VORTOX AIR TECHNOLOGY, INC.

Engineering • Design • Manufacturer

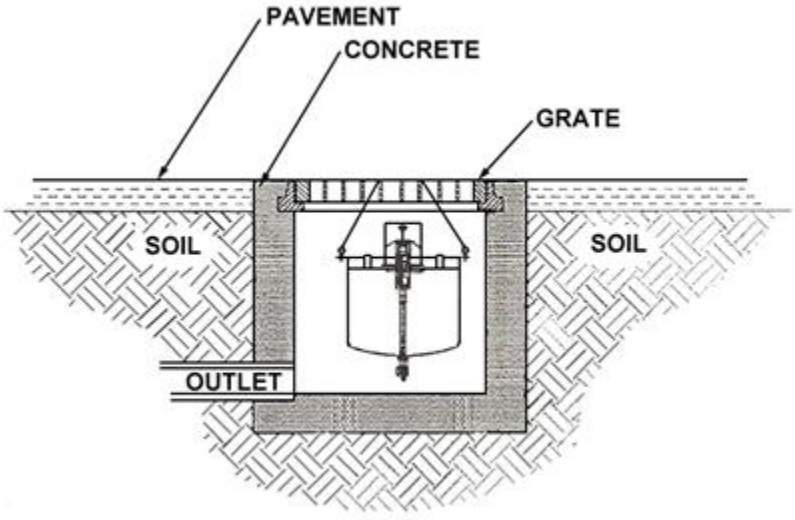
INSTRUCTIONS FOR THE ASSEMBLY AND INSTALLATION OF THE VORTOX LIQUID SAMPLER

I. SAMPLER SUSPENDED BY CABLE

The Vortox Liquid Sampler is a precision instrument manufactured of stainless steel, easy to install, use, and maintain. The ampler is available in standard 316L stainless steel ***or*** Teflon® coated 316L stainless steel on the internal surfaces of the Sampler where the effluent is captured.

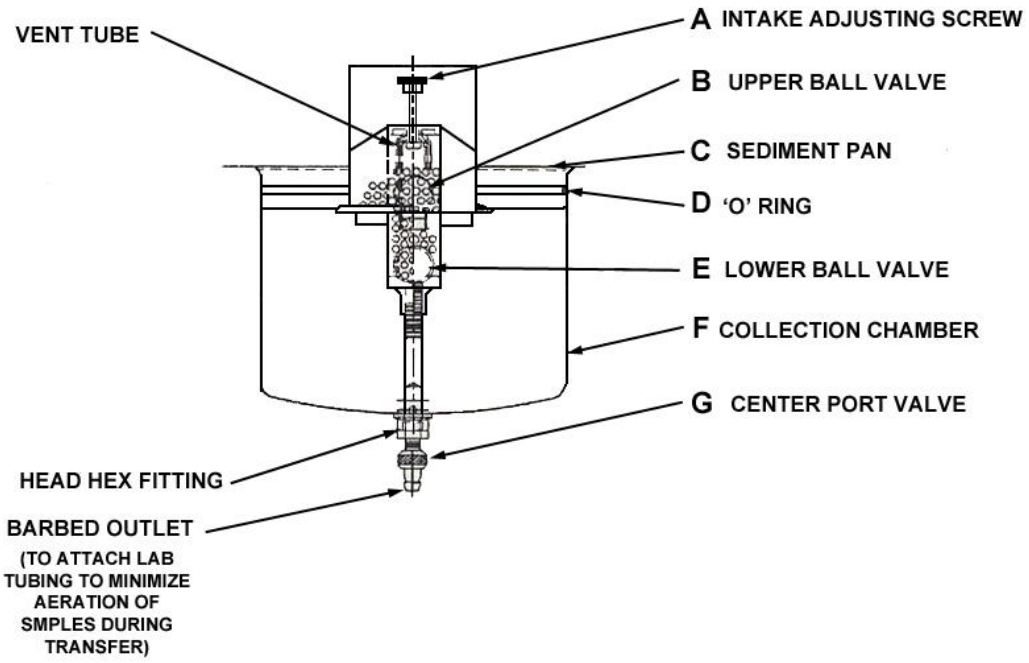
The Liquid Sampler can be suspended by stainless steel cables underneath existing grates with a drop box depth of approximately 16" ***or*** the Sampler has its own sump assembly and traffic rated grate for any below grade "in the ground" installation. **Refer to Section II** for installation instructions.

