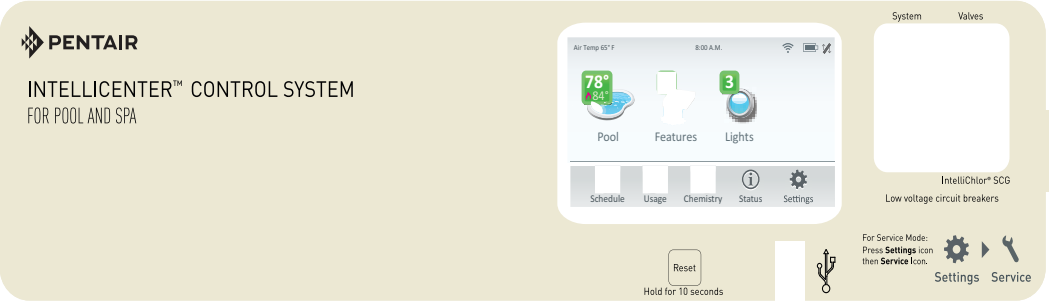
PENTAIR POOL

INTELLICENTER®
CONTROL SYSTEM

INSTALLATION GUIDE



IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

To access additional information, as well as digital copies of all IntelliCenter manuals, scan or click the provided QR code.

Pour accéder à des informations supplémentaires, ainsi qu'à des copies numériques de tous les manuels IntelliCenter, scannez ou cliquez sur le code QR fourni.

Para acceder a información adicional, así como copias digitales de todos los manuales de IntelliCenter, escanee o haga clic en el código QR proporcionado.

IMPORTANT SAFETY INSTRUCTIONS



This guide provides installation and operation instructions. Consult Pentair with any questions regarding this equipment (refer to *CUSTOMER SERVICE / TECHNICAL SUPPORT, page iv*).

Attention Installer: This guide contains important information about the installation, operation and safe usage of this product. Give this guide to the owner and/or operator of this equipment after installation.

Attention User: This guide contains important information that will help you in operating and maintaining this product. Retain this document for future reference. Read the entire Installation Guide and all related warning labels before installing, servicing or using this product.



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, or CAUTION and comply with the information. Be alert to the potential hazard. Make sure to read and comply with all warnings in this manual.

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 Guide.

⚠WARNING **SERIOUS BODILY INJURY OR DEATH CAN RESULT IF THIS PRODUCT IS NOT INSTALLED AND USED CORRECTLY.**

⚠WARNING INSTALLERS, POOL OPERATORS AND POOL OWNERS MUST READ THESE WARNINGS AND ALL INSTRUCTIONS BEFORE USING THIS PRODUCT.

⚠WARNING **This product is intended for use in swimming pool applications only.**

⚠WARNING Most states and local codes regulate the construction, installation, and operation of public pools and spas, and the construction of residential pools and spas. It is important to comply with these codes, many of which directly regulate the installation and use of this product. Consult your local building and health codes for more information.

⚠WARNING Read the operating instructions and warnings for all equipment filtration system before operating. 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 this guide or replacement safety labels.

⚠WARNING **RISK OF ELECTRICAL SHOCK OR ELECTROCUTION!** Always disconnect power at the circuit breaker before servicing the load/power center. Improper installation can create an electrical shock hazard that can result in death or serious injury.



This product must be installed by a licensed or certified electrician or a qualified service professional in accordance with the current National Electrical Code (NEC) or Canadian Electrical Code (CEC). All applicable local installation codes and ordinances must also be adhered to. Improper installation will create an electrical hazard which could result in death or serious injury to pool users, installers or others due to electrical shock, and may also cause damage to property. Always disconnect the power to the pool light at the circuit breaker before servicing the light. Failure to do so could result in death or serious injury to serviceman, pool users or others due to electrical shock.

⚠WARNING The electrical supply for this product must include a suitably rated switch or circuit breaker to open all ungrounded supply conductors to comply with the current National Electrical Code (NEC) or the Canadian Electrical Code (CEC). All applicable local installation codes and ordinances must also be adhered to. The disconnecting means must be readily accessible to the tub occupant but installed at least 5 feet [1.5 m] in US, or 3 meters [9.75 ft] in Canada, from the inside wall of the pool.

⚠WARNING **Use only copper supply conductor's rated for 60C/75C based on ampacity to support all loads (refer to NEC tables). Load/power center input supply to be protected by 150 Amp Maximum, 240 VAC Main Circuit Breaker.**

⚠WARNING Water temperature in excess of 100°F [37.7°C] 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]. 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. The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia in hot tubs and spas.

IMPORTANT SAFETY INSTRUCTIONS

⚠WARNING The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia in hot tubs and spas. This product 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 Except for UL listed spa-side remote controls, install all electrical equipment a minimum of 5 ft. [1.5 m] from the inside wall of the pool and spa.

⚠WARNING Do not permit children to use this product.

⚠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 5 ft. [1.5 m] away, adjacent to, and within sight of, the unit.

⚠CAUTION **For Installation of Electrical Controls at Equipment Pad (ON/OFF Switches, Timers and Automation Load Center).** Install all electrical controls at equipment pad, such as on/off switches, timers, and control systems, etc. to allow the operation (startup, shut-down, or servicing) of any pump or filter so the user does not place any portion of his/her body over or near the pump strainer lid, filter lid or valve closures. This installation should allow the user enough space to stand clear of the filter and pump during system start-up, shut down or servicing of the system filter.



⚠WARNING **HAZARDOUS PRESSURE: STAND CLEAR OF PUMP AND FILTER DURING START UP.** Pool filtration systems operate under high pressure. When any part of the filtration system (i.e. locking ring, pump, filter, valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the pump housing cover, filter lid, and valves to violently separate which can result in severe personal injury or death. Filter tank lid and strainer cover must be properly secured to prevent violent separation. Stand clear of all filtration system equipment when turning on or starting up pump.



Before servicing equipment, make note of the filter pressure. Be sure that all controls are set to ensure the system cannot inadvertently start during service. Turn off all power to the pump. **IMPORTANT: Place filter manual air relief valve in the open position and stand clear of the filter until all pressure has been relieved and the pressure gauge reads 0 psi.**

Before starting the system, fully open the manual air relief valve and place all system valves in the “open” position to allow water to flow freely from the tank and back to the tank. Stand clear of all equipment and start the pump.

IMPORTANT: Do not close filter manual air relief valve until all pressure has been discharged from the valve and a steady stream of water appears. Observe filter pressure gauge and be sure it is not higher than the pre-service condition.

Qualifications for Installers and Users

This product must be installed by a qualified service professional in accordance with all applicable local codes and ordinances. It must be serviced by someone who fully understands its operation. Improper installation or servicing could result in death or serious injury to pool users, installers, servicers, or others and may also cause damage to property.

If you are not familiar with your pool filtering system and/or heater, do NOT attempt to adjust or service without consulting your dealer or a qualified pool technician.

IMPORTANT SAFETY INSTRUCTIONS

FCC Standard - 47 CFR Part 15, Subpart C (Section 15.247). This version is limited to chapter 1 to chapter 11 by specified firmware controlled in the U.S.A.

In order to comply with FCC RF Exposure requirements, a minimum separation distance of 8 in (20 cm) must be maintained between the equipment and all persons during normal operation.

Canada - Industry Canada (IC) - The IntelliCenter Control System complies with RSS210 of Industry Canada. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The device complies with industry Canada's License Exempt RSSs. Operation is subject to the following: (1) This device may not cause interference; and (2) This device must accept interference that may cause undesired operation of the device.

Le dispositif est conforme à la licence d'Industrie Canada Exempt CNR. Le fonctionnement est soumis à la suivante. (1) Ce ne doit pas provoquer d'interférences ; et (2) Cet appareil doit accepter les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

This Class B digital apparatus complies with Canadian ICES-003.Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada. The term "IC" before the certification / registration number only signifies that the Industry Canada technical specifications were met.

Instruction to user - The IntelliCenter Control System 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. The IntelliCenter Control System 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 device does cause harmful interference to radio or television reception, which can be determined by switching the device 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.

Note: Changes and modifications made to the IntelliCenter Control System without the approval of the manufacturer could void the user's authority to operate this equipment.

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. Underwater luminaires should be installed according to requirements outlined in NEC 680.
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). 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 ft. [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 in accordance with the current National Electrical Code (NEC) or the Canadian Electrical Code (CEC). All applicable local installation codes and ordinances must also be adhered to. The disconnecting means must be readily accessible to the tub occupant but installed at least 10 ft. [3.1 m] from the inside wall of the pool.
6. This automation control system is designed to supply high voltage (120 VAC / 240 VAC) to a gas heater and override the thermostat in the heater's control circuit. This automation control system is intended to control gas heaters with a high temperature limit switch(s) safety circuit.

CUSTOMER SERVICE / TECHNICAL SUPPORT

Hours: 9:00AM to 7:00PM EST (6:00AM - 4:00PM PST)

Call: (800) 831-7133

Visit: www.pentair.com

Fax: (800) 284-4151

TABLE OF CONTENTS

IMPORTANT SAFETY INSTRUCTIONS ..... i-iii

INTRODUCTION 1

General Features 1

Flexible Demand Features 1

INSTALLATION 2

General Installation Guidelines 2

Control System Load Center (with Built-in Breaker Subpanel) 3-4

Control System Power Center (without Built-in Breaker Subpanel) 5-6

Preparing the Load/Power Center Enclosure 7

Mounting the Load/Power Center 8

Load Center Wiring Knockouts 9

Power Center Wiring Knockouts 10

Power Center Wiring Knockouts (P/Ns 523910 and 523911) 11

Installing Conduit and Conductors 12

System Power Connections 13

Main Power Connection (Load Center with Built-in Breaker Subpanel) 13

Grounding Connections 13

Bonding Connections 13

Circuit Breakers (Load Center with Built-in Breaker Subpanel) 13

Load/Power Center High Voltage Connections 14

Rewiring the Control System Transformer for 240 VAC 14-15

Accessing Control Boards and Electronics 16

Connecting Load/Power Center Relays 17-18

Connecting a Standard Valve Actuator 19

Connecting an IntelliValve Valve Actuator 20

Installing a Water Temperature Sensor 21

Installing an Air Temperature Sensor 21

Installing a Solar Temperature Sensor 22

Temperature vs. Resistance Data 22

Connecting a Standard Gas Heater to Load/Power Center 23

Connecting an IntelliFlo Pump to Load/Power Center 24

Connecting a Heat Pump or Hybrid Heater to Load/Power Center 25

Connecting a Salt Chlorine Generator Power Cable to the Enclosure 26

Connecting a Salt Chlorine Generator to IntelliCenter via RS-485 27

Connecting an IntelliChem Controller to IntelliCenter 28

Wiring the Salt Chlorine Generator Transformer to Load/Power Center Pump Relay 29

Rewiring the Salt Chlorine Generator Transformer for 120 VAC 30-31

Load Center Wiring Diagram 32

Power Center Wiring Diagram 33

Power Center Wiring Diagram (P/Ns 523910 and 523911) 34

TABLE OF CONTENTS (continued)

INITIAL SETUP 35
Initial System Start-Up 35
Setup Wizard Overview 35
Setup Wizard Navigation 36
Network and WiFi Setup 37-38
Control System Menu Tree 39
Control System Test 40
Testing Valve Actuators and Pumps 40-41
Solar Valve Test 41
Wireless Connections Diagram 42
Over-The-Air (OTA) Firmware Updates 43
Panel Mismatch 44
Enabling All System Panels 45
REPLACEMENT PARTS / ACCESSORIES 46
Load/Power Center Options 46
Upgrade Kits 46
Personality Kits 46-47
Expansion Kits 48
Replacement Parts 49
System Accessories 49
Configurations and Models 50
TROUBLESHOOTING 51
Standard Gas Heater 51
Solar Heater 52
Hybrid Heater 53-54
MasterTemp / Max-E-Therm 55
IntelliChem 56
IntelliChlor 57
Variable Flow Pump 57
Variable Speed Pump 58
GLOSSARY 59

Your feedback could play an important role in Pentair's goal to continuously improve our instructional material, and better support those who install, maintain, and use our products everyday.

