER DAMAGE**  
**KEEP DOOR CLOSED**



**CAUTION: RISK OF ELECTRIC SHOCK, READ INSTALLATION MANUAL.**  
**IMPORTANT:** This control panel must be installed according to the National Electrical Code (including article 680) and local code requirements. Mount with conduit hole down. The main lugs and neutral main are suitable for No. 14 to 6 AWG COPPER or ALUMINUM conductors for branch circuit wiring. Install interchangeable circuit breakers designed to fit this control panel interior, see list of suitable types below. Follow manufacturers instructions for installing and testing of ground fault circuit breakers (GFCB) and interrupters (GFCI). Additional approved wiring devices may be installed in the rectangular side knockout or inside the enclosure, provided the wiring devices have lead connections. Otherwise, the device with uninsulated terminals must be covered by internally installed metallic or nonmetallic wall box. When using side knockout, an approved rainproof cover must be installed over the wiring device if used outdoors. Make sure connections to low voltage compartment are sound and properly insulated. After wiring, install front panel over wiring compartment and close unused breaker openings with filler plates.



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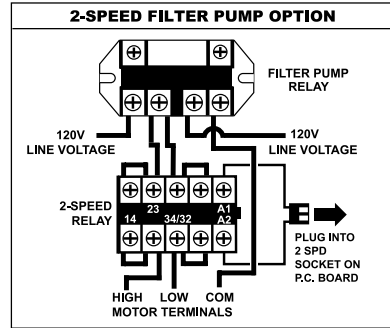
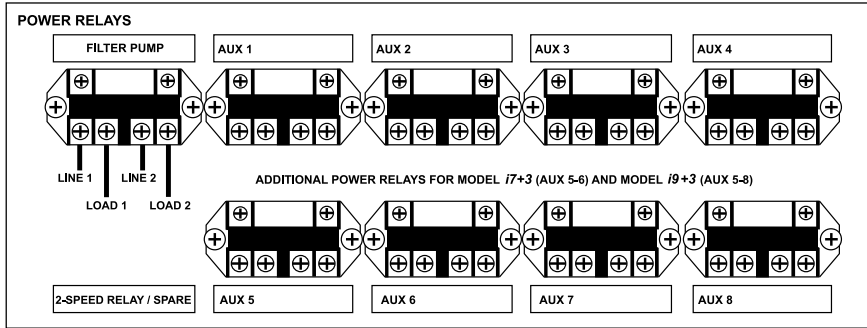
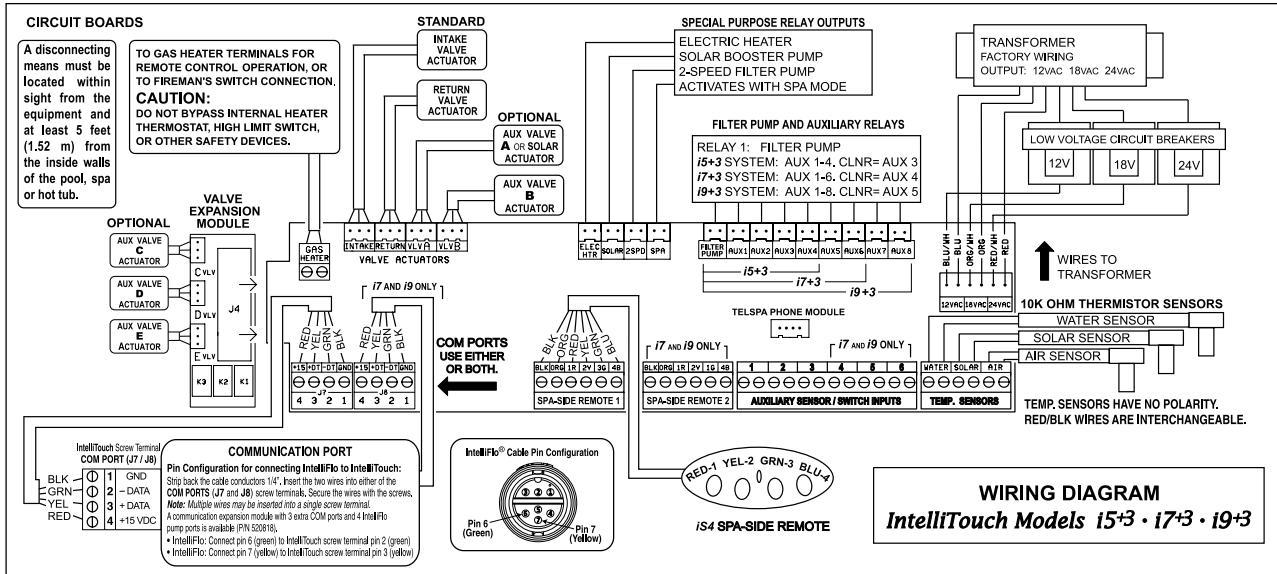
**System Wiring Diagram (Power Center)**

LABEL: P/N 520451 REV. A



**WARNING PREVENT ELECTROCUTION**  
 INSTALL AT LEAST 5 FEET FROM INSIDE WALL OF SPA OR POOL

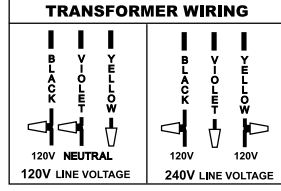
**DISCONNECT ALL CONNECTIONS BEFORE SERVICING THIS UNIT. THIS APPLIANCE HAS UP TO 11 SUPPLY CONNECTIONS.**



**RAINFOOF (TYPE 3R) CONTROL PANEL. FOR INDOOR OR OUTDOOR USE.**  
 SUITABLE FOR SWIMMING POOL/SPA APPLICATIONS  
 120V/240V 125 AMP MAX. SINGLE PHASE.  
 60 - 75 °C. MIN. INSULATION - REQUIRED ON ALL FIELD WIRING.  
 SHORT CIRCUIT RATING: 5000 SYMMETRICAL AMPERES.  
 TRANSFORMER INPUT: 120V., 2A., 50/60Hz;  
 240V., 2 WIRES, 1A., 50/60Hz.