Suspended in Existing Sump with Optional Eye Bolts and Cables



1. Remove the four (4) stainless steel eyebolts from the accessory pack and assemble into the four (4) holes in the Sampler flange.

2. The Sampler will be suspended from the grate by two (2) stainless steel cables with loops on each end that engage the four (4) eye bolts assembled to the Sampler.



3. The Sampler has an adjusting screw at the top of the ball valve under the handle for limiting the amount of liquid entering the Sampler. As the thumbscrew is turned clockwise, the ball is restricted in its vertical lift and throttles the orifice opening.

When the adjusting screw is adjusted down (clockwise) against the ball the valve is held closed and this is considered the zero (0) or starting position for adjusting the thumbscrew. The thumbscrew should be adjusted in one-quarter (¼) turn increments. One-half (½) turn open will take clean water approximately twenty (20) minutes for the Sampler to fill and shut off.

When adjusting screw is fully open (approximately 10 turns), the Sampler will fill in approximately two (2) minutes.

When adjusting the thumbscrew to the starting position, be very careful not to over tighten the screw against the ball or the ball will be damaged. A damaged ball will not allow the valve to operate properly. The adjusting screw is a precision-machined screw with slight resistance so as not to slip from its selected position. The effluent varies from site to site so the first time the Sampler is used the adjusting screw should be set one (1) full turn open. If the effluent is very heavy with particulate and debris, the adjusting screw might have to be opened more. Because the effluent is site specific, some experimenting will be required to obtain the desired setting.

4. After setting the adjusting screw and making sure the center port valve is closed (turned fully clockwise), the Sampler is ready for installation under the grate. Lift the grate up far enough to allow clearance for the Sampler, feed the cable through the grate, and hook the loops onto the eyebolts. One (1) cable will be at right angles to the other. The two (2) cables add stability to the Sampler so it will remain level.

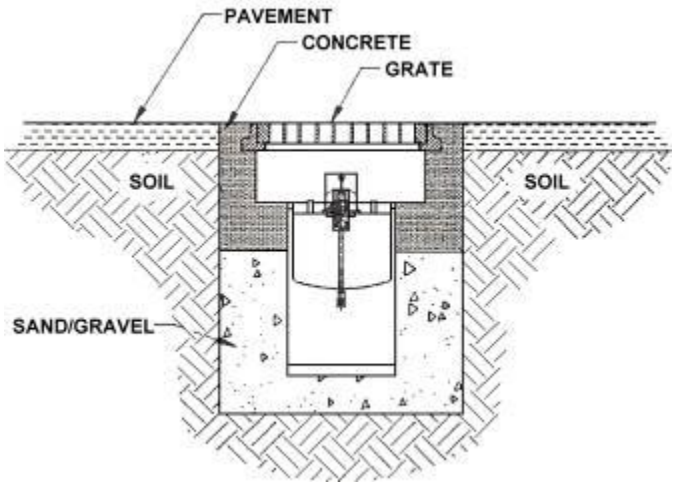
5. To extract the fluid from the Sampler turn the knurled knob on the valve at the bottom of the Sampler counter clockwise and the fluid will flow out the center of the valve. To prevent aeration of your sample attach a flexible tube to the barb at the end of the center port valve and the opposite end in the bottom of your laboratory sample bottles and open (turn counter clockwise) the valve.

