

Section 4.3: Overfill Protection



Overfill protection is equipment installed on the UST to help prevent your tanks from being overfilled during fuel delivery. Overfill protection is designed to stop fuel flow, reduce fuel flow, or alert the delivery person during delivery **before** the tank becomes full and begins releasing petroleum into the environment.



You must have an overfill protection device for every UST that is filled with more than 25 gallons of fuel at a time.

There are four common types of overfill protection:

- overfill alarms
- automatic shutoff devices
- ball float valves
- vent alarms

Identify the type(s) of overfill protection you have for each UST in the table below.

Note: Different tanks at your facility may have different types of overfill protection. Select the appropriate type of overfill protection for each tank at your facility.

Note: Some of the tanks at your facility may have two or more types of overfill protection. Only choose the type of overfill protection you are using to comply with the overfill protection portion of the UST regulations.

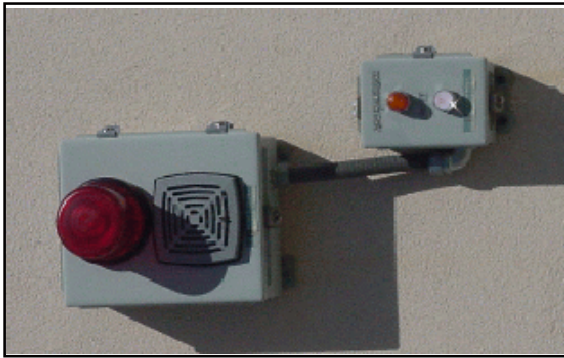
What Type(s) Of Overfill Protection Do You Have for Each Tank at Your Facility?					Go to these sections for information
UST Number:	1	2	3	4	
Overfill Alarm					Section 4.3.1
Automatic Shutoff Device					Section 4.3.2
Ball Float Valve					Section 4.3.3
Vent Alarm					Section 4.3.4
Manual Measurement					Section 4.3.5

If you know the type(s) of overfill protection you have, skip the descriptions below and proceed as instructed in the table above. Otherwise, take the following steps to figure out what is at your facility:

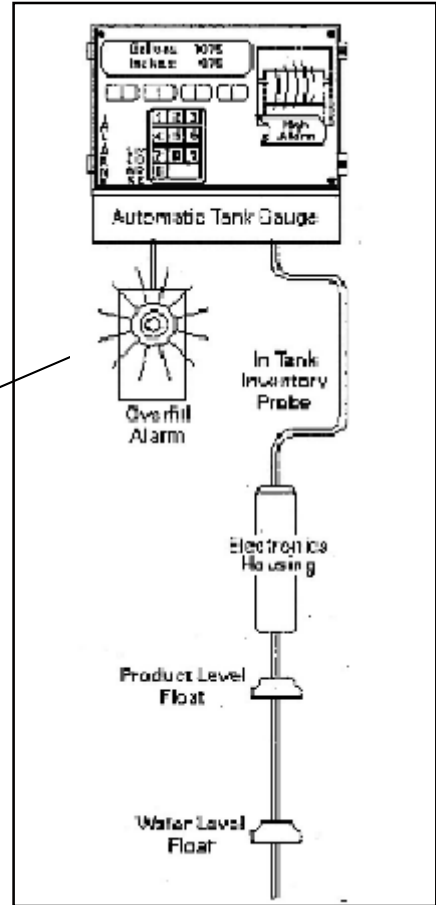
- Read the following information to help determine your type(s) of overfill protection. If you still have problems, then
 - Look through your old records to see if they help you.
 - Review your permit.
 - Contact the contractor who installed your underground storage tank.
 - Contact your service contractor/environmental consultant for assistance.

Descriptions of the Different Types of Overfill Protection

Overfill Alarm - This type has a remote indicator located on a structure, such as the wall of a building near the tank. It is typically connected to a continuous monitoring device such as an automatic tank gauge, and provides an audible and/or visual warning to the delivery person when the tank is close to being full. Many overfill alarms in Vermont have been mistakenly installed with the alarm sounding only at the in-tank monitor, inside the building. In order to work properly, the overfill alarm must be located on an outside wall, where the delivery driver can hear and/or see the alarm activate.



