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A&A Cleaning System Design Criteria

MANDATORY!

To assure proper cleaning and efficiency from the A&A System, it is mandatory that all pool drawings be sent to the factory for proper layout. Fax the drawing (1/8" scale) to (602) 331-4475 or mail them to A&A Manufacturing, 7418 East Helm Drive, Suite 100, Scottsdale, Arizona 85260. Each drawing must be accompanied with a Certified Design Fax Cover Sheet completely filled out (see page 5). Completed drawings will be faxed back or put in the mail within 48 hours of receipt.

The following layout criteria are included in this manual for information purposes only. Calculations are based upon a 1' radius dig in the shallow end of the pool and a 5' radius in the deep end.

Proper hydraulic design and head placement are the most important points to assure the A&A System working properly.

1. The following are some of the criteria used to locate and determine the number of cleaning heads required.

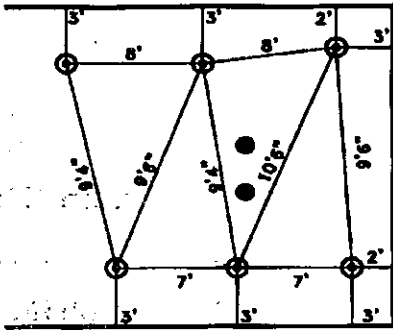


Figure 1-1: Overlap At Wall

All dimensions are from the finished wall. If you use 12" bond beams, measure from the bond beam form and add 12" to locate the cleaning head placement. If no bond beam, add the wall thickness to the distance from the form.

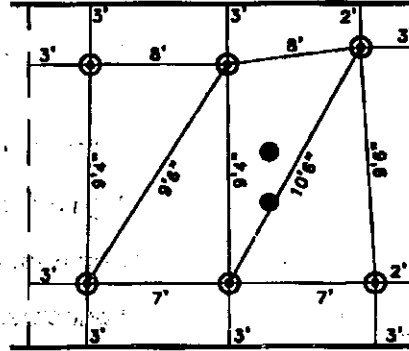


Figure 1-2: Away From Break

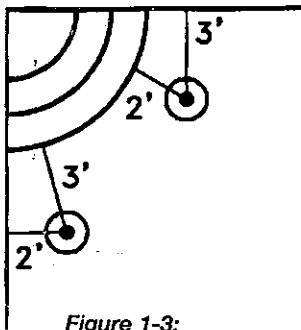


Figure 1-3: From Step Covets

2. HEAD COVERAGE

No openings can be allowed where cleaning head patterns converge (see *Figure 2-1*). If applying the previous criteria cannot eliminate the "dead" spot, an extra cleaning head will have to be added.

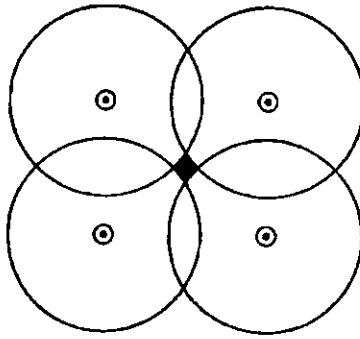


Figure 2-1: Head Coverage

In normal situations, a pool with a 20' break, (see *Figure 2-2*) measured from the deep end, would require four (4) high flow heads on the floor.

If the break were changed to 15', (see *Figure 2-3*) the deep end would, in most probability, still require the same four (4) heads for proper coverage and in some case could even require more heads in the shallow end to cover the larger area.

3. HIGH FLOW CLEANING HEAD COVERAGE

6' Radius or 12' Diameter

4. FLOW THROUGH EACH HIGH FLOW HEAD

18 – 20 G.P.M.

5. CHANGING BREAK LOCATION AND/OR DEPTH

NOTE! – The break must be treated as a wall as far as cleaning head placement is concerned.

Even though head coverage seems more than adequate, you cannot expect the heads that are in the shallow end of the pool to clean on the deep side of the break and vice versa.

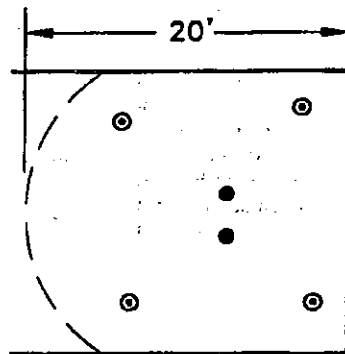


Figure 2-2: 20' Break

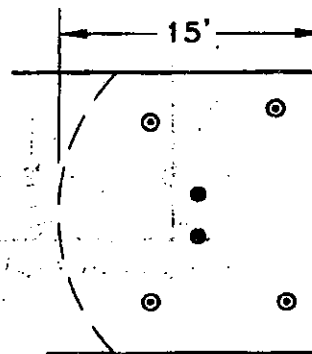


Figure 2-3: 15' Break

6. EXTENDING THE BREAK

If the break is extended, it is possible that one (1) or two (2) more heads may be required.

NOTE: Pool #1, (see *Figure 2-4*) by extending the break to over 20', creates a "dead spot" in the deep end.

Pool #2, by adding one (1) extra head, the deep end can be properly covered by relocating the heads as shown in *Figure 2-5*.

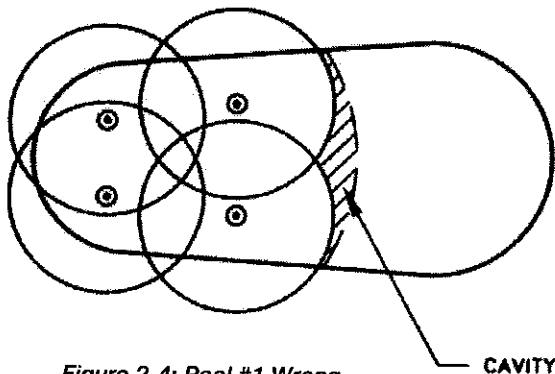


Figure 2-4: Pool #1 Wrong

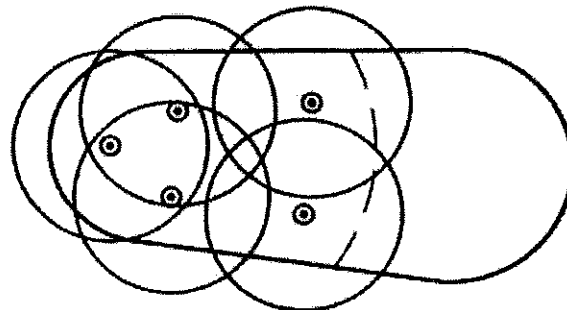


Figure 2-5: Pool #2 Right

7. DEPTH INCREASE ON THE DEEP END

If the depth is increased in the deep end, the floor heads will have to be moved closer to the wall (minimum 2' from the wall – maximum 2'6"). The reason for this is that even though the heads look close to the wall, the radius of the bowl has been increased. The cleaning heads must therefore, be placed higher on the radius to clean effectively.

8. ACCURATE DRAWING

It is essential that the layout drawing be drawn accurately and to scale. This especially includes the steps and benches. There is a tendency to draw the steps and benches as a matter of location only with little or no attention to their relative size. If a step is to finish with an

18" tread; draw it with an 18" tread. If, on the other hand, a step is finish with a 12" tread; draw it with a 12" tread. This is important so that your drawing shows the floor area that remains to be cleaned. *Proper placement of the floor heads and their coverage requires an accurate drawing!*

9. LOW FLOW CLEANING HEAD COVERAGE

- HEAD COVERAGE – 3'-6" Radius or 7' Diameter
- PLACEMENT – Place no further than 3'-6" from any vertical surface. Place no further than 7' from any other low flow head on a straight step or bench. Place near the front edge of steps (see Figure 3-1).

NOTE: If corners of the steps are flared as in Figure 3-2, the possibility of dead spots is reduced considerably.

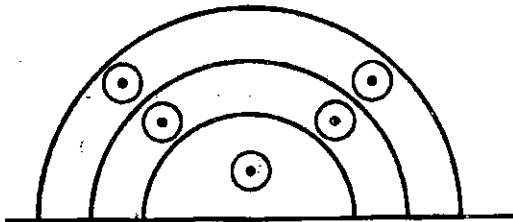


Figure 3-1: Non-flared Steps

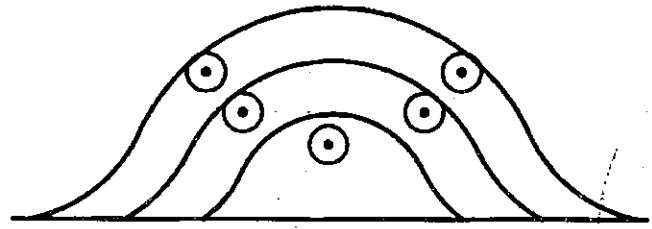


Figure 3-2: More Efficiently Cleaned Flared Steps

Locating the Cleaning Heads

When locating the cleaning heads in the pool and spa, it is recommended that the steps and benches be located and painted (to scale) on the floor of the excavation. This will allow much more accurate cleaning head locations since there is less margin for error on the smaller step and bench areas.

To assure proper cleaning head coverage, it is also recommended that the cleaning radii of each cleaning

head be painted on the pool floor after the cleaning head is located per the certified A&A plan. This can be done by driving a stake or piece of rebar in the cleaning head locations and attaching a 6' string to the stake and striking an arc all the way around each head location. With a paint spray can at the other end of the string, the circle can be painted as the arc is struck around the stake.

A&A Manufacturing International Dealer Meetings

Please award these points to:

MANNY SALES

Salesperson

CERTIFIED DESIGN FAX COVER SHEET

NOTE! A clean line drawing of the pool in 1/8" scale must accompany this completed order.

Pool Company: ABC POOL COMPANY

Pool Company Address: 1234 MAIN ST City: ANYTOWN State: AA Zip: 12345

Phone#: 602/256-6932 FAX#: 602/331-4475

Customer Name: MR & MRS. PROSPECT

Customer Address: 2222 MAIN ST City: ANYTOWN State: AA Zip: 12346

Phone#: _____ FAX#: _____

Depth: 3' to 5' to 4' Length 40' Width 16' Surface Area 640

Length of pipe between the nearest point of suction (Skimmer/Main Drain) and the Pump: 30 Feet

We use: UP Rated Pumps FULL Rated Pumps Pump Size Sold (if any): 1 hp.

Pump Model Name: XYZ BRAND Pump Model #: 1234XG

Filter Type: Cartridge DE Sand Minimum Flow Rate GPM: 90

Interior Finish: _____

Suction: Skimmer/Main Drain Common Separate Lines Number of Skimmers _____

(CHECK ONE BOX FOR EACH)	YES	NO		YES	NO
Pool Only	<input checked="" type="checkbox"/>	<input type="checkbox"/>	QuikSkim Venturi Skimmer	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pool & Spa With Common Equipment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Quik Leaf-Vac	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pool & Spa With Separate Equipment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	(Pool Equipment and Main Drain locations must be shown)		
Raised Spa	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Automatic Surface Returns	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Heater	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Beach Entry	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Transitional Break Shown (If Applicable)	<input type="checkbox"/>	<input type="checkbox"/>	(If Yes: show water line)		
Spa Spillover With Continuous Over-Flow _____ GPM's required			Chlorinator:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other water demands from same pump <input type="checkbox"/> _____ GPM's required (May require a separate pump)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> In-Line Chlorine-Generator	<input type="checkbox"/>	<input type="checkbox"/> In-Line Erosion
Solar Heating (If Yes: Booster pump required) <input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Dek-Clor	<input type="checkbox"/>	<input type="checkbox"/> Other _____
			Main Drain Shown	<input type="checkbox"/>	<input type="checkbox"/>

SHIP THE SYSTEM: YES NO If yes: White Black Tan Gray

Water Valve: Standard Low Profile Lid and Ring Color White Tan

P.O. # 12345 Ship By: Reg. UPS 3 Day Ground 2nd Day Air Next Day Air

Please also send: Quik Dek-Clor Quik Water Leveler Other: _____

A&A Manufacturing International Dealer Meetings

Please award these points to:

Salesperson
CERTIFIED DESIGN FAX COVER SHEET

NOTE! A clean line drawing of the pool in 1/8" scale must accompany this completed order.

Pool Company: _____

Pool Company Address: _____ City: _____ State: _____ Zip: _____

Phone#: _____ FAX#: _____

Customer Name: _____

Customer Address: _____ City: _____ State: _____ Zip: _____

Phone#: _____ FAX#: _____

Depth: _____ to _____ to _____ Length _____ Width _____ Surface Area _____

Length of pipe between the nearest point of suction (Skimmer/Main Drain) and the Pump: _____ Feet

We use: UP Rated Pumps FULL Rated Pumps Pump Size Sold (if any): _____

Pump Model Name: _____ Pump Model #: _____

Filter Type: Cartridge DE Sand Minimum Flow Rate GPM: _____

Interior Finish: _____

Suction: Skimmer/Main Drain Common Separate Lines Number of Skimmers _____

(CHECK ONE BOX FOR EACH)	YES	NO		YES	NO
Pool Only	<input type="checkbox"/>	<input type="checkbox"/>	QuikSkim Venturi Skimmer	<input type="checkbox"/>	<input type="checkbox"/>
Pool & Spa With Common Equipment	<input type="checkbox"/>	<input type="checkbox"/>	Quik Leaf-Vac	<input type="checkbox"/>	<input type="checkbox"/>
Pool & Spa With Separate Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<i>(Pool Equipment and Main Drain locations must be shown)</i>		
Raised Spa	<input type="checkbox"/>	<input type="checkbox"/>	Automatic Surface Returns	<input type="checkbox"/>	<input type="checkbox"/>
Heater	<input type="checkbox"/>	<input type="checkbox"/>	Beach Entry	<input type="checkbox"/>	<input type="checkbox"/>
Transitional Break Shown (If Applicable)	<input type="checkbox"/>	<input type="checkbox"/>	<i>(If Yes: show water line)</i>		
Spa Spillway With Continuous Over-Flow _____ GPM's required			Chlorinator:	<input type="checkbox"/>	<input type="checkbox"/>
Other water demands from same pump <input type="checkbox"/> <input type="checkbox"/> <i>(May require a separate pump) _____ GPM's required</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> In-Line Chlorine-Generator	<input type="checkbox"/>	<input type="checkbox"/> In-Line Erosion
			<input type="checkbox"/> Dek-Clor	<input type="checkbox"/>	<input type="checkbox"/> Other _____
Solar Heating <i>(If Yes: Booster pump required)</i> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Main Drain Shown	<input type="checkbox"/>	<input type="checkbox"/>

SHIP THE SYSTEM: YES NO If yes: White Black Tan Gray

Water Valve: Standard Low Profile Lid and Ring Color White Tan

P.O. # _____ Ship By: Reg. UPS 3 Day Ground 2nd Day Air Next Day Air

Please also send: Quik Dek-Clor Quik Water Leveler Other: _____

Excavation

STANDARD vs. HARD DIG

Unless the pool is being dug in an area where there is very hard soil conditions (caliche, rock, or coral), there is usually no need to dig the pool any deeper than normal

to accommodate the plumbing for the A&A System. In the event of a "hard dig", it may be advisable to over dig the pool 8" to 12" then back-fill the pool with good soil and compact, then dig the trenches for the cleaning system.