6. After transferring the sample to laboratory bottles, store your samples in a refrigerator until your laboratory picks them up. The Sampler must now be disassembled for clean up by turning the hex head on the center port valve, next to the sealing washer, clockwise. This disengages the center port valve from the double ball valve assembly and allows the Sampler to be separated into five (5) pieces: Collection chamber, Collection chamber "O" Ring, Sediment pan, Double ball valve assembly, and Center port valve for easy cleaning. Wash with a non-phosphate detergent in hot water and rinse with deionized water. A brush or swab can be used to remove heavy soils. If contaminants are not removed by the above procedure, consult with your laboratory as to which chemicals to use for cleanup of your Sampler. IT IS ABSOLUTELY MANDATORY THAT THE "U" VENT TUBE BE CLEAN AND FREE OF ANY FOREIGN MATERIAL. If the vent tube is not clean, it can cause the Sampler to not accept fluid. Before placing the cleanup, reassemble the Sampler by placing the "O" ring around the bottom of the sediment pan then place the sediment pan on top of the collection chamber, making sure the "O" ring engages all the way around the unit. Next, reinstall the double ball valve assembly in the recess at the center of the sediment pan and the center port valve through the hole in the bottom of the collection chamber, advancing the center port valve until it engages the threaded nut on the bottom of the double ball valve assembly. Tighten (counter clockwise) the hex head of the center port valve by hand. Over a period of time some leakage may occur around the sealing washer on the center port valve and it may be necessary to tighten the valve one turn with a wrench. DO NOT OVER TIGHTEN the valve, as it will damage the Sampler. Now the Sampler is ready to be placed in service. When putting the Sampler into service always check that the center port valve is closed (turn clockwise) and that the vent tube is open and can pass air and that the adjusting screw is positioned in the desired setting.

II. SAMPLER, SUMP AND GRATE SET BELOW GRADE

The Sampler, sump, and grate combination is available for those collection sites without a means for suspending the Sampler. For details on the operation of the Fluid Sampler please read all of **Section I.**

Sampler, Sump, & Grate Set in Ground



Note: Sampler must be cleaned (see Section I, paragraph 6) before installing and collecting sample.

1. It will be necessary to dig or bore a hole approximately twenty (20) inches in diameter and twenty-four (24) inches deep (22 inch diameter and 33 inches deep for 5.5 gallon unit) to accommodate the sump. We assume there is agreement between the appropriate regional water quality control board and the operating facility as to the proper collection point. Place the sump in the hole to check for proper depth. (Allow sufficient clearance to set the sump on a bed of approximately two (2) to four (4) inches of concrete and ensure the top of the grate is at or slightly below grade level.)

2. Pour approximately two (2) to four (4) inches of concrete into the hole to set and level the sump. After leveling the sump, pour gravel and /or sand into the void between the sump and the wall of the hole one-half (½) the way up. Check level of the sump then pour concrete to the top of the sump.

3. Remove the two (2) Allen head screws from the grate rim and separate the grate plate from the rim. Set the grate rim on the top edge of the sump and pour concrete all around the rim, blending the finish from the edge of the hole to the rim.

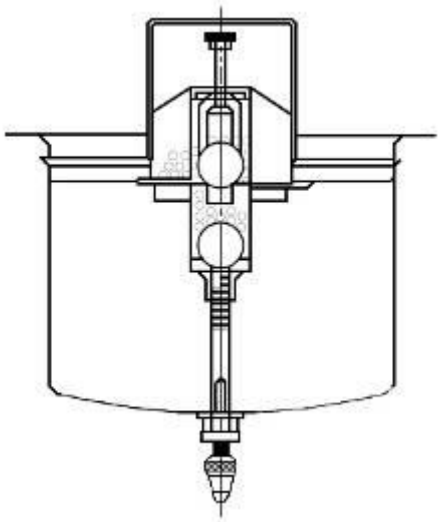
4. Be sure to clean all concrete and debris from the inside of the sump and off the seating surface between the Sampler and sump flange. Place the Sampler in the sump and lock in place by aligning the two (2) keyhole slots in the flange of the

Sampler with the welded studs located on the inner surface of the sump collar. A slight turn of the Sampler will engage and the stud and lock the Sampler in place. Align the holes in the grate plate with those in the rim and secure with Allen screws.

