



SUBMERGED, MULTIPLE AND SINGLE SUCTION OUTLET INSTRUCTIONS

IMPORTANT SAFETY INSTRUCTIONS FOR MODELS:

10AVRxxx, 10AVxxx, SUN18HPHxxx, WAV24xxx, 24xxx, 1216xxx, 914xxx, A8Rxxx, 8AVxxx, LP8AVxxx, RFS9xxx, RFS12xxx, P9xxx, P12xxx, P18xxx, P24xxx, WAV9xxx, WAV12xxx, WAV18xxx, A10RCFRxxx, 8FUWxxx, 10LTxxx, 10LTDxxx, 6HPxxx, 4HPxxx, 8HPxxx, R8HPxxx, 8MFxxx, R8MFxxx, 10MFxxx, 9MFxxx, R9MFxxx, 12MFxxx, R12MFxxx, 18MFxxx
(xxx = COLOR SUFFIX)

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

READ AND FOLLOW ALL INSTRUCTIONS

▲ WARNING!

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

Pipe Size	1½"	2"	2½"	3"
Flow Rate in GPM	45	80	110	160

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

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

Model	WAV24xxx	24xxx	1216xxx (and R1216xxx)	914xxx (and R914xxx)	SUN18HPHxxx (min 6" pipe size)	10AVRxxx (with solid riser ring) (min 2" pipe size)	A8Rxxx (with solid riser ring) (min 2" pipe size)	10LTxxx (min. 2" pipe size)	10LTDxxx (min. 2" pipe size)	8AVxxx (and RFS9xxx) (with vented riser ring)	10MFxxx (min 2" pipe size)	8MFxxx (min 2" pipe size)
Floor	1444 GPM @ 1.3 fps	1531 GPM @ 1.4 fps	460 GPM @ 1.46 fps	560 GPM @ 2.1 fps	1000 GPM @ 3.1 fps	166 GPM @ 4.8 fps	145 GPM -3" sump / 140 GPM -sumplless @ 2.9 fps	60 GPM @ .7 fps	125 GPM @ 1.4 fps	88 GPM @ 2.0 fps	158 GPM @ 1.6 fps	166 GPM @ 3.2 fps
Wall	1444 GPM @ 1.3 fps	1531 GPM @ 1.4 fps	445 GPM @ 1.4 fps	300 GPM @ 1.2 fps	644 GPM @ 2.0 fps	96 GPM @ 2.8 fps	84 GPM @ 1.7 fps	NA	NA	70 GPM @ 1.6 fps	162 GPM @ 1.7 fps	113 GPM @ 2.2 fps

Model	WAV18xxx (with vented riser ring)	WAV12xxx (with vented riser ring)	WAV9xxx (with vented riser ring)	P9xxx (with vented riser ring)	P12xxx (with vented riser ring)	10AVxxx (with vented riser ring)	8FUWxxx (min 2" pipe size)	P18xxx (with vented riser ring)	P24xxx	A10RCFRxxx (min 2" pipe size) (Sumplless)	R8MFxxx (min 2" pipe size)	9MFxxx (min 2 1/2" pipe size)
Floor	628 GPM @ 1.1 fps	361 GPM @ 1.3 fps	224 GPM @ 1.5 fps	270 GPM @ 2.1 fps	360 GPM @ 1.5 fps	206 GPM @ 4.1 fps	110 GPM @ 2.2 fps	740 GPM @ 1.5 fps	1428 GPM @ 1.5 fps	170 GPM @ 1.7 fps	146 GPM @ 2.9 fps	258 GPM @ 2.3 fps
Wall	628 GPM @ 1.1 fps	361 GPM @ 1.3 fps	224 GPM @ 1.5 fps	270 GPM @ 2.1 fps	360 GPM @ 1.5 fps	96 GPM @ 1.9 fps	106 GPM @ 2.1 fps	740 GPM @ 1.5 fps	1428 GPM @ 1.5 fps	164 GPM @ 1.7 fps	130 GPM @ 2.6 fps	274 GPM @ 2.4 fps

