Owner's Manual

HydroTher

HydroTher Commercial Spa & Wellness Equipment

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Owner's Manual

For Commercial Swim Spas and Hot Tubs

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SAVE THESE INSTRUCTIONS

IMPORTANT

Before proceeding with the installation of any commercial equipment, please take the time to carefully review any State, Provincial, Regional, Municipal or other regulations or codes that would apply to the construction, design or operation of Commercial/Public Hot Tubs in the location where the unit is to be installed. In addition, care should be taken to review applicable regulations concerning the determination of category of a Swim-in-Place Pool. In many areas, Swim-in-Place pools are considered to be either swimming pools or hot tubs. In either case, ensure your familiarity with all applicable regulations.

The colour of the hot tub or Swim-in-Place pool must also comply with local codes and requirements.

In some cases, items such as change rooms, foot washes, showers, emergency phones, deck area, lighting, restricted access, alarms and emergency equipment may be also be regulated. These requirements must be addressed to ensure a successful regulatory inspection or review.

Should there be any confusion as to Hydrother commercial equipment complying with your codes or regulations, or should more information be required, please contact Hydrother or your Commercial Hydrother Dealer.

Please always follow local Health Regulations in the operation of your commercial swim spa or hot tub. The following are minimum recommended standards for use.

1 Children should NOT use a swim spa or hot tub without alert adult supervision.
2 Do not use a swim spa or hot tub unless all suction guards are installed to prevent body and hair entrapment. Do not sit in front of, or on top of the suction fittings or skimmer, as this will obstruct proper circulation and may result in personal injury.
3 Never operate the swim spa or hot tub pump without having all suction and return lines open.
4 Always keep the pool area secure. Keep optional hardcover locked when swim spa or spa is not in use.
5 People using medications and/or having any adverse medical history should consult a physician before using a swim spa or hot tub.
6 People with infectious diseases should not use a swim spa or hot tub.
7 Exercise caution when entering or exiting a swim spa or hot tub. Always install a handrail. Turn off the jets before entering the swim spa or hot tub to improve visibility of the steps.
8 To avoid unconsciousness and possible drowning, do not use drugs or alcohol before or during the use of a swim spa or hot tub.
9 Pregnant woman should consult a physician before using a swim spa or hot tub.
10 Recommended operating temperatures are 80-89˚F (26-29˚C) for swim in place pools and 100˚F (38˚C) for hot tubs. Where the temperature is above 100°F (38°C) prolonged immersion may be injurious to your health. We recommend measuring the water temperature with an accurate thermometer before entering. Lower temperatures and shorter use periods for young children and/or those users potentially affected by hot temperatures is recommended.
11 Do not use a swim spa or hot tub that is heated above 90°F (32°C) immediately following strenuous exercise.
12 Do not permit or use electric appliances (such as light, telephone, radio or television) within 5 ft (1.5 m) of this swim spa or hot tub, unless such appliances are rated at 12VDC or less.
13 Where provided test the GFCI (Ground Fault Circuit Interrupter) monthly.
14 Post emergency phone numbers for Police, Fire Dept., and Ambulance at the nearest phone.

USER WARNINGS

HYPERTHERMIA

Since your swim spa or hot tub can be set to reach temperatures of 104°F (40°C), users should be aware that extended submersion in water that exceeds normal body temperature can lead to hyperthermia. The causes, symptoms and effects of hyperthermia may be described as follows:

Hyperthermia occurs when the internal temperature of the body reaches several degrees above the normal body temperature of 98.6°F (37°C). The symptoms of hyperthermia include drowsiness, lethargy, and an increase in the internal temperature of the body. The effects of hyperthermia include:

- Unawareness of impending hazard
- Failure to perceive heat
- Failure to recognize the need to exit the swim spa
- Physical inability to exit the swim spa
- Fetal damage in pregnant woman
- Unconsciousness resulting in the danger of drowning

If you sense any of the symptoms of hyperthermia, safely exit the swim spa or spa immediately and contact assistance if required

WARNING
THE USE OF ALCOHOL, DRUGS OR MEDICATION CAN SIGNIFICANTLY INCREASE THE RISK OF FATAL HYPERTHERMIA. POST THESE INSTRUCTIONS

IMPORTANT USER SAFETY INSTRUCTIONS

Your physiological response to hot water is very subjective and depends on your age, health, and medical history. If you don't know your tolerance to hot water, or if you get a headache, or become dizzy or nauseous when using your swim spa or spa, get out and cool off immediately.

NEVER ALLOW DIVING OR JUMPING IN YOUR SWIM SPA OR SPA

RECOMMENDED WATER TEMPERATURE FOR SWIM SPA IS 80 – 84°F (26 – 29°C) RECOMMENDED MAXIMUM OPERATING TEMPERATUTRE FOR YOUR COMMERCIAL HOT TUB IS 104°F.

CAUTION
ANTI-ENTRAPMENT (Vac Alert VA–2000) DEVICES MAY BE REQUIRED IN SOME REGIONS. PLEASE CHECK YOUR LOCAL BUILDING CODES BEFORE CONSIDERING DELETION. THESE UNITS REQUIRE PERIODIC CHECKS AND CALIBRATION, SEE OWNERS MANUAL FOR INSTRUCTIONS.

GENERAL INSTALLATION CONSIDERATIONS

SHELL PLACEMENT AND CONSIDERATION:

1 Planning must be made to ensure that a clear passageway is sized to accommodate the dimensions of the preplumbed shell from a receiving area to the actual installation location. In outdoor installations, fencing, elevations or other obstructions must be taken into consideration. Indoor installations require that items such as windows, hallways, stairs and door ways be evaluated/measured to ensure that access is available to bring the shell through. Wherever possible consideration must be made to provide clear passage way in the future to remove the shell should this be required. (Hydrother's Commercial Warranty does not cover costs associated with the removal or reinstallation.)

2 The swim spa or hot tub preplumbed shell will be delivered skid mounted and may be either hand carried/ rolled by 4-5 (hot tub shell) / 10 to16 (Swim Spa) able-bodied adults, trailered, or craned to its final installation site. If rollers are to be utilized, we recommend at least five 4" pipes, 8' long, be placed under a swim spa or hot tub shell to move it across a soft lawn, down a path, etc.

3 Some installations require the use of a crane. When a crane is used for lifting, place the straps under the shell, and whenever possible, in between the plumbing and the shell (to avoid damaging the plumbing). The straps should be tied off so that they will not slip in any direction.

4 Your shell will usually arrive on a common carrier closed box trailer. It may be necessary to arrange with a local towing co. for a tilt and load flatbed truck, with a winch system, to pull the swim spa from the box trailer to the flat bed. The swim spa/hot tub can then be gently slid off the flatbed truck or lifted by a crane into place.

