

OneSump

At-Grade Fill Port Spill Containment System

Installation, Maintenance and Testing

Franklin Fueling Systems • 3760 Marsh Rd. • Madison, WI 53718 USA

Tel: +1 608 838 8786 • 800 225 9787 • Fax: +1 608 838 6433 • www.franklinfueling.com

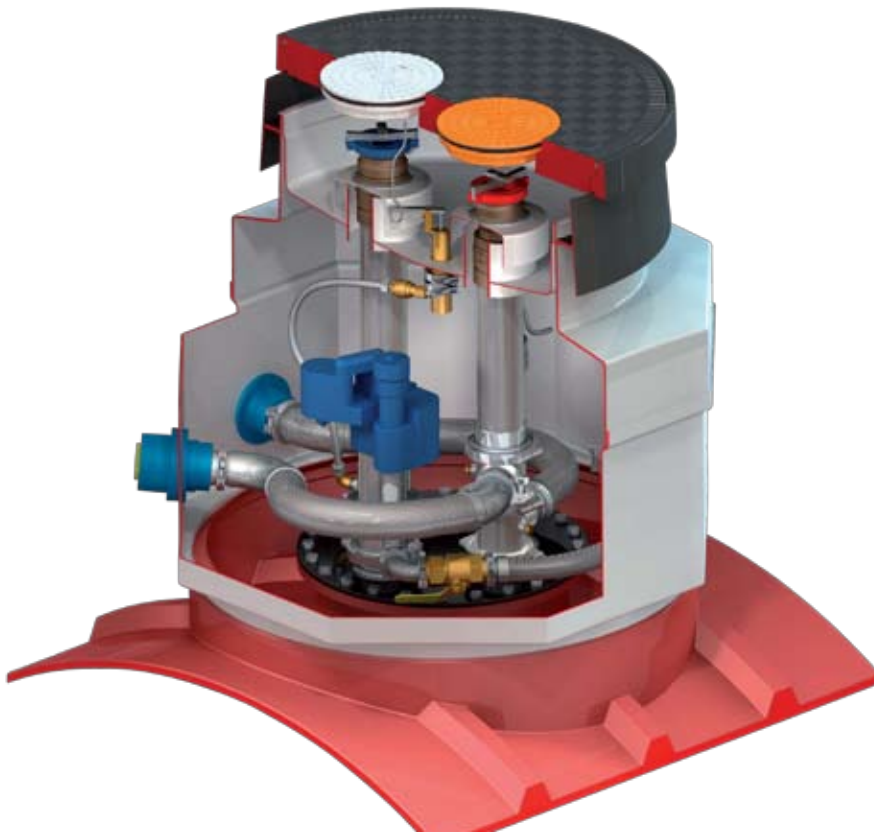
Safety

Follow all federal, state and local laws governing the installation, testing and inspection of this product and its associated systems. When no other regulations apply, follow NFPA codes 30, 30A and 70 from the National Fire Protection Association. Failure to follow these codes could result in severe injury, death, serious property damage, environmental contamination and/or system degradation.

IMPORTANT NOTE:

Prior to installation, please read these instructions thoroughly and completely. Check to make sure all the parts needed are included. No substitutions are allowed on the primary components unless approved by FFS. Failure to properly follow these instructions may result in improper operation of the system.

Product Description



The OneSump system combines the functions of an at-grade fill port containment sump and a turbine containment sump into one single tank top containment sump. One single tank top containment sump houses the fill and vapor risers along with the turbine and tank level monitor probe (TLM).

The key feature of the OneSump is a 15 gallon lift off aluminum spill containment bowl that can be removed easily without any tools for maintenance or sump access. The other significant feature of the sump system is that all the risers and fittings are connected with flange clamps and gaskets instead of pipe fittings and unions. This allows for easy removal of risers for sump access and assures reliable, leak free fitting joints.

The design of the OneSump uses the Fibrelite FL-100 42" gasketed manway cover, gasketed access ports, and FL-100 frame assembly. The only traditional pipe fitting that will occur with this design is the burial-depth-specific portions of the UST installation that will establish the length of the 4" risers and the 2" nipple on the turbine pump. All other components are designed to be either preassembled or pre-fitted. The UST manway must have at least (4) 4" threaded bungs on either 16" or 550mm centers (depending on the manway configuration).