Model	R9MFxxx (min 2 1/2" pipe size)	12MFxxx (min 2 1/2" pipe size)	R12MFxxx (min 2 1/2" pipe size)	18MFxxx (min 3" pipe size)
Floor	258 GPM @ 2.3 fps	274 GPM @ 1.2 fps	274 GPM @ 1.2 fps	293 GPM @ .6 fps
Wall	274 GPM @ 1.3 fps	278 GPM at 1.3 fps	278 GPM at 1.3 fps	NA

INSTALLATION LAYOUTS

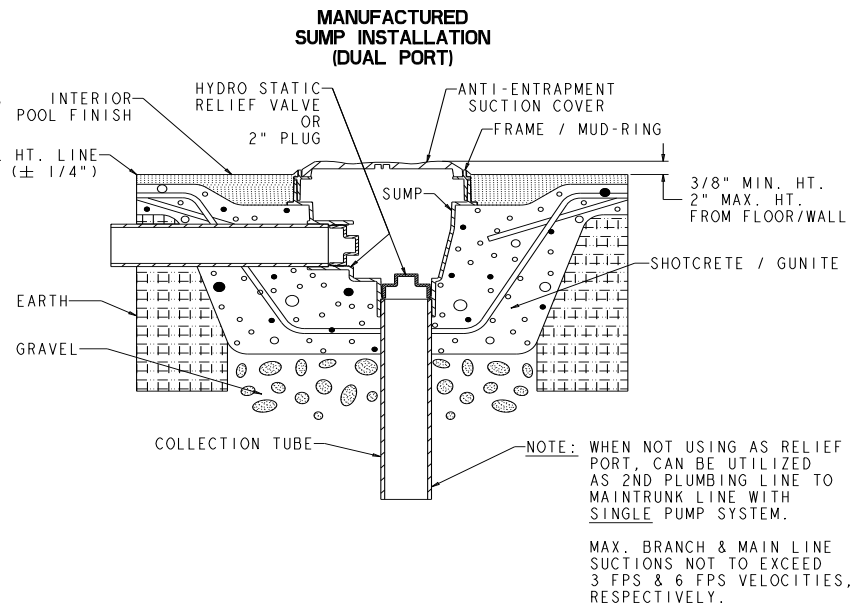
- Requires Phillips screw driver. Hand tighten only. Do not use electrical or air drills.
- See Fig. 1 for installation layout with manufactured sump
- See Fig. 2 for installation layout without manufactured sump (Field-fabricated sump)
- Measure from underside of high point of the cover to the top of pipe(s) to determine proper sump depth.
- 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 (A), or DDSB (B) (SB = Std Sump Bucket, DD (A) = Deep Sump/Frame, DDSB (B)= Deep Sump Bucket) with 10AVRxxx, 10AVxxx, 10LTxxx, 10LTDxxx, 8HPxxx, A8xxx, 8AVxxx, LP8AVxxx, WAV9xxx, WAV12xxx, SUN9xxx, SUN12xxx, 1216xxx, R1216xxx, 914xxx, R914xxx, A8Rxxx, 8FUWxxx, P9xxx, P12xxx, 8MFxxx, R8MFxxx, 9MFxxx, R9MFxxx, 10MFxxx, 12MFxxx, R12MFxxx, 18MFxxx
- 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 10" round DDSB (B, D, F) available in 3 styles: (12" Deep)
 - Regular Collar (frame) with 2 - 2 1/2" & 2" ports on bottom only (No Side Port) (B)
 - Regular Collar (frame) with 1 - 4" port on bottom only (No Side Port) (D)
 - Regular Collar (frame) with 1 - 6" port on bottom only (No Side Port) (F)