Note: If the Sampler is stored for any length of time or is inactive for an extended period of time, a routine check should be made of the vent tube to insure it CAN PASS AIR AND THE BALL VALVES MOVE FREELY OFF THE SEATS.

STORM WATER SAMPLER FROM VORTOX AIR TECHNOLOGY, INC.

- Grab Samples



- Composite Samples

  - All Stainless Steel
  - Adjustable Intake Rate
  - Teflon Lined (optional)
  - Disassembles for Cleaning
  - No Electrical Requirements

The primary design of this product is to capture grab samples and/or composite (time weighted, continuous collection) samples.

The Sampler comes in two sizes: eight-tenths of a gallon (.8) and five and a half gallons (5.5) capacities. Both have an adjusting screw at the top of the ball valve for controlling the rate at which the liquid enters the Sampler. As the adjusting screw is turned downward (or clockwise) the ball is restricted in its vertical lift and throttles the orifice opening. When the adjusting screw is adjusted down against the ball, the valve is held closed.

For Example: when the adjusting screw is opened (½) a half turn, it will take Clean Water approximately 20 minutes (for a .8 gallon capacity, 1.0 inch head) to fill and shut off.
When the adjusting screw is fully open (approximately 10 turns) the Sampler will fill in approximately 2 minutes. The adjusting screw is a precision-machined screw with slight resistance so as not to slip from its selected position. Because the effluent is site specific, some experimenting will be required to obtain the desired setting.

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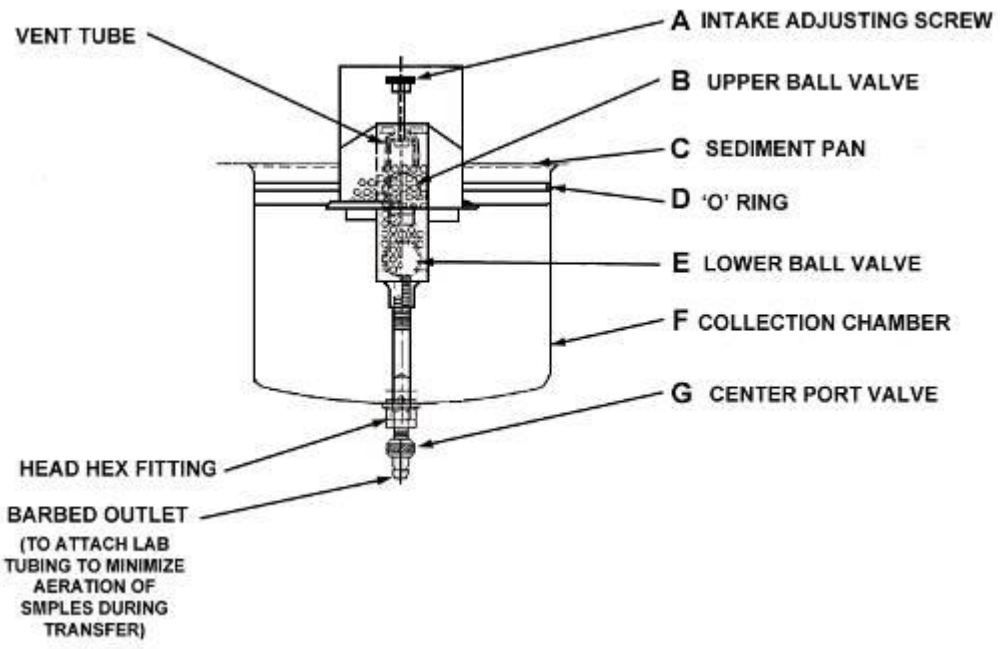
STORM WATER SAMPLER ASSEMBLY

