SYSTEM START-UP

Apply power to the system.

At the LX-30 Power Center, check that the **POWER Status Light** has turned on. If the status light is not on, check the 3 amp circuit breaker which is located above the faceplate. Tripped circuit breaker is indicated by a white tab. Push to reset.

Turn the **FILTER PUMP Service Switch** "ON" and "OFF" to verify that pump is operating.
Return **FILTER PUMP Service Switch to** "TIMER" position, and activate filter pump using the **FILTER TIMER Dial**.
If the system incorporates a pool cleaner pump, activate pump using the **CLEANER TIMER Dial**.

At the Remote Control, turn **SPA Switch** to "SPA" position.
Check that Valve Actuators have rotated to correct positions. If either valve is 180° out of phase, flip **toggle switch** on rear of Valve Actuator from "ON1" to "ON2" position.

Turn **HEAT Switch** to "SPA" position, and check that heater has been activated.

Turn **AUX1** and **AUX2 Switches** "ON", and verify that auxiliary equipment has been activated.

The system is now ready to be operated as desired.

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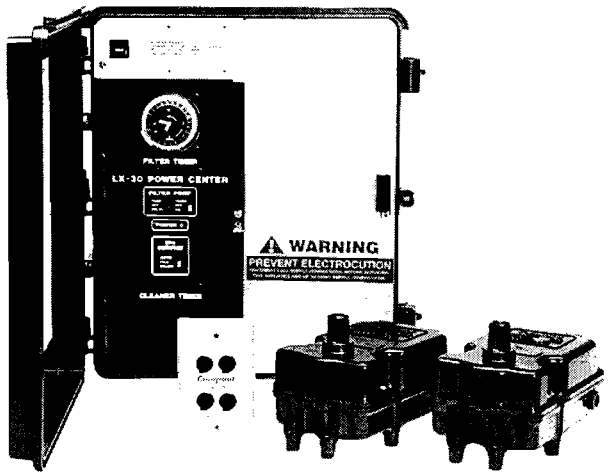
942-0938

INSTALLATION INSTRUCTIONS
CP30 POOL-SPA SWITCHING SYSTEM



IMPORTANT SAFETY INSTRUCTIONS

All wiring must be performed by a qualified electrician. Basic safety precautions and local codes should always be followed when installing and using this electrical equipment.

READ AND FOLLOW ALL INSTRUCTIONS.

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

SAVE THESE INSTRUCTIONS.

PLUMBING REQUIREMENTS

Plumb system in accordance with recommended hydraulic schematic (**Page 3**), local codes and the following guidelines.
Bring all lines back to the equipment pad.

1. **Spa should be at or above the level of the pool.**
   If spa is attached to pool, provide a dam between the two bodies of water to allow spa overflow into pool.
   If spa is not attached to pool, an overflow, sufficient in size to carry the full pump-flow, must be installed at water level in the spa.
2. Plumb a three-port **Intake Valve** on the suction-side of the filter pump, so that center port of valve is connected to the pump inlet.
   Connect spa suction to one side of Intake Valve, and pool suction to the other side.
3. Plumb a three-port **Return Valve** on the return-side of the heater, so that return water will enter valve through the center port. Connect spa return to one side of Return Valve, and pool return to the other side.
4. A ½" spa make-up line (incorporating a ½" manual gate or ball valve and, for elevated spas, a ½" check valve) may be provided 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. For systems which incorporate a skimmer, it is possible to balance the amount of suction between the skimmer and the 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.
6. 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.

SYSTEM OPTIONS

POOL CLEANER :

For systems which incorporate a booster pump pool cleaner, it is possible to add a mechanical time clock for programming the daily cleaning cycles.

Install **24-Hour Time Clock** (**model TMR-LX**) into LX-30 faceplate at the **CLEANER TIMER** location, and plug into circuit board at **CLNR TIMER socket**, in accordance with instructions provided.
Install a **Relay Kit** (**model RLY-LX**) at the LX-30 Power Center in accordance with instructions provided, and plug into circuit board at **CLNR relay socket**.

NOTE : It will not be possible to activate the pool cleaner unless the CP-30 Remote Control has been connected.

SPA WATERFALL CONTROL :

For systems where spa water level is higher than that of the pool, it is possible to use either **AUX1** or **AUX2** Switches at the Remote Control to rotate the return valve to spa return position.
This creates an overflow (waterfall effect) from the spa into the pool, while the system is in "pool mode". The effect will, however, cease whenever the system is in "spa mode".

To enable this feature, install a **Spa Waterfall Control** (**model RLY-WTRFL**) at the LX-30 Power Center in accordance with instructions provided.