It is not advisable to have the excavator dig any of the trenches for the A&A System since accurate location and placement of the cleaning heads rest with the plumbers. Therefore, all trenches should be laid out and dug by the plumber.

EQUIPMENT LOCATION

It is recommended that the pool equipment be located as near the pool as possible and that the skimmer be located somewhere near the transitional break or center of the pool. This would allow the A&A return lines access to the same trenches dug for the skimmer and the main drain lines. If this is done, the excavator can dig the skimmer niche all the way to the pool floor wide enough to accommodate the A&A return lines as well as the main drain line.

TRANSITIONAL BREAKS

It is important, however, that the excavation be performed per plan in regard to all the radii and slopes to the pool floor. A gradual slope from the shallow end to the deep end of the pool, avoiding an abrupt drop-off at the transition, will enhance the sweeping action of the A&A System. In the case of a diving pool, where a sharp transitional break is required, the floor heads must be laid out so that each side of the break is cleaned by its own set of cleaning heads. One should not expect the heads on one side of the break to reach across and clean on the other side. (See drawings on page 2). A transitional break should be treated as if it were a wall.

Plumbing The A&A Cleaning Heads

1. Make sure to have the A&A Certified Design Layout available for fast reference (See Figure 7-1).

NOTE: All cleaning head locations are measured from the finished pool wall.

2. Mark the exact location of each cleaning head in the pool floor by driving a wood stake or a piece of rebar in the ground at the proper location.

3. Place a 6' long cord, with a loop at one end, over the stake. Using either a sharp object or a can of spray paint

at the end of the length of cord, trace the furthest extent of the cord on the ground all around the stake.

4. Once circles around each of the stakes have been traced, stand outside the pool dig to see if all areas will be covered.

5. Dig A&A floor pipe runs, skimmer niche and filter run trench. Dig floor trenches 6" deep. (Skimmer niche can be dug to the pool floor by the excavator, but dressing out the niche may be necessary.)

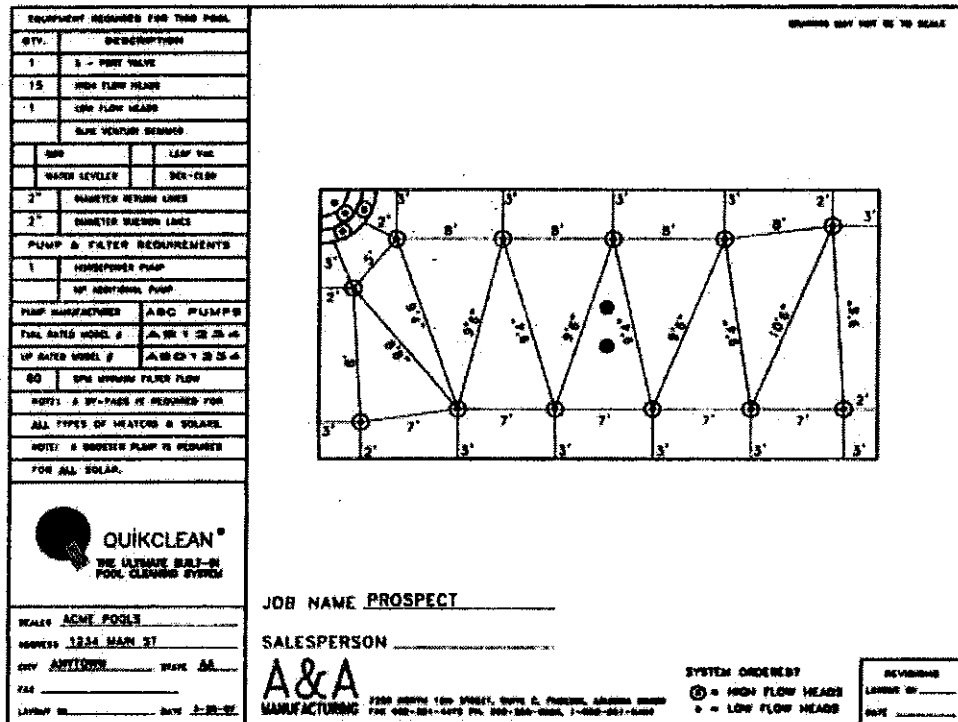


Figure 7-1

Plumbing The Pool Floor And Filter Run

1. All pipe for the A&A System must be 2" Schedule 40 PVC or equivalent. The A&A System is designed to be installed using 2" feed lines from the water valve. It is recommended that the lines enter at a skimmer location near the center of the length of the pool. The skimmer niche should be excavated to the pool floor wide enough to accommodate the A&A lines as well as the main drain line.
2. Plumb down the skimmer niche first. Follow the trenching to the first set of cleaning heads (*See Figures 9-1 and 9-2*). Pipes must be plumbed as close to the back of the skimmer niche as possible. This will aid in the placement of the steel and assure maximum gunite strength in this area. Use only 2" Schedule 40 PVC pipe and fittings. Use both primer and glue liberally.
3. The risers for the A&A heads must be exactly 90° to the finished pool floor - this must be exact!! The use of a 90° ell and a 45° ell with a nipple in between them will allow adjustments to achieve the 90° angle to the pool floor. Before gluing these three pieces together, experiment with the position of each until the desired angle is achieved. With a marking pen, mark lines across each of the parts so that, when they are taken apart to be glued, they will be returned to exactly the same position. This assures you of having the proper angle for the riser.
4. Use only the 2" x 15" A&A riser provided with each cleaning head. This riser is specially extruded to assure the exact I.D. to accept the A&A floor fitting without the need to ream. (*See Figure 24-2*) The A&A riser is printed (with a repeating pattern) "A&A Manufacturing A&A Manufacturing" in red ink for easy identification.
5. Plumb each zone as laid out on the Certified Design Layout. Cap and glue each of the risers with a standard 2" cap. Whenever possible, use two 45° ells with a nipple in between instead of a 90° ell. This allows maximum water flow with less "head loss".
6. Plumb all feed lines from the skimmer niche back to the A&A water valve so that all the lines, including the suction lines, are laying flat in the trench. Plan the placement of these lines in the trench so that they are laying in the proper order in relation to the firing order of the water valve (see Figure 9-2).
7. Connect all feed lines in the filter run trench to the A&A water valve. (*See Pages 10 and 12 for instructions for plumbing the water valve.*)
8. **NOTE!...IMPORTANT!!** Pressurize the A&A System with a minimum of 35 p.s.i. and leave the system under pressure through the rest of the construction phases until time to install the A&A floor fittings. The pressure testing device should be installed at the equipment header. This pressure should be checked by each crew **BEFORE THEY START** their own particular phase of construction. It is important that, if a pressure drop is detected, it is corrected before the next phase of construction begins.
9. Cover all the lines in the pool floor with a minimum of 4" of dirt. All trenches should be back-filled, raked smooth and compacted. All excess dirt should be thrown out of the pool excavation so the pool interior is restored to the same condition as before the trenching and plumbing. The floor of the pool should be smooth with no "peaks and valleys". Proper compacting, with tamper and water if needed, is mandatory.
10. Fill in the filter run trenches.

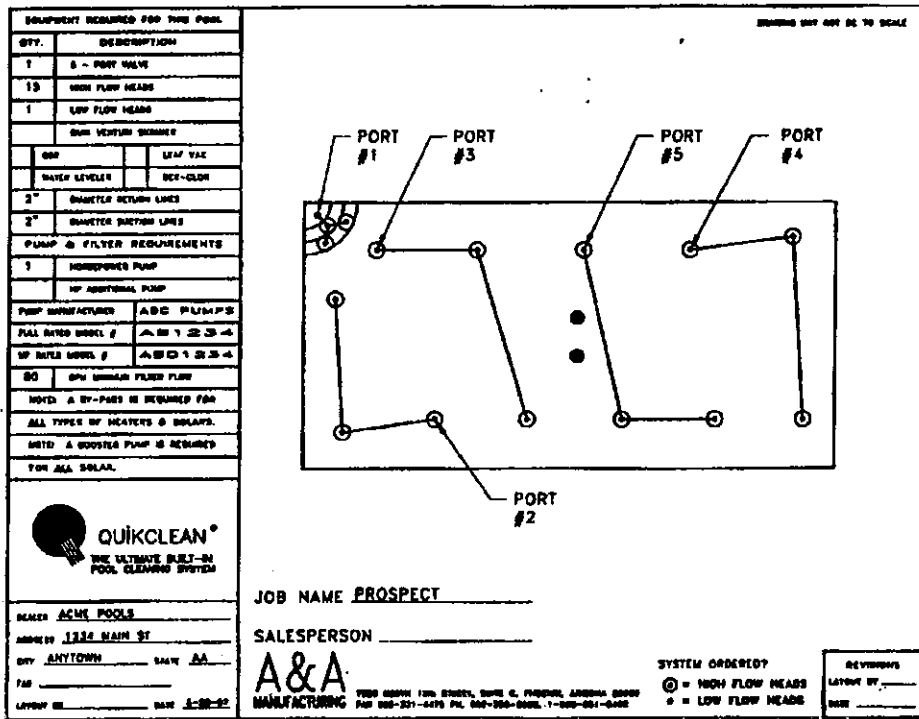


Figure 9-1

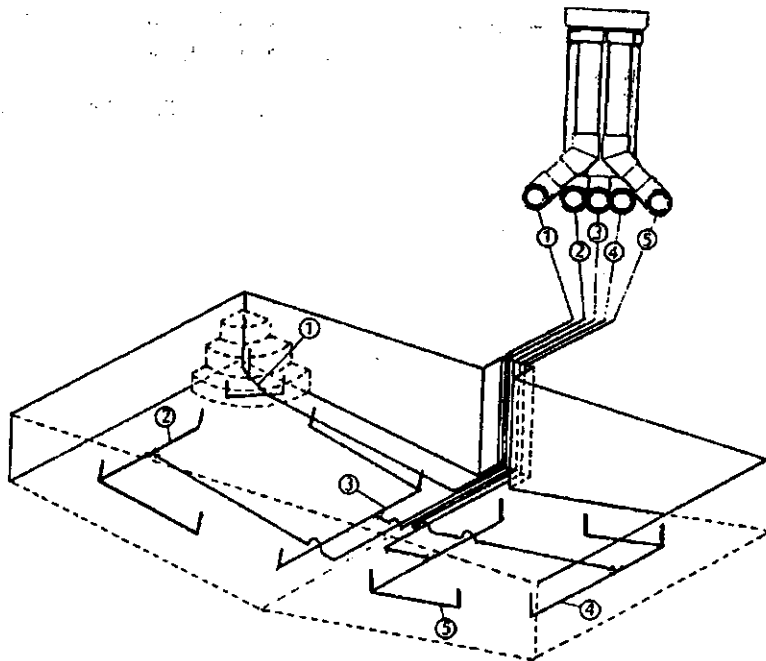


Figure 9-2

Plumbing The 5-Port A&A 'T' Valve

1. The 5-port 'T' valve is packed "ready to pressurize". There is no need to open the valve to remove parts prior to pressurizing the system. See page 32 for special "start-up" procedures.
2. Determine the length of PVC pipe that is required to place the Water Valve at its desired height above ground level. Cut three pieces of 1-1/2" Schedule 40 PVC pipe to that length.
3. Cut two more pieces 4" shorter.
4. Glue the longest three pieces into three adjacent ports of the valve and the remaining two shorter lengths in the remaining two side by side ports. Use a medium body PVC to PVC pipe cement (for PVC Types I and II through 6"). Apply the glue to the valve base while it is in the upright position (ports down) and allow the assembly to cure in the upright position to prevent the glue from running into the internal area of the valve.

Note! It is important that you follow the above procedure and plumb one pipe at a time into the Water Valve rather than plumbing the five pipes up to the valve and attempting to glue all five into the valve at the same time.

5. See Figure 10-1 for the plumbing configuration of the 5-Port Valve so that when finished, the returns from the valve to the pool all lie flat in the trench in their proper firing sequence.
6. Use 1-1/2" to 2" 90° ells to connect the 1-1/2" pipes out of the valve to 2" return lines to the pool.
7. Plumb a threaded 1-1/2" nipple into the QuikStop of the upper water valve housing. (DO NOT OVERTIGHTEN) With a 90° ell and a union, connect the valve to the header (See Figure 19-1). Paint all the exposed PVC pipe and the water valve to prevent UV deterioration.

