SUBMERGED, MULTIPLE AND SINGLE SUCTION OUTLET INSTRUCTIONS

IMPORTANT SAFETY INSTRUCTIONS FOR
10AVRxxx, 10AVxxx, SUN18xxx, SUNA18xxx, SUN18HPHxxx, WAV24xxx, 24xxx, 1216xxx, R1216xxx, 914xxx, R914xxx, A8Rxxx, A8xxx, 8AVxxx, LP8AVxxx, RFS9xxx, RFS12xxx, RWAV9xxx, RWAV12xxx, SUN9xxx, SUN12xxx, WAV9xxx, WAV12xxx, WAV18xxx, A10RCFRxxx, 8FUWxxx, 10LTxxx, 10LTDxxx

(*** = COLOR SUFFIX)

MEETS OR EXCEEDS ANSI/APSP 16-2011
ANTI-ENTRAPMENT/ANTI-VORTEX

READ AND FOLLOW ALL INSTRUCTIONS

IMPROPER INSTALLATION OR USE OF THIS PRODUCT MAY PRESENT A RISK OF HAIR OR BODY ENTRAPMENT AND DROWNING. Install this equipment in accordance with the instructions provided. Use only with the components and mounting hardware provided. FAILURE TO FOLLOW THESE INSTRUCTIONS AND/OR USE WITH COMPONENTS NOT PROVIDED BY AQUASTAR POOL PRODUCTS AND INTENDED TO BE USED WITH THIS PRODUCT MAY RESULT IN IMPROPER POSITIONING OR FUNCTIONING OF SUCTION OUTLET AND MAY CAUSE SEVERE PERSONAL INJURY OR DEATH.

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE

• If not a single, unblockable outlet, in the event of one suction outlet being completely blocked, the remaining suction outlets serving the system shall have a flow rating capable of the full flow of the pump(s) or the specific suction system. If in doubt about the rating and/or head loss curve of your system, consult a qualified pool or spa professional and/or your respective equipment manufacturer(s). Also, double check with your local building/health authorities regarding single vs. multiple drain installations, etc.

• All sizes of connecting pipe are acceptable, pending velocity and GPM calculations. The larger, the better! DO NOT exceed maximum flow rate(s) of cover or pipe(s) flow rate(s), whichever is less.

• Replace cover and screws within 5 years.

• SPECIAL NOTES:
  - Pool finish should never exceed top of frame.
  - Taper pool finish down and away from top (or lower) of frame.
  - Top of grate should never be installed lower than the pool finish.
  - Take special notice when retrofitting into an existing frame where possible existing multiple layers of re-plastering have created a concave situation, either chip or grind down old surface or install new frame at higher level. Use of bushing kit may also be required to achieve proper elevation.

MAXIMUM RECOMMENDED SYSTEM FLOW RATE BY PIPE SIZE

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>1½&quot;</th>
<th>2&quot;</th>
<th>2½&quot;</th>
<th>3&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Rate in GPM</td>
<td>45</td>
<td>80</td>
<td>110</td>
<td>160</td>
</tr>
</tbody>
</table>

ALL MODELS LISTED BELOW = ANTI-ENTRAPMENT/ANTI-VORTEX AND FOR SINGLE OR MULTIPLE USE

MAX FLOW RATES (PER OUTLET) MOUNTING POSITIONS (***=COLOR SUFFIX)

<table>
<thead>
<tr>
<th>Model</th>
<th>WAV24xxx</th>
<th>24xxx</th>
<th>1216xxx (and R1216xxx)</th>
<th>914xxx (and R914xxx)</th>
<th>SUN18HPHxxx (min 6&quot; pipe size)</th>
<th>10AVRxxx (and 10AVRDDSxxx, 10AVRDDDxxx) (with solid riser ring) (min 2&quot; pipe size)</th>
<th>8AVxxx (and 8AVSBxxx, 8AVSBACxxx, 8AVSDSBxxx, 8AVRxxx) (with solid riser ring) (min 2&quot; pipe size)</th>
<th>10LTxxx (min. 2&quot; pipe size)</th>
<th>10LTDxxx (min. 2&quot; pipe size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor</td>
<td>1444 GPM @ 1.3 fps</td>
<td>1531 GPM @ 1.4 fps</td>
<td>460 GPM @ 1.46 fps</td>
<td>560 GPM @ 2.1 fps</td>
<td>1000 GPM @ 3.1 fps</td>
<td>166 GPM @ 4.8 fps</td>
<td>145 GPM @ 3&quot; sump / 140 GPM -sumpless @ 2.9 fps</td>
<td>60 GPM @ 7 fps</td>
<td>125 GPM @ 1.4 fps</td>
</tr>
<tr>
<td>Wall</td>
<td>1444 GPM @ 1.3 fps</td>
<td>1531 GPM @ 1.4 fps</td>
<td>445 GPM @ 1.4 fps</td>
<td>300 GPM @ 1.2 fps</td>
<td>644 GPM @ 2.0 fps</td>
<td>96 GPM @ 2.8 fps</td>
<td>84 GPM @ 1.7 fps</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