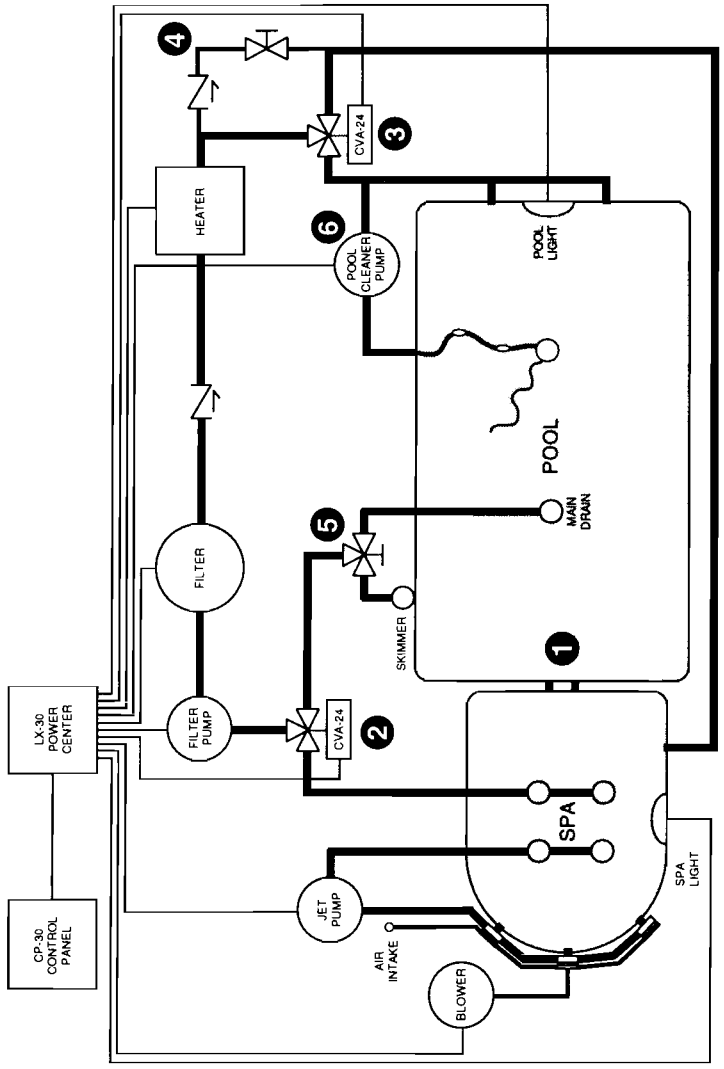
FREEZE PROTECTION :

A **Recirculating Freeze Sensor** (**model FPS-C**) may be added to the system. It will protect the plumbing and equipment from possible freeze damage by running the filter pump whenever the temperature falls to approx. 41°F.
Install FPS-C in accordance with instructions provided, and connect to circuit board at **FRZ** and **GND screw terminals**, in accordance with wiring diagram.

An **Auxiliary Freeze Sensor** (**model FPS-AUX**) may also be added to activate auxiliary equipment (such as a jet pump) during potential freezing conditions.
Install FPS-AUX in accordance with instructions provided.

NOTE : It is advisable to inspect and test the freeze sensor(s) at least once a year, preferably prior to the onset of the freezing season. Testing can be accomplished by immersing sensor in ice water.

RECOMMENDED HYDRAULIC SCHEMATIC



Refer to Page 2 for Plumbing Requirements.

EQUIPMENT LOCATION

Select a convenient location to install the various components of the System.
All electrical equipment must be located five feet or more from the water's edge :

1. **LX-30 Power Center** at the equipment site.
2. **CVA-24 Valve Actuators** at valves to be motorized.
3. **CP-30 Remote Control** at convenient location indoors or outside.

POWER CENTER

Select a convenient location (at the equipment site) to mount the **LX-30 Power Center**. Ensure that the location is greater than 5 feet from the water's edge and no further than 15 feet from any motorized valves (otherwise Valve Actuator cable will need to be extended).
Mount the LX-30 on a flat surface using appropriate screws through the three external mounting points located on the side of the enclosure.
Do not drill and mount from inside the enclosure.
Install to provide drainage of compartment for electrical components.

LOW-VOLTAGE CABLES

Determine lengths of low voltage cable needed between Power Center and the various pieces of equipment.

1. 4-pair 22AWG cable to CP-30 Remote Control.
2. 3-conductor 22AWG cable to dual-thermostat gas heater (if applicable).
3. 2-conductor 22AWG cable for fireman's switch connections (if applicable) to dual-thermostat gas heater.
4. 2-conductor 22AWG cable to single-thermostat gas heater (if applicable).
5. 2-conductor 14AWG cable to electric heater (or heat pump).
6. CVA-24 Valve Actuators are provided with 15 feet of 3-conductor cable.