Sample Overfill Alarm



Sample Schematic for an Overfill Alarm

Automatic Shutoff Device - This type is a mechanical device located inside the fill pipe of your tank. Look down your fill pipe to see part of this device. It will be similar to the picture below. You will see what appears to be a line cutting through your fill pipe (or a half moon shape in your fill pipe).

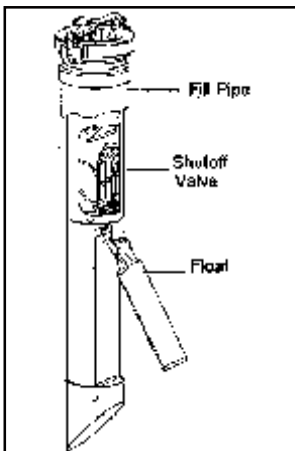
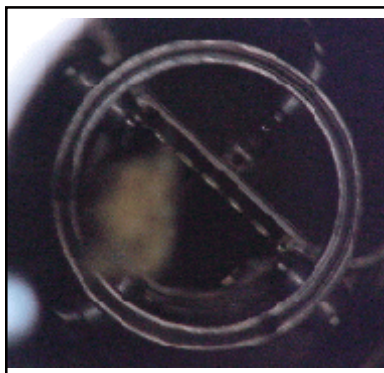
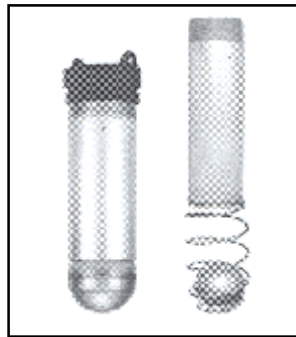


Diagram of an Automatic Shutoff Device

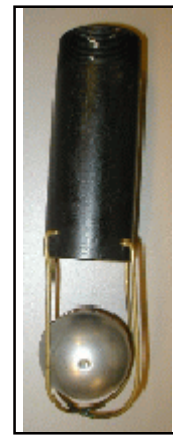


Looking Through the End of Automatic Shutoff Device

Ball Float Valve - You might find it difficult to determine whether you have this type of overfill protection because it is located inside the tank where the vent line exits the tank. You might be able to find an extractor port for the ball float valve (see picture below). However, extractor fittings are commonly used for other purposes, so even if you do find such a device, it does not guarantee that your tank is equipped with a ball float valve. You may need to look through your installation paperwork or call your contractor to determine whether your tank has this type of overfill protection.



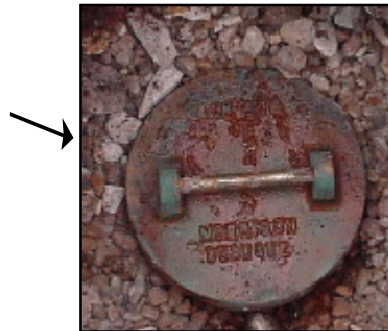
Sample Ball Float Valves



Sample Ball Float Valve



Sample Extractor Port



Closeup of Extractor Port

Vent Alarm - A vent alarm, or vent whistle, is a small device, usually a tube, which typically is installed between your tank and the vent pipe. It signals that the tank is full, thereby minimizing the chance of overfilling. When oil is pumped into your tank, air is displaced from inside the tank through the vent pipe. As the air passes through the vent pipe, it makes a whistling sound. When the level of the fuel reaches the end of the tube the whistling stops, which indicates that the tank is full. Vent whistles are typically used on small tanks only. It is very uncommon to find a vent whistle on a tank larger than 2,000 gallons.



Sample Vent Alarm



Sample Vent Alarm

4.3.1 Overfill Alarms



Overfill alarms use an alarm or warning light to warn the delivery person to stop delivery because the fuel is approaching the tank capacity. When the alarm goes off, the delivery person must stop the flow of fuel to the tank.

Requirements and BMPs for Overfill Alarms



The overfill alarm must activate when the fuel in the tank reaches 90 percent of the tank capacity.



The overfill alarm must be located so it can be seen and/or heard by the person making the delivery at the UST system delivery location. This ensures the delivery person will be alerted when the tank is almost full. Overfill alarms that are part of the automatic tank gauge and are audible only inside the building do not comply with Vermont's requirements.