The OneSump spill containment bowl does not attach to the riser piping or the sump. The bowl is free floating and sets on top of the sump top hat. The only connection is the dry break quick connect fitting which connects to a ½" stainless steel flex line that drains into a ½" port on the drop tube fitting adaptor. Fuel is drained from the sump spill containment bowl by pulling a cable attached to the drain mechanism.

The cable is configured with nylon section that indexes into a clip attached to the FL-100 cover. The latching of the cable allows the driver to keep the drain open while he is packing the truck for departure (the delivery driver does not need to continuously hold the drain pull cable to drain the fuel).

To seal off the drain valve from the tank ullage, it is recommended to drain the containment bowl above the drop tube. The drain valve bottom section is secured using hand tightened flange clamps and gaskets to ease removal of any sediment or debris.

A "drip cap" is installed over each of the fill and vapor risers. These direct any fuel that runs down the adaptors into the spill containment bowl. These two drip cap assemblies are sealed with a friction fit o-ring and are removed by hand without any tools.

To allow full access inside the sump for maintenance or installation, the TLM riser can be removed by unscrewing the flange clamp by hand. The fill and vapor riser can also be easily removed by unfastening the two-bolt clamp at their base. No pipe wrenches are required to disassemble the risers or flex connections.

Since flex connections are used inside the sump (instead of rigid piping), planning must account for aligning the product and vent entry fittings. The site-specific installation drawings will show the piping configuration for each tank top sump.

Note: Unlike some other types of below-grade fill port systems, riser alignment handcuffs or turnbuckles cannot be used with this installation.

The alignment tolerance for a standard 48" burial sump is about 3/4" from center; however, installers must be careful when setting the sump to the UST collar to keep proper alignment. An optional alignment wedge set is available for cases where the risers are too far out of the alignment. This set uses two wedge fittings with one degree of angle each which can be rotated to achieve an angle relative to the manway from between zero and two degrees.

Site Layout Instructions

OneSump sites that use fusion poly piping systems (UPP, etc.) typically require site-specific tank sump configuration drawings. These drawings include complete bill of materials along with detailed assembly drawings. Some fusion poly piping system layouts will use a custom tank sump configuration which can be rotated relative to the tank centerline in order to accommodate individual site variations.

After the initial site work has been completed and the tanks have been set into position, the elevation of each tank manway must be determined in reference to grade. With this dimension known, the tank manway becomes a fixed, solid datum point from which elevations for that particular sump can be set (call it "X"). This is important to properly locate the fill and vapor adaptors at an elevation which allows them to function with the FL-100 multiport cover. Setting this datum also removes reliance on string lines which can sag and/or be knocked over.

Note that for the turbine flex connection to fit properly, the turbine must be rotated into the correct position. The flex connection should be fitted to the entry BEFORE the turbine has been tightened into the final position. Note that the turbine is attached to the sump with a flanged two-bolt clamp and gasket fitting to allow the turbine to be swiveled into the required position. The contractor will need to supply a 2" nipple with a length specific to the burial depth of the UST for the turbine.

Penetration fitting elevation is another important factor. The turbine penetration should be as low as possible on the sump. The vent line penetration must be made to make the proper slope to the tank which can only be made after the vapor tee fitting is installed and the slope determined. However, the turbine line does not need to make fall inside the sump. An over-under arrangement may be used to keep the flex lines and fittings out of the way of each other depending on the site piping layout.

Note: Do NOT rotate the turbine pump to the point where the electrical connection housing or line check assembly moves into the direct center area of the sump. If it does, it will interfere with the drain assembly on the spill containment bowl. Also, depending on the sump layout, the TLM should be installed on the centerline manway opening furthest away from the turbine pump(s).