MAX FLOW RATES (PER OUTLET) MOUNTING POSITIONS (***=COLOR SUFFIX)

<table>
<thead>
<tr>
<th>Model</th>
<th>WAV18xxx (with vented riser ring)</th>
<th>WAV12xxx (and RWAV12xxx) (with vented riser ring)</th>
<th>WAV9xxx (and RWAV9xxx) (with vented riser ring)</th>
<th>SUN9xxx (with vented riser ring)</th>
<th>SUN12xxx (with vented riser ring)</th>
<th>10AVxxx (and RFS12xxx, 10AVDDSxxx, 10AVDDDxxx) (with vented riser ring)</th>
<th>8FUWxxx (and 8FUWSDxxx, 8FUWSBxxx, 8FUWBxxx, 8FUWDDxxx, 8FUWUxxx) (with vented riser ring)</th>
<th>A10RCFRxxx (and A10RCFRxxx) (min 2&quot; pipe size)</th>
<th>LP8AVxxx (and LP8SBxxx, LP8SBACxxx)</th>
<th>LP8SBVxxx (with vented riser ring)</th>
<th>SUNA18xxx (with vented riser ring)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor</td>
<td>628 GPM @ 1.1 fps</td>
<td>361 GPM @ 1.3 fps</td>
<td>224 GPM @ 1.5 fps</td>
<td>160 GPM @ 2.2 fps</td>
<td>232GPM @ 1.8 fps</td>
<td>206 GPM @ 4.1 fps</td>
<td>110 GPM @ 2.2 fps</td>
<td>170 GPM @ 1.7 fps</td>
<td>100 GPM @ 2.5 fps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wall</td>
<td>628 GPM @ 1.1 fps</td>
<td>361 GPM @ 1.3 fps</td>
<td>224 GPM @ 1.5 fps</td>
<td>128 GPM @ 1.7 fps</td>
<td>232 GPM @ 1.8 fps</td>
<td>96 GPM @ 1.9 fps</td>
<td>106 GPM @ 2.1 fps</td>
<td>164 GPM @ 1.7 fps</td>
<td>70 GPM @ 1.7 fps</td>
<td>538 GPM @ 1.5 fps</td>
<td></td>
</tr>
</tbody>
</table>

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Rev 102411
INSTALLATION LAYOUTS

A. Requires Phillips screw driver. Hand tighten only. Do not use electrical or air drills.
B. See Fig. 1 for installation layout with manufactured sump
C. See Fig. 2 for installation layout without manufactured sump (Field-fabricated sump)
D. Measure from underside of high point of the cover to the top of pipe(s) to determine proper sump depth.
E. Top of all suction outlets shall not exceed 2” above pool floor or wall.

MANUFACTURED SUMP INSTALLATION (DUAL PORT)

IMPORTANT
- Single or Multiple drain use.
- Models: SB, DD, or DDSB (SB = Std Sump Bucket, DD = Deep Sump/Frame, DDSB = Deep Sump Bucket) with 10AVRxxx, 10AVxxx, 10LTxxx, 10LTDxxx, 8HPxxx, 8AVxxx, 8AVxxx, LP8AVxxx, WAV9xxx, WAV12xxx, SUN9xxx, SUN12xxx, 1216xxx, R1216xxx, R914xxx, A8Rxxx, A8Rxxx, 8FUWxxx (AV=Anti-Vortex)
- NOTE: 8” round SB available in 3 styles: (6” Deep)
  - Regular collar (frame) with side/bottom ports
  - Adjustable collar (frame) (AC) with side/bottom ports
  - Vinyl/fiberglass (V) with side/bottom ports
- NOTE: 9” and 12” square and 12” round DDSB available in 1 style: (12” Deep)
  - Regular Collar (frame) with ports on bottom only (No Side Port)

FIELD FABRICATED SUMP INSTALLATION (SINGLE OR DUAL PORT)