A qualified UST contractor should check your overfill alarm annually to make sure it is set at the proper height in the tank and that the overfill alarm activates at 90 percent of the tank capacity. The UST contractor should trip the alarm manually to make sure that it is functioning properly.



You should educate and alert your delivery person about your overfill alarm. One way is to place a sign near each fill pipe (in clear view of the delivery person) saying there is an overfill alarm for that tank, what occurs when it activates, and the necessary actions to take when it activates. Make sure your sign is durable. See the sample sign in Appendix B.

4.3.2 Automatic Shutoff Devices



An automatic shutoff device stops the delivery when the fuel has reached a certain level in the tank by shutting off the flow of fuel to the UST system.

Requirements and BMPs for Automatic Shutoff Devices



Automatic shutoff devices must activate when the fuel in the tank reaches 95 percent of the tank capacity.

- There must not be any object in the fill pipe that would keep the shutoff mechanism from activating.
- The automatic shutoff device must be positioned so that the float arm is not blocked and can move through its full range of motion.



A qualified UST contractor should check your automatic shutoff device annually to make sure that it is functioning properly and that the automatic shutoff device activates at 95 percent of the tank capacity or before the fittings at the top of the tank are exposed to fuel.



Automatic shutoff devices must not be used if your tank receives pressurized deliveries because it might result in dangerous situations.

4.3.3 Ball Float Valves



The ball float valve (also called float vent valve) is installed at the vent line in the tank and restricts vapor flow as the tank gets close to being full. As the tank fills, the ball in the valve rises, restricting the flow of vapors out of the UST system during delivery. The flow rate of the delivery will decrease noticeably and should alert the delivery person to stop the delivery.

Requirements and BMPs for Ball Float Valves

As of October 31, 2010, it will be required that **all ball float valves** be replaced with another method of overfill protection, as it has been determined by industry that ball float vent valves are ineffective with certain types of suction systems



Ball float valves must activate by restricting fuel flowing into the tank when the fuel in the tank reaches 90 percent of the tank capacity or at least 30 minutes before the tank will be overfilled. For ball float valves to work properly:

- the air hole in the ball float valve must not be plugged
- the ball cage must be intact
- the ball must move freely in the cage
- the ball must seal tightly on the pipe
- the top of the tank must be airtight during delivery so that vapors cannot escape from the tank. Everything from other tank access ports to fittings to drain mechanisms on spill buckets must be tight and be able to hold the pressure created when the ball float valve engages.



You must not use a ball float valve for overfill protection if any of the following apply:

- Your UST system receives pressurized deliveries
- Your UST system has suction piping (see section 4.8.2 for information on suction piping)
- Your UST system has coaxial Stage I Vapor Recovery (see Chapter 5 for the definition of Stage I Vapor Recovery)



A qualified UST contractor should check your ball float valve annually to make sure that it is functioning properly and that the ball float valve activates at 90 percent of the tank capacity or at least 30 minutes before the tank will be overfilled.



Overfills or dangerous situations may occur under any of the above circumstances. For example, pressure could build up in the tank and result in gasoline spraying out into the environment or onto the delivery person.

4.3.4 Vent Whistles

Requirements for Vent Whistles



The vent whistle (also called a vent alarm) is a device that makes a whistling sound as the tank is being filled. Once the whistling sound stops, it is an indication that the tank is full.



Vent whistles may be used only when tight fill, pump-off deliveries are made. The vent pipe must be located adjacent to the fill (within 8 feet). The vent whistle must be installed so as to alarm (stop whistling) when the tank is 90 percent full. Vent whistles must be installed so as to allow annual inspection for proper operation.

4.3.5 Manual Measurement

Requirements for Manual Measurement



UST systems that never receive more than 25 gallons at a time are not required to be equipped with an overfill prevention device. Typically, this only applies to tanks containing used oil. Even though no overfill device is required, these tanks still must not be overfilled. The liquid level in the tank must be measured with sufficient frequency to ensure that the liquid level never exceeds 90 percent of the tank's capacity. You also must keep records of measurements made to prevent overfill. Contact DEC if you are unsure if your measurement schedule and practices are regular and sufficient.