Install cable, using plastic or metallic conduit where cables run underground, through concrete, etc.

NOTE: Never install low voltage and high voltage wires in the same conduit. It is advisable to maintain a minimum distance of 12" between parallel runs of low voltage and AC current-carrying wires.

HIGH-VOLTAGE WIRING

GENERAL :

At the equipment site, install an electrical sub-panel with separate breakers for each load.
Make sure that the motor(s) on the equipment have built-in thermal protection.
All high voltage connections are made to terminal blocks, which are located behind service panel in right-side compartment of LX-30 Power Center.
A high voltage wiring label is located adjacent to terminal blocks.
Knock-out holes are provided on bottom of enclosure for conduit mounting.

To reduce the risk of electric shock, provide a continuous green insulated copper wire, no smaller than #12 AWG, between grounding bus of LX-30 and grounding terminal of electrical sub-panel.
A wire connector is provided for bonding to local ground points. To further reduce the risk of electric shock, this connector should be bonded with a #8 AWG copper wire to any metal ladders, pipes, or other metal within five feet of the spa.

SYSTEM POWER :

Provide a separate circuit breaker to power the system.
Either 115 or 230V AC can be used (115V is preferable). System draws less than 1 amp.
The circuit breaker should be readily accessible to the spa user, but installed at least 5 feet from the water's edge. The breaker will open all ungrounded supply conductors to comply with section 422-20 of the National Electrical Code, ANSI/ NFPA 70-1987.
Run wires from circuit breaker to high voltage compartment of LX-30, and connect to top terminal block, which is marked "**SYSTEM POWER**".
Install 2 jumper wires for 115V, or 1 jumper for 230V, according to wiring label.

EQUIPMENT POWER :

Provide independent circuit breakers for **R1** (FLTR), **R2** (AUX1), and **R3** (AUX2).
Run wires from breakers to high voltage compartment of LX-30, and connect to LINE 1 and LINE 2 of appropriate terminal blocks. Connect pumps and other high voltage equipment to LOAD 1 and LOAD 2 terminals at appropriate terminal blocks.
Each individual terminal block can be wired for either 115V or 230V AC.
For 115V equipment, only half of the terminal block will be used (ie: LINE 1 and LOAD 1).

If power relays are being used to control underwater lighting fixtures, a GFCI should be provided. The conductors on the load side of the GFCI must not occupy conduit, boxes or enclosures containing other conductors unless the additional conductors are also protected by a GFCI.

VALVE ACTUATORS

Mount **Valve Actuators** (**model CVA-24**) to three-port valves in accordance with instructions printed on box.

Run cables to low voltage compartment of LX-30 Power Center, and plug into circuit board at appropriate valve socket :

1. Intake (suction) Valve to **INT VLV socket**.
2. Return Valve to **RET VLV socket**.
3. Auxiliary Valve (optional) to **AUX VLV socket**.

Coil any excess cable, and carefully store inside low voltage compartment.

REMOTE CONTROL

Provide a standard single-gang electrical box for mounting the **CP-30 Remote Control**. If located outdoors, the electrical box must be raintight.

Strip jacket of 4-pair cable 6" to identify the twisted pairs and assure correct connections.
Strip insulation of each wire 3/8", and connect to switch pigtails using wire nuts in accordance with appropriate wiring diagram.
Pay attention to the two different wiring possibilities (for either a dual-thermostat or a single-thermostat heater). **See Pages 6 and 8.**
Insulate any unused wires from possible shorting.

Mount Remote Control to electrical box, using gasket and mounting screws provided.

LOW-VOLTAGE WIRING

All low voltage connections are made to circuit board which is located behind the hinged faceplate in left side compartment of the LX-30.
Strip jacket of 4-pair cable 6" to identify the twisted pairs and assure correct connections. Strip insulation of each wire ¼", and connect to appropriate screw terminals in accordance with wiring diagram.
Pay attention to the two different wiring possibilities (for either a dual-thermostat or a single-thermostat heater). **See Pages 6 and 8.**

NOTE : For the convenience of the Pool Serviceperson, the screw terminal can be unplugged from the circuit board without disconnecting wires.

HEATER CONNECTIONS

The system is capable of activating :

1. a dual-thermostat gas heater with fireman's switch. (**Page 6**).
2. a dual-thermostat gas heater without fireman's switch. (**Page 7**).
3. a single-thermostat gas heater. (**Page 8**).
4. an electric heater (rated up to 3KVA) or a heat pump. (**See below**).