Scan or click the QR code to take a quick survey and help us provide the most easy-to-use and accurate product manuals possible!

INTRODUCTION

General Features

- 4” x 3” color touchscreen.
- Up to 100 programmable schedules/programs for easy system scheduling
- 32 Feature Circuits: Allows additional speeds/ programs for a variable speed pump or for an actuator to be assigned without using an existing auxiliary circuit.
- 16 Groups: Assign groups of lights and AUX circuits to allow control by a single button
- Supports up to 16 IntelliFlo® Pumps
- Supports up to four SpaCommand® or iS10, two iS4, or one QuickTouch® II wireless remotes.
- Supports up to two Indoor Control Panels
- Valves: Intake/Return plus A and B valve circuits. Expandable up to 10 valves (shared equipment).
- Supports RS-485 connected heaters
- 39 Auxiliary Circuits (up to three Expansion Enclosures)
- Can allow automation of two bodies of water
- Multiple heater capability
- Over-The-Air Software Updates
- Spa Side Control Enable/Disable
- Solar Heating Option/Support
- 16 Heat Pump Support
- Heat Pump Cooling Support
- Assignable and Customizable Circuit Names
- Special Circuit Types/Function
- Two Speed Pump Support
- USB port compatible with standard flash drives
- Optional WiFi Connectivity

Flexible Demand Features

IntelliCenter includes Flexible Demand features offering an opportunity, only with the user’s consent, for the user to participate in energy provider incentive programs to offset system energy usage.

Participating in one of these programs may provide an incentive to the user, such as a monetary reward or electrical bill credit.

When enrolled in one of these programs, these features allow the energy provider (or other entities authorized by the user) the ability to automatically schedule, shift, or even curtail the system’s energy consumption (including filtration pumps, booster pumps, water feature pumps, and heat pumps) during times when electricity is more expensive, the electrical grid is stressed, and/or when there is an abundance of renewable energy on the grid.

Following one of these scenarios, the system will then adjust its operation to maintain proper filtration and chemical dispersion.

To learn more about Flexible Demand features and how to enroll, scan or press the provided QR code.

INSTALLATION

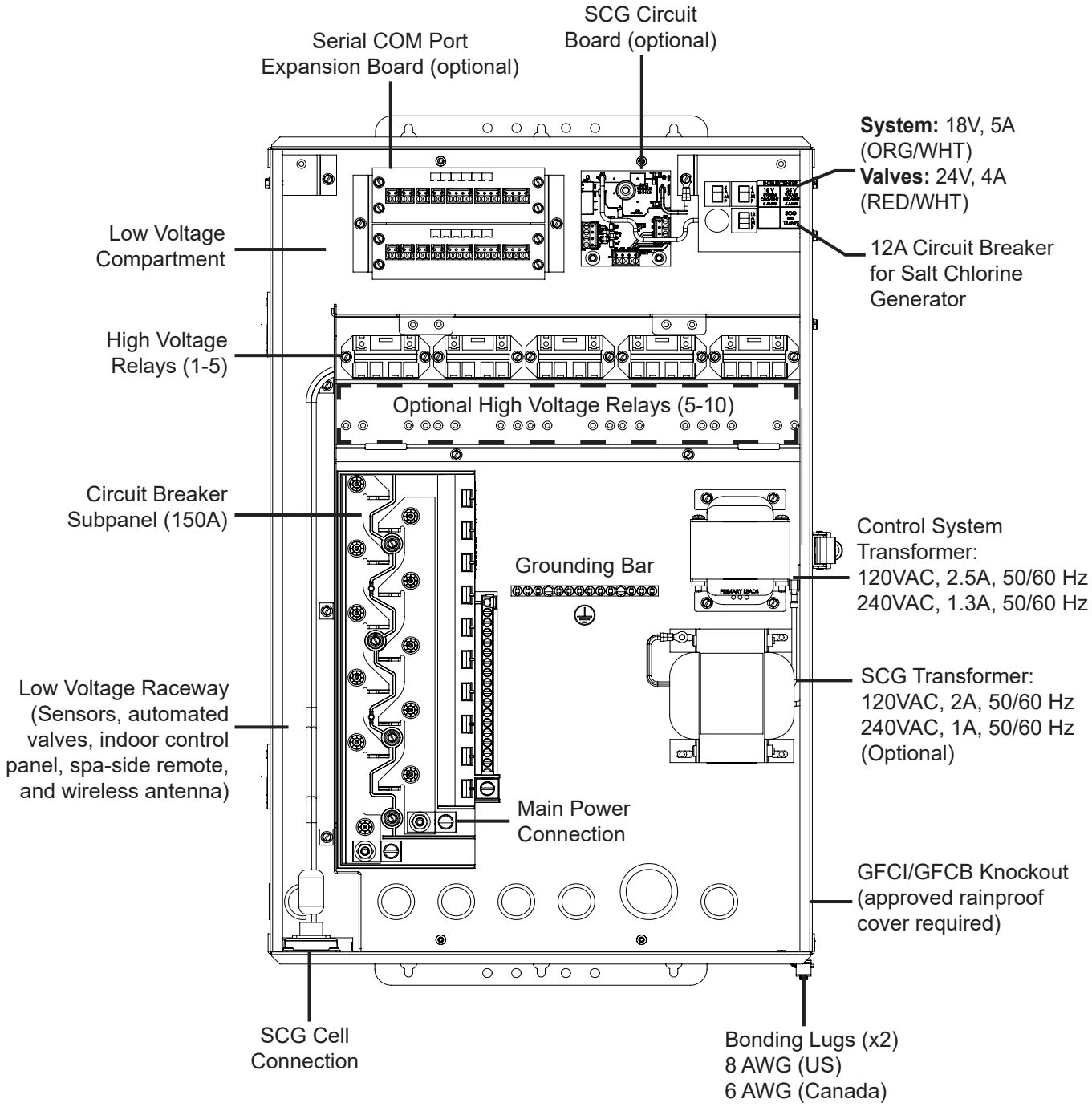
General Installation Guidelines

⚠WARNING RISK OF ELECTRICAL SHOCK. BEFORE REMOVING THE HIGH VOLTAGE COVER PANEL FROM THE ENCLOSURE, DISCONNECT ALL POWER TO INTELLICENTER AT THE MAIN CIRCUIT BREAKER.

- The IntelliCenter Load/Power Center must be installed at the equipment pad.
- Main power for the Load/Power Center must be provided from the main circuit breaker panel.
- All electrical equipment, except for UL Listed spa-side remotes, must be installed no less than 5 feet [1.5 m] in US, or 3 meters [9.75 ft] in Canada, from the pool and/or spa, and comply with all national, state, and local codes.
- Install the Load/Power Center at least 5 feet [1.5 m] from pool, spa, and/or hot tub.
- Provide enough space for the operator to stand clear of the filter and pump during system start-up.
- Before permanently installing the enclosure, consider the length of all of the conductors that will have be connected. Make sure to consider cable lengths for the sensors to the Load/Power Center location. The air temperature sensor cable is 3 feet [91.4 cm] long and the water temperature sensor cable is 25 feet [7.6 m] long.
- Use 22 AWG four conductor cable to the Load/Power Center. The preferred wire color scheme is: Red, Yellow, Green, and Black. The maximum recommended cable length is 2,000 feet [607 m].
- Mount the Load/Power Center on a flat vertical surface so the wiring knockouts are facing downwards. Upper and lower brackets are provided to mount the enclosure.
- NEVER mount the enclosure horizontally. Water can enter the wiring knockouts and damage the system.
- Consider the Load/Power Center location when routing power conduit to the Load/Power Center and additional high voltage equipment.
- Install the Load/Power Center so that drainage is provided for all electrical components.
- Provide at least 5 feet [1.5 m] in front of the Load/Power Center.
- The Load/Power Center includes a grounding bar for grounding all equipment. All equipment including the Load/Power Center enclosure must be bonded to earth ground.

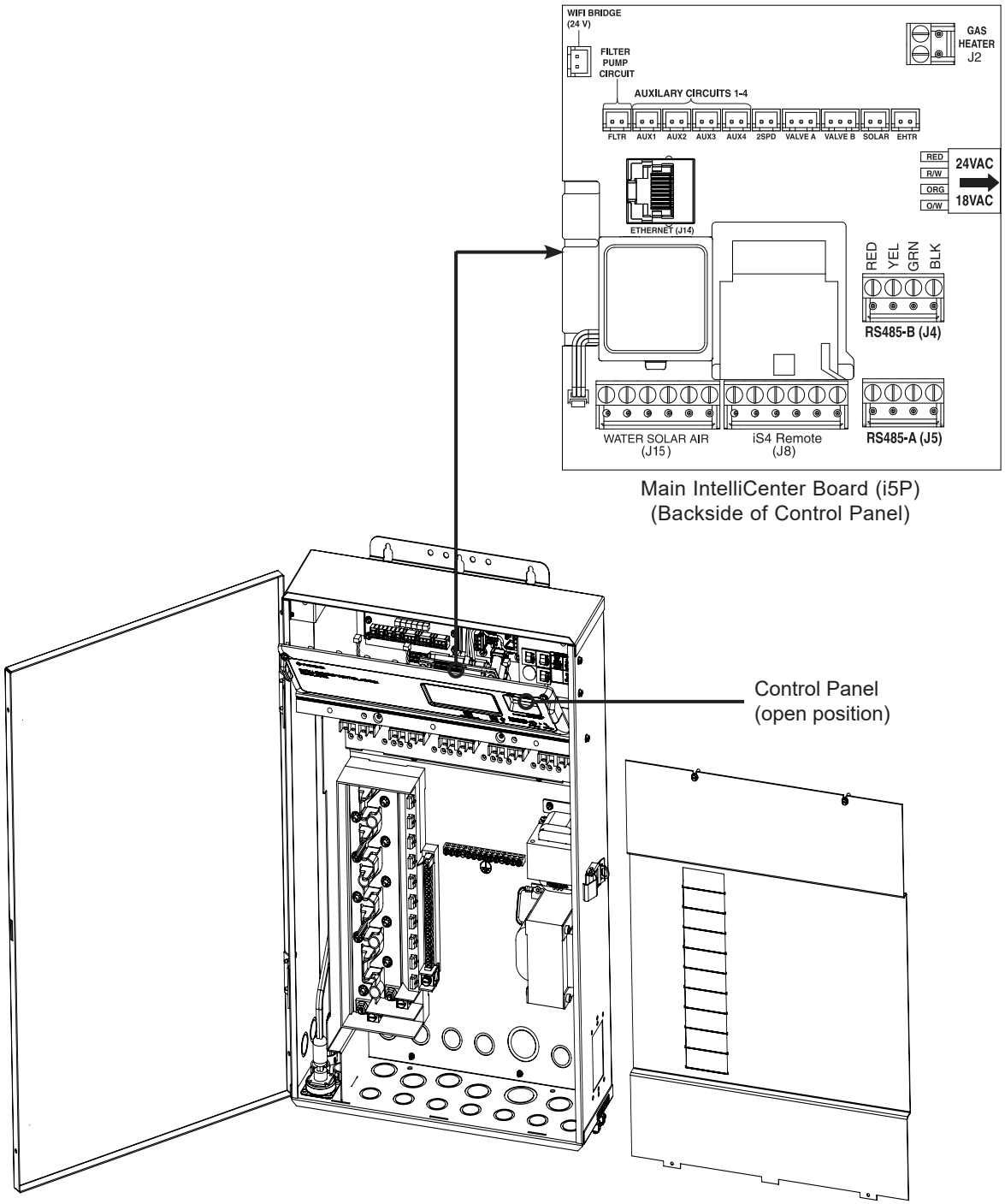
Control System Load Center (with built-in subpanel)

Power to the load center is provided from the main breaker panel.