Threaded Adaptors

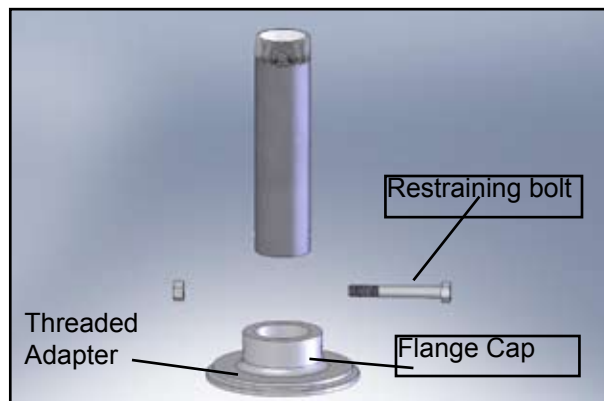
Install the threaded riser adaptors as the first step in installing the OneSump kit. You will need:

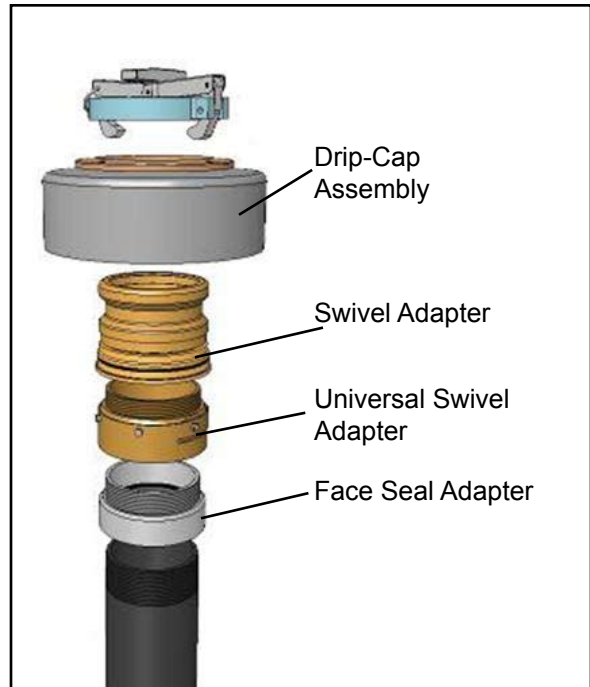
- Flange cap with boss for 2" pipe
- Two-bolt clamp, 6" x 1/16" aluminum blind gasket,
- Pre-drilled 2" pipe nipple,
- 1/2" restraining bolt
- Approved thread sealant,
- Pipe wrench.

These parts are used as a tool to thread the male adaptor fittings into the manway while not damaging any critical mating surfaces.

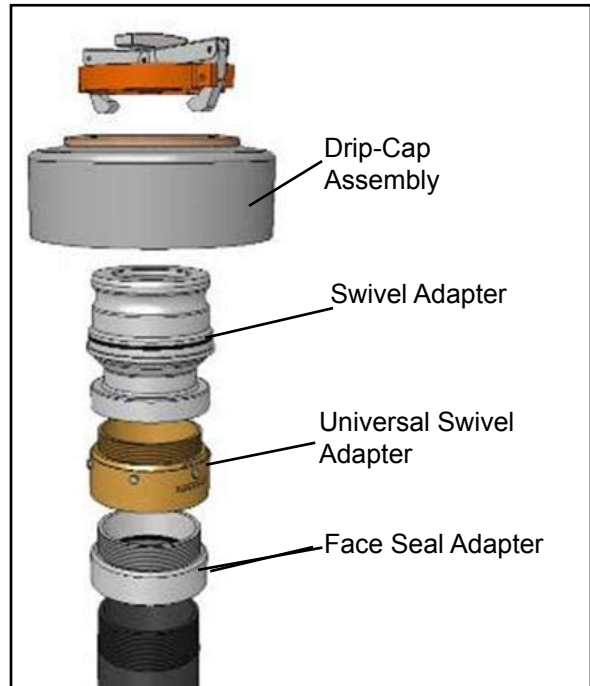
Note: The turbine and TLM risers use the same male flange adaptor (S1-04-B) while the fill riser uses S1-05-C and the vapor riser uses S1-06-B.

Out of the four, only the vapor riser uses a male flange adaptor with internal ball float threads. Insert the aluminum blind gasket and flange cap (used for installation only) and tighten the two-bolt clamp evenly to approximately 20 ft-lbs. Insert the 2" pipe nipple into flange cap with restraining bolt as shown below and in drawing S1-OS-K. Tighten the male flange adaptor. Repeat for the remaining male flange adaptors. Use Gasoila SoftSet thread sealant.