5 Do not lift the swim spa/hot tub by the plumbing or fittings as you may cause leaks.

6 Your pool can be installed above grade, in the floor or ground, or half-and-half.

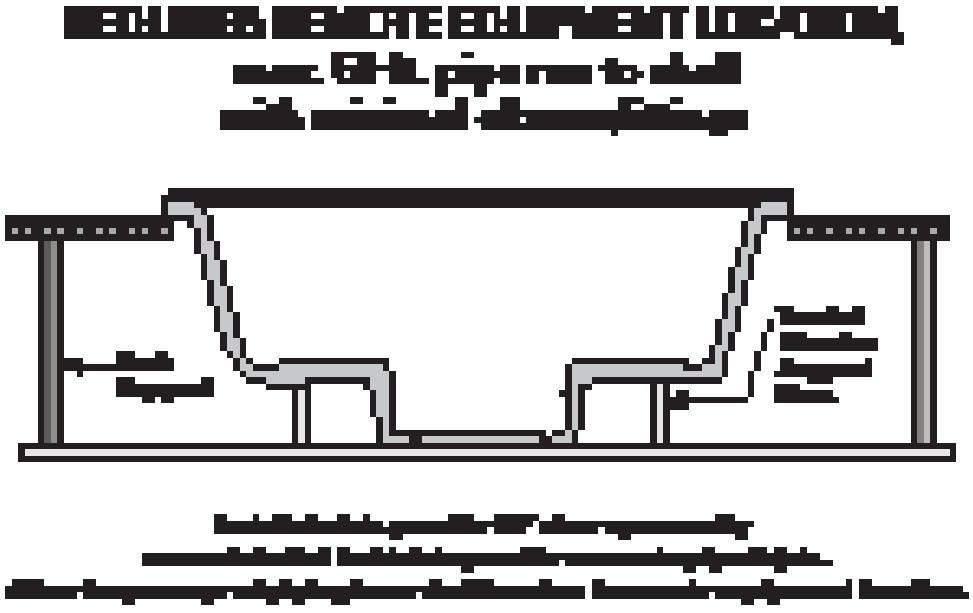
7 Ensure that your Hydrother swim spa is properly supported by either a level concrete pad, or a properly constructed floor slab capable of supporting 925 kg/m2 (200 lbs./ft.2).

8 If you are building your own custom cabinet or decking, please consider providing the following:

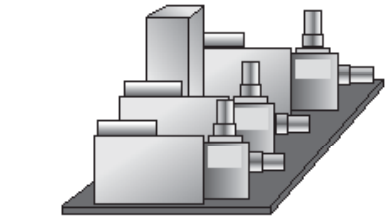
- **a** Allowance should be made for access to the under side of the swim spa or hot tub to allow for access to the plumbing and fittings.
- **b** Ensure that enough deck area is available for the installation of the deck mounted water level controller tank (water level controller tank is part of the shell in the H 1100 and H 1200 and additional decking is not required).
- **c** Grounding of handrails and placement of handrails to safeguard safe entry and exit to the swim spa or spa.

9 Your Hydrother swim spa or hot tub, with steel support legs (or wooden base if so equipped), is self-supporting on its base. The shell surround or decking should be decorative only, not for support.

10 A nearby hose bib connection is recommended for cleaning the surrounding deck area.

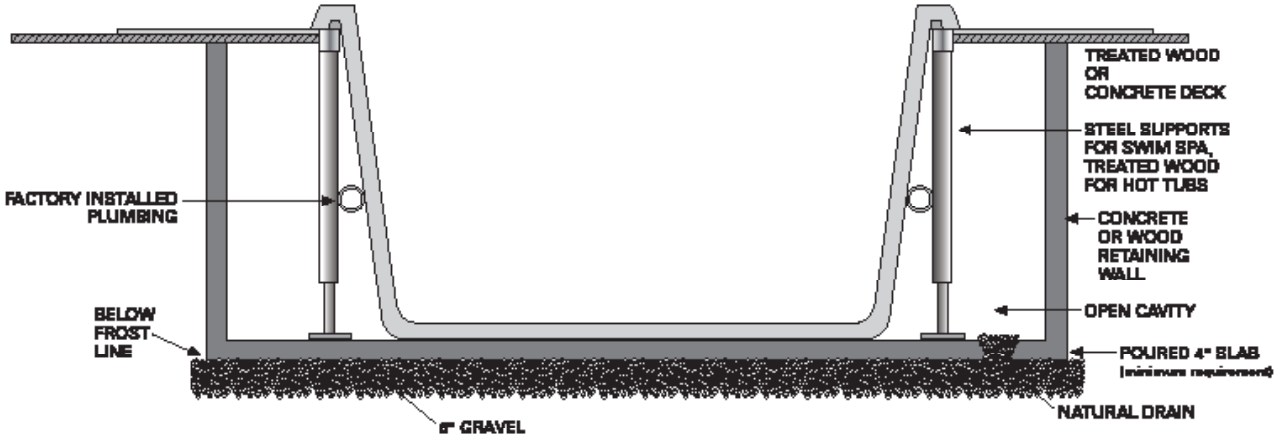


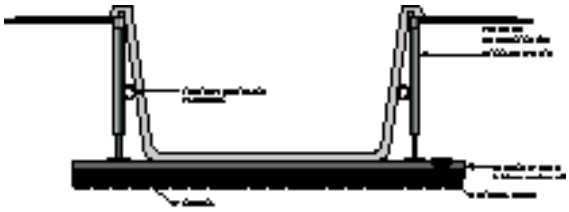
GENERAL INSTALLATION CONSIDERATIONS

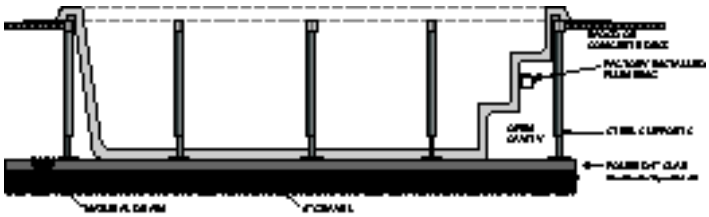


Install deck to provide 18" clear open cavity around shell of Swim Spa to provide access to pipe & jets. Allow for passage of piping from shell location to remote equipment location.

REQUIRES REMOTE EQUIPMENT LOCATION,
max. 50 ft. pipe run to shell
with minimal elbows/fittings







MECHANICAL EQUIPMENT:

Your Hydrother Commercial Hot Tub or Swim in Place Pool and Mechanical Equipment has been preplumbed so that only fresh water and connecting plumbing is required. Electrical equipment, wiring, connections and other considerations will be reviewed specifically elsewhere in this manual. Please refer to the schematic for plumbing connection points for your specific swim spa or hot tub model.

1 Consideration must be made for pipe routing of the plumbing between the preplumbed shell and the mechanical equipment. This connecting plumbing must carried out in the full size of the connection points on the preplumbed shell. Connective plumbing materials are recommended to be PVC schedule 40 Pipe and fittings. (In some cases, CPVC pipe and fire stop materials may be required due to Fire Codes. Please consult your local building official.) Metallic piping should be avoided due to the corrosive effects of chemicals. Ensure that your plumbing contractor is experienced in working with PVC materials. Connections to the provided flexible PVC pipe connection points on the jet and filter lines must be made with a PVC schedule 40 coupling or female adaptor using primer (such as Weld On # P-70) and transition glue (such as Weld On # 795). Always allow proper curing and drying time when making joint connections.

GENERAL INSTALLATION CONSIDERATIONS CONTINUED

MECHANICAL EQUIPMENT CONT.