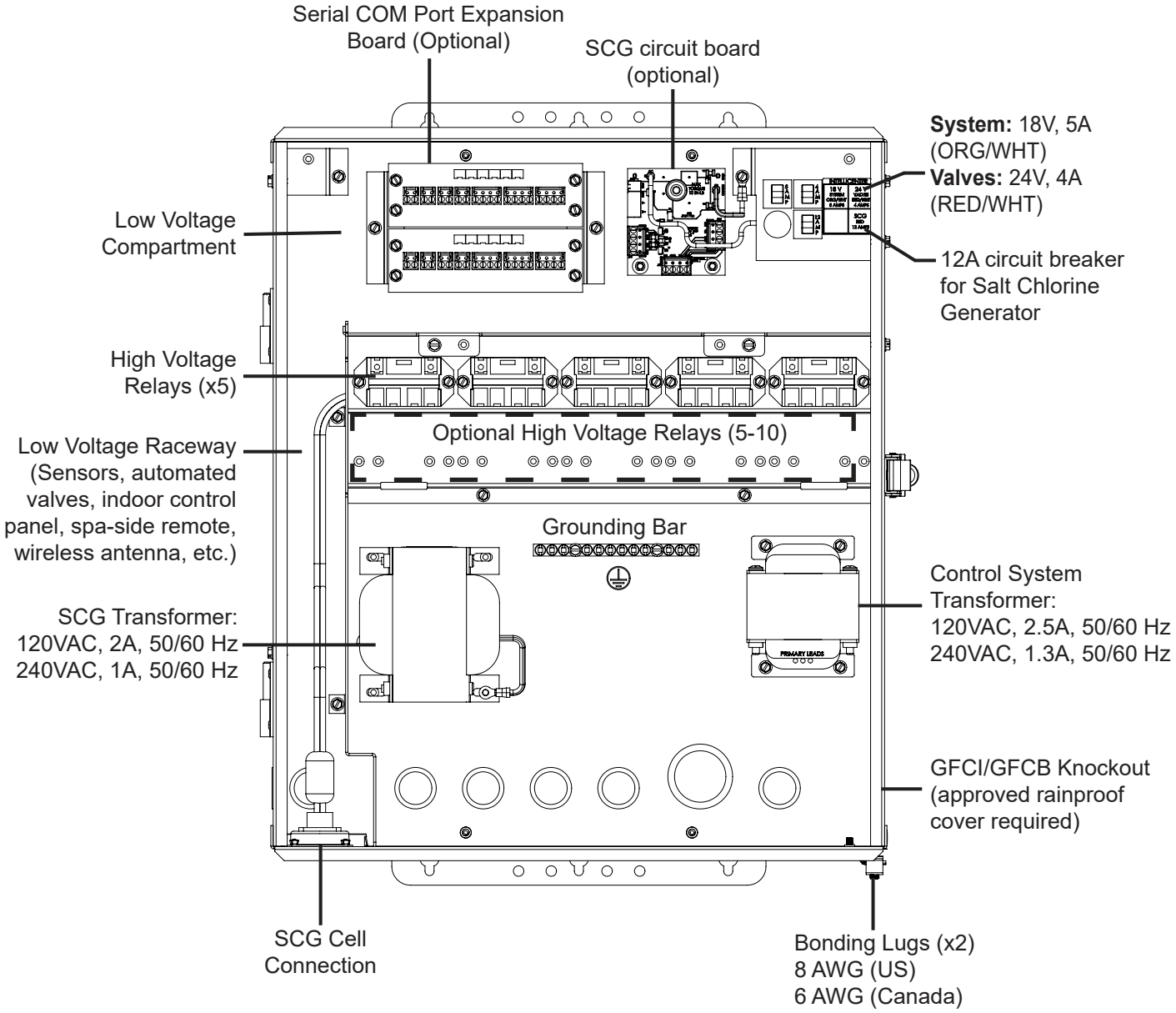
IntelliCenter Load Center

Control System Load Center (with built-in subpanel) Continued

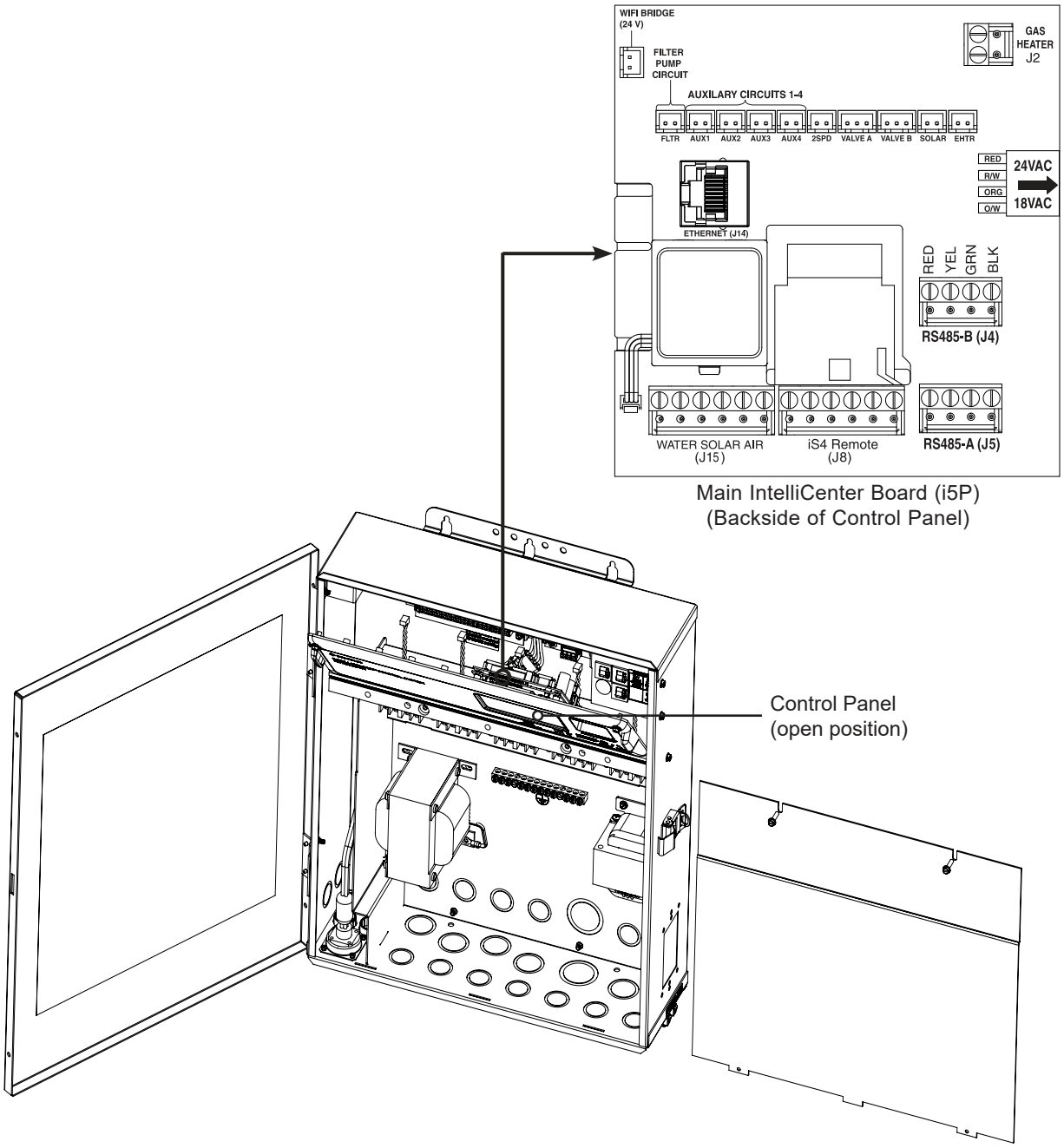


Control System Power Center (without built-in subpanel)

Power to the IntelliCenter is provided from an external breaker subpanel installed at the equipment pad. The Power Center should be installed next to this subpanel.



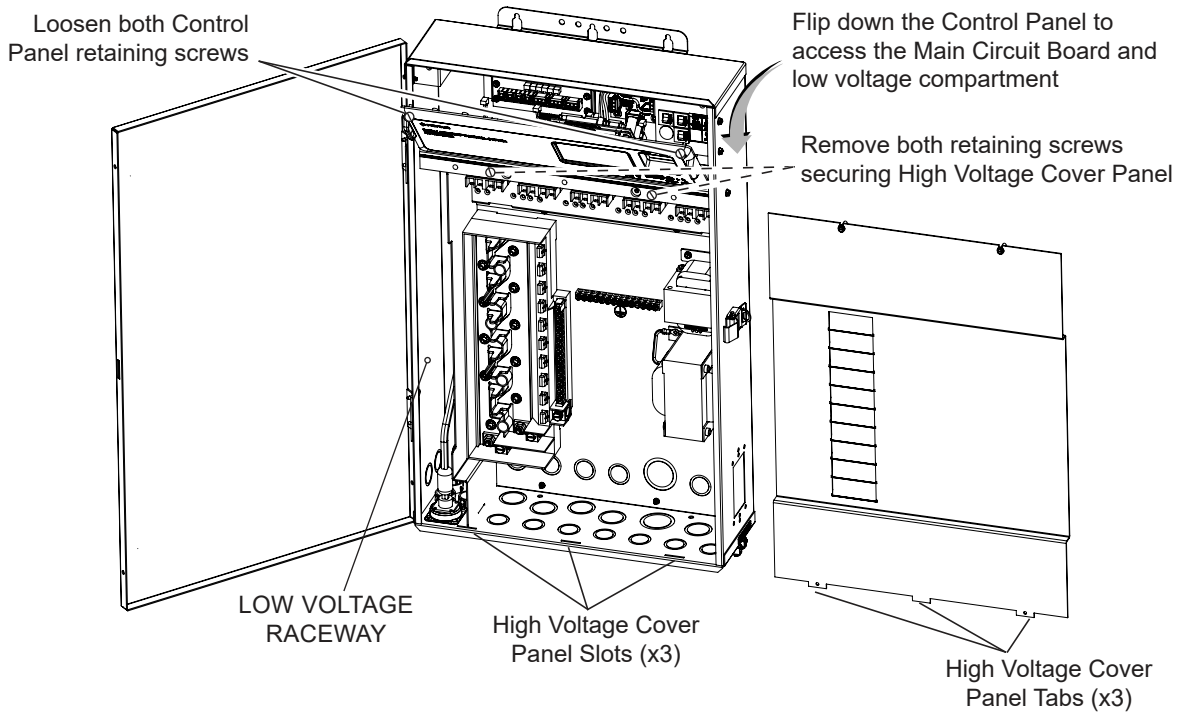
Control System Power Center (without built-in subpanel) Continued



Preparing the Load/Power Center Enclosure

⚠WARNING BEFORE INSTALLING THE LOAD/POWER CENTER, ALWAYS SWITCH OFF THE MAIN POWER at the main circuit breaker.