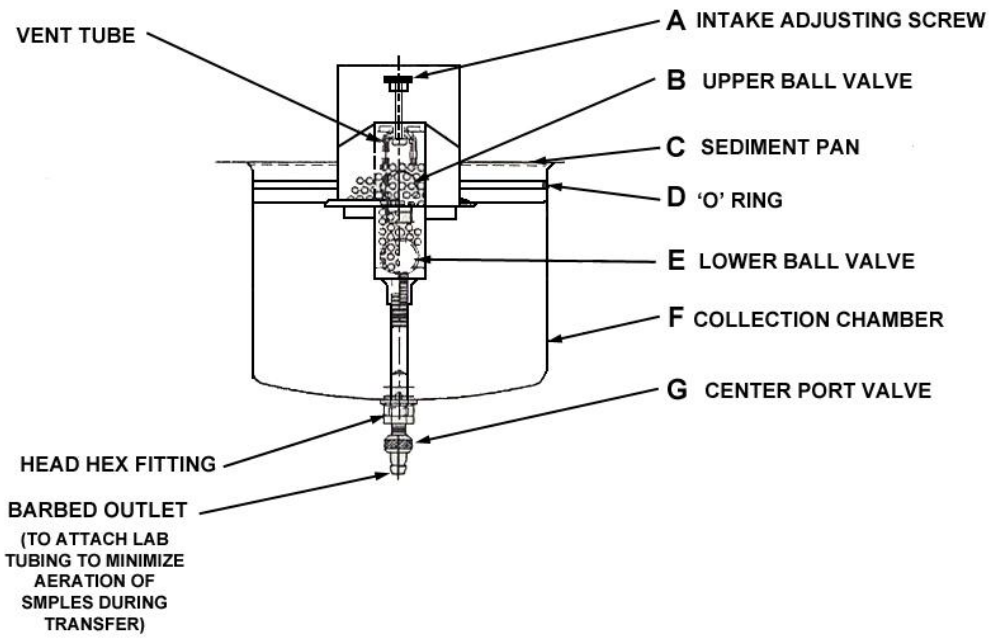


TO CLEAN (MOST APPLICATIONS)

Use a wrench on the hex head fitting (located on the center port valve) to loosen and disengage the center port valve assembly from the ball valve assembly.

When disassembled, wash each of the four (4) components: Ball valve Assembly, Center port valve assembly, Inner walls of the Collection chamber and of the Sediment pan Assembly, in a phosphate free detergent. Then rinse completely with deionized water and reassemble. Be sure to wash and reposition the “O” Ring in the groove located in the sediment pan.

HOW IT WORKS!



Prior to installing the sampler the Intake adjusting screen (A) must be set to allow the appropriate intake liquid flow. Also, the center port valve (G) must be in the closed position. The upper ball valve (B) will stay in its closed position (in order to keep contaminants out of the sampler) until the liquid begins to fill the sediment pan assembly (C) causing the ball to rise. This then allows the liquid to enter the collection chamber (F). As the collection chamber fills, the lower ball valve (E) rises and once full, causes it to close and preserve the sample. (Note: If only a partial sample is collected, the upper ball valve (A) returns to its closed position, thus preserving the sample.)

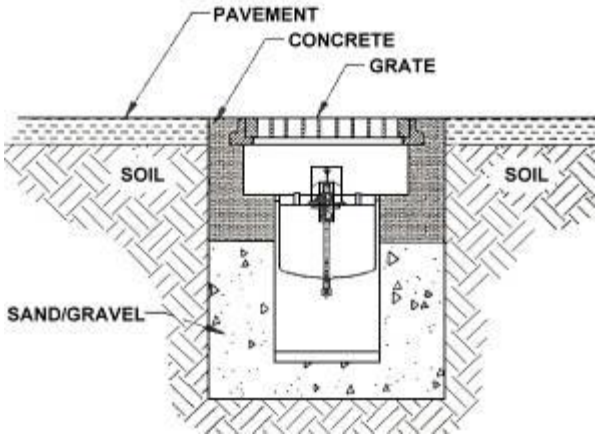
At the earliest appropriate time, the sampler is retrieved and the liquid sample is transferred to an appropriate lab bottle. This is accomplished by using the center port valve (G) located on the bottom of the sampler. To minimize aeration of the sample a tube can be attached to the valve for transfer to the lab bottle.