IMPORTANT
- At IAPMO (a nationally recognized testing lab), all Aquastar suction outlet covers have been tested with 3” deep sumps (unless otherwise indicated).
- “A” and/or “B” should be a min. 3” to bottom of cover. (except: SUN18HPhxxx, WAV18xxx, SUNA18xxx - 6”, WAV24xxx and 24xxx - 12”, A8Rxxx at 140 GPM-Floor / 84 GPM-Wall, A10RCFRxxx, A10RCFRRxxx - Sumplex)
- Second Line can be on bottom area.
- Single or Multiple drain use.
- Models: 10AVRxxx, 10AVxxx, 8AVxxx, LP8AVxxx, WAV9xxx, WAV12xxx, WAV9xxx, WAV12xxx, WAV24xxx, 24xxx, RF89xxx, RFS12xxx, WAV18xxx, SUN9xxx, SUN12xxx, 1216xxx, R1216xxx, R914xxx, A8Rxxx, A8xxx, SUN18HPhxxx, A10RCFRxxx, A10RCFRRxxx, SUNA18xxx, 8FUWxxx, 10LTxxx, 10LTDxxx (AV=Anti-Vortex)

WARNING! SUCTION ENTRAPMENT HAZARD

In increasing pump size will increase flow. When in doubt, consult your pool and spa professional. NEVER use a pool or spa that has a missing or broken suction outlet cover. Using a pool or spa with a missing or broken suction outlet cover can result in hair or body entrapment which can cause severe bodily injury or death. The vacuum in suction outlets and/or suction outlet covers which are damaged, broken, cracked, missing or unsecured can cause severe injury and/or death due to the following entrapment hazards: Hair entrapment – Hair can become entangled in suction outlet cover. Limb entrapment – A limb inserted into an opening of a suction outlet sump or suction outlet cover that is damaged, broken, cracked, missing or not securely attached can result in a mechanical bind or swelling of the limb. Body suction entrapment – A negative pressure applied to a large portion of the body or limbs can result in an entrapment. Evisceration/dismemberment entrapment – A negative pressure applied directly to the intestines through an unprotected suction outlet sump or suction outlet cover which is damaged, broken, cracked, missing, or unsecured can result in evisceration/dismemberment entrapment. Mechanical entrapment – There is a potential for jewelry, swimsuit, hair decorations, finger, toe or knuckle to be caught in an opening of a suction outlet cover resulting in mechanical entrapment.

After installation of fittings, if a gap exists between pool finish and base of cover it must be filled in with a 2-part epoxy to avoid finger or other entrapment.

WARNING! TO REDUCE THE RISK OF ENTRAPMENT HAZARD

If not an approved single, unblockable outlet, a minimum of two functioning suction outlets per pump must be installed. Suction outlets in the same plane (i.e. floor or wall) must be installed a minimum of three feet (3’) (1 meter) apart, as measured from center point to center point. Dual suction fittings shall not be located on seating areas or on the backrest for such seating areas. If any suction outlets are located closer they shall be located on two different planes (i.e. one on the bottom and one on the vertical wall, or one each on two separate vertical walls). The maximum system flow rate shall not exceed the flow rating of any listed (per ANSI/APSP 16-2011) suction outlet cover installed. Never use pool or spa if any suction outlet component is damaged, broken, cracked, missing or not securely attached. Replace damaged, broken, cracked, missing or not securely attached suction outlet components immediately. In addition to two or more suction outlets per pump installed in accordance with latest APSP, IAF Standards and CPSC guidelines, follow all national, state and local codes applicable. Use only transitional (typically green) glues when attaching PVC pipe to ABS fittings. Use gray medium set glue when attaching PVC pipe to our PVC based skimmers and double deep sump buckets. In both cases, do not ever use blue glue or related hot glues, clear glues or any fast setting cement.

WARNING! – Failure to remove pressure test plugs and/or plugs used in winterization of the pool/spa from the suction outlets can result in an increased potential for suction entrapment as described above.

WARNING! – Failure to keep suction outlet components clear of debris, such as leaves, dirt, hair, paper and other material can result in an increased potential for suction entrapment as described above.

WARNING! – Suction outlet components have a finite life, the cover/grate should be inspected before each use of facility and replaced at least every five (5) years or if found to be damaged, broken, cracked, missing, not securely attached or missing screws. DO NOT use facility until corrected!