2 While the combination of your swim spa/hot tub insulation, moving water and optional hardcover results in economical operation with your electric heater, gas heater or heat exchanges are sometimes used to provide heat to your swim spa or hot tub. In this case the heater should be deleted from your swim spa or hot tub at the time of order. Hydrother, in these cases can provide a by-pass connection for on-site plumbers to pipe in the heater outlet and inlet. Ensure that all piping connections to the heater are done in CPVC pipe to resist high heat conditions.

The installation of a gas heater is governed by local authorities, please check your local bylaws for requirements such as required distance from property lines, trees, enclosures, etc.

3 A mechanical room must be allocated to house the mechanical equipment for your commercial Hot Tub or Swim-in-Place Pool. The size of the room will vary in accordance with the model and mechanical equipment selected but will range from 8' x 6' to 10'X 6'. In any case this mechanical room should be on the same elevation as the shell and within 30' of the shell location or one floor down from the elevation of the shell. The use of 45's and 90's should be minimized to allow for good flow. **Should a more remote location for the mechanical equipment be required, please consult with Hydrother for possible changes in equipment or pipe sizing to ensure acceptable performance.**

4 Within the mechanical room there must be the following provisions; electrical main panel for the equipment (specific requirements to be covered later.) ¾" fresh water connection, a hub mounted floor drain capable of accepting 40 USGPM for at least one hour and a sealed waterproofed floor.

5 The preplumbed shell of the hot tub/ Swim-in-Place Pool will come skid mounted and shrink wrapped. The shell must never be handled by the fittings or plumbing as this will result in damage to the unit.

6 The Mechanical Equipment is pre assembled on its own pad with isolation valves already installed. The mechanical package should be lifted only by the base to avoid damage to the equipment.

7 Although each Hydrother commercial hot tub is factory water tested, the hot tub/Swim-in-Place Pool should be operated for 24 hours prior to closing in the deck or enclosure around the shell. This will allow for leaks to piping or fittings that may have been damaged during transportation or installation.

8 Safety Vacuum Release Systems should be installed on each pump (see enclosed diagram).

INDOOR INSTALLATION CONSIDERATIONS

SURROUNDING DECK SPACE

- This is an important consideration necessary to provide safe exit and entry to the shell and may be mandated by your building department. If no regulations are present, Hydrother suggests that a minimum of three feet of deck be designed with a six foot clear deck located at the side of the shell where the steps are located.

- Deck drainage should be provided around the shell to remove splash out water with a deck drain located at the entry point of the shell.

- The deck should be constructed of hard, easy to clean non-slip materials and sloped away from the shell and towards drains.

- Locate the handrail and anchors at one side of the steps going down into the shell. If seniors are to be regular users of the facility, you may want to install a handrail for each side of the steps going down into the shell. See appendix for handrail shop drawings.

HUMIDITY AND VENTILATION

- Your Mechanical Engineer must take into consideration the increased humidity that the hot tub/ Swim-in-Place pool will contribute. Regular use of a Hydrother floating insulation cover or safety hardcover will reduce humidity substantially.

- In some cases, a dehumidification/heat recovery system will be specified. If this is the case, Hydrother must be requested to provide a bypass connection to feed water to this unit. In some other cases, the mechanical engineer will design a damper system that will vent humid air and bring in dryer air into the spa area.

- In the most simple of solutions, an exhaust fan to the outside air can be wired to a humistat so that humid air will be vented to the outside. In each approach, the goal to manage humidity levels to promote comfort and eliminate damage to the surrounding structure.

INDOOR INSTALLATION CONSIDERATIONS CONTINUED

JET PUMP TIMER BUTTON

- All commercial swim spas or hot tubs must be equipped with timers for the jet pump to limit the time that the current flow or hydrotherapy action occurs. There are two reason for this requirement; firstly to remind users that they have been in the hot water environment for the recommended period of time to prevent hyperthermia and secondly to stop the operation of the jet pump when no one is in the water.

- The timer button must be located on the wall a minimum of ten feet from the shell but within the same room.

CEILING HEIGHTS

- Consideration must be given to ensuring that there is acceptable clearance from the deck surrounding the shell vertically to the ceiling of the room enclosing the hot tub/Swim-in-Place Pool. Local building codes will likely dictate the minimum ceiling height acceptable. Otherwise, a minimum of seven feet should be used to allow for user safety.

LIGHTING

- Again local building codes should dictate required illumination levels and if there is a requirement for emergency lighting in case of a power failure. In any case sufficient lighting should be provided for the safe use of the facility. Hydrother Industries recommends that light fixtures be suitable for high humidity settings and that no lights be installed directly over the water surface for satety and maintenance reasons to allow for service.

OUTSIDE INSTALLATION CONSIDERATIONS

Where the commercial or hot tub/Swim-in-Place Pool is to be installed outdoors and seperate from the building structure consideration should be given to the following:

- Ensure that the shell is properly supported either by a level concrete pad or a deck capable of supporting 200 lbs/sq.ft. (925 kg./sq.m.) If there is a possibility that the concrete pad could shift due to freezing/ thawing ground movement, a extended foundation below the slab should be constructed.
- Where the shell is to recessed below grade, consideration must be given to dewatering systems such as weeping tile to ensure that the shell is not surrounded by ground water.
- Where to shell is to be partially or fully recessed into the ground a “crib” or “vault” should be constructed to house the shell and provide a clear 18” space between the crib walls and the wall of the shell to allow for access if service should be required. An access hatch should be installed on the deck or side of the crib to allow for service personnel to gain entry.
- Where cool weather operation is planned, consideration must be given to locating the shell close to doors leading indoors.
- Either deck drains surrounding the shell or having the deck sloping away from the shell is required to deal with splash out water.
- Local code compliant fencing and locking hardware must be present to prevent unauthorized use of the facility.
- A locking hardcover should be purchased for all outdoor shells to reduce heat loss, increase security, minimize debris and maintenance.

Where the Outdoor facility is subject to freezing conditions, further considerations must be made:

1 Circulation plumbing between shell and mechanical system should be insulated and in the case of long runs-heat traced.Circulation piping should be sloped down at 1-2 degrees to allow for draining of the shell in case of power failure.

2 Surrounding deck areas and pathway to indoors may require have radiant heating to eliminate water freezing around the shell and minimize risk of falling.

3 Snow and ice must be consistently removed to provide clear deck spa and access to emergency exits.

OUTSIDE INSTALLATION CONSIDERATIONS CONTINUED

ELECTRICAL REQUIREMENTS

Please refer to your applicable building and or electrical code for compliance issues. Your local electrical codes will also instruct on the type and size of wiring to be used in the connection of all equipment and controls. Some other issues may include:

At the shell location, any metallic components within 10 feet of the shell must be grounded including the metallic support legs (where provided). This will include the anchors for the handrail normally provided with your commercial hot tub or Swim-in-Place pool. For each handrail used, one of the anchors will have to be grounded. A grounding screw is provided on each of the anchors for this purpose.

At the mechanical equipment location, a main power panel will be provided (by others) and the following connections and equipment be supplied and installed by a qualified electrician complying with local codes.

1 To the filter pump a starter (on/off/auto) is to be installed and connected to the filter pump.

2 To the jet pump timer box a disconnect (on/off) switch is to be installed and connected to the timer box using the wiring diagram on the inside of the timer box. The wiring from the timer box to the jet pump has already been factory wired.