Product Riser



Vapor Riser

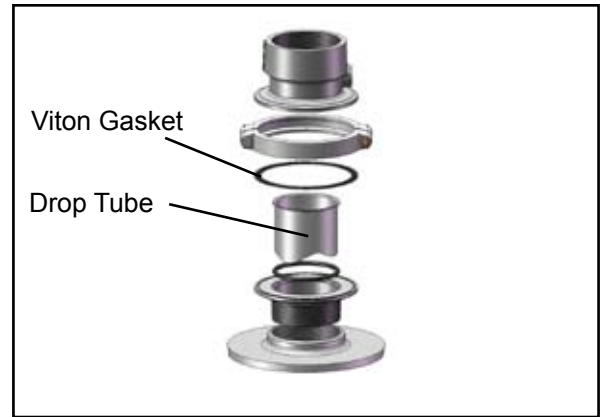
Determining Riser Length

Build the fill and vapor risers after the male flange adaptors have been securely installed in the tank manway. First determine the length of the riser by using the dimension from the top of the FL-100 cover to the top of the steel manway elevation as the key reference dimension (X). Drawing S1-0S-F, the Standard Section Layout, provides details on the riser length and installation.

Product and Vapor Riser Assembly

Refer to the riser assembly drawing details (S1-OS-C, S1-OS-F) and the photos below. The assemblies can be removed after fabrication as necessary for access.

1. Apply thread sealant to the face seal adaptor and turn it onto the pipe.
2. The universal swivel adaptor and product adaptors are threaded together using a supplied flat faced gasket to make the seal.
3. Torque the product, vapor and swivel adaptors using the Universal specific tools.
4. If a ball float overfill valve is used in the vapor riser; a non-standard longer valve must be used to account for the increased elevation of the tank manway and the male flange vapor adaptor (S1-06-B) above the tank. Use of a standard length ball float in this application can result in exceeding the allowable tank overfill settings.



Fill Riser with Drop Tube

Dimensions

The basic dimension for this installation is to set the top of the corbel $1\frac{1}{2}$ " below the underside of the FL-100 frame (the elevation of the FL-100 frame is determined by grade at the site plus drainage slope). Setting the corbel too high will not allow enough space between the cover and the OneSump containment bowl while too low will put the product and vapor adaptors out reach of the nozzles. Refer to drawings S1-OS-F, S1-OS-G and S1-OS-H.

Assemble all the components and again measure the riser height since the actual length of the assembled fittings will vary due to pipe thread engagement. The target is to have the top of the vapor and product adaptors about $\frac{1}{2}$ " below the top of the top hat.

Note that for Diesel installations, the vapor riser is omitted and the top of the vapor tee fitting is sealed with a cap and clamp.



Depending on the customer requirements, the drop tube is typically sealed between the male flange drop tube adaptor (S1-05-C) and the female flange adaptor with side port (S1-02-B) on the fill riser as shown below. S1-05-C has a custom o-ring groove to seat and seal the drop tube into position. In order for the o-ring (O-RING-419) to fit properly, any factory gasket on the drop tube shoulder must be removed.

If the factory gasket is not removed, a proper seal can not be formed. The standard Viton flange gasket must also be used to make sure the entire assembly is sealed and secure.

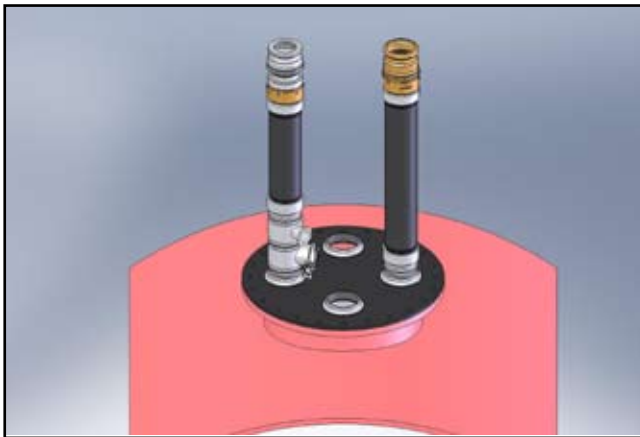
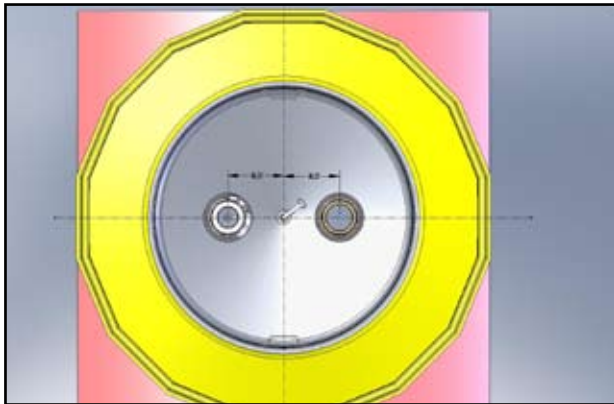
For best performance, the drain hose from the containment bowl drain should attach to the female flange adaptor side port over the drop tube. Refer to drawing S1-OS-K for details of fill riser assembly.