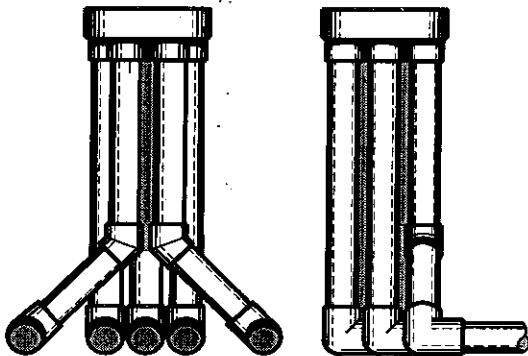


Figure 10-1

Figure 10-1 shows the finished configuration of In the case of a small pool, it may not be a 5-port valve allowing all return lines to lie necessary to use all five ports of a 5-port flat in the trench. valve.

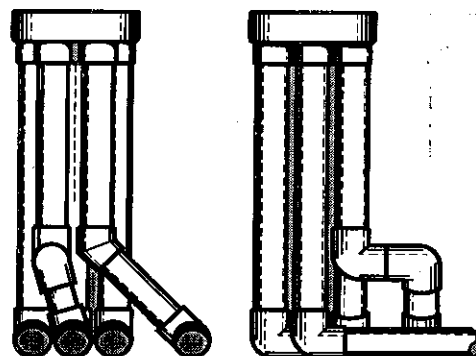


Figure 10-2

Figure 10-2 shows how the plumbing can be modified to convert a 5-port valve into a 4-port valve.

Water Valve Speed Control

The A&A water valve is equipped with an internal speed control that will easily adjust the speed of the valve with finger tip pressure (See Figures 11-1 and 11-2). While each water valve has been pre-set at the factory to achieve a speed that will be best for most pools, the valve may now be adjusted for any specific application. If you desire to slow the valve down, gradually open the

speed control gate. If you desire to increase the speed of the valve, simply close the speed control gate allowing more water to pass through the diverter and past the impeller. A duration of 45-65 seconds per port normally attains the best cleaning efficiency. (See Figures 11-1 and 11-2)

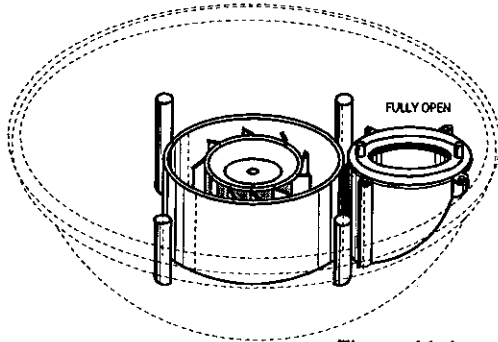


Figure 11-1

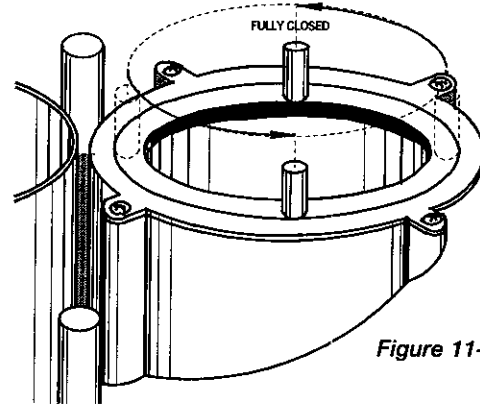


Figure 11-2

QuikStop (Pause Control)

The A&A water valve is also equipped with a QuikStop pause control that allows the valve to be stopped on any desired port. This will allow filtering of water without the inconvenience of cleaning heads popping up throughout the pool floor. To stop the water valve on any zone, merely turn the QuikStop knob 180° so that the “tear

drop” shaped knob is pointing down. (See Figures 11-3 and 11-4)

To restart the Water Valve for normal operation, simply rotate the QuikStop knob 180° so that the “tear drop” shaped knob is pointing upward.

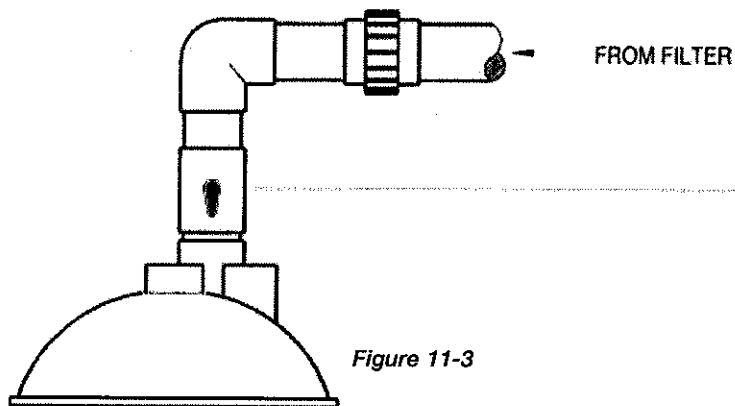


Figure 11-3

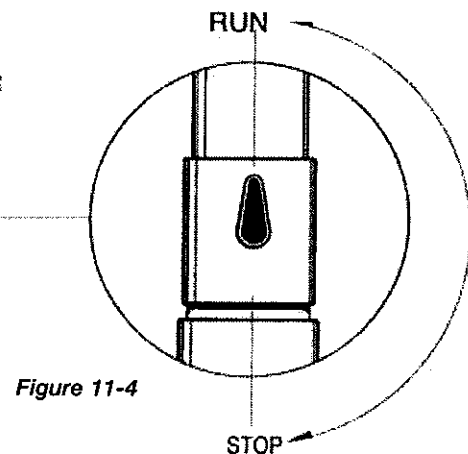


Figure 11-4

To stop the water valve on any zone, merely turn the QUIKSTOP knob 180 degrees

Plumbing The 6-Port A&A 'T' Valve (Top Entry)

1. The 6-port 'T' valve is packed "ready to pressurize". There is no need to open the valve to remove parts prior to pressurizing the system. See page 32 for special "start-up" procedures.

2. Determine the length of 1-1/2" PVC pipe that is required to place the valve at the desired height above ground level. Cut three pieces of 1-1/2" Schedule 40 PVC pipe to that length.

3. Cut three more pieces 4" shorter.

4. Glue the longest three pieces into adjacent ports of the Water Valve and the three shorter lengths into the three remaining adjacent ports. Use a medium body PVC to PVC pipe cement. Apply the cement to the ports in the valve base while the valve is in the upright position (ports down) and allow the assembly to cure in the upright position to prevent the glue from running into the internal area of the valve. (See Figure 12-1)

Note! It is important that you follow this procedure and plumb one pipe at a time into the valve ports rather than plumbing all the lines up to the valve and attempting to glue all six into the valve at one time.

5. See Figures 12-2 through 12-4 for the sequence and configuration for plumbing the balance of the assembly so that when finished, all the return lines lie flat in the trench and are lying in their proper firing sequence.

6. Use 1-1/2" to 2" ells to connect the 1-1/2" pipes out of the valve to the 2" return lines from the valve to the pool.

7. Plumb a threaded 1-1/2" nipple into the top of the QuikStop (DO NOT OVERTIGHTEN) and with a 90° ell and a union, connect the valve to the header (See Figure 12-1). Paint all of the exposed PVC pipe and the water valve to protect from UV rays.

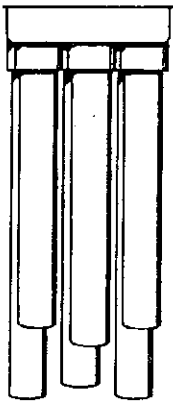


Figure 12-1

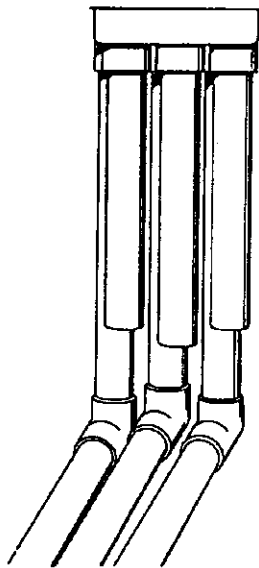


Figure 12-2

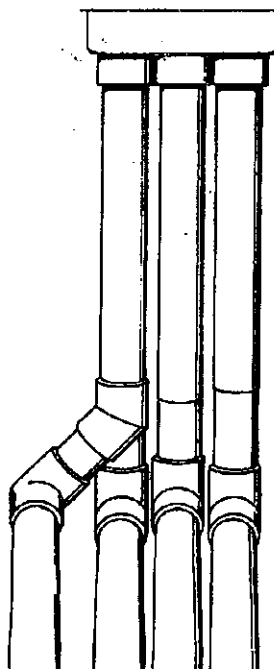


Figure 12-3

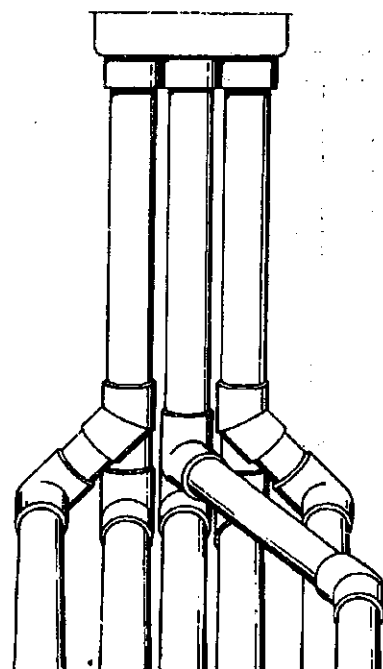
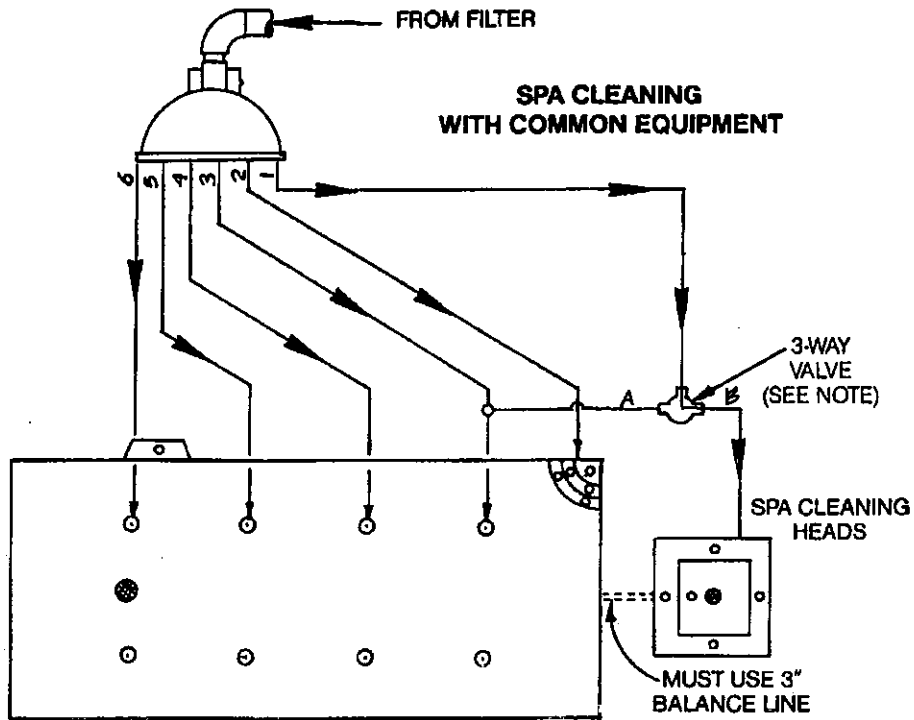


Figure 12-4

Plumbing The A&A System In A Spa

1. Place the A&A Cleaning Heads in the spa as directed in the A&A Certified Design Layout.
2. If the spa shares common equipment with the pool, see Figure 14-1 for the method of plumbing the A&A System in the spa.
3. When the spa shares common equipment with the pool, it will be necessary to provide a means for the water introduced to the spa through the A&A System to be returned to the pool. This is required because the water used to clean the spa has been drawn from the pool. The recommended method of returning this water is with a Spa Spillway. It can be accomplished by a 3" balance line between the pool and spa (balance line cannot exceed 10' in length).
4. If the spa is raised, it is imperative that a check valve be installed just below the actuator valve in the line that feeds the spa, otherwise, water in the spa will drain back through the cleaning heads until the water in the spa reaches the same level as in the pool.

To provide water for a spa spillway feature, consult A&A Manufacturing for the modifications required to assume the cleaning efficiency of the A&A System will not be reduced.



NOTE: 3-way valve in position "B" above cleans spa when not heated. When in position "A" shallow end will be double cleaned.

SPA CLEANING WITH COMMON EQUIPMENT

SPA FUNCTION	VALVE SETTINGS			
	1	2	3	4
CLEAN	CLOSED FROM SPA	OPEN TO ACTUATOR	OPEN TO SPA	OPEN
HEAT & THERAPY	OPEN FROM SPA	OPEN TO SPA	EITHER	CLOSED
MAINTAIN HEAT & CLEAN POOL	CLOSED FROM SPA	OPEN TO ACTUATOR	CLOSED TO SPA	CLOSED

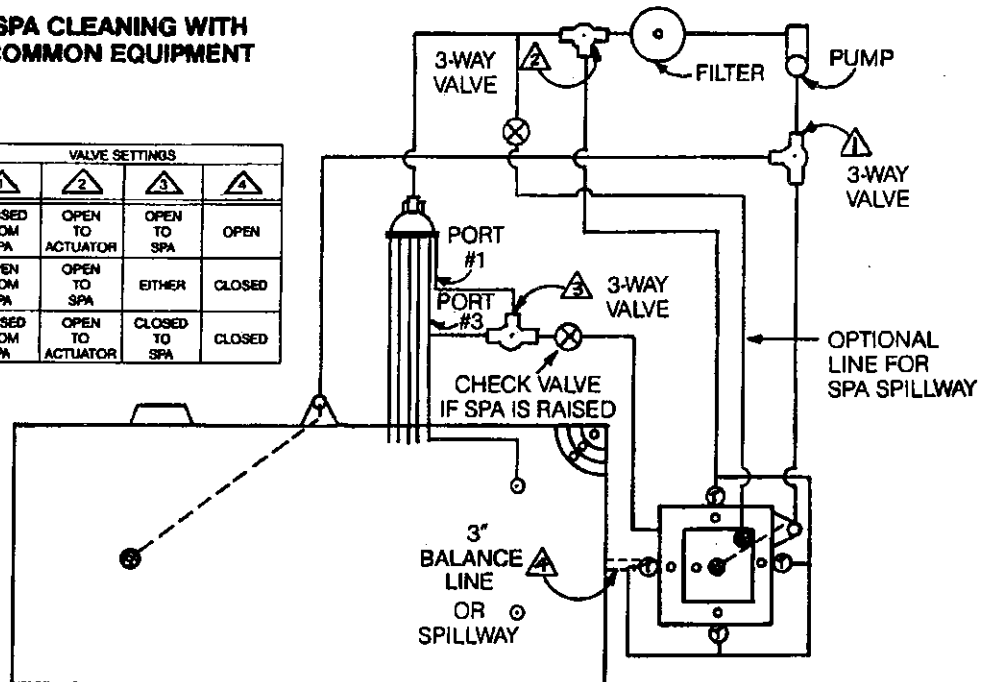


Figure 14-1

Plumbing The Low Profile 6-Port A&A 'T' Valve In The Equipment Area

Note: The feed line to this valve is into the lower housing. A union will not be required. A 2" feed line with a 2" coupling may be plumbed directly into the valve.