3 To the electric heater (standard on all packages) a disconnect (on/off) switch is to be installed and connected to the heater using the wiring diagram shown on the inside of the heater panel.

4 Amperages for the above components are listed in the Appendix of this manual within the specification section for the hot tub / Swim-in-Place Pool selected.

In the case of three phase voltages, special care must be taken to ensure that proper rotation is checked in relation to the wiring polarity. Damage caused by improper rotation will not be covered under warranty.

Should your mechanical package be equipped with an emergency shut off button and alarm, the two pumps must have a magnetic contactor in line so as to shut off the pump when the shut off button is depressed.

Within the Mechanical Equipment room and on the wall midpoint and 4 feet off the floor should be installed a 110 volt duplex receptacle for the standard chemical feed equipment. Add service equipment/tools (See chemical controller information within this manual)

VAC-ALERT™ SAFETY VACUUM RELEASE SYSTEM (SVRS)
PLUMBING AND INSTALLATION DIAGRAMS

Figure 1 One (1) Pump
One (1) Main Drain Line

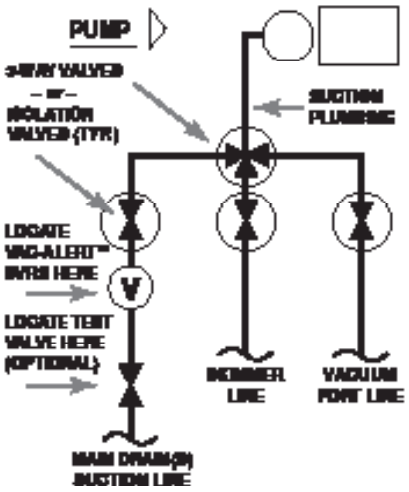
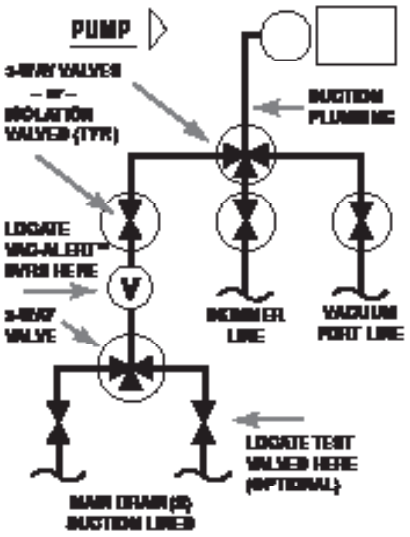


Figure 2 One (1) Pump
Two (2) Main Drain Lines



A: Always Locate The Vac-Alert™ SVRS On The Main Drain Suction Line. SVRS Unit Must Be Mounted In The Vertical Position.

B: Do Not Use 2-Way Or 3-Way Valves As Test Valves. Use A Fast-Acting, Full-Flow, Full-Port, Ball Valve Or Butterfly Valve As A Test Valve. A Test Valve Is An Optional Alternative To A Pole-Mounted Test Mat. Each Vac-Alert™ SVRS Unit Must Be Tested Three (3) Times To Insure Proper Adjustment And Operation.

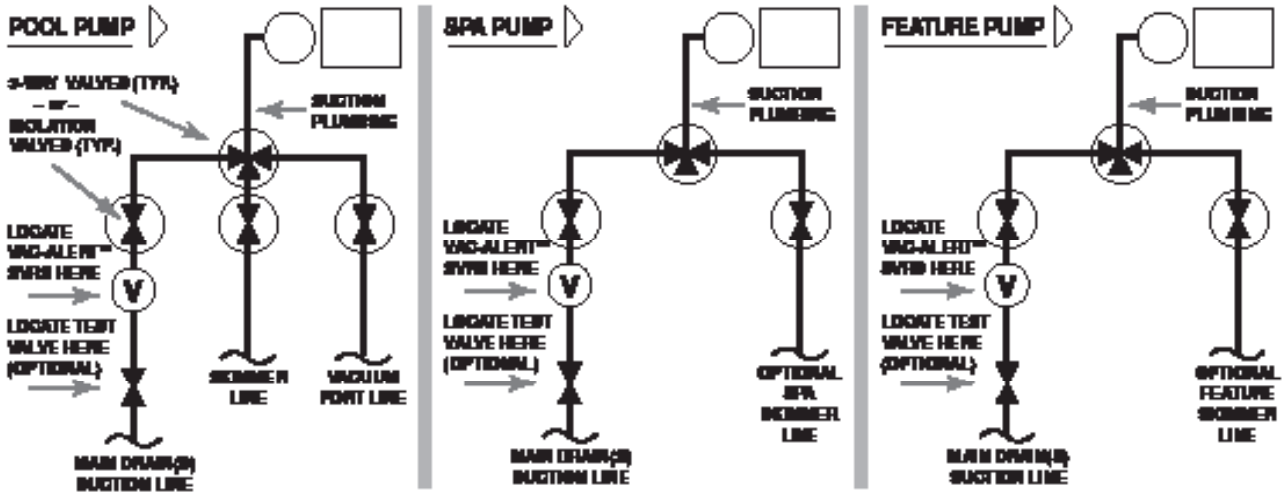
C: For Multiple Pump Systems, One (1) Vac-Alert™ SVRS Unit Is Required For Each Pump Plumbed To A Dedicated Main Drain Suction Line.

D: The Vac-Alert™ SVRS Unit Is Rated For Suction Vacuum Levels Up To 19 Inches Of Hg (Mercury). For Vacuum Levels Above 19 Inches Of Hg, Either Throttle The Return Side Of The Pump To Produce A Running Vacuum Less Than 19 Inches Of Hg, Or Call Vac-Alert™ For Further Instruction.

E: Do Not Install A Check Valve In A Main Drain (S) Suction Line Protected By A Vac-Alert™ SVRS.

F: A Vac-Alert™ SVRS Unit May Also Be Used In A Vacuum Port Line To Protect Against Body Or Limb Entrapment.

Figure 3 Multiple Pumps
Multiple Main Drain Lines



FLOW THRU SCHEDULE 40 PVC PIPE					
VELOCITY - FEET PER SECOND					
PIPE SIZE	6 FPS	7 FPS	8 FPS	9 FPS	10 FPS
1"	16 GPM	18 GPM	21 GPM	23 GPM	25 GPM
1.5"	37 GPM	43 GPM	50 GPM	56 GPM	62 GPM
2"	62 GPM	72 GPM	82 GPM	92 GPM	103 GPM
2.5"	88 GPM	102 GPM	117 GPM	131 GPM	146 GPM
3"	139 GPM	159 GPM	181 GPM	203 GPM	227 GPM