Sump Alignment

Before the sump is attached to the collar or glassed to the tank, the sump base and top hat must be aligned with the fill and vapor riser to ensure proper alignment to the spill containment bowl and avoid interference.

To do this, begin assembling the sump piping according to the provided site specific drawing set (i.e. build at least fill and vapor riser assembly).

1. Fit the sump base and top hat together and use the two risers to locate the sump central to the risers.
2. Make sure the risers are either 16" or 550mm apart (depending on the model) and central to the sump in both axis of the tank.
3. Set the bowl on the top hat to verify the risers are central to the holes in the bowl.
4. It is also recommended that the sump be oriented as shown in assembly drawing S1-OS-B with one sump face parallel to the tank centerline. This alignment will facilitate the installation of piping. Trim or adjust the sump if necessary and secure by typical means.



Spill Containment Bowl Assembly

The drain valve assembly will need to be clamped onto the spill containment bowl. The direction of the dry break should be approximately 90 degrees to the two riser tubes (to clear the risers).

The bottom clamp can be removed for cleaning the trap area. Note that depending on the burial depth, a 90 degree elbow can be threaded onto the dry break fitting to extend the length of the flex fitting. The 1/2 " flex connector is threaded into the female flange adaptor above the drop tube on the fill riser, while a male dry break quick-connects to the loose end of the flex connector.

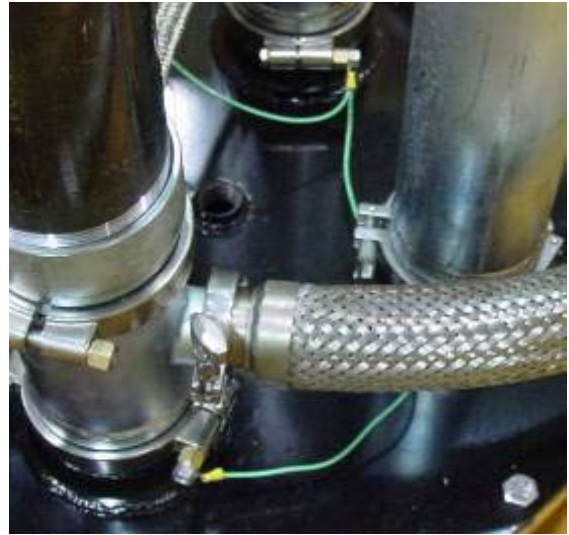
The screen and lever assembly comes pre-installed in the bowl. This assembly may need to be adjusted for the particular installation (i.e. the drain pull arm must point toward the product riser as shown below). The drain pull arm can be adjusted by loosening the two set screws and rotating the lever arm close to the drip cap but not so close as to interfere with the lever action. Retighten set screws.



Electrical Fittings and Conduits

The electrical boxes should be on the opposite side from the vapor and TLM risers to maintain access to the sump, as these risers are the fastest to remove for access. If the conduits are on the same side, they will hinder entrance into the sump.

Note in the sump photo with the top hat removed that the two electrical conduits are near the turbine.



Grounding the Risers

Installation and Alignment of FL-100 Frame

Note: Alignment of the FL-100 cover frame is critical to the proper operation of the OneSump spill containment system. Failure to achieve the proper orientation or to prevent shifting during setting can make it necessary to remove and reset the frame.

The Fibrelite FL-100 cover frame is to be installed so the alignment to the fill and vapor risers are ensured. This alignment will allow access to the fill and vapor adaptors when the 10" multiport covers are removed.