fig. 1

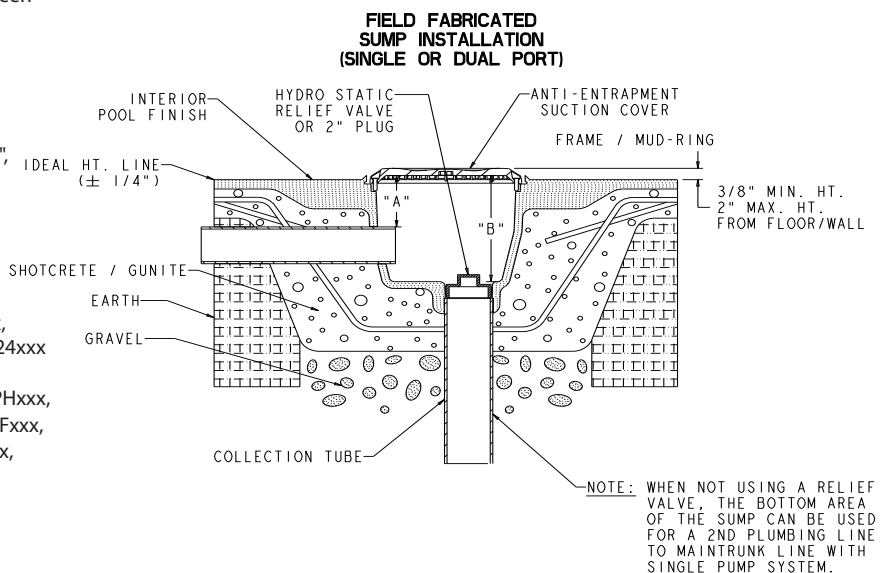


FIELD FABRICATED SUMP INSTALLATION (SINGLE OR DUAL PORT)

IMPORTANT

- At IAPMO and UL (nationally recognized testing labs), 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, P18xxx, 18MFxxx- 6", WAV24xxx, P24xxx and 24xxx - 12", A8Rxxx at 140 GPM-Floor / 84 GPM-Wall and A10RCFRxxx - Sumpless)
- Second Line can be on bottom area.
- Single or Multiple drain use.
- Models: 10AVRxxx, 10AVxxx, 8AVxxx, LP8AVxxx, WAV9xxx, WAV12xxx, P9xxx, P12xxx, P18xxx, P24xxx, WAV24xxx, 24xxx, RFS9xxx, RFS12xxx, WAV18xxx, 1216xxx, 914xxx, A8Rxxx, SUN18HPHxxx, A10RCFRxxx, 8FUWxxx, 10LTxxx, 10LTDxxx, 8MFxxx, R8MFxxx, 9MFxxx, R9MFxxx, 10MFxxx, 12MFxxx, R12MFxxx, 18MFxxx

fig. 2



For additional information on proper drain installation refer to The Association of Pool & Spa Professionals ANSI/APSP-7 Standard and the US Consumer Product Safety Commission Guidelines for Entrapment Hazard.

▲ WARNING! SUCTION ENTRAPMENT HAZARD

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/DISEMBOWELMENT 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/disebowelment 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 of compliance is available on AquaStar Pool Products Inc.'s website under news & information: www.aquastarpoolproducts.com

A Safe Drain is No Accident™



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SUMPLESS, BULKHEAD POOL & SPA SUBMERGED SUCTION OUTLET INSTRUCTIONS

VGB SERIES

IMPORTANT ADDITIONAL SAFETY INSTRUCTIONS FOR
4HPxxx, 4SPAxxx, 6HPxxx, 8HPxxx, R8HPxxx
(xxx = 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 (xxx=COLOR SUFFIX)							
Model	4HPxxx	4SPAxxx (Self Contained Spa Fitting-2 outlets)	4HP & 4SPA TOTAL OPEN AREA	6HPxxx (2") (and 8HPxxx, R8HPxxx)	6HPxxx (1 1/2") (and 8HPxxx, R8HPxxx)	6HP TOTAL OPEN AREA	8HP & R8HP TOTAL OPEN AREA
Floor	N/A	N/A	N/A	224 GPM @ 6.3 fps	177 GPM @ 5.0 fps	10.4 sq. in.	15.8 sq. in.
Wall	56 GPM @ 3.5 fps	100 GPM @ 3.0 fps	5.2 sq. in.	224 GPM @ 6.3 fps	122 GPM @ 3.4 fps	10.4 sq. in.	15.8 sq. in.

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.