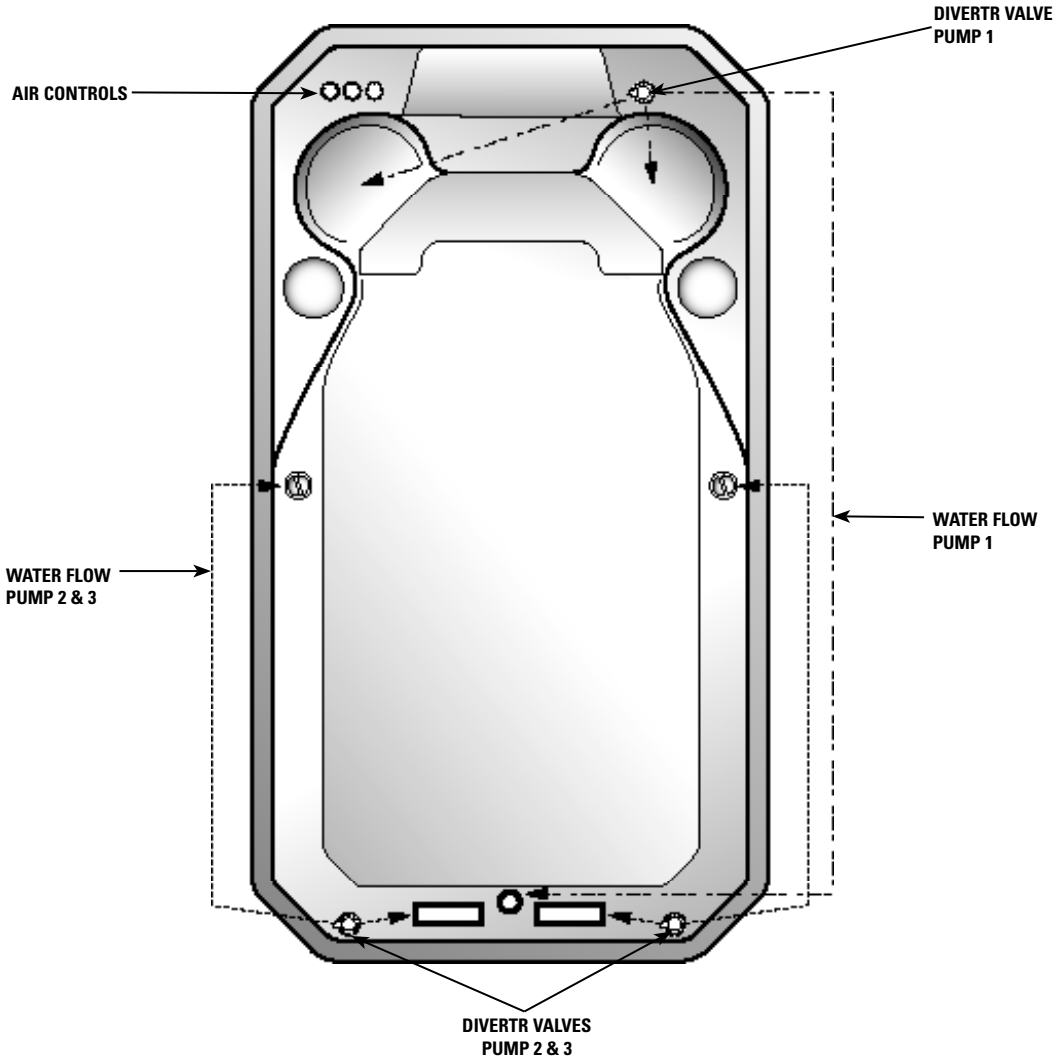
SWIM SPA OPERATING INSTRUCTIONS

For full resistance activate jet pumps and turn main swim jet diverter valves (located either side of the wide stream jets) clockwise to concentrate flow though the main Wide Stream jets. These diverter valves, operate by diverting part of the jet pump flow to the thigh round jets located at the back of the swim tank. In the event that the flow is too strong, you can direct the water to the jets located on the sidewall near the rear of the swim tank by simply adjusting the diverter valves (see Diverter Valves diagram for more information). For maximum power, ensure that all water flow is directed through the three swim jets. By turning the diverter valves at the wide stream jets, you can regulate how strong the flow is to either the wide stream jet or the thigh jet that can be used for hydrotherapy. To avoid being pushed to one side, it is recommended that swimmers wear swim goggles and focus on the lower jet or the light lens (where installed) while swimming.

If the water flow drifts to one side correct by redirecting the lower jet nozzle. The air/water ratio in the hydrotherapy jets or lower swim jet can be adjusted by turning the small air control levers located adjacent to the steps. Usually the air controls are not turned on for swimming. They are utilized for the therapy seats, or for the thigh jets. While the Hydrother "Wide Stream" swim jets provide a uniform deep and wide flow exceeding 550 GPM, it is possible to out-swim the jets (although not for long periods of time) unless you are positioned properly. Your head should be approximately 2' to 3' from the jets and centered in the pool.

DIVERTER VALVES

Your Hydrother AquaTrainer is equipped with 3 diverter valves to control water current flow speeds. Pump 1 Diverter Valve allows you to direct the flow of water from pump 1 so that it increases the power of the lower swim jet or the hydrotherapy jets on the bucket seats, or a combination of the two. Simply turn the valve left or right.



The two Swim End Diverter Valves allow water to be directed from the top two swim jets (pumps 2 and 3), to the hip jets on either side of the swim spa which gives added buoyancy to the swimmer and resistance for water-aerobics.

WATER CHEMISTRY

As in any commercial aquatic facility, there are always state, provincial or federal health standards that will apply to the chemical and general operation of your Hydrother commercial swim spa or hot tub. The operator of any commercial swim spa or hot tub must become familiar with these applicable standards to ensure compliance at all times. Failure to do could result in personal injury or death and increase the liability of operation to the operator and owner of the facility. The suggestions below are meant as a general suggestion and warning to ensure minimal standards and protection of the commercial swim spa or hot tub. If there should be any conflict between your local codes or regulations and the general guidelines noted within this manual, the local codes or regulations should be followed and Hydrother Industries should be contacted to ensure that the commercial warranty will not be voided.

NOTABLE POINTS

- Your enjoyment of your commercial swim spa or hot tub and the reliability and longevity of your support equipment are directly related to how well water quality is maintained.
- ALWAYS observe and follow the instructions on the chemical container in respect to dosages.
- The small volume of water in your swim spa or hot tub is easily affected by external factors such as oils, lotions, perspiration and chemicals. It is imperative that you give your swim spa or hot tub regular attention to maintain clean, safe and balanced water to prevent premature damage and/or failure (corrosion/calcification) to the electrical support equipment. Maintaining your swim spa or hot tub water balance/chemistry, while simple, is extremely important. Neglected water will allow bacteria to quickly spread and expose users to potential injury or death.
- The mineral content of swim spa or spa water increases from water evaporation, sanitizers and other chemicals. If the mineral concentration, particularly calcium, becomes too high, the minerals will literally “drop” or precipitate out of the water and deposit on the swim spa walls, plumbing, jets, in the filter and on the heater element.
- It is very important that pH be checked frequently and maintained in the recommended range as indicated below.
- It is also very important that Total Alkalinity (the ability of the water to resist a change in pH) be maintained in the recommended range as indicated below
- Heater and other component failure due to improperly maintained pH or Total Alkalinity levels will not be covered under warranty.
- Although there may be two identical swim spa or hot tub models right next door to each other, the maintenance requirements will be different, dependant on such factors as:
  - bather load
  - frequency of use/quantity of bathers
  - different body chemistry
  - sun vs. shade
  - temperature

For these reasons, it is very important to develop proper swim spa or hot tub water maintenance habits and follow your local regulations regarding water maintenance procedures.

SWIM SPA OR HOT TUB WATER BALANCE
GENERAL OVERVIEW

Always follow the instructions on the label of the chemical container to determine the correct dosages to either manually adjust water chemistry or fill automatic feeders.