1. Open the enclosure door.
2. Remove the two retaining screws from the High Voltage Cover Panel and remove the panel from the enclosure.
3. Loosen the two retaining screws securing the top edge of the Control Panel and fold down the Control Panel to access the control board and electrical connections.
4. Refer to the necessary section for equipment wiring and install instructions
   - **Mounting the Load/Power Center**, page 8
   - **Load Center Wiring Knockouts**, page 9
   - **Power Center Wiring Knockouts**, page 10
   - **Power Center Wiring Knockouts (P/Ns 523910 and 523911)**, page 11
   - **Installing Conduit and Conductors**, page 12
   - **System Power Connections**, page 13
   - **Load/Power Center High Voltage Connections**, page 14
   - **Accessing Control Boards and Electronics**, page 16
   - **Connecting Load/Power Center Relays**, page 17
5. After electrical connections have be completed, close the Control Panel and tighten the two retaining screws.
6. Insert the panel's three tabs into the slot at the bottom of the enclosure.
7. Secure the panel using the two retaining screws.
8. Close and the enclosure door.



Mounting the Load/Power Center

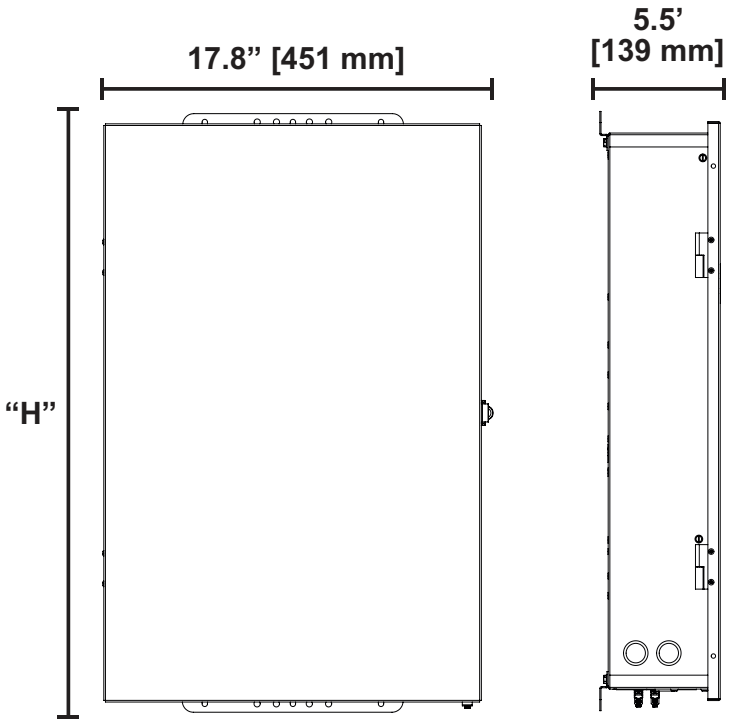
Mount the IntelliCenter Load/Power Center on a vertical wall or post at least 5 feet [1.5 m] in US, or 3 meters [9.8 ft.] in Canada, from the inside wall of the pool or spa.

1. If connecting IntelliCenter to a WiFi network, ensure the desired install location receives a strong and stable WiFi signal.

   Note: If signal strength is insufficient due to distance between the IntelliCenter antenna and WiFi router, install a WiFi extender or consider an alternative mounting location.

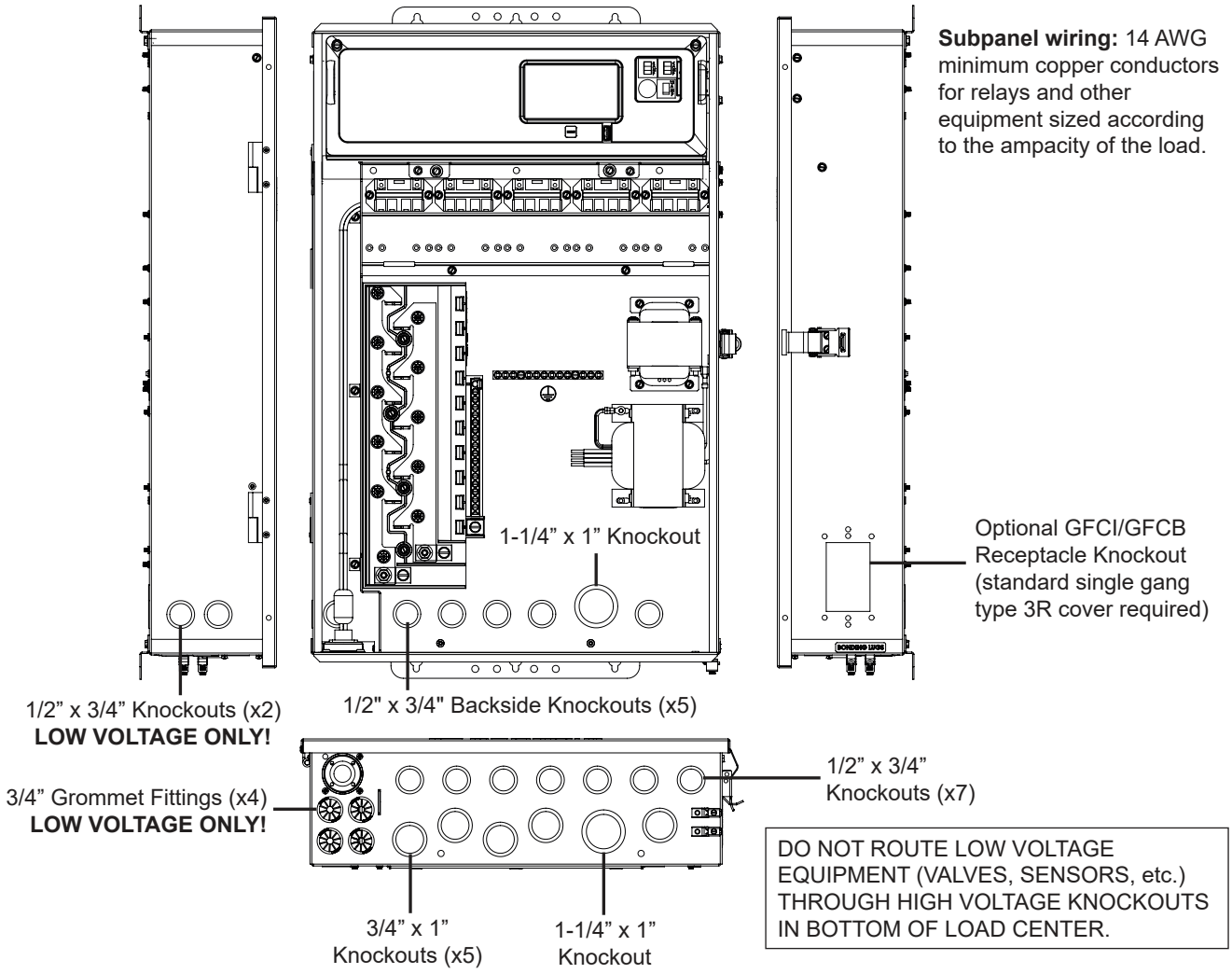
2. Position the enclosure against a vertical flat surface.
   If wall anchors are being used, support the enclosure in place (horizontally level and square) against the surface.
3. Mark the enclosure mounting points.
4. If using wall anchors, drill and set the anchors, then secure the enclosure with three screws in both the top and bottom mounting brackets.

"H" Dimension	
Load Center	**26.9" [684 mm]**
Power Center	**21" [532 mm]**
Power Center (P/N 523910 / 523911)	**17.4" [443 mm]**



Load Center Wiring Knockouts

- Determine the number of low voltage and high voltage connections needed at the Load Center. Conduit size and runs will be based on the size and number of conductors within the conduit.
- Ensure the enclosure has been mounted at least 5 feet [1.5 m] in US, or 3 meters [9.8 ft] in Canada, from the inside wall of the pool or spa.
- The Low Voltage Raceway features two 1/2” x 3/4” knockouts on the left side of the enclosure.
- The High Voltage Compartment features twelve 1/2” x 3/4” knockouts, five 3/4” x 1” knockouts, and two 1-1/4” x 1” knockouts.
- Use 1-1/4” x 1” conduit for the main power conductors.