1. The 6-port Low Profile 'T' valve is shipped ready to pressurize. There is no need to open the valve to remove parts prior to pressurizing the system. *Note: There is a brass nut installed ahead of the band clamp knob. Do not remove this nut until the pressure has been released from the system, then discard it.*
2. Determine the length of PVC pipe that is required to continue the feed line into the Water Valve so that it remains the same height as the rest of the manifold. (See Figure 16-2) Cut two pieces of 1-1/2" Schedule 40 PVC pipe to that length.
3. With **no** primer or glue on the pipe or valve, insert the feed inlet of the actuator valve into a coupler on the return line from the filter. Then determine the direction the feed lines at the bottom of the valve must point in order to connect to the lines coming up from the bottom of the pool.
4. With the actuator valve between you and the feed lines coming from the pool, sight over the center of the valve in a direct line with the feed lines and place a mark on the opposite side of the valve. This provides a "bench mark" for determining the angle the 90° ells will be pointing when glued to the end of the lines out of the bottom of the actuator valve.
5. Select the two ports on the bottom of the actuator valve that are opposite of each other and also comes the closest to forming a 'T' with the imaginary line to the feed lines coming from the bottom of the pool. (See Figure 15-1).
6. Glue the two pieces cut in Step #2 into the two ports selected in Step #5 (See Figure 15-2). Use a medium bodied PVC to PVC pipe cement. When applying the glue to the actuator valve ports and when you insert the PVC pipe into each port, hold the valve in the upright position to prevent the glue from running into the valve seats.
7. Cut two pieces of the 1-1/2" Schedule 40 PVC pipe six inches shorter than the first two and glue them in the back two ports opposite the side with the "bench mark".
8. Cut two pieces of 1-1/2" PVC pipe 5-1/2" long and glue a 45° fitting on one end of each of these pieces. Glue the 45° fitting assemblies to the shortest two pipes in the actuator valve (the back two ports) and swing them until they are as close to forming a line 90 degrees to the line of sight to the feed lines from the pool. (See Figure 15-3).
9. Cut two pieces of 1-1/2" Schedule 40 PVC pipe three inches shorter than the first two cut in Step #2 and glue these pieces in the remaining two ports of the actuator valve. (See Figure 15-4).
10. Glue six 2" to 1-1/2" reducers into six 2" 90° ells. Glue these assemblies to the ends of the six pipes in the bottom of the actuator valves so that the 90° ells point to the feed lines from the pool when the valve is glued to the feed line from the filter. (See Figure 15-5).
11. Glue the feed line from the filter into the actuator valve using a level to assure that the pipes from the valve are vertical. Then glue the two inch feed lines from the pool into the 90° ell at the bottom of the valve.

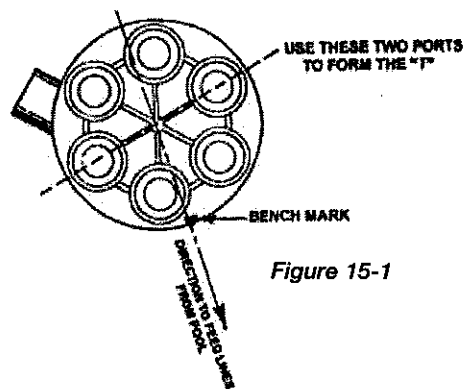


Figure 15-1



Figure 15-2

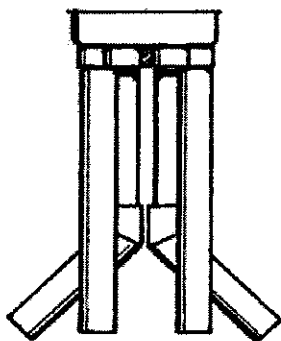


Figure 15-3

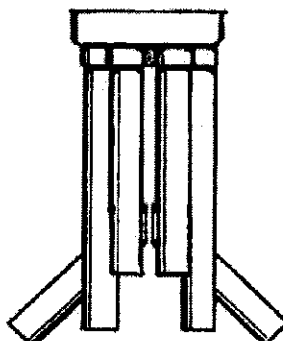


Figure 15-4

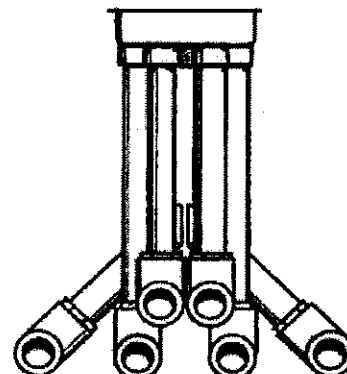


Figure 15-5

If The Valve Is Located In A Remote Location Near The Pool

1. Run the schedule 40 pipe size specified on the A&A Design Sheet, from the header to the remote valve location.
2. Determine the length of 2" Schedule 40 PVC required to raise the feed line from the bottom of the trench to the desired height of the actuator valve. (The ideal installation would be for the feed line to run directly into the actuator valve with no riser or 90° ells. This would probably require the valve to be below the finished grade – see letter "c" below.)

Factors to Determine the Desired Height

- a) The finished height of the valve must be high enough that the band clamp on the valve will be above pool water level. If lower than water level, water from the pool will flow from the valve if and when the clear lid is removed. The 2" feed line stub up to the valve and the 1-1/2" stubs below the valve **must be a minimum of 6" long.** (See Figure 16-1).
- b) If the height of the valve is to be below water level, a ball valve or gate valve must be installed on each of the 1-1/2" lines out of the valve. **(The Water Valve must all be accessible for servicing.)**
- c) If the desired valve level is below the finished grade the valve must be installed inside a housing similar to a sprinkler valve box (see Figure 16-1). This housing

must be large enough to allow access to the band clamp of the valve or the ball or gate valves on the pipes if the valve is below water level. **Center the housing over the valve so that the band clamp knob is accessible!**

3. Follow steps 2 through 7 on page 15 to plumb from the valve to the pool floor.

4. The return line from the equipment area can be plumbed directly to the valve with a 90° ell or with a nipple from the ell and a coupling to the valve.

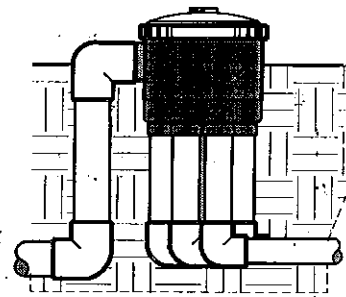


Figure 16-1

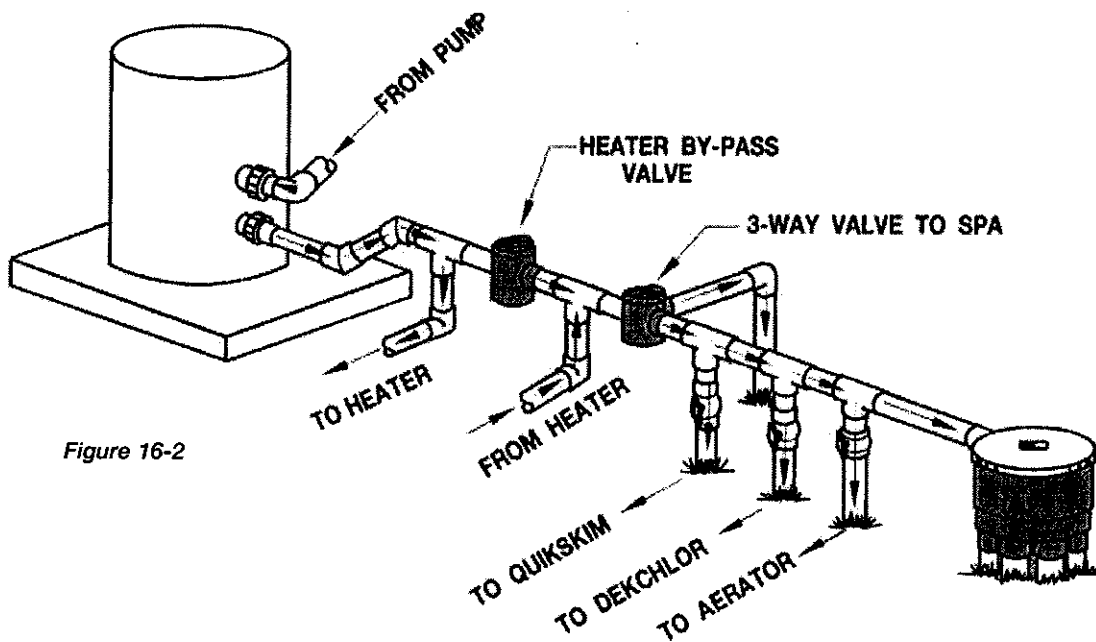


Figure 16-2

Numbering The Zones For Proper Valve Sequencing

The 6-port A&A water valve rotates in a clockwise direction when looking down into the valve from above. When the valve is plumbed as described on pages 1 and 2, the firing sequence is as illustrated in Figure 17-1. If the shallow end of the pool and /or the lower numbered zones are in the other end of the pool, the zones can be numbered and sequenced as illustrated in Figure 17-2.

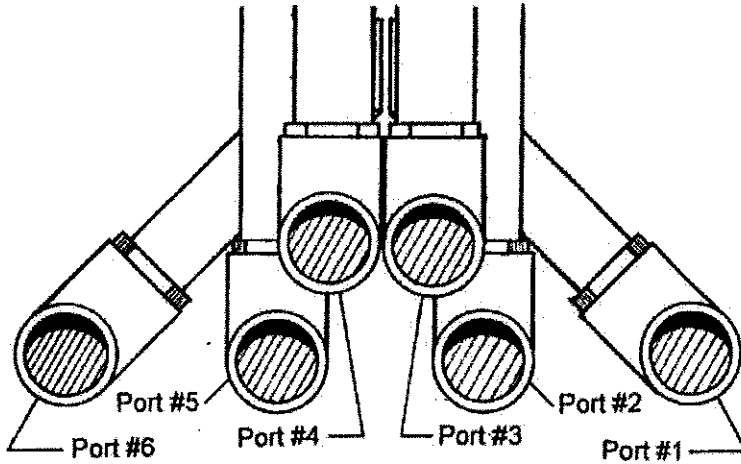


Figure 17-1

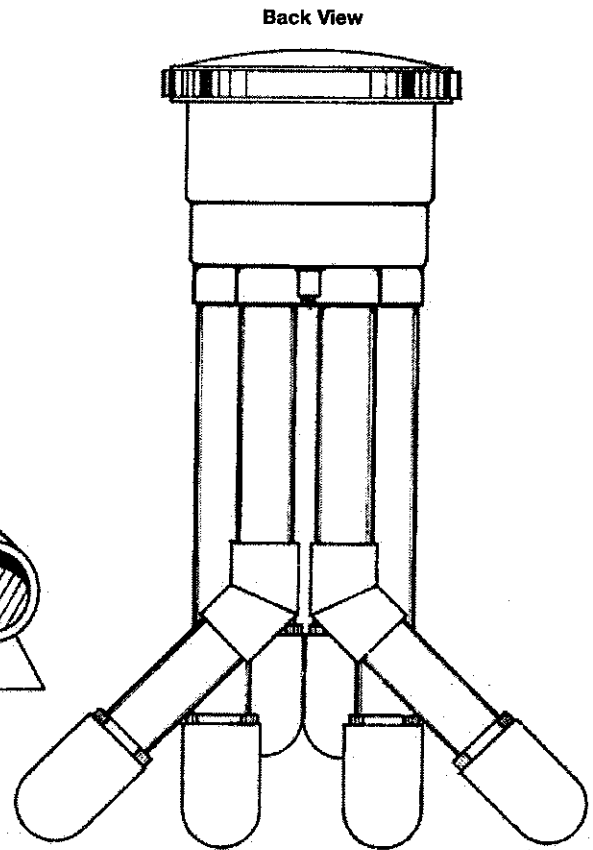


Figure 17-3

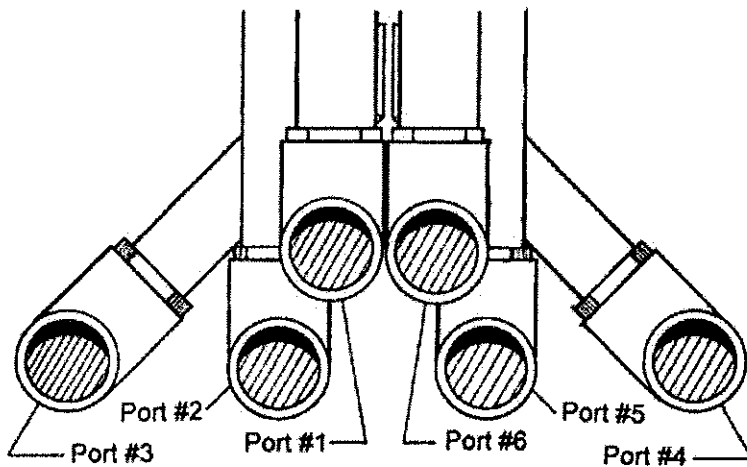


Figure 17-2

Adjusting The Speed Control On The *Low Profile* 6-Port Valve

The rotation speed of the Low Profile 6-port valve is determined by the position of the clear top when it is placed on the valve. For maximum cleaning efficiency, it is recommended that the cycle time for each zone be adjusted to run approximately 60 seconds. The volume of water allowed to enter the impeller chamber of the actuator valve controls the speed.