CHEMICAL SAFETY HINTS

- Never switch from chlorine to bromine using the same chemical feeder. Some residual may remain in the feeder and these two chemicals are incompatible. **A dangerous chemical reaction will occur if this instruction is not followed.**
- Never pre-mix chemicals with each other prior to adding to swim spa or spa water or feeders.
- Add only one chemical to the water at a time
- Always add chemicals to water and not vice-versa
- Always ensure that containers are kept sealed when not in use
- Always keep chemicals separated within the storage areas and kept off the floor
- Chemicals may be corrosive, so handle with care and store in a cool dark place
- Never smoke near chemicals as most are flammable
- Ensure any spilled chemicals are carefully cleaned up immediately
- Always have the “Poison Control” telephone number handy in the event of an emergency
- Keep chemicals out of children’s reach
- Wear safety glasses and gloves when handling chemicals and follow proper safety precautions

CHEMICAL TERMINOLOGY

1 **CHLORINE** – in granular or puck/tablet form, is an oxidant and biocidal agent. It is very effective and fast acting. Recommended chlorine residual level is 1.0 to 3.0 ppm.
2 **CHLORAMINES** – a compound formed when chlorine combines with nitrogen or ammonia present in the water. When allowed to go unchecked, it causes eye and skin irritation and is indicated by a strong chlorine odour.
3 **ONE-PART BROMINE** – also available in puck/tablet form, is another type of oxidant/biocidal agent, and is introduced into the hot tub water via a brominator. Recommended bromine residual level is 2.0 to 4.0 ppm
4 **TWO-PART BROMINE** – composed of a liquid or powder component introduced manually into the water on a weekly basis, and a granular component that is added daily or as the hot tub is used.
5 **BROMAMINES** – are formed when bromine destroys nitrogen-bearing organic matter. Unlike chloramines, bromamines don't cause eye irritation, however, when allowed to go unchecked, will cause an objectionable odour.
6 **SHOCK** – the practice of adding an oxidizing agent to hot tub water to destroy ammonia, nitrogenous and organic contaminants (chloramines and bromamines)
7 **pH** – a logarithmic value expressing the relative acidity or basicity of a substance (such as hot tub water) as indicated by the hydrogen ion concentration. pH is expressed as a number on a scale of 0 to 14, where 0 is most acidic, 1 to 7 being acidic, 7 considered neutral, 7 to 14 being basic, and 14 being most basic. The ideal range for hot tub water is 7.4 to 7.6 ppm
8 **pH INCREASER** – raises the pH level of the water.
9 **pH DECREASER** – lowers the pH level of the water.
10 **TOTAL ALKALINITY (TA)** – the amount of carbonate, bicarbonate and hydroxide compounds present in the water that determines the ability or capacity of the water to resist change in pH. Also known as the 'buffering' capacity.
11 **ALKALINITY BOOSTER** – raises the alkalinity.
12 **CALCIUM HARDNESS** – the calcium portion of the total alkalinity which represents 70 to 75% of total hardness. Calcium concentrations determine whether water is 'soft' - too little calcium, or 'hard' -too much calcium.
13 **CALCIUM BOOSTER** – increases the calcium level.
14 **TOTAL DISSOLVED SOLIDS (TDS)** – a measure of the total amount of dissolved matter in the water (calcium, carbonates, bicarbonates, magnesium, metallic compounds, etc.)
15 **SEQUESTERANTS (STAIN AND SCALE CONTROLLERS)** – keeps dissolved metals and minerals in the water from attacking the hot tub shell and support equipment components.
16 **DEFOAMER** – removes foam build-up from the water surface. At best, this is a temporary remedy, as excessive foam is merely a symptom of improper water balance (typically high organic residue and/or high pH).
17 **CARTRIDGE FILTER CLEANER** – degreases and cleans cartridge filters.
18 **OZONATOR** – generates Ozone (a gaseous molecule composed of 3 atoms of oxygen) and is injected into the hot tub water for the oxidation of water contaminants.
19 **TEST KIT** – used to monitor specific chemical residual or demands in the water. May be in the form of litmus strips or liquid drops.
20 **PPM** – abbreviation for 'parts per million', the unit of measurement used in chemical testing which indicates the parts by weight in relation to one million parts by weight of water. Essentially identical to the term mg/L - milligrams per liter.

WATER BALANCE PROBLEM SOLVING

CLOUDY WATER

Cloudy water could be caused by:

- high dissolved solids thereby requiring full or partial water drainage
- by a low disinfectant level
- incorrect pH requiring balancing
- suspended particles necessitating a filter cleaning
- insufficient filtration time

BLUE WATER

Blue water could be caused by too much metal or mineral content in the water, especially copper or iron. Low alkalinity or improper pH level may be the cause. First, balance the alkalinity, secondly the pH, then add a sequestering agent.

FOAMING

Foaming is caused by the agitation of dissolved solids. This can be caused by the buildup of too much chemical by-products in the pool water, people not showering before using the swim spa or spa, body lotions, etc. To correct, add a small amount of foam eliminator and turn on jets to circulate the water. At best, this is a temporary remedy, as excessive foam is merely a symptom of improper water balance. In extreme cases, the water will require draining and the filter will require cleaning.

SKIN IRRITATION

Most skin irritation is caused by too high or too low pH. Test and adjust. Where irritation continues, consult your physician.

SUGGESTED ROUTINE MAINTENANCE

If equipped with an automatic chemical controller, some jurisdictions may allow less frequent testing than is required for manually adjusted feeders. Please ask your health inspector or department for your testing requirements. The below testing suggestions are based on the most stringent standards and may differ from your actual requirements under your local codes or regulations.

Hourly when unit is open for use:
Test water for chlorine or bromine and pH levels:

If your chlorine/bromine level is below 3 ppm either increase the setting on your brominator or chemical controller to maintain a free chlorine or bromine residual reading of 3 – 5 ppm or add manually.

If your pH is below 7.4 or above 7.6, either adjust the setting on your feeder or chemical controller to maintain a reading of 7.5 as an ideal or add extrem manually.

DAILY

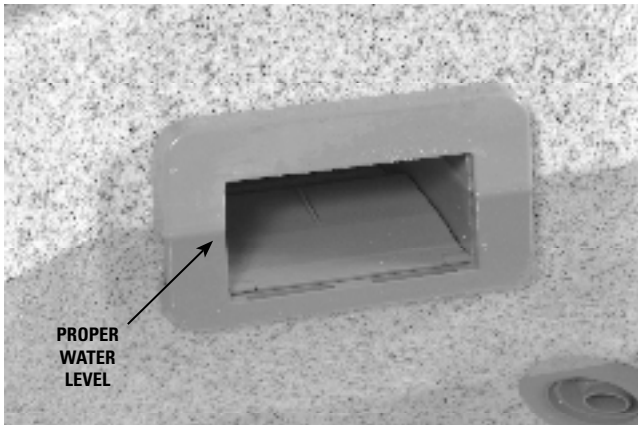
Test water for alkalinity.

If the alkalinity level is outside of the normal recommended range of 80–120 ppm adjust manually to this range with an ideal of 120 ppm if using bromine and 100 ppm if using chlorine.