If the FL-100 cover frame is not properly positioned the fill and vapor nozzles will not be able to connect to the vapor adaptors. The required alignment is illustrated in assembly drawing S1-OS-I, with one facet of the frame oriented perpendicular to the tank centerline and a second facet oriented perpendicular to a line passing through the center of the fill and vapor risers.

Sensor Installation and Grounding

There are several ways to attach the sump monitoring sensor. Shown below, the sensor mounting tube is attached to the turbine riser with channel strut and clamps. The fill and vapor risers must be grounded. A 3/8" ID #12 lug can be bolted to the riser clamps as shown.



Installation and Operation of the Spill Containment Bowl and Cover



1. Set the bowl near the edge of the manway.
2. Retrieve the ½" flex line.
3. Pull the dry break ring back to engage the plug on the drain trap.



4. Set the bowl over the sump
5. Thread the ½" line into the sump.
Verify that the bowl is fully resting on the top hat.



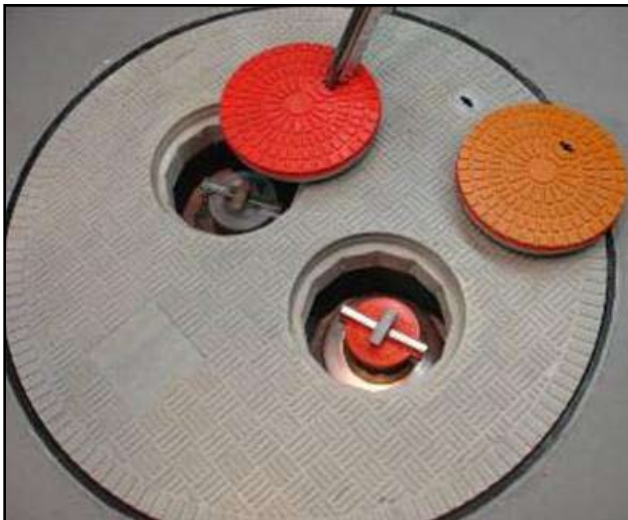
6. Remove the toggle caps
7. Using both hands, set the drip caps over the risers.
8. Make sure the O-rings on the risers that seal to the drip caps are clean and free of any dirt or grit.
9. Periodically lubricate with o-ring grease.



10. Verify the drain line lever arm is towards the product riser.
11. The drain line cable is attached to the product cap. This assures the drain line is easy for the driver to grasp and operate.
12. Make sure the drain bowl is clean and free of dirt and debris.



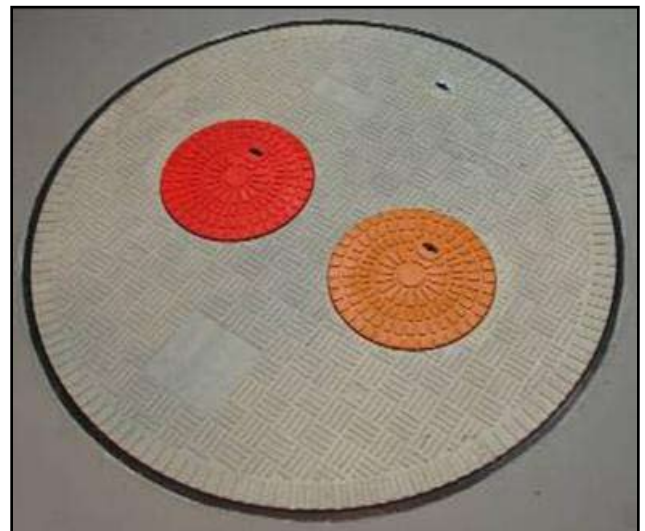
13. Using the FL-7A handle, move the cover into place. Refer to the FL-100 operating instructions.



- 14. To access the fill port, use the FL-7A handle to remove the small access port covers.
- 15. Align the port covers to the match marks on the main cover when replacing.
- 16. Jump on port cover to seat gasket.



- 17. To drain the OneSump spill containment system, pull on the product cap attached to the drain cable.
- 18. Once the drain is fully depressed, hook the nylon latching rod into the locking latch attached to the FL-100 cover.



19. The cover should be flush to grade, including the composite grade ring.

Periodically inspect the cover assembly to make sure it is clean and free from excessive dirt and debris. Foreign material in the gasket mating surface can compromise the water tightness integrity.