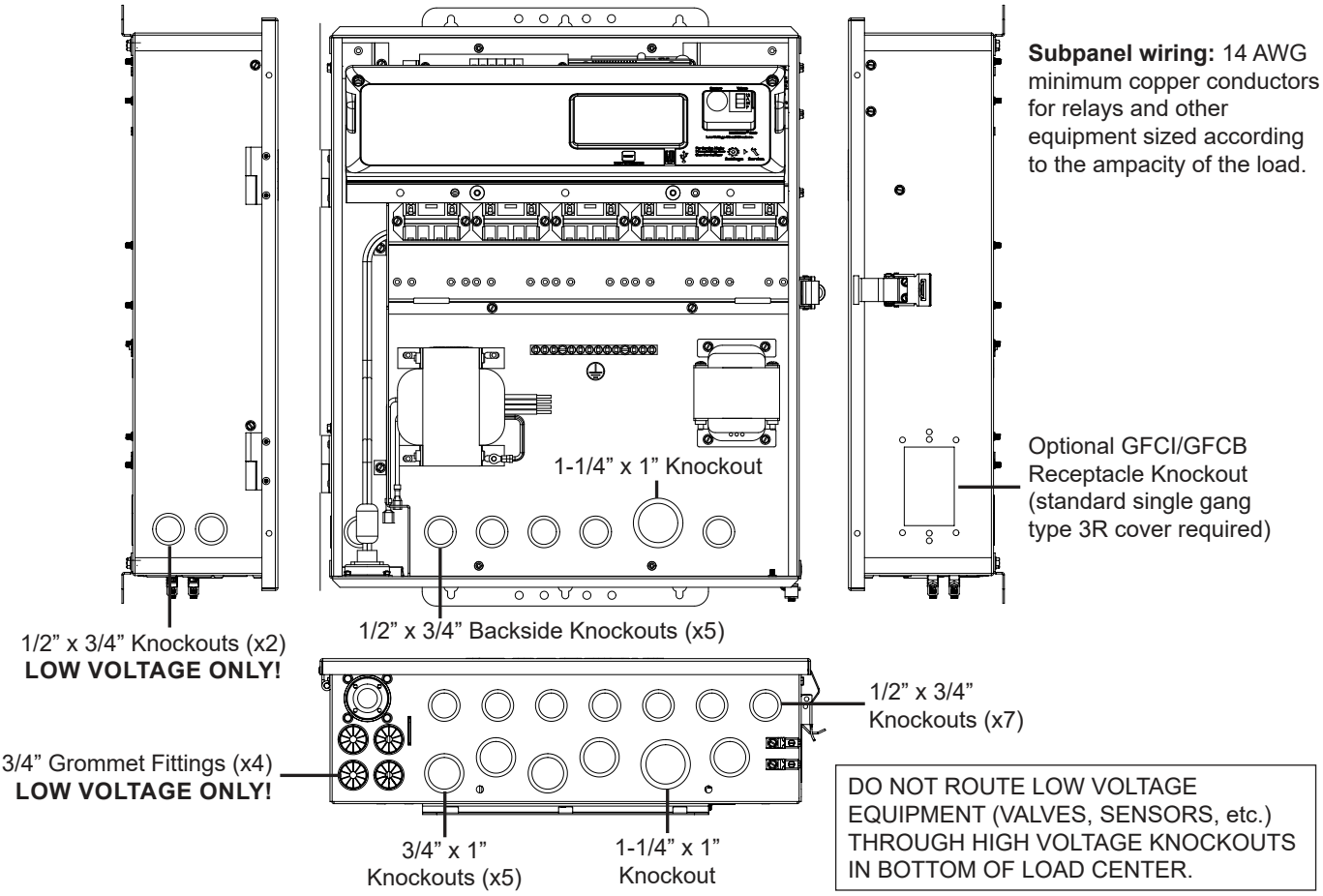


Load Center Knockout Locations

Power Center Wiring Knockouts

- Determine the number of low voltage and high voltage connections needed at the Power Center. Conduit size and runs will be based on the size and number of conductors within the conduit.
- Ensure the enclosure has been mounted at least 5 feet [1.5 m] in US, or 3 meters [9.8 ft] in Canada, from the inside wall of the pool or spa.
- The Low Voltage Raceway features two 1/2” x 3/4” knockouts on the left side of the enclosure.
- The High Voltage Compartment features twelve 1/2” x 3/4” knockouts, five 3/4” x 1” knockouts, and two 1-1/4” x 1” knockouts.
- Use 1-1/4” x 1” conduit for the main power conductors.

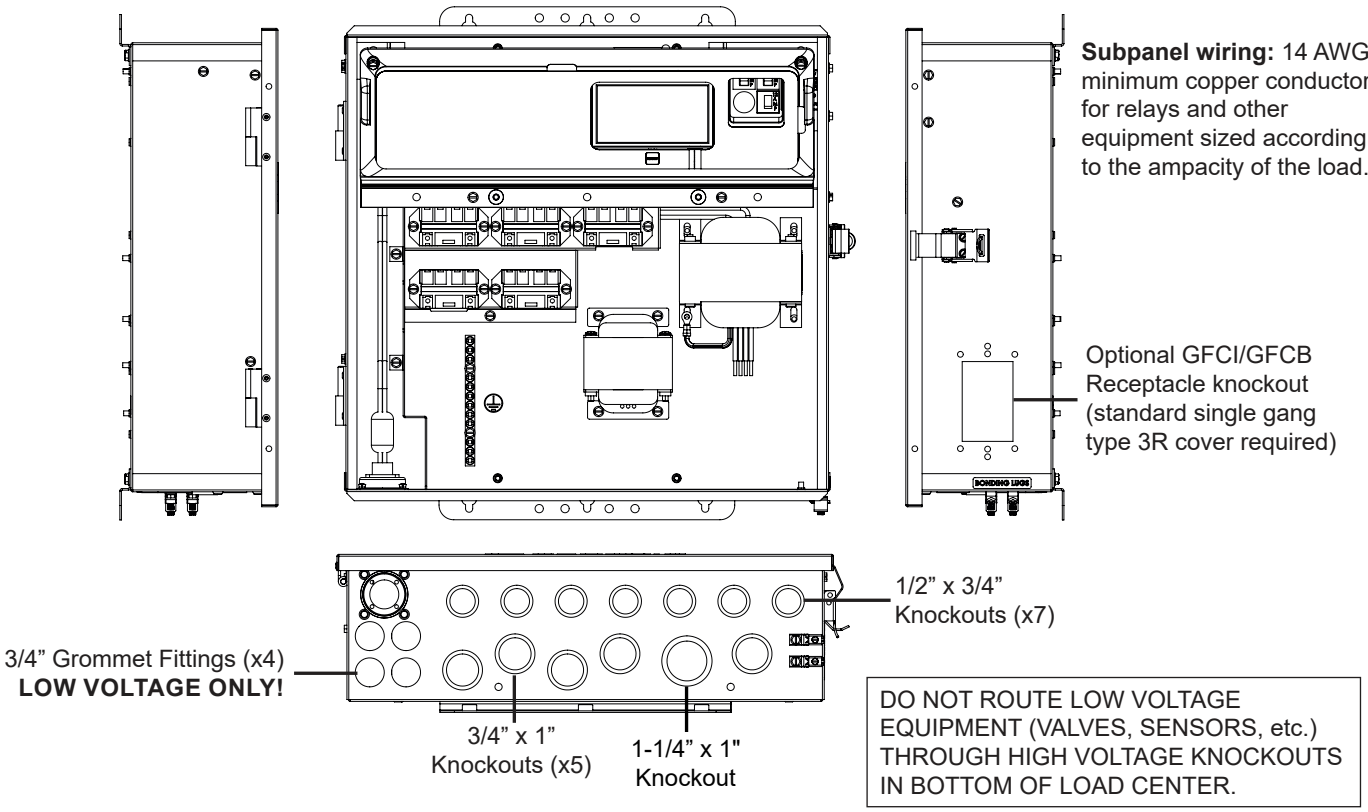
For IntelliCenter P/Ns 523910 and 523911 knockouts: Refer to *Power Center Wiring Knockouts (P/Ns 523910 and 523911), page 11*.



Power Center Knockout Locations

Power Center Wiring Knockouts (P/Ns 523910 and 523911)

- Determine the number of low voltage and high voltage connections needed at the Power Center. Conduit size and runs will be based on the size and number of conductors within the conduit.
- Ensure the enclosure has been mounted at least 5 feet [1.5 m] in US, or 3 meters [9.8 ft] in Canada, from the inside wall of the pool or spa.
- The High Voltage Compartment features seven 1/2” x 3/4” knockouts, five 3/4” x 1” knockouts, and one 1-1/4” x 1” knockout.
- Use 1-1/4” x 1” conduit for the main power conductors.



Power Center Knockout Locations (P/Ns 523910 and 523911)

Installing Conduit and Conductors

Before installing electrical conduit to the enclosure, read the following recommended guidelines:

Note: Electrical installation of the IntelliCenter Control System **MUST BE PERFORMED BY A QUALIFIED SERVICE PROFESSIONAL AND/OR UNDER DIRECT SUPERVISION OF A QUALIFIED PROFESSIONAL** in accordance with the National Electrical Code or Canadian Electric Code, as well as any local codes at the time of installation.

- Determine the number of low and high voltage circuits being used in the IntelliCenter Load/Power Center. The conduit length is based on the conductor size, and the number of conductors within the conduit. **The number of pieces of equipment to be controlled will dictate the size of the conduit. DO NOT RUN HIGH VOLTAGE AND LOW VOLTAGE CONDUCTORS IN THE SAME CONDUIT.**
- Use 14 AWG minimum to 6 AWG maximum, 140°F/158°F [60°C/70°C] rated copper conductors for relay circuits depending on the required load. Follow NEC guidelines concerning the number and size of conductors that can be installed in various sizes of conduit.
- Supply conductor must be sized to support all loads. The maximum supply current is 150 Amps at 120 VAC/240 VAC.
- Supply circuit must be protected by suitable breaker rated no higher than 150 Amps. If a single relay is used for more than one device, verify the total load does not exceed the rating of the circuit.
- The IntelliCenter circuit board requires 120 VAC, 3 Amp power to operate control circuits and the optional salt chlorine generator. This power should be connected to one of the circuit breakers in the subpanel.
- Complete conduit installation before concrete is poured. Underground conduit should be positioned in well compacted soil. Ensure that all conduit joints are well sealed.

System Power Connections



Do NOT connect main power to the Load/Power Center until all other electrical connections (heaters, pumps, actuator valves, lights, etc.) have been completed.

Main Power Connection (Load Center with Built-in Breaker Subpanel)

IntelliCenter Load Center with circuit breaker subpanel is rated for 150 Amps maximum. Run properly rated conductors from the main breaker panel to the main power connections on the built-in Load Center breaker subpanel. The connection at the main breaker panel should be to a 240 VAC circuit breaker rated at 150 Amps maximum.

Grounding Connections

Connect a ground conductor from the main breaker electrical panel to the Load/Power Center Grounding Bar inside the enclosure. Also ground all high voltage equipment that is connected to the Load/Power Center relays or circuit breakers.

Bonding Connections

Also connect the Load/Power Center to the pool bonding system using 8 AWG (6 AWG for Canada) conductor. There are two Bonding Lugs on the bottom of the Load/Power Center.

Circuit Breakers (Load Center with Built-in Breaker Subpanel)

Circuit Breakers are to be supplied and installed by the installer. For recommended circuit breaker types, refer to the circuit breaker chart on the inside of the Load/Power Center door.

Some pool equipment requires connection to ground fault circuit breakers (GFCI). Check all local and national codes for these requirements.

Follow all breaker manufacturer rating requirements. **To determine conductor size, refer to the recommendations listed on the circuit breaker label.**

Load/Power Center High Voltage Connections

⚠WARNING



Do NOT connect main power to the Load/Power Center until all other electrical connections (heaters, pumps, actuator valves, lights, etc.) have been completed.

- Use three conductors, red, black, and white (or red, red and black for 240 VAC) for main power to the Load/Power Center. Maximum load is 150 Amps at 120/240 VAC. These conductors should be secured to the supply side of circuit breaker.
- For main power conduit, use the 1-1/4” x 1” knockout located directly under the internal breaker panel.
- Use the rectangular knockout on the right side of the Load/Power Center enclosure to mount an approved GFCI or GFCB with rainproof type 3R cover (supplied by installer) for direct connection of underwater lights.
- Use one of the four 3/4" low voltage grommet fittings located in the bottom of the enclosure for temperature sensor connections.
- For IntelliCenter wiring diagrams, refer to pages 32-34 or the label on the inside of the Load/Power Center door.
- To rewire the Salt Chlorine Generator transformer for 120 VAC, refer to *Rewiring the SCG Transformer for 120 VAC, page 30*.