Note: Refrigeration of the sample might be required. The Vortox sump assembly will accept ice. This will assist in chilling the sample to aid with its preservation.

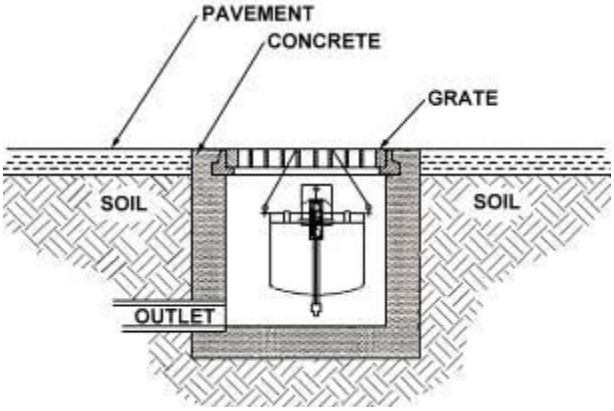
TYPICAL INSTALLATIONS

Installation will vary in many cases. Actual locations of sample collection sites must be confirmed by the permitting agency.

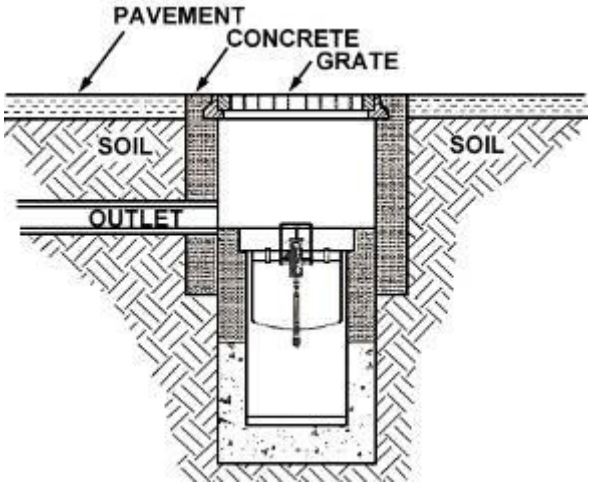
Sampler, Sump & Grate Set In Ground:



Sampler Suspended In Existing Sump with Optional Eye Bolts & Cables (.80 Gallon Only):



Sampler and Sump Installed In Core Drilled Bottom of Existing Sump:



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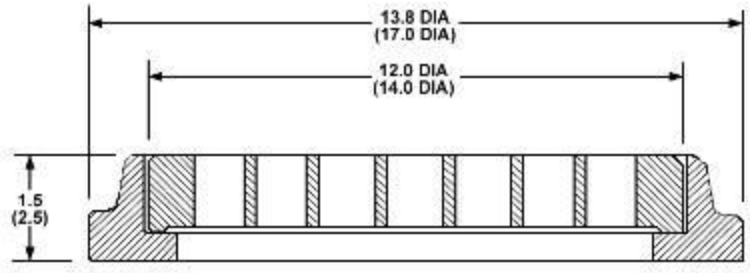
OPTIONS & ACCESSORIES

GRATE ASSEMBLIES- TRAFFIC rated FSG8A and FSG10A. Non-traffic rated FSG10B. Cast Iron secured with Allen head screws.

FSG8A: Use with Sump Assembly FSS8A

FSG10A & FSG10B: Use with Sump Assembly FSS10.