OneSump Spill Containment System Access

To access the containment sump for inspection, maintenance or testing, follow the following steps:

1. Remove the FL-100 cover using the FL-7A tool
2. Remove the product and vapor toggle caps (note the product cap stays with the containment bowl assembly)
3. Lift off the drip caps from the risers
4. Lift off the spill containment bowl assembly by grabbing the two handles on the inside of the containment bowl (note the containment bowl assembly weight is 25 lbs).
5. With the spill containment bowl assembly on the edge of the cover frame, pull back the engagement ring on the double poppet dry break to remove the drain line

At this point, the containment bowl is free from the sump and the sump can be inspected or entered. Remove the risers if needed for the specific maintenance task by unbolting the clamp fittings. A blind flange can be installed to seal the tank opening.

To climb into the sump

6. Step down on the turbine and remove the TLM riser. Use a 6" flange cap (S1-01-B) to seal off the tank ullage. If more access is needed, the top section of the vapor riser and fill riser can be removed.

Most jurisdictions consider the containment sump on a fuel filled UST an OSHA classified confined space!



7. To enter the sump, step down on the turbine head.



8. Slide down into the space between the riser and top hat.



9. Remove the risers as required



10. Using a blind flange cap on the vapor riser

Installing the OneSump clamp/gasket fittings

Make sure the face groove is clean and the gasket is properly seated into the groove. Failure to do this may result in leaks and gasket failure! Use the following guide for installation torque:

- 2" single pin clamp - ½ turn past finger tight (~ 25 inch-pounds)
- 6" single pin clamp – ½ turn past finger tight (~ 25 inch-pounds)
- 6" two-bolt clamp – 25 foot-pounds

A metal based anti-seize lubricant should be used on the threads of the 6" clamp bolts.

Use nylon zip ties on 2" single pin clamps to protect against vibration.

Maintenance

Drip Caps

The drip caps are sealed with an O-ring attached to the riser adaptor. Every time the drip cap is removed, it should be inspected to make sure the O-ring is in place and that the mating surfaces are clean. During annual inspection, the O-ring should be lubricated with an O-ring lubricant. Replace if the O-ring appears to be damaged or cut.



Drain Valve and Trap

Periodically inspect and clean the drain assembly and drain screen. Replace the screen if damaged. Periodically remove the bottom drain section and remove any sediment or dirt that may have accumulated. The drain is accessed by removing the two clamp fittings as below.



OneSump Testing

Containment Bowl

The integrity of the OneSump spill containment bowl and drain valve is verified with a hydrostatic water test. The steps are as follows:

1. Remove the FL-100 cover and drip caps
2. Remove any trash or debris and clean the aluminum bowl
3. Fill the containment bowl to ¼" below the top of the riser inverts (do not fill any higher than this as water may spill into the tank top containment sump)
4. Mark the water level and observe that the water level does not change

An alternative test method is to remove the OneSump containment bowl and set it on a stand assembly so that the bowl is approximately 2 feet off the ground. This is to allow the underside of the bowl to be observed for leaks.

FL-100 Cover Skirt-Top Hat Seal

The space between the containment sump top hat and the skirt of the FL-100 frame is to be sealed with a flexible fuel resistant polysulfide sealant. This eliminates the possibility of either liquid or vapor entering the backfill. After initial construction and periodically thereafter, the integrity of the seal shall be verified by a simple hydrostatic test. The test consists of cleaning the annulus space and filling it with water and observing for no drop in the level. A poly sump with the polysulfide seal is shown below.



Note: The tank top containment sump is to be tested per the manufacturer's instructions and is not part of the OneSump test.

Customer Service Contact Information:

Franklin Fueling Systems Customer Service and Technical Support: 1-800-225-9787

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Franklin Fueling Systems

www.franklinfueling.com

3760 Marsh Road • Madison, WI 53718, U.S.A.

Tel: +1 608 838 8786 • Fax: +1 608 838 6433

Tel: USA & Canada 1 800 225 9787 • Tel: México 001 800 738 7610

Franklin Fueling Systems GmbH

Rudolf-Diesel-Strasse 20 • 54516 Wittlich, GERMANY

Tel: +49-6571-105-380 • Fax: +49-6571-105-510