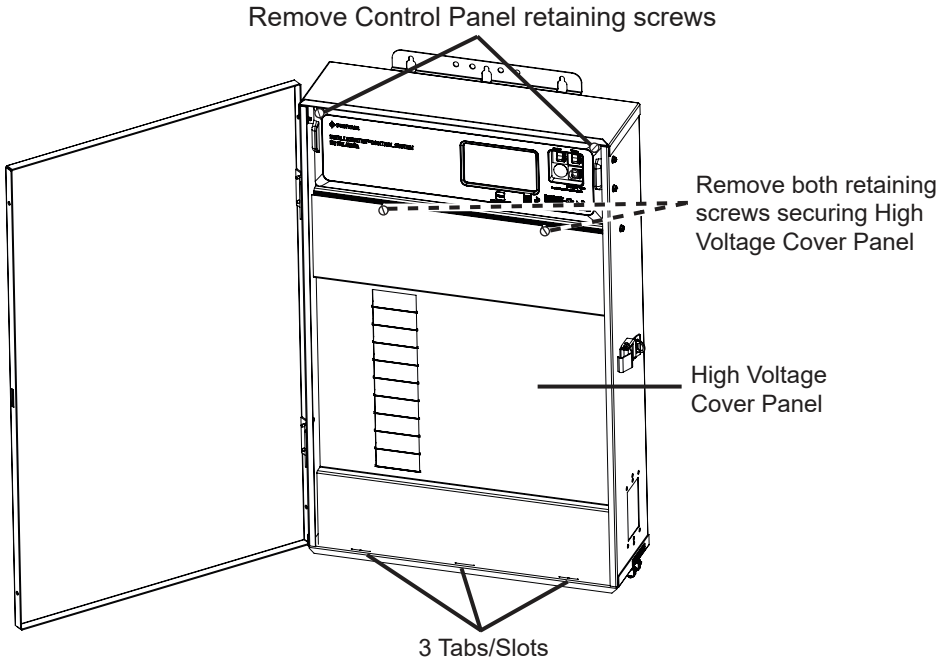
Rewiring the Control System Transformer for 240 VAC

The IntelliCenter Load/Power Center system transformer is wired for 120 VAC at the manufacturer. To rewire the transformer for 240 VAC, refer to the instructions below and the wiring diagram on page 15.

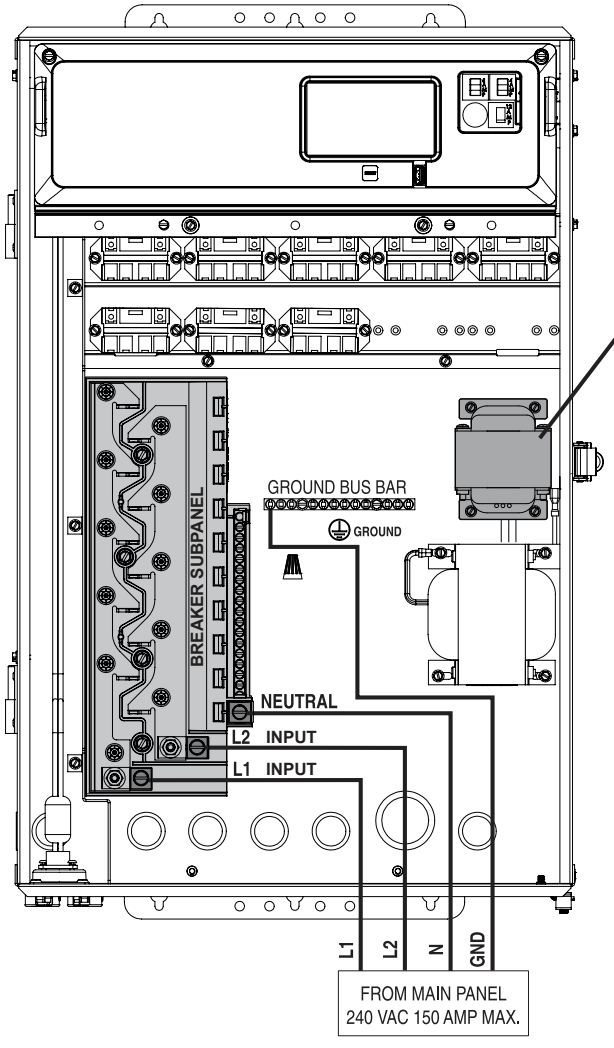
⚠WARNING BEFORE REMOVING THE HIGH VOLTAGE COVER PANEL, disconnect power to the IntelliCenter at the main circuit breaker.

1. Disconnect power to the Load/Power Center at the main circuit breakers.
2. Open the enclosure and remove the two retaining screws securing the High Voltage Cover Panel.
3. Remove the High Voltage Cover Panel from the enclosure.
4. Rewire the Control System Transformer for 240 VAC as shown in the wiring diagram on page 15.
5. Insert the high voltage panel’s three tabs into the slots at the bottom of the enclosure.
6. Reinstall the two retaining screws securing the High Voltage Cover to the enclosure.
7. Close and secure the enclosure door.

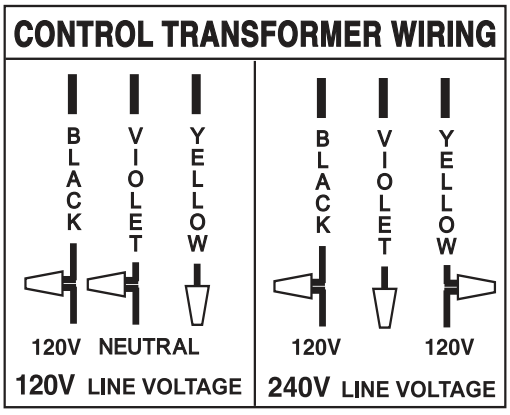
Rewiring the Control System Transformer for 240 VAC (Continued)



IntelliCenter Load Center



Control System Transformer:
120 VAC, 2.5 A, 50/60 Hz
240 VAC, 1.3 A, 50/60 Hz



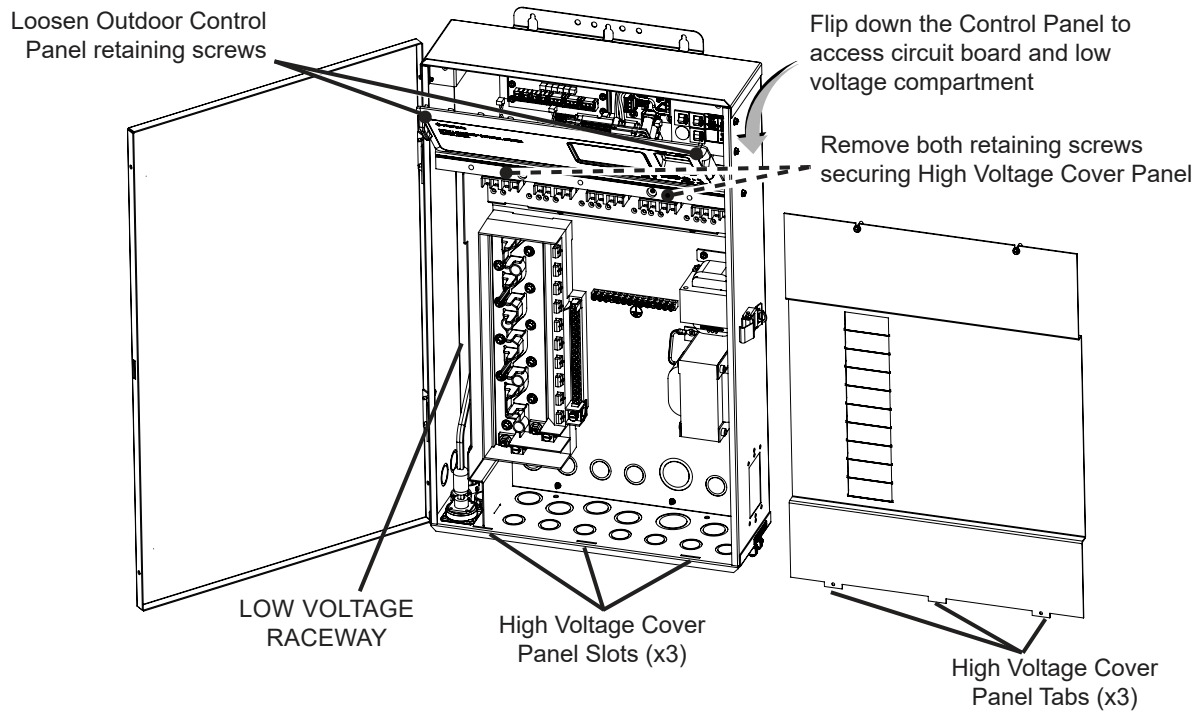
IntelliCenter System Transformer Wiring Diagram

Accessing Control Boards and Electronics

The system control board, optional personality kits, and other low voltage connections are located behind the control panel.

To access the control boards and low voltage connections:

1. Open the enclosure door.
2. Remove the two retaining screws from the High Voltage Cover Panel and remove the panel from the enclosure.
3. Loosen the two retaining screws securing the top edge of the Control Panel.
4. Fold down the Control Panel to access the control board.
5. Refer to the necessary sections to connect filtration system components to IntelliCenter.
   - **IntelliCenter Load/Power Center Relays**, page 17
   - **Valve Actuators**, page 19
   - **IntelliValve Valve Actuators**, page 20
   - **Temperature Sensors**, page 21
   - **Standard Gas Heater**, page 23
   - **IntelliFlo Pump**, page 24
   - **Heat Pump or Hybrid Heater**, page 25
   - **Salt Chlorine Generator,** page 26
   - **IntelliChem Chemical Controller,** page 28
6. After electrical connections have be completed, close the Control Panel and tighten the two retaining screws.
7. Insert the panel's three tabs into the slot at the bottom of the enclosure.
8. Secure the panel using the two retaining screws.
9. Close and secure the enclosure door.



Connecting Load/Power Center Relays

The standard IntelliCenter Load/Power Center features five pre-installed high voltage relays, four auxiliary (AUX) circuits, and one filter pump circuit.