ELECTRIC HEATER OR HEAT PUMP :

For systems which utilize a heat pump or electric heater, a **Relay Kit** (**model RLY-LX**) should be added at the LX-30 Power Center.
Install RLY-LX in accordance with instructions provided, and plug onto circuit board at the **EHTR relay socket**.
The relay is capable of controlling a heat pump, an electric heater (rated up to 3KVA), or the magnetic contactor of a larger electric heater.

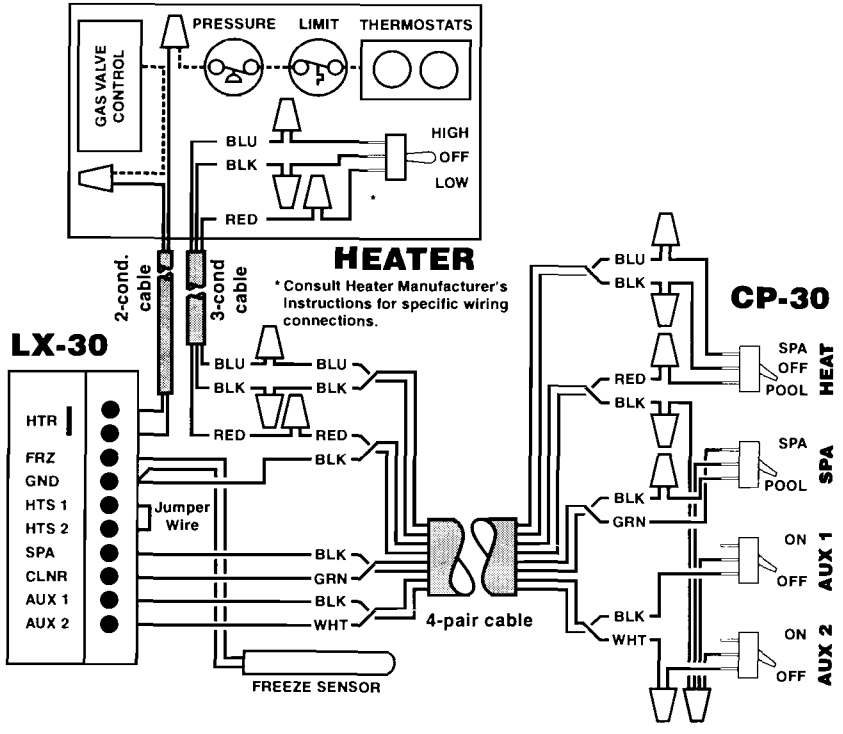
Inside the heater (or heat pump), connect two 14 AWG wires in **series** with the heater thermostat circuitry. Place the heater toggle switch in the "ON" position, and set the thermostat to the desired temperature.

Run the two wires to the high voltage compartment of the LX-30 Power Center, and connect to **LINE 1** and **LOAD 1 terminals** of the electric heater relay.

DUAL-THERMOSTAT GAS HEATER :

Inside the gas heater, connect 3-conductor cable in **parallel** with the heater toggle switch (**blue** to POOL, **black** to COMMON and **red** to SPA).
If the heater requires a fireman's switch, connect 2-conductor cable in **series** with the heater circuitry (at Fireman's Switch terminals if provided).
Do not disconnect or bypass the flow, pressure or high limit switches.
Place the heater toggle switch in the "OFF" position, and set the thermostats to desired pool and spa temperatures.

Run the cable(s) to the low-voltage compartment of LX-30 Power Center.
Strip insulation of 3-conductor cable 3/8", and connect to 4-pair cable using wire nuts in accordance with wiring diagram (**below**).
If the heater requires a fireman's switch, connect 2-conductor cable to **HTR screw terminals** and provide an insulated jumper wire between **HTS1** and **HTS2 screw terminals** on circuit board, in accordance with wiring diagram (**below**).



If the heater does not require a fireman's switch, omit the 2-conductor cable and jumper wire at the LX-30 circuit board.
For connections to MiniMax heater, see Page 7.

SINGLE-THERMOSTAT GAS HEATER :

Inside the gas heater, interrupt wire between thermostat and gas valve, and connect 2-conductor cable in **series** with the heater circuitry (at Fireman's Switch terminals if provided).
Do not disconnect or bypass the flow, pressure or high limit switches.
Place the heater toggle switch in the "ON" position, and set the thermostat to the desired temperature.

Run the 2-conductor cable to low voltage compartment of LX-30 Power Center.
Strip insulation ¼", and connect to **HTR screw terminals** on circuit board, in accordance with wiring diagram (**below**).