Prior to closing, and with no one in the water for the rest of the day, shock the swim spa or hot tub water to a disinfectant residual of 10 ppm using a chlorine shock or non chlorine shocking chemical. (ie: monopersulfate)

WEEKLY

1. Test for calcium hardness. Ensure that the hardness is in the range of 200 ppm – 300 ppm.
2. Add sequesterant (stain and scale controller)
3. Either remove and clean cartridge filter element or backwash optional sand filter following manufacturer's recommendations.
4. Remove and clean out skimmer basket



DRAINING

Your local Health regulations may detail how often to drain the swim spa or hot tub. The swim spa or hot tub should be drained whenever the water has been contaminated outside of proper operating conditions or after a period of time that allows for the accumulation of chemical by products that will interfere with proper water chemistry. Use of the facility and your attention to water chemistry and filtration will determine how often this situation occurs.

Hydrother recommends that for a commercial spa the water should be drained using the following calculation:

1/3 gallonage of the spa divided by the average daily number of users equals the days between draining.

In the case of swim spas, draining should not be required as often. We suggest draining and refilling monthly.

Before proceeding please note that all PVC ball valves on the mechanical equipment are open when the handle is in line with the pipe onto which it is part of. This same valve is closed when the valve handle is across the pipe onto which it is mounted.

To drain the swim spa or hot tub:

- Turn off filter pump, jet pump and heater at the disconnect electrical switch.
- Turn off the fresh water feed to the automatic water level controller and/ or manual connection.
- Open the waste line on the filter return pipe identified as "drain" with a label
- Close the final isolation valve returning water from the filter system to the swim spa or spa.
- Turn on the filter pump and monitor the flow of water to the on-site drain to waste. (Do not recycle this water in any manner and ensure that the on-site waste drain is not a direct plumbing connection to the Hydrother support system as to avoid waste water backing up into the filter system)
- Reverse the above to fill and start operation
- Remember to close the manual fresh water fill valve, failure to do this will result in the swim spa or spa flooding and causing potential damage.
- Manually treat water to establish normal operating levels.

SUGGESTED ROUTINE MAINTENANCE CONTINUED

CLEANING THE SKIMMER BASKET

1 Shut off the filter pump.
2 Remove debris from basket. (Note: Avoid hitting the basket against objects to knock debris loose as this may damage the unit)
3 Reinsert basket.
4 Start back up the filter pump, and as the pump begins to operate, monitor water flow over the weir door to assure that it is free floating.

CLEANING THE PUMP STRAINER BASKET

In all Hydrother commercial hot tubs and swim spas the filter pumps (and jet pumps on the spa models) have strainer baskets as part of the pump housing that ensures that no large debris enters and damages the pump. These strainer baskets must be cleaned out weekly or sooner when debris has been collected to ensure water flow, pump performance and that the pump is not damaged by this flow restriction. In all pumps equipped with strainer baskets, a clear lid is provided for easy viewing of the condition of the strainer basket. (A flashlight is sometime helpful in viewing)

To clean out the strainer basket

- The pump must be shut off at the disconnect switch. Failure to shut off the power to the pump while cleaning out the strainer may result in coming into contact with moving parts that could cause injury.
- Close the valves that isolate the pump from the shell of the swim spa or spa.
- Remove the retaining ring that secures the clear lid from the pump housing. Be careful not to misplace the O Ring that seals the lid.
- Remove the basket from the strainer casing and remove the debris form the basket
- Reinstall the strainer basket and lid, open the isolation valves and turn on the pump to normal operating position.

CLEANING THE ACRYLIC SURFACE

The acrylic surface can be cleaned and polished using a soft cloth and non-abrasive acrylic cleaner.

Caution: Never use an abrasive cleaner damage will occur.

CARTRIDGE FILTER

The cartridge should be cleaned every week, depending on the amount of use. Signs that the filter requires cleaning include:

- Reduced jet power
- Hazy gray water
- Rattling noise in the pump or filter
- Heater not working

Removal

1 Turn off filter pump and isolate the filter system using the first and last isolation valves.
2 Open the air vent/bleeder valve on the top of the filter lid.
3 Pull the filter lid upwards, and lift the cartridge element straight up and out of filter housing

Cleaning

4 With a garden hose and spray nozzle, hose off the cartridge element, ensuring to carefully separate every pleat. If very dirty use and specific cartridge filter cleaner and leave to soak before hosing off. In most cases a spare cartridge filter element is a good idea allowing for one element to be cleaned while another replaces the dirty one to resume operation.

5 Ensure that before reinstalling the element and starting up the system that you ensure that the O ring that seals the filter lid to the main part of the tank is in place and in good condition.

If you have elected for the sand filter option, please see attached sand filter operation guide.

SUGGESTED MAINTENANCE SCHEDULE FOR HYDROTHER COMMERCIAL HOT TUBS

DAILY

VISUALLY CHECK ALL FITTINGS, RAILINGS, SURROUNDING DECK AREA, ETC TO THAT THERE ARE NO HAZARDS

CHECK THAT ALL SIGNS ARE POSTED, THE EMERGENCY PHONE IS IN WORKING ORDER AND THAT THE FIRST AID KIT IS PROPERLY STOCKED

CHECK WATER LEVEL IS AT LEAST HALF WAY UP SKIMMER
(NOT NECESSARY IF EQUIPPED WITH AUTOMATIC WATER LEVELOR)

TEST AND RECORD BROMINE/CHLORINE, PH, AND ALKALINITY LEVEL OF WATER EVERY BEFORE OPENING HOT TUB AND EVERY TWO HOURS THEREAFTER. (ONLY NECESSARY ONCE A DAY IF EQUIPPED WITH CHEMICAL CONTROLLER)

DESIRED LEVELS ARE: CHLORINE OR BROMINE 3-5 PPM.
PH 7.4 -7.6
ALKALINITY 80 -120 PPM

WEEKLY

CLEAN PERIMETER SCUM OR TILE LINE WITH NON ABRASIVE APPROVED CLEANER

ADJUST AND CALIBRATE CHEMICAL CONTROLLERS

BI-WEEKLY

DRAIN, REFILL HOT TUB AND CLEAN ACRYLIC SURFACE WITH APPROVED NON-ABRASIVE CLEANER WHILE EMPTY. PLEASE NOTE THAT FOR INSTALLATIONS WITH EXTREME HEAVY USE DRAINING THE HOT TUB MORE OFTEN MAY BE NECESSARY…SEE BELOW FORMULA. IN THE EVENT THAT THE TUB WILL BE EMPTY AND AS A RESULT THE CHEMICAL CONTROLLER PROBES WILL NOT BE SUBMERSED IN WATER YOU SHOULD

REMOVE THE PROBES AND TEMPORARILY PLACE THEM IN A CONTAINER OF WATER.

FORMULA FOR DETERMINING NEED TO DRAIN HOT TUB

1/3 GALLONAGE OF THE HOT TUB DIVIDED BY THE AVERAGE DAILY NUMBER OF USERS EQUALS THE DAYS BETWEEN DRAININGS

REPLACE CARTRIDGE FILTER. PRESSURE SPRAY CLEAN DIRTY CARTRIDGE FILTER, SOAK OVERNIGHT IN CARTRIDGE CLEANER, RINSE CLEAN AND STORE FOR UNTIL OTHER CARTRIDGE REQUIRES CHANGING IN TWO WEEKS.