FSG10 Shown:

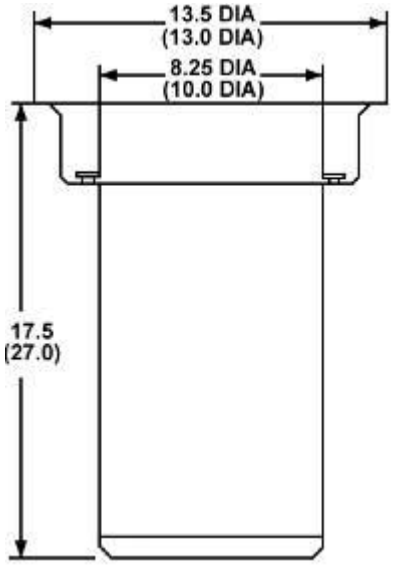


Sump Assemblies- Stainless Steel completely sealed.

FSS8A- Use with Storm Water Samplers: FS8A & FST8A

FSS10- Use with Storm Water Samplers: FS10A & FST10A

FSS10 Shown:



Eye Bolts (4) & Cables (2) - Stainless steel

FSE18- Used to suspend Storm Water Samplers: FS8A & FST8A beneath existing grates.

Sump Assembly Lid/ Cover- Stainless steel, aids in keeping sump free from debris (it is not water tight) when sampler is not in place.

FSL8- Use with Sump Assembly FSS8A

FSL10- Use with Sump Assembly FSS10

Plug Assembly- Water tight, mechanical plug, **completely** seals off sump assembly from unwanted debris and **liquids** that might otherwise enter the sump between collections of samples. T-wrench included.

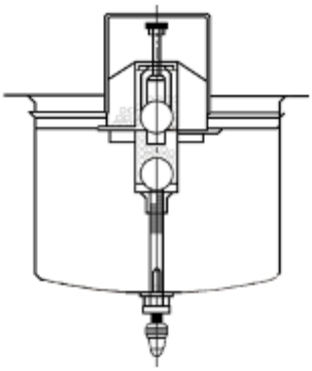
FSP8- Use with sump assembly FSS8A
FSP10- Use with sump assembly FSS10

Teflon® Coating (Optional) - Applied to inner surface of sample collector and shaft portion of center port valve assembly. Teflon® Coating is designated by the letter "**T**" as the third alpha character in the Sampler part number. (Example FS**T**8A)

VARIOUS CONFIGURATIONS

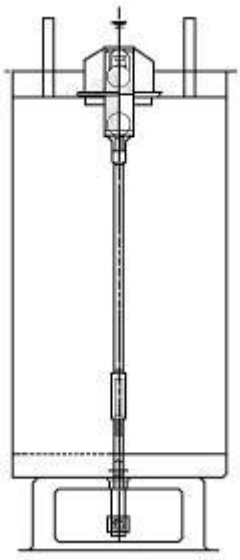
FS8A – Storm water sampler
FST8A- Teflon® Lined sampler

- .80-gallon capacity
- All stainless steel construction
- Polypropylene ball valves
- Nitrile Ball valve gasket



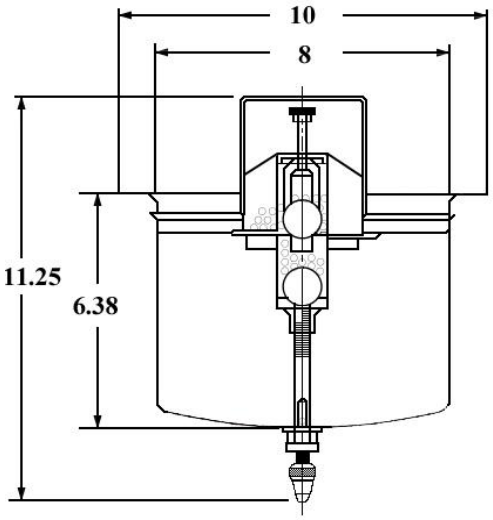
FS10A- Storm Water Sampler
FST10A- Teflon® Lined Sampler

- 5.50-gallon capacity
- All stainless steel construction
- Polypropylene ball valves
- Nitrile Ball valve gasket



SAMPLER DIMENSIONS

FS8A & FST8A- Storm Water Sampler



FS10A & FST10A- Storm Water Sampler