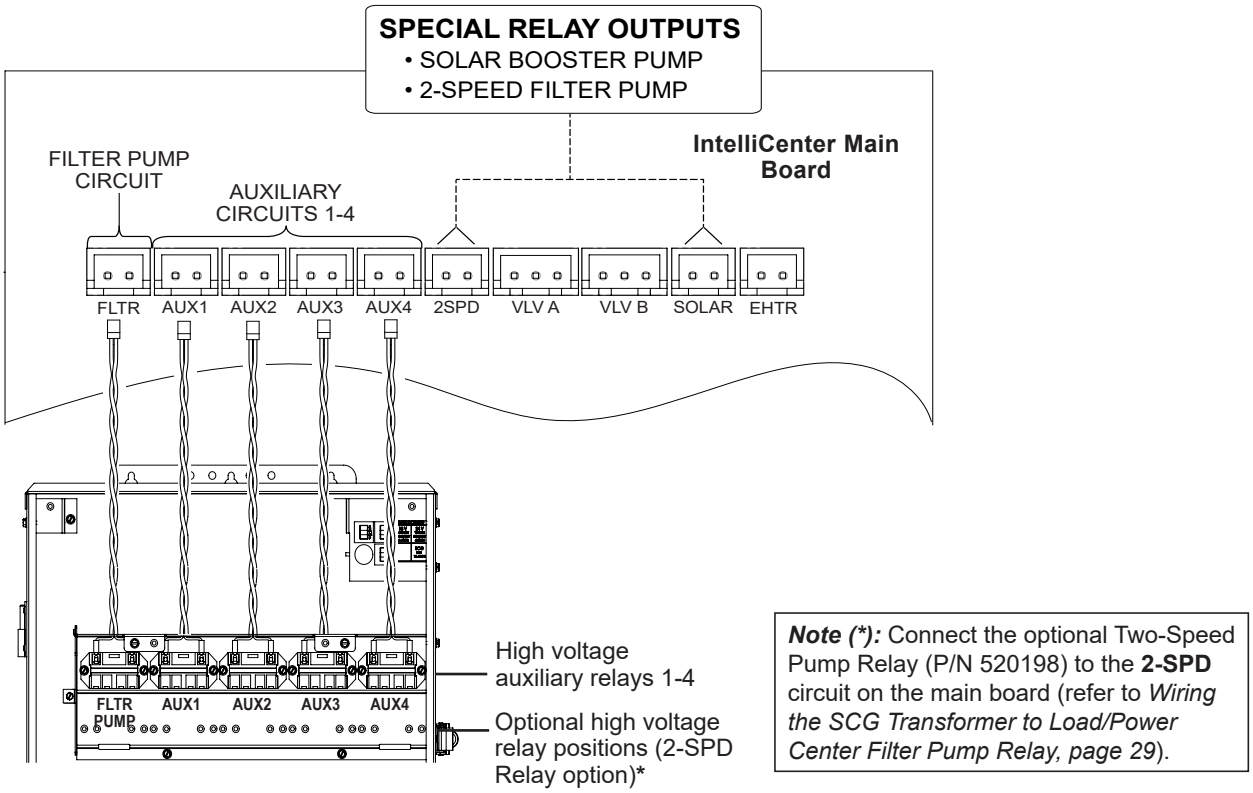
1. **Single Equipment: Pool Only or Spa Only** – Intended to control a single body of water (LO-TEMP and HI-TEMP).
    - **i5P (P/N 521909)** – Main System Board. Includes four AUX circuits and one dedicated filter pump circuit.
    - **i8P (P/N 521910)** – Includes three additional AUX circuits, for a total of seven auxiliary circuits and one dedicated filter pump circuit.
    - **i10P (P/N 521911)** – Includes five additional AUX circuits, for a total of nine auxiliary circuits plus one dedicated filter pump circuit.
2. **Shared Equipment: Pool and spa combinations with shared filtration system** – Intended to control water flow between a pool and spa the share a filtration system.
    - **i5PS (P/N 521912)** – Added to i5P main board for pool/spa combination systems.
    - **i8PS (P/N 521913)** – Added to i5P main board for pool/spa combination systems. Includes three additional AUX circuits, for a total of seven auxiliary circuits.
    - **i10PS (P/N 521914)** – Added to i5P main board for pool/spa combination systems. Includes five additional AUX circuits, for a total of nine auxiliary circuits.
3. **Dual Equipment: Pool and Spa with Dual Sets of Equipment** – Intended to control two separate sets of pool equipment. Each set of a equipment (Pool or Spa) can control one temperature setting.
    - **i10D (P/N 521915)** – Added to i5P main board for dual body systems. Includes five additional AUX circuits and a dedicated filter pump circuit, for a total of nine auxiliary circuits and two dedicated filter pump circuits.

To connect the relays to the IntelliCenter main board AUX plugs:

1. Route the power relay conductors into the low voltage compartment and to the main control board.
2. Connect the conductors to the desired AUX terminal (**FLTR PUMP**, **AUX1**, **AUX2**, **AUX3**, **AUX4)**.

    Note: For AUX terminal locations, refer to the diagram on the next page.

Connecting Load/Power Center Relays (Continued)



Note (*): Connect the optional Two-Speed Pump Relay (P/N 520198) to the **2-SPD** circuit on the main board (refer to *Wiring the SCG Transformer to Load/Power Center Filter Pump Relay, page 29*).

IntelliCenter Relay-to-AUX Connections

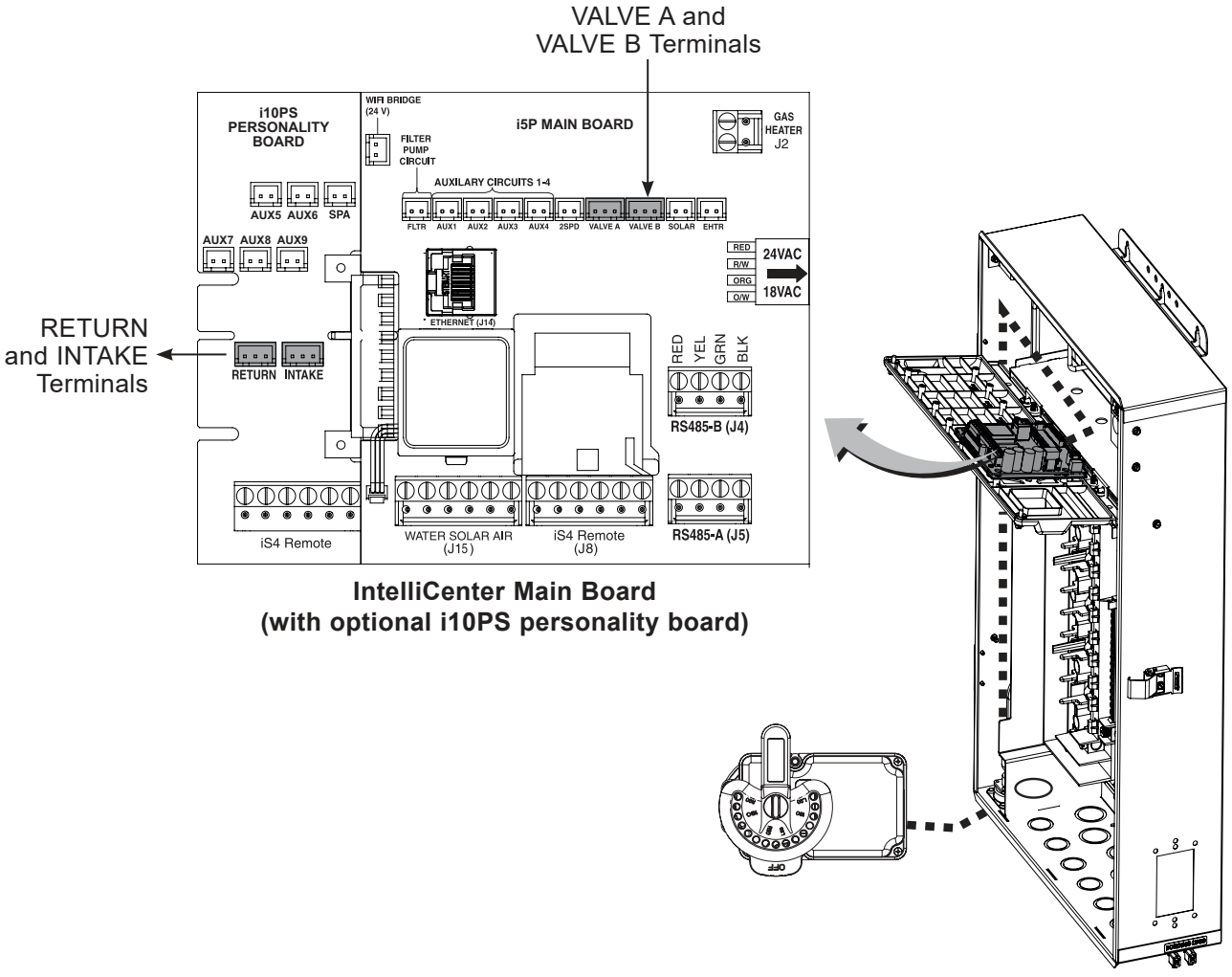
Connecting a Standard Valve Actuator

1. At the Load/Power Center, route the actuator cable to the through the low voltage raceway along the left-side of the enclosure to the IntelliCenter board.
2. **General Purpose Valves (solar, water-feature, in-floor cleaner, etc.):** Connect the Valve A actuator to the **VALVE A** terminal on the IntelliCenter main board, and the Valve B actuator to the VALVE B terminal. See below for terminal locations.
3. **Pool/Spa Intake and Return Valves:** Connect the Intake Valve actuator to the **INTAKE** terminal on the installed PS-series personality board, and the Return Valve actuator to the **RETURN** terminal. See below for terminal locations.

   Note: RETURN and INTAKE terminals are only available on Share Equipment (PS-Series) personality boards.

   Note: Excess cable should be coiled in the low voltage raceway in the left-side of the enclosure. Do not coil the cable in the upper low voltage compartment.

If additional valves connections are needed, a Valve Expansion Kit (P/N 522038z) can be purchased and installed. This expansion board will allow control of up to 10 valves.



IntelliCenter Main Board
(with optional i10PS personality board)

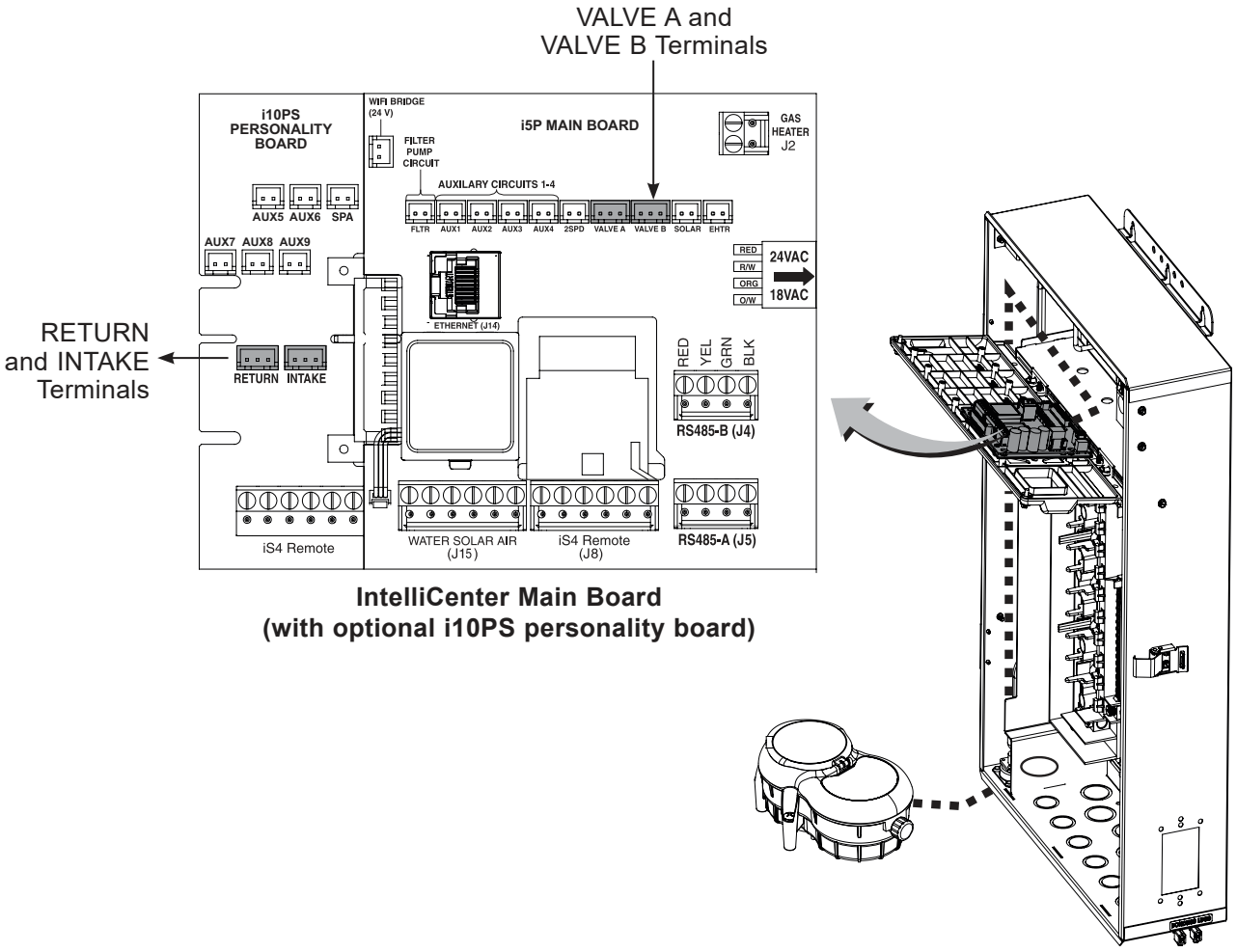
Connecting an IntelliValve Valve Actuator

1. At the Load/Power Center, route the actuator cable through the low voltage raceway to the IntelliCenter board.
2. **General Purpose Valves (solar, water-feature, in-floor cleaner, etc.):** Connect the Valve A actuator to the **VALVE A** terminal on the IntelliCenter main board, and the Valve B actuator to the VALVE B terminal. See below for terminal locations.
3. **Pool/Spa Intake and Return Valves:** Connect the Intake Valve actuator to the **INTAKE** terminal on the installed PS-series personality board, and the Return Valve actuator to the **RETURN** terminal. See below for terminal locations.