RELAY CONTACT OUTPUT	
General: 25A, 277VAC	
PUMP	LIGHT
1.5 HP 120 VAC	1.5 KW 120 VAC TUNGSTEN
3 HP 277 VAC	4.5 KW 240 VAC TUNGSTEN
20 FLA/120 LRA, 120 VAC	20A, 277 VAC BALLAST
17 FLA/102 LRA, 277 VAC	

**PREVENT WATER DAMAGE**  
**KEEP DOOR CLOSED**



**CAUTION: RISK OF ELECTRIC SHOCK, READ INSTALLATION MANUAL.**

**IMPORTANT:** This control panel must be installed according to the National Electrical Code (including article 680) and local code requirements. Mount with conduit hole down. The main lugs and neutral main are suitable for No. 14 to 2 AWG conductors. Use No. 14 to 6 AWG COPPER or ALUMINUM conductors for branch circuit wiring. Install interchangeable circuit breakers designed to fit this control panel interior, see list of suitable types below. Follow manufacturers instructions for installing and testing of ground fault circuit breakers (GFCB) and interrupters (GFCI). Additional approved wiring devices may be installed in the rectangular side knockout or inside the enclosure, provided the wiring devices have lead connections. Otherwise, the device with uninsulated terminals must be covered by internally installed metallic or nonmetallic wall box. When using side knockout, an approved rainproof cover must be installed over the wiring device if used outdoors. Make sure connections to low voltage compartment are sound and properly insulated. After wiring, install front panel over wiring compartment and close unused breaker openings with filler plates.



**SUITABLE CIRCUIT BREAKERS**

SIEMENS	QP, QT, QPF, QE, QAF
MURRAY	MP-T, MH-T, MP-GT, MP-ET, MP-AT

TOTAL CONNECTED LOAD OF QT OR MH-T BREAKERS ON ONE BRANCH BUS SHALL NOT EXCEED 110A.

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LISTED POOL/SPA CONTROLLER 5K42

Customer Service 800-831-7133

**System Wiring Diagram (Load Center)**

## Glossary of Terms

**Expansion Kit:** A kit that includes additional auxiliaries to an existing Personality Kit. Requires a Load Center for each Expansion Kit.

**Feature Circuits:** Programmable circuits that may control relays and/or valve actuators. For details see the IntelliTouch Systems User's Guide (P/N 520102)

**High Voltage Compartment:** Large lower right compartment of Load Center for all high voltage wiring including circuit breakers, relays, and GFCI (see page 9).

**Indoor Control Panel:** This fourteen button remote controller with LCD (liquid crystal display) is wired to the Personality board in the Power/Load Center. The control panel can be wall mounted inside a house to control IntelliTouch Systems.

**iS4:** Four function Spa-Side remote. Can be spa wall or deck mounted.

**iS10:** Up to ten function spa-side remote with temperature changing capability. Can be spa wall or deck mounted.

**Load Center:** Metal enclosure with power relays, transformer, and circuit breakers. The Load Center is installed prior to Personality Kit installation. Used for distributing power for controlling IntelliTouch Systems. Also known as the "sub-panel."

**Low Voltage Compartment:** Top compartment of Load Center for all low voltage wiring.

**Low Voltage Raceway:** Vertical space in the left side of Power/Load Center for low voltage cabling.

**MobileTouch® Controller:** Wireless controller for the IntelliTouch Systems with all the functionality of the Indoor Control Panel.

**Mud Box:** Enclosure to provide mounting features for iS10 spa-side remote that is cast into gunite, concrete, or other spa wall/deck construction.

**Outdoor Control Panel:** Control panel with flexible hinge installed in upper portion of Power/Load Center to control IntelliTouch systems.

**Personality Board:** The circuit board mounted on top of the Outdoor Control Panel motherboard. The Personality board defines the system capabilities.

**Personality Kit:** Set of parts to define the capability of a system; may include: Outdoor Control Panel, temperature sensors, actuators, control panel (Indoor control panel or MobileTouch® wireless control panel), additional relays, actuators.

**Power Center:** Same as Load Center with the exception of the circuit breaker base.

**Relay Circuits:** The circuits that control the relays on the Personality Board. Connectors on top edge of the circuit board.

**Terminal Connector:** Removable connector that may attach to circuit board with multiple sockets (anywhere from 2 to 12) to receive wires from controllers and sensors; wires held by screw terminals; multiple wires of a small enough gauge (usually 22 AWG) may be coupled to a single socket of a terminal connector.

**Transceiver:** Circuit board with attached antenna that can send and receive radio frequency (wireless) transmissions.

## Notes

# Notes





P/N 520100 - Rev B