1. There is a raised speed control guide molded into the top lip of the valve housing (see Figure 18-1) and a groove molded into the clear lid that accepts the speed control guide.
2. Place the lid on the valve housing so the molded groove in the lid is over the speed control guide.
3. Cycle time is increased by rotating the lid counterclockwise and decreased by rotating it clockwise.
4. Once the desired speed is achieved, remove the band-clamp and, with a marking pen, place a mark on the edge of the lid and valve housing as registration marks. This will allow the replacement of the lid to the same position if and when the valve is opened.

Using The QuikStop (Pause Control)

To use the QuikStop pause control, raise the black lever on the valve lid to the full vertical position so the it locks in place. This will pause the cycle of the Water Valve and the Cleaning Heads in the pool. To restart the Water Valve, return the lever to it's original horizontal position. (See Figure 18-2).

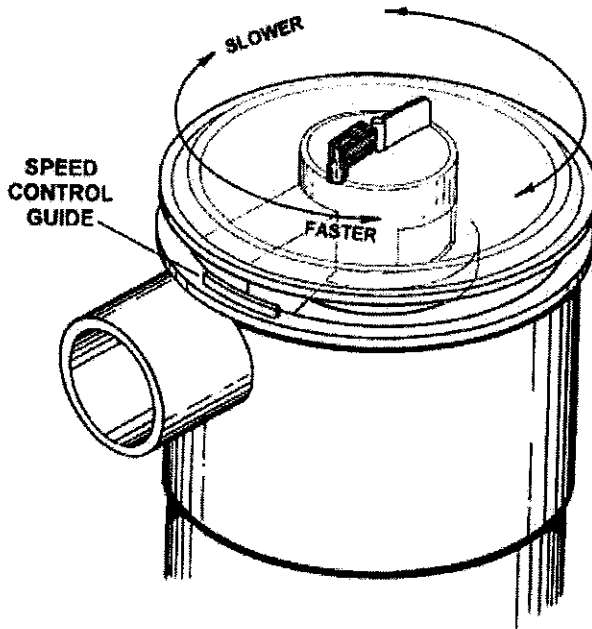


Figure 18-1

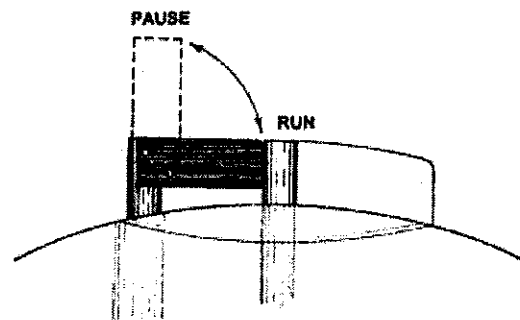


Figure 18-2

Plumbing A Chlorine Feeder Or Generator Into An A&A System

1. Chlorine generators or feeders release strong concentrations of hypochlorous acid and/or chlorine gas. It is extremely important that they are NEVER plumbed directly ahead of and in-line with the A&A water valve.

DEDICATED LINE

2. It is required that a "loop" be installed as in Figure 34. A dedicated line for the chlorine feeder must be plumbed directly to the pool. Use 1-1/2" Schedule 40 PVC and reduce to 1" underground to the pool. The larger diameter PVC pipe gives rigidity and strength to the assembly.

NOTE! There are no exceptions! Plumbing a chlorine generator or feeder directly in line with the A&A water valve will void the warranty!

3. Due to the restriction of water flow through the salt water generator cells, it is necessary to plumb a 2" bypass around the cells with either a 2" two-way valve or a 2" ball valve. (See Figure 19-2).

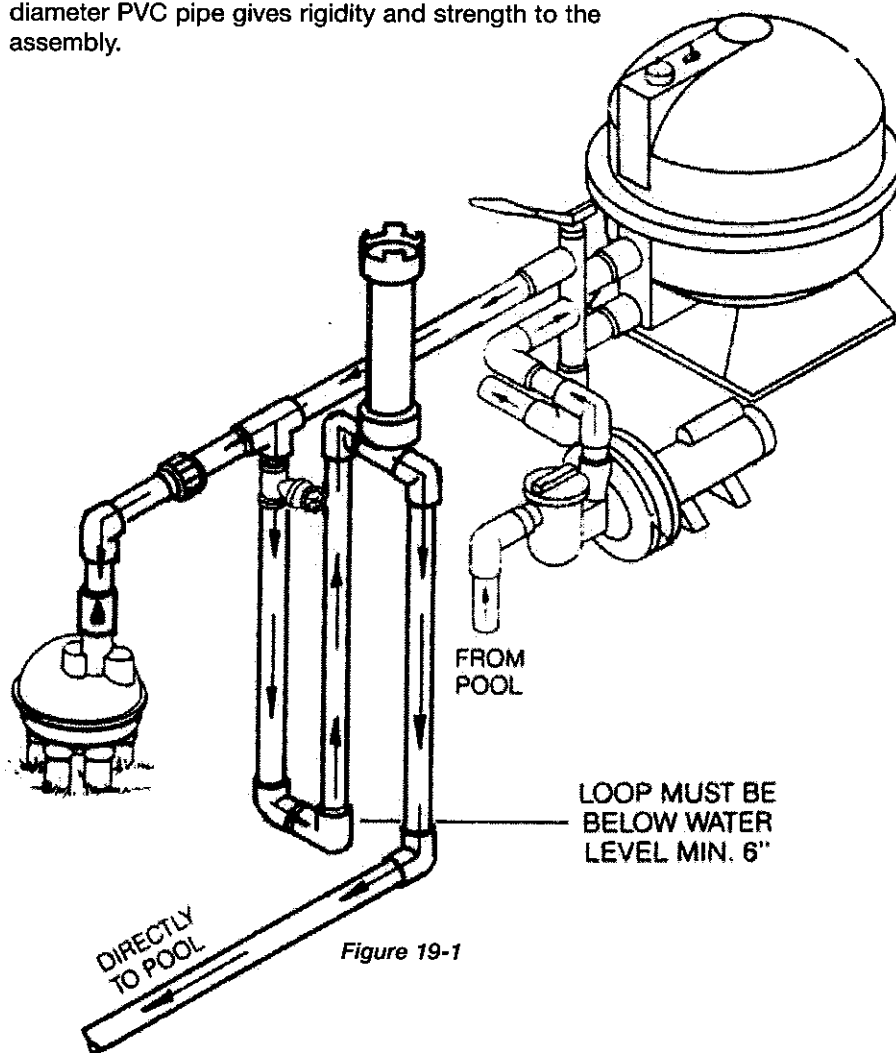


Figure 19-1

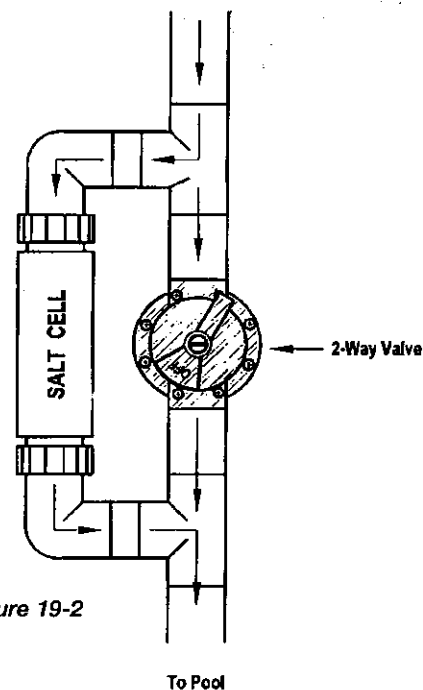


Figure 19-2

To Pool

4. To avoid the problems experienced with the installation of a chlorine feeder in the equipment area, we recommend the use of A&A's Quik Dek-Chlor. It was designed specifically for this purpose. Quik Dek-Chlor was designed to eliminate the unnecessary damage to the water actuator valve and other pool equipment. The Dek-

Chlor in an "end of the line" erosion feeder that is installed pool side in the deck and feeds chlorine directly into the pool. This type of installation keeps the high concentrations of chlorine from entering and damaging the pool equipment. (See Figures 20-1 & 20-2).

DEK-CHLOR INSTALLATION SCHEMATIC

3/4" GATE VALVE & FEED LINE

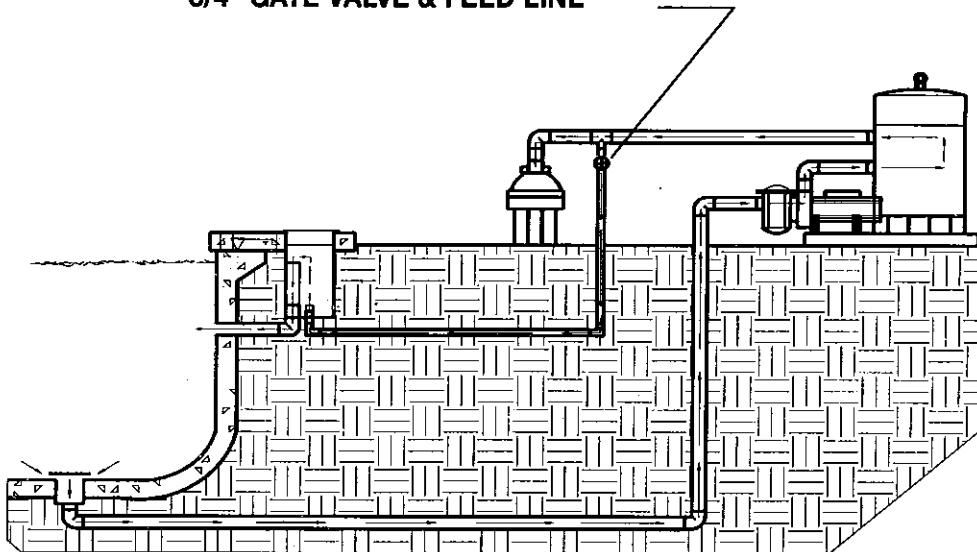


Figure 20-1

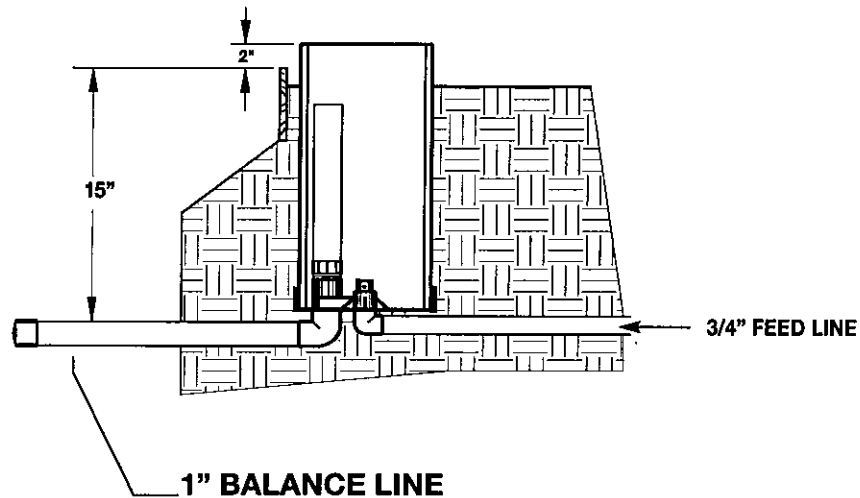


Figure 20-2

Plumbing A Heater In An A&A System

1. Due to the additional restrictions to flow caused by heaters, **IT IS NECESSARY TO PLUMB A 2" HEATER BY-PASS WITH A 2" BALL VALVE OR GATE VALVE WHENEVER A HEATER IS PRESENT!** This will allow the heater to accept all the water it can handle while bypassing the remainder to the A&A water valve. **THERE ARE NO EXCEPTIONS!**