   Note: RETURN and INTAKE terminals are only available on Share Equipment (PS-Series) personality boards.

   Note: Excess cable should be coiled in the low voltage raceway in the left-side of the enclosure. Do not coil the cable in the upper low voltage compartment.

If additional valves connections are needed, a Valve Expansion Kit (P/N 522038z) can be purchased and installed. This expansion board will allow control of up to 10 valves.



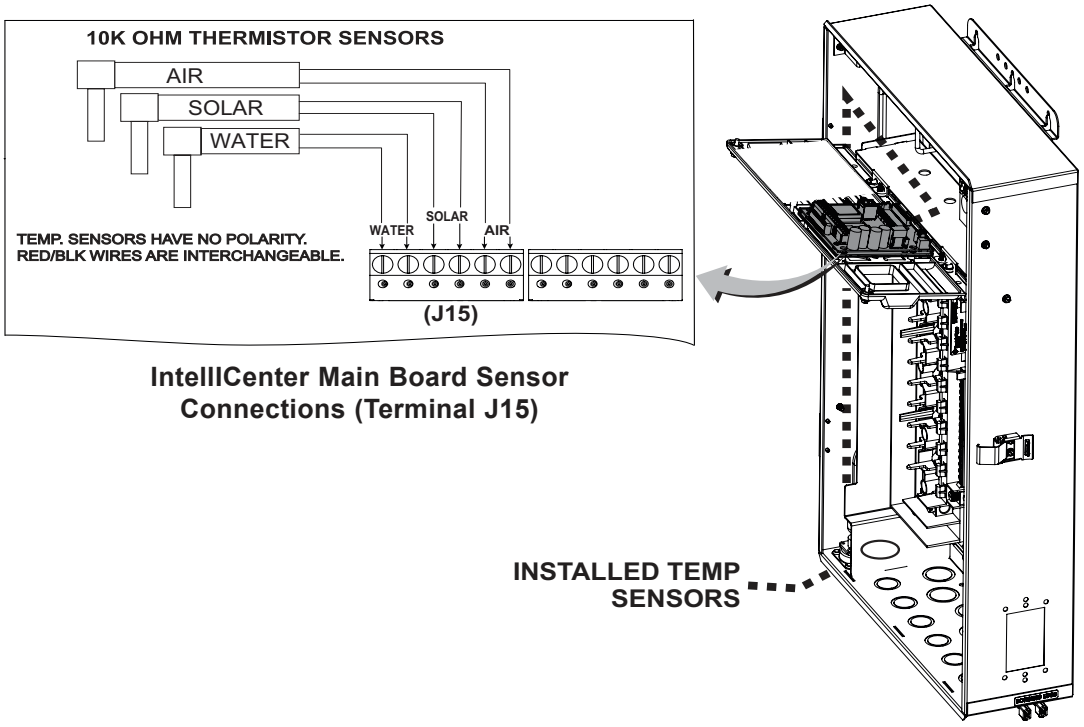
IntelliCenter Main Board
(with optional i10PS personality board)

Installing a Water Temperature Sensor

1. Select a convenient location to mount the water sensor in the plumbing system between the filter pump and filter. Drill a 3/8-inch diameter hole in one side of the pipe.
2. Insert tip of sensor into the hole. Use the band clamp to secure the sensor to the pipe. Tighten the clamp just enough so that the O-ring begins to flatten. Do not overtighten
3. Fasten the cable to the plumbing with cable ties.
4. Run the provided 22 AWG cable from the sensor to the Load/Power Center and route the cable through the low voltage raceway to the circuit board.
5. Strip necessary conductors 1/4-inch [6.4 mm] and cut off unused conductors.
6. Secure the conductors into the **WATER** screw terminals at the **J15** terminal block. Refer to diagram below.

Installing an Air Temperature Sensor

1. Mount the sensor in a shaded area, away from air conditioners.
2. Run the provided 22 AWG cable from the sensor to the Load/Power Center and route the cable through the low voltage raceway to the circuit board.
3. Strip necessary conductors 1/4-inch [6.4 mm] and cut off unused conductors.
4. Secure the conductors into the **AIR** screw terminals at the **J15** Terminal Block. Refer to diagram below.



IntelliCenter Main Board Sensor Connections (Terminal J15)

Installing a Solar Temperature Sensor

⚠CAUTION **DO NOT DRILL HOLES OR CLAMP SENSOR INTO A SOLAR PIPE.**

1. Mount the sensor on a flat surface, with similar exposure to sun. Do not let the sensor touch the panels. For glazed panels, install the sensor between collector and glazing.
2. If necessary, splice a two-conductor extension conductor to the sensor. Run two-conductor cable between the sensor and the enclosure. Use waterproof connectors to connect the sensor to the cable. Use 20 AWG outdoor rated sensor wiring and be sure the conductor connections are protected from the environment. Use shielded cable for long runs or runs near other electrical wiring.
3. Strip necessary conductors 1/4-inch [6.4 mm] and cut off unused conductors.
4. Secure the conductors into the **SOLAR** screw terminals at the **J15** terminal block. Refer to diagram on previous page.

Temperature vs. Resistance Data

IntelliCenter uses 10k Ohm thermistor sensors. When the solar sensor is disconnected from the control system, the sensor will read 10k Ohm at 77°F [25°C].

Refer to the table below for resistance at other temperatures. A properly functioning sensor should be accurate to ±0.2°C.

TEMPERATURE	RESISTANCE (Ω)
-30°F (-34°C)	234,100
-25°F (-32°C)	196,300
-20°F (-29°C)	165,100
-15°F (-26°C)	139,300
-10°F (-23°C)	118,000
-5°F (-21°C)	100,200
0°F (-18°C)	85,350
5°F (-15°C)	72,910
10°F (-12°C)	62,480
15°F (-9°C)	53,640
20°F (-7°C)	46,230
25°F (-4°C)	39,910
30°F (-1°C)	34,560
35°F (2°C)	30,000
40°F (5°C)	26,100
45°F (7°C)	22,760
50°F (10°C)	19,900

TEMPERATURE	RESISTANCE (Ω)
55°F (13°C)	17,440
60°F (16°C)	15,310
65°F (18°C)	13,480
70°F (21°C)	11,880
75°F (24°C)	10,500
77°F (25°C)	10,000
80°F (27°C)	9,298
85°F (29°C)	8,250
90°F (32°C)	7,331
95°F (35°C)	6,530
100°F (38°C)	5,826
105°F (41°C)	5,209
110°F (43°C)	4,663
115°F (46°C)	4,182
120°F (49°C)	3,757

Connecting a Standard Gas Heater to the Load/Power Center

IntelliCenter features low voltage dry contacts that can be connected to most gas heaters or heat pumps with 24 VAC control circuits. The following connection instructions are for gas heaters and heat pumps with low voltage thermostats.

1. Switch OFF power to the heater.

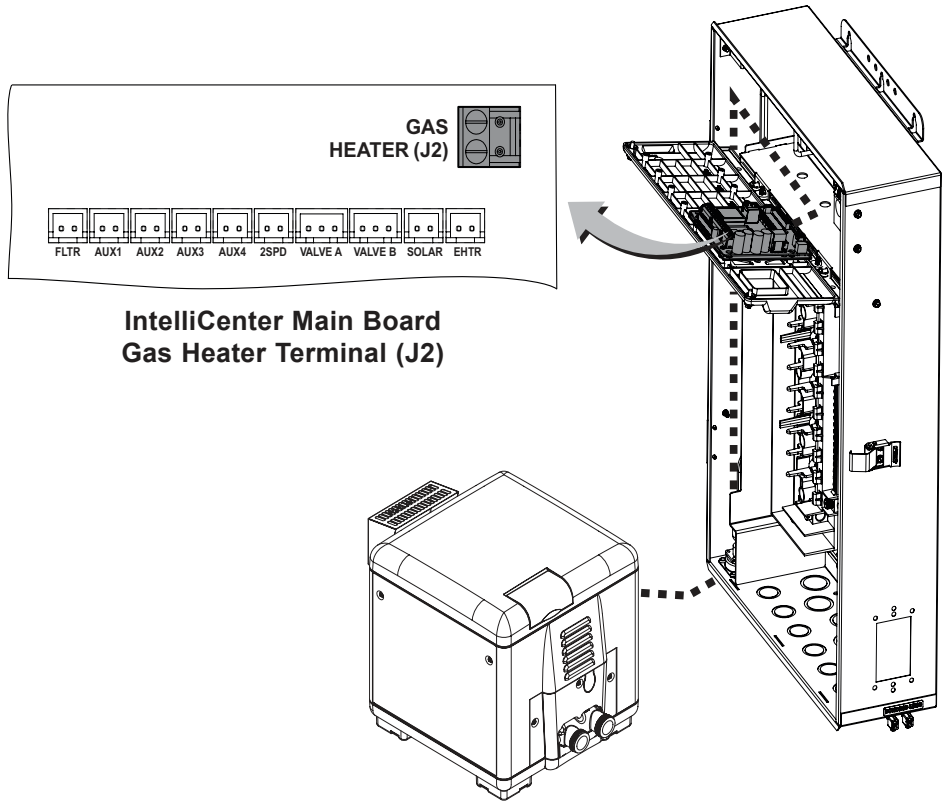
> **⚠CAUTION** **DO NOT** disconnect the conductor from the thermostat, pressure switch, high limit switch, or other safety devices.

2. Remove the factory installed jumper from the heater Fireman's Switch.
3. At the heater, connect the conductors in accordance with heater manufacturer's instructions. For older heaters without instructions for remote operation, connect the conductors to the Fireman's Switch in series with the thermostat, pressure switch, and other safety switches.
4. Run a two-conductor cable from the heater Fireman's Switch connector through the low voltage raceway to the Load/Power Center circuit board, as shown below.

   Note: Use 221°F [105°C] rated conductor for connections to the heater. When connecting conductors inside the heater, be cautious of HOT internal parts of the heater. Refer to the minimum temperature rating for conductors recommended by the manufacturer. Refer to the heater owners manual for details.

5. Strip each conductor 1/4-inch [6.4 mm].
6. Insert the conductors into the **GAS HEATER (J2)** two-screw terminal on the main IntelliCenter board. Refer to diagram below.

> **⚠CAUTION** Ensure conductors from the heater to the IntelliCenter Load/Power Center are isolated from any line voltage conductors in the heater. Failure to follow these instructions may cause heater malfunction.



IntelliCenter Main Board
Gas Heater Terminal (J2)