As the manufacturer, AquaStar Pool Products, Inc., hereby certifies that their suction outlet and drain covers meet or exceed the requirements of the Virginia Graeme Baker Pool & Spa Safety Act, VGB 2008 and ANSI/APSP 16-2011 standards and safety regulations as set forth by the Consumer Products Safety Commission.

A copy of this certificate is available on AquaStar Pool Products Inc.’s website under news & information: www.aquastarpoolproducts.com
SUMPLESS, BULKHEAD POOL & SPA SUBMERGED SUCTION OUTLET INSTRUCTIONS

VGB SERIES

IMPORTANT ADDITIONAL SAFETY INSTRUCTIONS FOR 4HPxxx, 4SPAxxx, 6HPxxx, 8HPxxx, R8HPxxx

(*** = COLOR SUFFIX)

READ AND FOLLOW ALL 4 PAGES OF INSTRUCTIONS

MEETS OR EXCEEDS ANSI/APSP 16-2011 ANTI-ENTRAPMENT/ANTI-VORTEX

MAX FLOW RATES (PER OUTLET) MOUNTING POSITIONS (***=COLOR SUFFIX)

<table>
<thead>
<tr>
<th>Model</th>
<th>4HPxxx</th>
<th>4SPAxxx (Self Contained Spa Fitting-2 outlets)</th>
<th>4HP &amp; 4SPA TOTAL OPEN AREA</th>
<th>6HPxxx (2&quot;) (and 8HPxxx, R8HPxxx)</th>
<th>6HPxxx (1 1/2&quot;) (and 8HPxxx, R8HPxxx)</th>
<th>6HP TOTAL OPEN AREA</th>
<th>8HP &amp; R8HP TOTAL OPEN AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>224 GPM @ 6.3 fps</td>
<td>177 GPM @ 5.0 fps</td>
<td>10.4 sq. in.</td>
<td>15.8 sq. in.</td>
</tr>
<tr>
<td>Wall</td>
<td>56 GPM @ 3.5 fps</td>
<td>100 GPM @ 3.0 fps</td>
<td>5.2 sq. in.</td>
<td>224 GPM @ 6.3 fps</td>
<td>122 GPM @ 3.4 fps</td>
<td>10.4 sq. in.</td>
<td>15.8 sq. in.</td>
</tr>
</tbody>
</table>

SPECIAL NOTES FOR HP FITTINGS

• 6HP, 8HP & R8HP MAX FLOW IS 224 GPM ALLOWED FOR BOTH FLOOR AND WALL WITH 2" OR GREATER PIPE SIZES
• WHEN 1.5" PIPE SIZE IS USED, MAX FLOW RATE ALLOWED FOR THE 6HP, 8HP & R8HP IS 177 GPM AND 122 GPM FOR FLOOR AND WALL RESPECTIVELY
• 4HP MAX FLOW IS 56 GPM ALLOWED ONLY FOR WALL APPLICATIONS
• 4SPA IS FOR USE IN SELF-CONTAINED, FACTORY-MANUFACTURED PORTABLE SPAS AND HOT TUBS ONLY AND FOR MULTIPLE DRAIN USE ONLY. FLOW RATE ABOVE IS FOR TWO SUCTION OUTLETS.
• NO SUMP IS REQUIRED. AQUASTAR'S "SUMPLESS SERIES" ARE DESIGNED AND TESTED FOR SAFE FLUSH-MOUNT INSTALLATIONS TO TILE, FIBERGLASS, ACRYLIC, VINYL AND STEEL AS WELL AS PLASTER, PEBBLE, CONCRETE, ETC.
• ABS BULKHEAD ADAPTER FITTING MUST BE SECURELY ATTACHED TO PLUMBING WITH PROPER GLUE. USE ABS TO PVC TRANSITIONAL GLUES (SUCH AS: OATEY ® WELD-ON ® AND OTHER GREEN NSF GLUES)
• DO NOT USE CLEAR, "HOT", "BLUE" OR ANY FAST SET GLUES WITH ANY AQUASTAR POOL PRODUCTS
• ESPECIALLY WHEN RETRO-FITTING, EXTRA SECURE INSTALLATIONS CAN BE OBTAINED BY APPLYING WET AND DRY EPOXY, SILICONE, ETC. TO UNDERSIDE OF BASE PLATES.
• AFTER INSTALLATION OF BULKHEAD ADAPTER FITTINGS, IF A GAP EXISTS BETWEEN POOL FINISH AND BASE OF COVER IT MUST BE FILLED IN WITH A 2-PART EPOXY TO AVOID FINGER OR OTHER ENTRAPMENT.