2. By-pass lines should be plumbed in conjunction with all types of heaters (gas, electric, heat pumps, solar, etc.).

3. To assure maximum flow, the heater should be located as close to the return header as possible.

4. A booster pump is required for all solar heating systems.

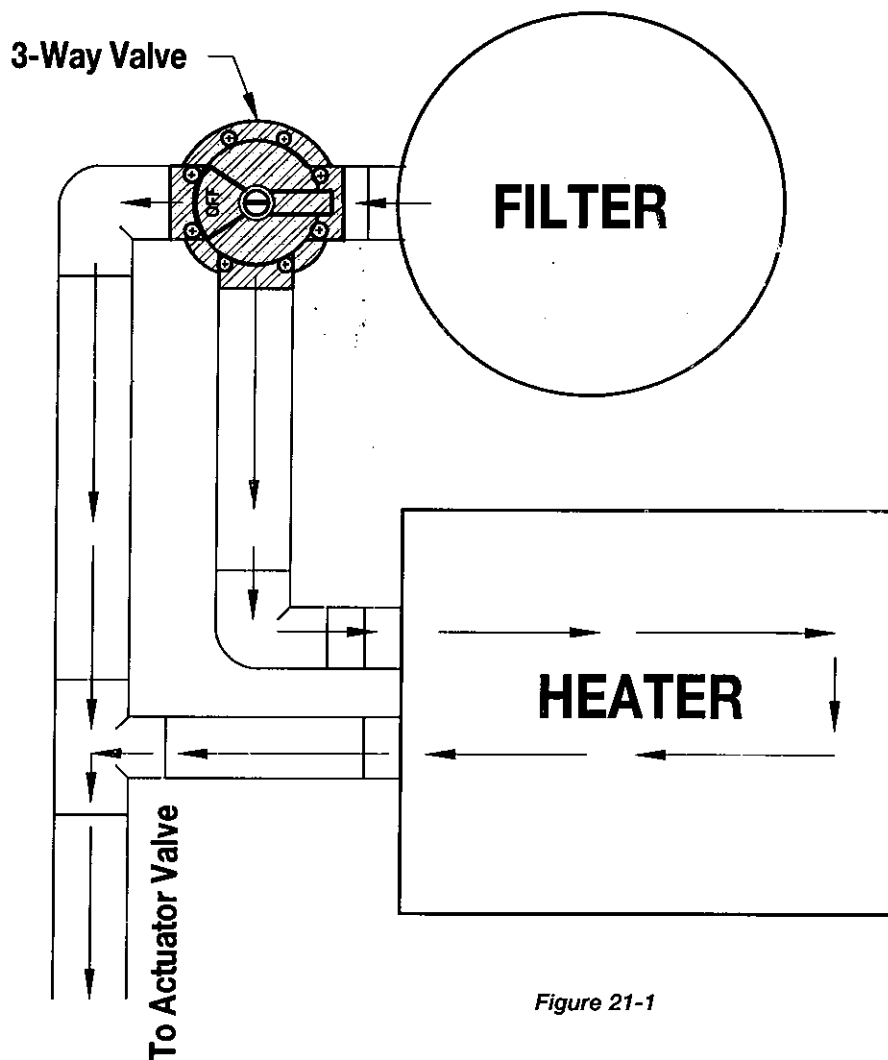


Figure 21-1

Plumbing The A&A Water Valve When The Pool Equipment Is Below Water Level

If the pool equipment must be located below the pool water level, it will be necessary to install full-flow gate valves or ball valves on each pipe just below the A&A water valve. This will eliminate flooding through the valve

if servicing is required. **DO NOT USE** directional check valves as they might fail.

Plumbing Steps With The A&A Risers

For optimum step cleaning, it is desirable to place the center of the cleaning heads no more than 4" from the front of the finished step edge. (See Figure 22-1) This will allow the jets of water to reach further around a curved step. The following drawing (See Figure 22-1) gives the dimensions for riser placements that can be used for the standard step sizes, i.e., top step with an 18" deep tread and the second and third steps with a tread depth of 12". These dimensions are also based upon a 12" bond beam.

The horizontal dimensions are taken from the back of the bond beam form to the centers of the risers while the vertical dimensions are taken from the top of the bond beam form to the top of the 2" cap on the risers. **DO NOT TRY TO SET THE HEIGHT OF THE RISERS BY MEASURING FROM THE BOTTOM UP!**

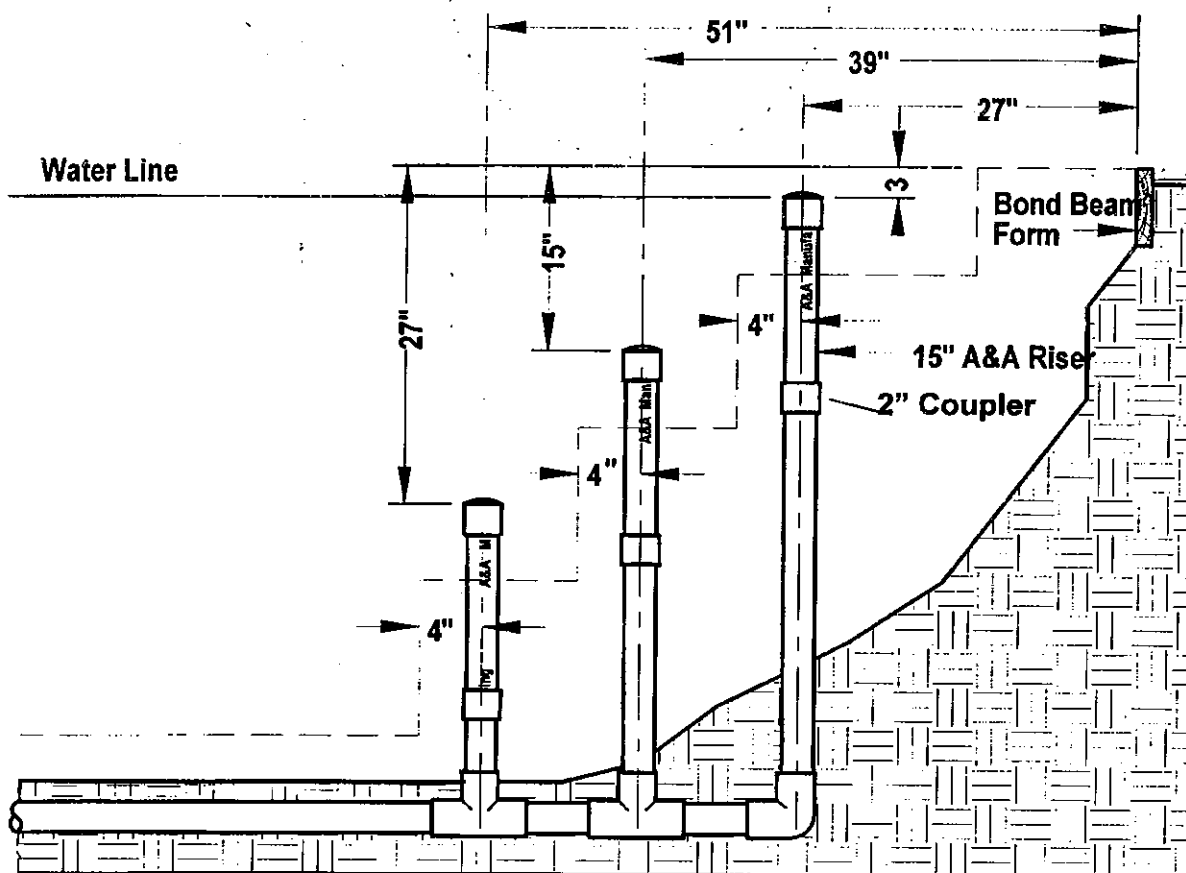


Figure 22-1

Steel Installation

STOP & CHECK

1. IMPORTANT! Before starting the steel installation, check the system pressure gauge to make certain there was no pressure loss indicating a leak in the system. If a loss is detected, STOP and notify the pool builder immediately! Repair any leak before the steel installation! It is extremely difficult to repair under the steel.

2. Install the steel using extreme care not to move the pipes. Steel should not be placed directly against

an A&A riser. Keep the steel approximately 3" away from all risers.

3. It is recommended that steel be placed 6" on center in the skimmer cove to ensure structural integrity. A&A MAX, SELECT OR ULTRA SYSTEM

4. If an A&A MAX, SELECT or ULTRA System is being installed, see page 27 for special instructions for installing the steel around the dual main drains.

Concrete Installation

STOP & CHECK

1. IMPORTANT!! Before any concrete installation begins, check the system pressure gauge to make certain there has been no pressure loss indicating a leak in the system. If a loss is detected, STOP and notify the pool builder immediately!

IMPORTANT!! Check to ensure that all the A&A risers will finish perpendicular to the contour of the finished pool floor prior to applying the concrete.

FLAIR STEPS IF POSSIBLE

2. The cleaning efficiency of the A&A System will be

greatly enhanced if all corners are covered or radiused rather than finished with sharp angles. Flaring the steps is also recommended to avoid the sharp angles where the steps meet walls or other vertical areas.

FINISHING

3. The gunite or shotcrete surfaces can be finished right up to the A&A 2" PVC risers. (See Figure 24-4). It is necessary to make a slight recess around the riser to facilitate cutting the riser flush with the pool floor (See Figures 24-4 and 24-5). A "three finger" swipe around the riser is sufficient.

Installing The A&A Floor Fittings

1. With a PVC pipe cutter or hack saw, cut off the caps from the risers approximately 2" to 3" from the finished gunite surface (See Figure 24-5).

2. Set the depth of the A&A cut-off tool so that the blade will cut the stub of the riser even with the finished gunite surface. This setting will require a dimension of approximately 4-1/2" from the top of the cut-off tool frame to the bottom of the saw blade (See Figure 25-1). Adjustments may be required to get the exact depth of the cut. This will allow each of the riser stubs to be cut at the precise depth and angle. This will allow a plaster or marcite thickness of 3/8". If an exposed aggregate or pebble finish is used, that may require a thicker finish, set the cut-off tool so that it leaves the stub higher. Figure 25-1 shows the tool set at 4-1/2". If the aggregate finish

is to be 1/8" thicker, set the tool so that the blade is 4-3/8" from the top of the frame.

3. Cut each of the riser stubs with the A&A cut-off tool while positioning the frame on the gunite surface so that the stub will be cut at the same angle as the finished floor (See Figure 25-2).

CLEAR ALL LINES – EVERY TIME

4. Blow out all the lines of debris that might have become entrapped inside the pipe during plumbing. For best results, use a 2 hp spa blower via a hose inserted into each port of the water valve one port at a time. Allow the blower to blow air through each port a sufficient amount of time to remove all the debris. (See also pages 32-33 for further instructions for clearing the lines.)

5. NO REAMING NECESSARY: Since the A&A 2" PVC risers, provided with each of the A&A cleaning heads, was extruded to an exact I.D., it will not be necessary to ream the inside of the stub before gluing the floor fitting into position.

6. Using the A&A Certified Layout as a guide, install each of the A&A cleaning head assemblies in it's proper location. The cleaning head internals are shipped already assembled in the floor fittings and a metallic plaster shield covers the top of the assembly. Each foil shield is

printed to identify which are the **LOW FLOW** and **HIGH FLOW** heads.

GLUE AND PRIMER SPECIFICATIONS

7. Apply both primer and glue on the inside of the riser stub. **Apply glue only to the floor fitting. DO NOT** apply primer directly to the floor fitting as the heat produced may distort the plastic. Use ABS to PVC cement.

8. The pool is now ready for plastering.

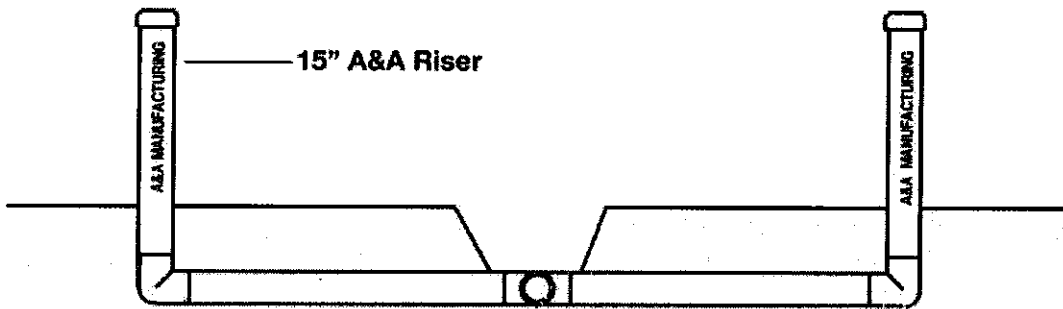


Figure 24-1

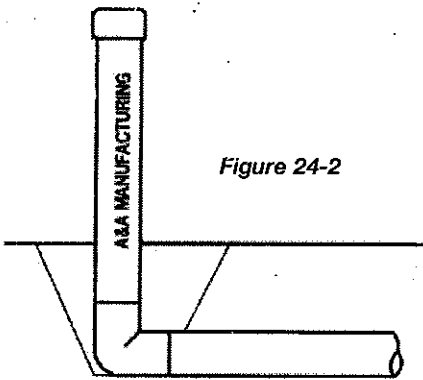


Figure 24-2

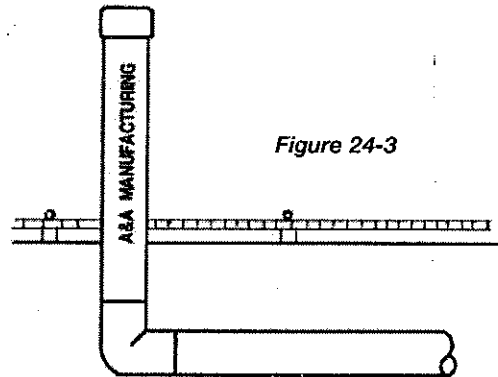


Figure 24-3

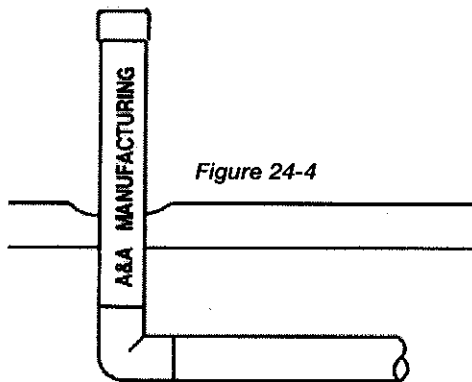


Figure 24-4

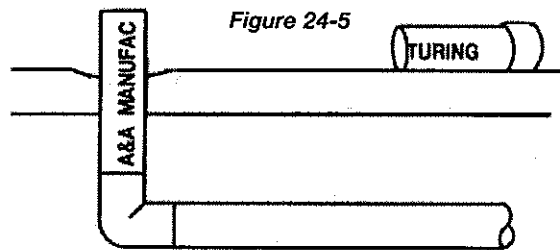
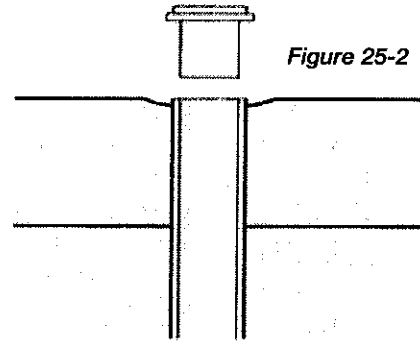
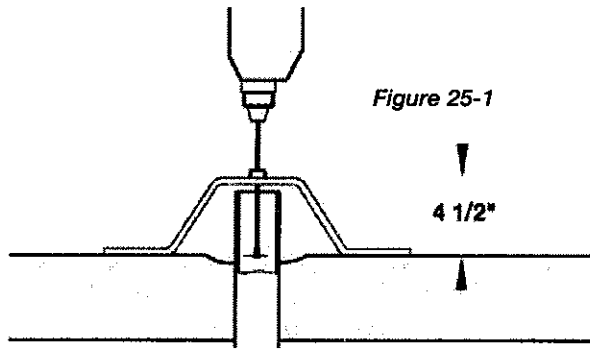


Figure 24-5



Plumbing The A&A MAX , SELECT Or ULTRA Systems

The A&A MAX, SELECT or ULTRA Systems include the A&A in-floor cleaning system plus QuikSkim, a venturi powered skimmer and Quik LeafVac, a safety engineered, anti-vortex, dual main drain system with a debris collecting canister located in the equipment area in front of the circulation pump.