QUARTERLY

CHECK ALL JETS AND SUCTION FITTINGS. CLEAN WITH VINEGAR SOLUTION TO REMOVE SCALE.

YEARLY

PURCHASE NEW CARTRIDGE FILTERS

BI-YEARLY

REPLACE PROBES ON CHEMICAL CONTROLLER

SAND FILTER OPERATION

WHERE SAND FILTER IS PROVIDED

For complete operational instructions, please refer to filter manufacture's owner's manual.

Each sand filter will be factory plumbed by Hydrother to the dial valve connected to the filter pump (pressure side). The return line to the swim spa or hot tub and the drain/ backwash line, complete with a backwash line and manual isolation valve, that must be plumbed to a hub mounted floor drain.

On the top of the sand filter, a dial valve directs the water through the filter as to perform several functions. Each function is selected by depressing the dial valve selector handle (with the pump off) and turning this handle to the label on the dial valve top face that describes that function. There are five functions, these are:

Caution: Always turn off the filter pump when changing the position of the dial valve selector handle. Failure to turn off the pump when operating the dial valve will result in damage.

FILTRATION

With the dial valve handle in the "FILTER" position, the water flows through the filter sand and is cleaned and then exits through the return port of the dial valve connected to the rest of the return mechanical system where it is heated and chemically treated.

BACKWASH

When the pressure gauge on the dial valve exceeds 25 PSI or 10 PSI above clean operating pressure readings, this indicates there is too much dirt in the filter and the filter must be rinsed of this dirt. To accomplish this, with the pump off the dial valve handle must be turned to the "BACKWASH" position as noted on the dial valve. Once the dial valve is in the BACKWASH position, the isolation valve installed on the backwash drain line connecting the dial valve to the floor drain must be opened to allow the dirty water to go to waste. The filter pump is then turned back on and the water will be directed to the bottom of the filter washing upwards and releasing the dirty water through the dial valve connection and isolation valve to the floor drain. The pump should be allowed to run until the water seen in the backwash sight glass (located on the dial valve beside the waste connection piping) is clear, normally taking 2-3 minutes. After backwashing, always proceed to the RINSE function.

RINSE

This function is performed after each backwash and removes any dirty water from the filter prior to returning to the filter function. After the backwash function is complete, turn the dial valve selector handle to RINSE with the pump off. Then turn the pump back on for 1 minute after which turn the pump off and turn the dial valve selector handle to the FILTER position close the drain/waste line isolation valve and turn the pump back on to resume filtration.

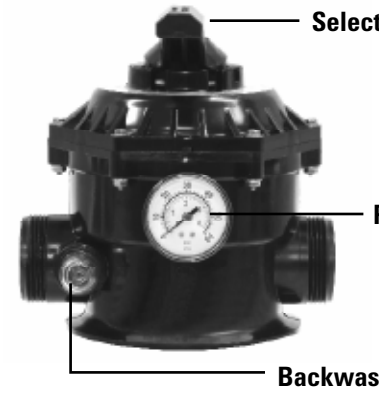
DRAIN

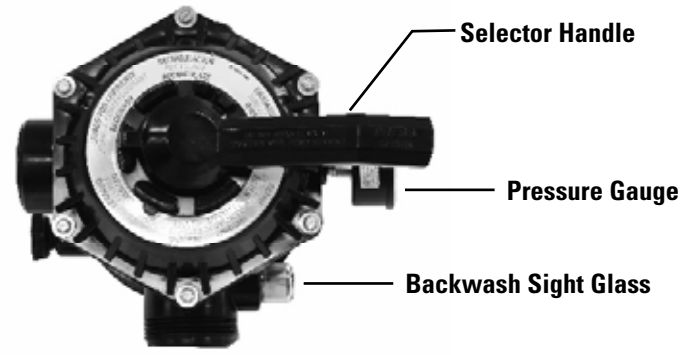
With the dial valve handle turned to the DRAIN position, the water from the filter pump will flow directly through the dial valve to the drain/waste line. Make sure that the drain line isolation valve is in open position to allow for the water to go to the floor drain and waste. To fully drain the swim spa or hot tub, ensure that the skimmer is plugged/isolated with the provided expansion plug so that the water will be drawn from the bottom of the shell.

RECIRCULATION

With the dial valve selector handle in this position, the pumped water simply flows through the dial valve and back to the swim spa or hot tub. The filter should not be operated in this mode.

Always consult with a pool/spa service professional to determine when the filter sand will require replacement.





HARD COVERS AND LIFTERS (OPTIONAL)

In an uncovered pool, over 90% of the heat is lost from the water surface. The evaporation also affects the chemical balance and could create humidity problems indoors. Hydrother Hard Covers are engineered for maximum thermal efficiency and appearance. The 2 halves of the covers are hinged in the middle for easier handling, and the zip fastener allows the (tapered 4" to 3") styrofoam inserts to be changed if damaged. We recommend that you flip the inserts every 6 months. The skirt on the cover hugs the lip of the pool for a tight fit. The handles are placed so that one person can easily carry even a large cover. Optional lifters are also available which allow easy removal/placement of your safety hardcover.

The locks, with one part fastened to the deck or skirt, prevent small children or animals from entering the pool. Do not drag the cover across the pool or decking. Fold cover sections first, then lift by the handles. Standing on the hardcover could cause the styrofoam to crack which will lead to water absorption and void warranty.

NEVER LEAN OR STAND ON YOUR HARDCOVER

The cover should be cleaned at least twice a year with a vinyl moisturizer and protector to clean andrestore the vinyl oils for longer life.

WINTERIZING

In the event that you do not wish to use your swim spa or hot tub year-round, it is very important that you properly winterize your unit to protect against damage from winter freezing. A local pool or hot tub service firm should perform such a service for a nominal fee. If you winterize the pool yourself, please follow the directions outlined below:

- Drain the swim spa or hot tub entirely, remove water from the plumbing with a wet/dry vac, and add antifreeze to suspect areas such as pump volute(s), jet channels, 3 way diverter valve, filter housing, and air valves.
- Remove any plugs from pump, filter or heater to ensure complete draining of equipment package.

Open all unions.

- Drain the filter cartridge housing, clean the filter element and store in a warm, dry place. Where practical, disconnect support pack chemical control and feed equipment and probes (remember to cap probes with shipped caps filled with balanced water to keep tips of probes moist, failure to do so will damage probes) and store inside. Cover exposed plumbing connections with plastic bags and duct tape.
- If your swim spa or hot tub is fully submerged, and could lift from freeze/thaw conditions, we recommend plugging and removing your suction covers, and refilling the pool with a minimum of 24"of water. The addition of some plumbers/RV antifreeze to both the water and suspect areas of plumbing where water may collect is recommended.
- Cover the pool and remove snow build up regularly. Where utilizing your safety hardcover we suggest installing a protective sheet over the cover.
- It is assumed that your swim spa has been properly installed on a reinforced level concrete pad to eliminate lifting of the swim spa due to hydrostatic ground water pressure.

NOTE: Whenever you are not 100% sure that your pool is adequately winterized, please consult your authorized Hydrother swim spa or hot tub dealer or professional pool or hot tub service company.

Caution: Recommends that an authorized representative winterize your pool in the initial year.

NOTES