Plumbing the Quik LeafVac

Note: The LeafVac canister will be installed in the equipment area immediately in front of the pump. It **will not** be installed in the pool deck! Pressure testing may be completed through the installed LeafVac.

1. Run the suction lines from the skimmer and the main drains to the equipment area.
2. Plumb a 2" line from the bottom of the LeafVac canister up to the pump inlet so that the lid of the

LeafVac is approximately the same height as the pump lid. It is best to use double 45° fittings, rather than 90° elbows. **A 4" CPVC nipple is required at the pump inlet.** (See Figure 26-1)

3. Install a 3-way valve to the inlet port of the LeafVac canister and plumb both suction line to the three way valve **exactly** the same as when the 3-way valve is installed at the pump. **Note:** It is recommended that this 3-way valve be only slightly open to the venturi powered skimmer. This will allow maximum pump suction from the main drains for best debris removal.

Install the 3-Way Valve Ahead of the LeafVac **ONLY!**

Do NOT Install the 3-Way Valve Between the LeafVac & the Pump

SUCTION LINE FROM QUIKSKIM OR MAIN DRAINS

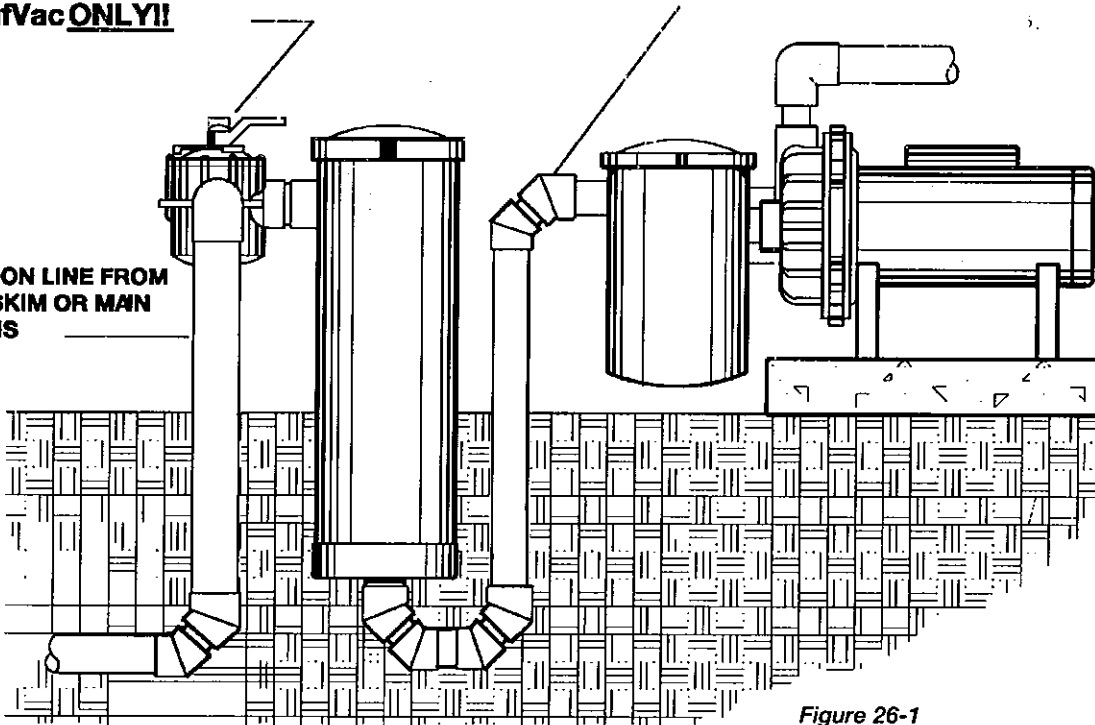


Figure 26-1

Plumbing The LeafVac Main Drains

1. The two supplied anti-vortex main drains should be placed approximately 4 feet apart and connected by a 2" line with a 2" Tee directly between them (See Figure 27-2). From the Tee, run a 2" suction line back to the LeafVac in the equipment area. If you normally use the ABS pots with your main drains, those must be ordered separately from A&A Manufacturing. Only the anti-vortex covers are included with the Quik LeafVac.

2. These dual anti-vortex main drains may require a deeper niche in the gunite than you normally cut. The ring for the anti-vortex cover will require a deeper niche and the steel dip bars must dip further so that the finished gunite niche will accept the ring for the anti-vortex cover. (See Figure 27-1 for detailed dimensions of the niche.)

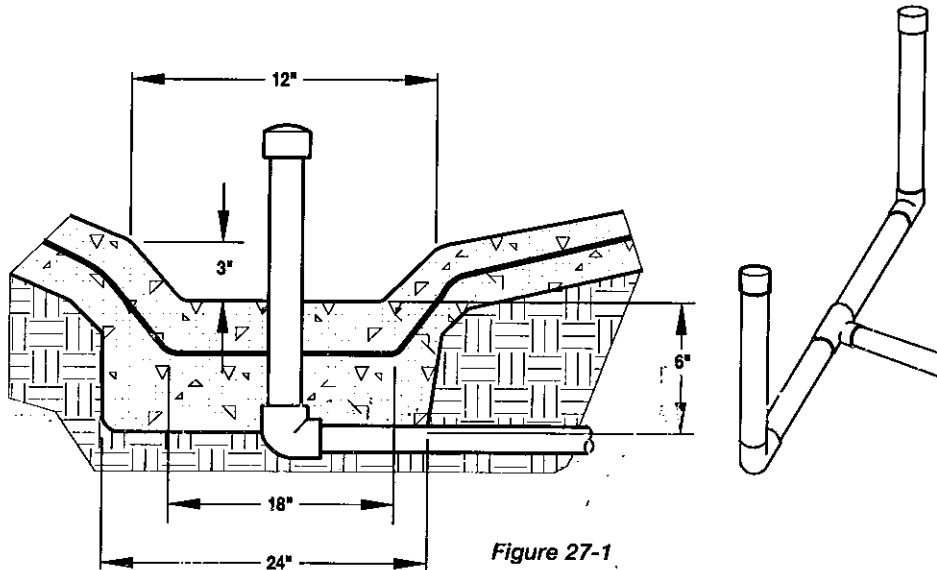


Figure 27-1

Plumbing The QuikSkim Venturi Skimmer

1. Set the QuikSkim venturi skimmer as you would install a conventional skimmer.

2. **SUCTION LINE** – The suction line out of the QuikSkim must be plumbed with 2" Schedule 40 PVC.

3. **RETURN VENTURI LINE** – Water is directed to the QuikSkim by installing a Tee fitting with a 1-1/2" to 2" reducer just ahead of the in-floor cleaning Water Valve and installing a 1-1/2" ball valve or gate valve just below the Tee (See Figure 16-2 & 23-1). This valve is to be fully open during the operation of the QuikSkim which will take no more than 5 to 6 gpm through the venturi orifice. **If a DE filter is used on this system, this valve must be closed while charging the filter with DE through the venturi skimmer.**

4. Run a 1-1/2" line from the ball valve or gate valve to

the rear port of the QuikSkim. Glue the line to the QuikSkim after installing and gluing a 2" to 1-1/2" reducer fitting into the rear port of the QuikSkim. If this line must be pressure tested, install a 2" plug in the venturi fitting and tighten it before step #5. **(DO NOT OVERTIGHTEN!)**

5. Glue an 18" length of 2" Schedule 40 PVC into the discharge port of the QuikSkim and cap the end to prevent gunite from entering. (See Figure 28-1)

NOTE: For steps 4 and 5 use ABS to PVC cement.

PRESSURE TESTING

6. To pressure test the 1-1/2" line from the equipment to the QuikSkim, install a 2" threaded plug into the inlet

fitting on the inside of the skimmer. Install a second plug into the front suction port in the bottom of the skimmer so that the suction line can be pressure tested at the same time. **(Do not over-tighten these plugs!)**

FINISHING

7. Before plastering or applying the finish surface to the pool, cut the 1-1/2" discharge line so that it will finish flush to the final finish surface. **Do not obstruct this line with an eyeball, main drain covers or other type of**

fitting. It must remain fully open to assume proper functioning.

8. Before plaster, remove the test plugs and install the threaded venturi fitting into the threaded return fitting inside the QuikSkim.

9. Install the 3" long PVC sleeve, that is supplied, into the discharge fitting directly opposite the venturi fitting. **DO NOT GLUE THE 3" SLEEVE INTO THE FITTING!!** This must remain unglued so that a threaded plug can be threaded into the bottom port in the event that winterizing is necessary (See Figure 28-1).

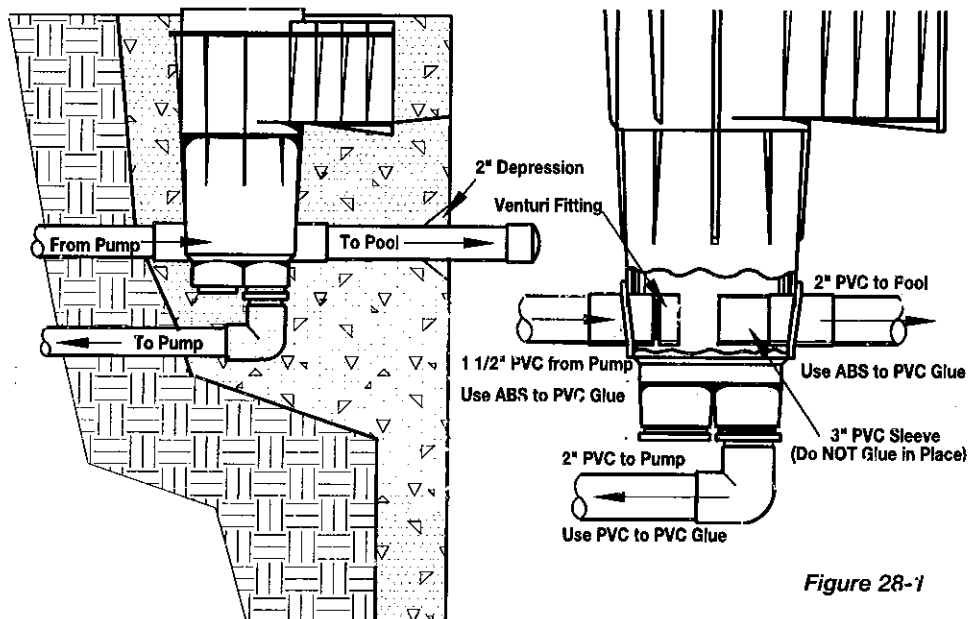
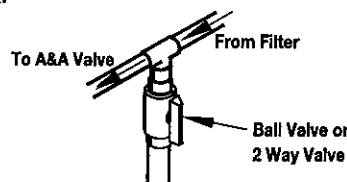


Figure 28-1



Operating The QuikSkim

1. The QuikSkim venturi skimmer may be operated simultaneously with the normal skimmer function or the suction from the pump may be shut off allowing only venturi powered skimming action taking place. Either way, a much stronger skimming action will result as compared to a standard skimmer.

2. If the QuikSkim is installed on a pool that also has a **Quik LeafVac**, the suction through the main drains and the LeafVac may be greatly enhanced by restricting the

suction from the skimmer (see the NOTE below). This action will result in maximum debris removal from the bottom of the pool through the main drains while the QuikSkim efficiently removes the surface debris.

NOTE: The valve controlling the suction through the skimmer should be left slightly open. There are occasions when the pump may be "starved" when 100% of the suction is coming through the main drains only.

Plastering Or Finishing The Pool Surface

1. With the A&A cleaning heads installed in the floor fittings and the metallic plaster shields still in place, plastering may begin. It is important that the plaster shields remain in place while the plaster application and finishing takes place to avoid plaster entering the A&A heads. After final troweling is complete, peel off the shields and make final touch-up to the surface immediately around the floor fitting where necessary.

2. IMPORTANT – AGGREGATE OR PEBBLE TYPE FINISHES!! Do not remove the plaster shields until after the final acid wash.

3. IMPORTANT – A&A MAX, SELECT OR ULTRA INSTALLATIONS - Special attention must be given to these installations. Please follow the instructions to assure that each installation is completed properly.

Failure to follow these directions may result in ineffective installations.

a) LeafVac – The main drain covers that are supplied with the LeafVac **must be used** or the MAX or SELECT System will not function properly. The removal of debris through the main drains is totally dependent up on the correct main drain covers. **NO other brand of main drain cover will work!!!**

b) QuikSkim - The 2" return line plumbed through the pool wall just below the skimmer throat must be finished flush with the finished plaster wall.

Absolutely NO fitting, cover, main drain cover, grate, etc. is to cover the outlet!

Starting-Up The MAX, SELECT Or ULTRA Systems

1. Install the venturi into the discharge fitting inside the venturi skimmer. (See figure 28-1, Pg. 28)

2. Install the short piece of PVC pipe into the discharge port of the venturi skimmer. (See figure 28-1, Pg. 28)

3. If the pool is a plaster or marcite pool, set aside the skimmer basket with the silt sock for installation after the plaster dust has been cleared from the pool water (plaster dust will plug up the fine mesh in the silt sock).

4. Adjust the pump suction so that it is pulling 50/50

between the skimmer and main drains and close the return line valve to the venturi skimmer. This will allow the surface water as well as water from the bottom of the pool to be filtered of plaster dust.

5. After the plaster dust is cleared from the pool, put the skimmer basket with the silt sock into the skimmer and open the return water to the skimmer venturi. Turn the pump suction to approximately 90% main drain and 10% skimmer.

Winterizing The A&A System

In geographic areas where freezing may be possible, it will be necessary to take precautionary steps to prevent any damage to the A&A System. To prevent damage to the system, all the water in the feed lines that are located above the frost line and in the water valve must be removed.

1. Remove the upper housing from the top feed valve or the lid from the low profile valve and remove all the internal parts and store them for reinstallation in the Spring.
2. Remove the cleaning heads from the pool and /or spa that are above the frost line and store them until Spring also.

3. Using either a portable tank-type air compressor or a 2 hp spa blower, blow all the water out of each of the ports of the A&A water valve one at a time. Once a line is cleared of all the water, plug that port of the water valve and each of the floor fittings where the cleaning heads were removed in Step #2.

4. For those feed lines that supply cleaning heads below the frost line, fill the lines with air and quickly install winterizing plugs in that port of the water valve to create air locks that will prevent the water from rising back up the lines to above the frost line.

Winterizing The MAX, SELECT or ULTRA Systems

1. Follow steps #1 through #4 above.

2. Remove the lid from the LeafVac canister and set the 3-way valve on the lines into the LeafVac so the skimmer side is open and the main drain side is closed. With the blower, blow the water from the suction port in the bottom of the skimmer back through the LeafVac canister and place a 2" test plug in the suction port of the skimmer. Switch the 3-way valve on the LeafVac from skimmer to main drains.

3. With the compressor or spa blower, blow all the water from the LeafVac canister to the main drains through the upper port inside the LeafVac canister. Once the water has been blown out to the main drains, install a 2" plug in the upper port of the canister to prevent water from rising back up into the pipe.

4. After the filter has been drained for winterizing, turn the pump on a short time to evacuate all the water from the LeafVac canister. While the pump is still running, quickly install another 2" test plug in the bottom threaded fitting of the canister. Shut the pump off. The filter should drain a little more water that was pulled from the LeafVac.

5. After lowering the pool water level below the skimmer, remove the venturi fitting from the inlet fitting of the venturi skimmer. This will allow the water in the return line to the skimmer to drain into the skimmer when the return header is drained back at the pool equipment.

Tsunami™ 'T' Valve Retrofit Installation Instructions

Parts included in the 'T' Valve Retrofit Kit (T Kit): 5 or 6 'T' Valve Clip Assemblies; Clip Elevation Tool; Adhesive; Assembled Gear Train; 2 Anti-Friction Washers; O-Ring; 2 Impeller Shims; Impeller.

1. Read complete instructions carefully prior to installing parts!

2. Disassemble the existing water valve and remove all the internal parts.

3. Acid wash the water valve base to remove any and all foreign material from the surfaces that are to be glued or scrape those surfaces with a knife blade.

4. Check the 'T' Valve Clip Assembly to assure that the swivel pin does not extend beyond either side of the clip. Adjust the pin if necessary. It is important that the swivel pin is flush with both sides of the clip.

5. Before applying adhesive, slide the clip assembly into the water valve port to assure a proper fit. Open and

close the 'T' valve to make sure there are no obstructions to a smooth operation. Make sure that glue surfaces are reasonably dry.

6. If item 5 above is OK, apply the A&A supplied adhesive to both sides of the clip surfaces (see Figure 31-1), then slip the clip assembly into the water valve base. Note: Do not substitute any other adhesive for this application. **Use the supplied adhesive only! (For best results, apply, then mix the two parts of the adhesive from the tubes right onto the clips, as they are ready to install. Follow this procedure separately for each clip since the cure time for the adhesive is very short.)**

7. Immediately place the Clip Elevation Tool (supplied) in front of the port and under the 'T' valve elevator pin (see

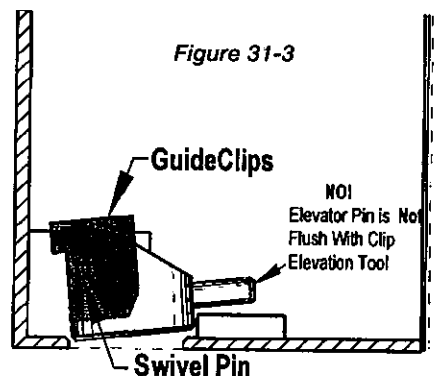
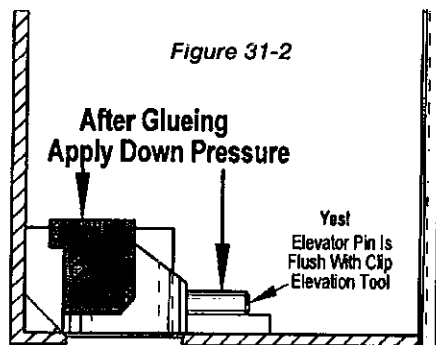
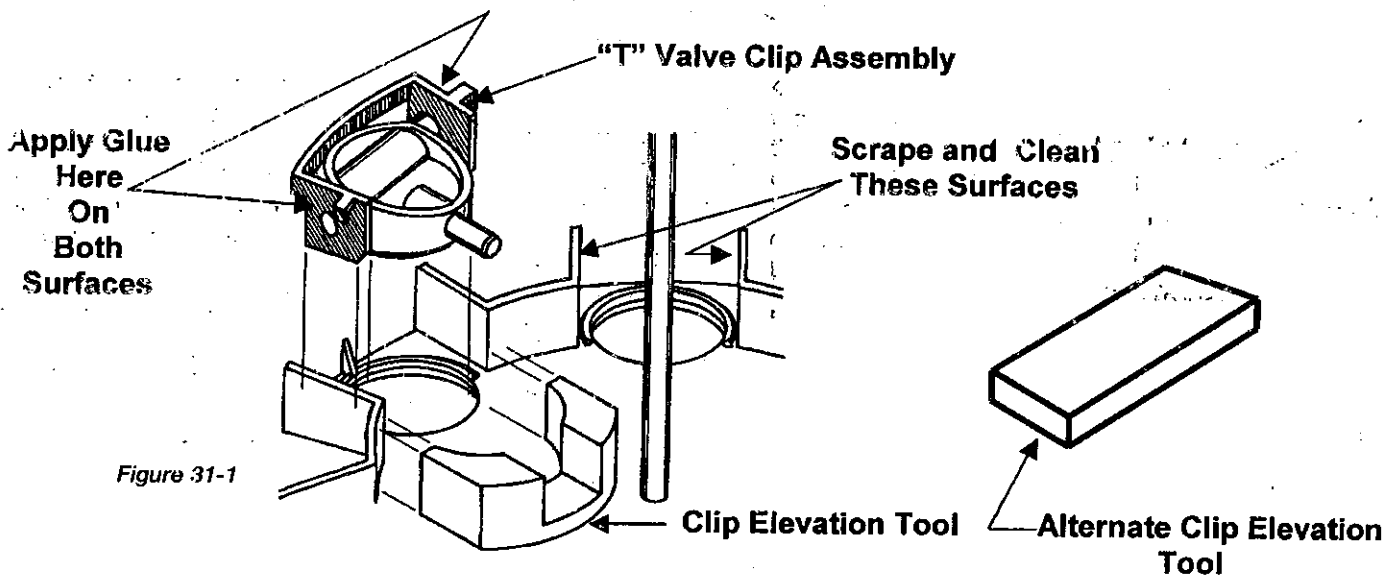


Figure 31-1). Press down the elevator pin until contact is made with the Clip Elevation Tool and at the same time pushing down on the gray frame of the 'T' Valve Clip Assembly to assure that it is properly seated on the water valve base (see *Figures 31-1 and 31-2*). Carefully remove the Clip Elevation Tool. **Note: Correct seating of the 'T' Valve is the essential part of proper water valve operation. Do not be concerned with the location of the top guides of the clip.**

8. Perform steps 1 through 7 on the remaining ports.
9. Complete the water valve installation by either:
 - a. Separating the cam from the gear plate, then installing it under the 'T' Valve elevator pins, and replacing the gear plate onto the cam, while adding the two impeller shims, then the impeller, **OR**,
 - b. Carefully place the cam under the 'T' Valve elevator pins with your fingers through the holes provided in the

gear plate, while adding the two impeller shims, then the impeller.

10. Wait at least 10 minutes before reinstalling the water valve top. (It would be ideal if the glued surfaces could air dry for at least 30 minutes. Weldon 725 is a very fast drying glue that will not contaminate when used in damp areas. However, the longer time it has to cure the better.) Turn the system on for one complete rotation of the valve to check for proper function.
11. Advise the customer that the system will be off for one day to allow the glued surfaces to properly cure. **Note:** You may filter the pool water by diverting the flow to surface returns if they are available. However, no water should flow through the water valve for at least 24 hours.
12. After the 24 hour curing period, the system may be operated normally.

Clearing The Lines With The 1-1/2" Standard Or Low Profile 'T' Valve

It is imperative that all lines from the actuator valve be cleared of debris before the pool is turned over to the customer. This will assure that there will be no cleaning head malfunction due to debris plugging or restricting flow.

Opening the Standard or Low Profile 'T' Valve

1. Make certain that the pressure has been released from the system before removing the band clamp from the actuator valve.
2. Remove the clamp knob and then remove the brass pressure test lock nut from the band clamp and discard it. (See *Figure 32-1*)

3. Remove the lid or upper housing from the actuator valve and remove the gear plate and impeller. **Note:** there is a 4" diameter PVC ring under all the 'T' valves. This ring held the 'T' valves up during the pressurizing process. Remove that ring and discard it. The water valve is now prepared for clearing the lines prior to setting the cleaning heads.

4. **NOTE:** if the lines are not going to be cleared until after the pool start-up, see section "CLEARING THE LINES AFTER START-UP". Replace the gear plate, impeller and lid or upper housing and re-install the band-clamp. Tap around the band-clamp as you tighten the clamp knob to assure a good seal. The system is now ready to start-up.

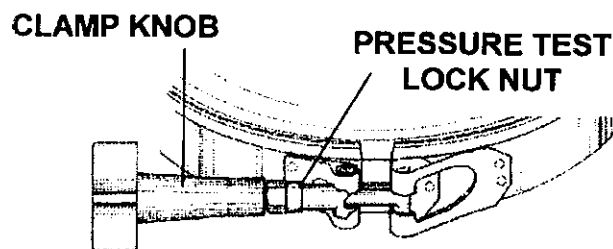


Figure 32-1

Clearing The Lines *Prior* To Final Interior Finish

Special equipment required. Short section of garden hose and a wet/dry shop vacuum with a minimum of a 5 hp motor.

1. Prepare a short section of 5/8" garden hose (approximately 3' long) with a female fitting on one end and plain hose on the other end. This is to attach to the end of a garden hose so that the plain end can be flattened and extended down into one port at a time in the actuator valve.
2. With an A&A layout showing the heads on each zone, select the zone and riser in the deepest part of the pool and cut the cap off that riser **only**. Water will flow out of that riser and drop the water level in one of the ports of the actuator valve.
3. At the actuator valve, place the flattened, plain end of the garden hose, previously prepared, into the port from which the cap was just cut off and turn on the water allowing it to run into that port.
4. Place the shop vac hose into the riser that was cut off and let it run until it begins to pull air. This will lift debris up out of that portion of the zone. Remove the vac hose and install a 2" plug into the riser.
5. Using the A&A plan, determine the next deepest riser that is on the same zone and cut the cap off that riser. Repeat the above procedure for each remaining riser on that zone. **Note:** Each riser on that zone will have to be

plugged until the last one is vacuumed out.

6. After all the risers on that zone have been vacuumed out and the debris has been removed, the 2" plugs may then be removed and used on the next zone.
7. Cut the cap off the lowest riser from the next zone, then return to the actuator valve and insert the garden hose into that corresponding zone (where the water level is lower). Repeat the above procedures until all the zones have been cleared.
8. Glue the cleaning heads in place per the **A&A Installation Manual** instructions. The actuator valve can now be re-assembled. **Note:** In order to allow proper functioning of the water actuator valve, the 4" PVC ring must be removed and discarded.
9. Replace the lid or upper housing and re-install the band-clamp. **Do not replace the brass pressure test lock nut, use only the clamp knob.** Tap around the band-clamp as you tighten the clamp knob to assure a good seal. The system is now ready for start-up.

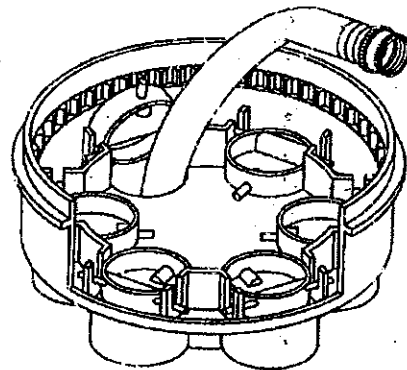


Figure 33-1

Clearing The Lines *After* Start-up

1. With the A&A plan, determine which heads are connected to each zone of the actuator valve. With the installation tool on the end of a brush pole, remove one cleaning head from each zone.
2. Turn the pump **on** and allow the valve to cycle through all 5 or 6 zones, then remove one more cleaning head from each zone and replace it into the previous fitting from which a head had been removed. This will allow all the water to flow from only one riser at a time. **Do not remove all the heads or more than one head at a time from any zone.**
3. Continue doing this until all of the cleaning heads have been removed and debris flushed from each zone. The last set of heads can now be replace.