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TECH NOTES

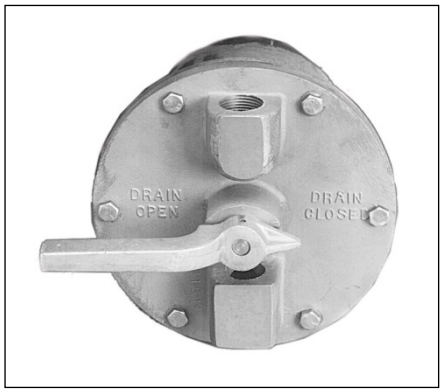
VB-TN-010 Rev. A **August 16** **R. HANSON**

Specifying Drip Traps

Drip traps are recommended for installation on the biogas line, typically at the drain connections of condensate and sediment traps and at low points in the piping. Its basic purpose is for the convenience of safely removing condensate collected from the gas.

Varec Biogas offers several types of drip traps for biogas applications.

Model 246 Low Pressure Manual Drip Trap



The Model 246 Series Drip Traps are designed to prevent gas from escaping while draining. Condensate from gas is drained in either the 2-1/2 QT or 6-QT reservoir of the drip trap. To remove condensate that is accumulated in the drip trap reservoir, simply rotate the handle. The disc, ports, and "O" ring seals are positioned to block gas before opening the drain outlet ensuring that gas does not escape regardless of disc position. The air inlet port located at the outlet connection allows condensate to flow freely from the reservoir when draining.

With the handle in the "closed" position, condensate from the gas piping enters the reservoir while the outlet drain port remains closed. When the handle is rotated to the "open" position, the inlet drain connection is closed to prevent gas from escaping while the reservoir is emptied.

The 246 manual drip trap is ideal for maximum working pressures of 5 psig (35 kPa).

Model 246AT Low Pressure Electric-Actuated Drip Trap

The 246AT Series consist of a low pressure drip trap controlled by an electric rotary actuator rated for Class 1., Divs. 1 and 2 area and is directly mounted on the drip trap with stainless steel mounting brackets.

The unit includes a timer enclosed in a NEMA 7 housing to open and close the drip trap at set time intervals.

The timer enclosure is mounted on the actuator with a Class 1, Div. 1 conduit seal to prevent passage of gases, and vapors or flames through the fitting connection.

The “FILL” line is open to allow condensate to accumulate in the drip trap reservoir.

The rotating disc, ports and seals of the drip trap are designed to isolate the gas line connection or the “FILL” Line before opening the “DRAIN” line, ensuring that gas cannot escape regardless of disc position.

The actuator is designed to open and close the drip trap at the specified setting of the timer. The actuator sets the drip trap disc in the closed position. When the actuator rotates the disc to the “DRAIN” or “OPEN” position, the inlet or “FILL” port is closed and the accumulated condensate drains from the reservoir.

When required, a control panel can be supplied with the Model 246AT series to allow for remote operation and monitoring of several 246AT drip traps.

The 246AT electric-actuated drip trap is ideal for max working pressures of 5 psig (35 kPa).

Model 245 Automatic Drip Trap

The drip trap removes condensate automatically with a float-operated needle valve. Condensate accumulates in the reservoir, and will activate the float-operated needle valve that is connected to the lever arm. As the float rises, the lever opens the needle valve, draining the condensate.

The float, arm and lever are designed to prevent gas from escaping while draining. The float is positioned within the reservoir so that the needle valve closes when the liquid level is still above the outlet port.

The 245 automatic drip trap is rated to a maximum working pressure of 25 psig (173 kPa).

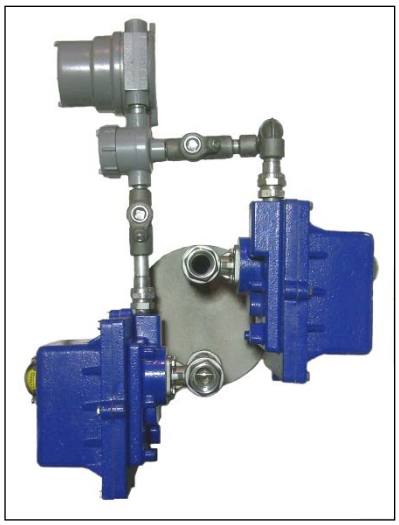
Model 247 High Pressure Drip Trap

The Model 247 High Pressure Drip Trap is rated for a maximum working pressure of 100 psig (688 kPa). This unit is typically installed at low points in the gas piping downstream of booster blowers or compressors.

Condensate is accumulated in the drip trap reservoir and drained manually by operating the valve handles. The double-seal ball plug valves and locking lever isolate the gas line connection before opening the drain port, ensuring that gas cannot escape while draining condensate.

To allow condensate to fill the reservoir, simply rotate the locking lever downward and turn the fill handle parallel with the fill pipe. The drain handle remains perpendicular to the drain pipe and is held in place by the locking lever. To drain the reservoir, the "FILL" handle is rotated 90° and the locking lever is moved upward to secure the fill handle in its closed position. The "DRAIN" handle must be slowly rotated until it is parallel with the drain pipe, and the drain valve is open. When the reservoir is empty, the handles are returned to the fill position (lower valve closed, upper valve open).

Model 247AT Electric-Actuated High Pressure Drip Trap



For automatic operation, the plug valves come equipped with actuators and a timer that are set to operate the FILL and DRAIN valves at set intervals. The possibility of leaving both FILL and DRAIN valves open or closed is avoided via an electrical interlock between the FILL actuator and DRAIN actuator. The FILL valve is open and the DRAIN valve is closed at the start of the cycle.

Like the Model 246AT, the 247AT may be specified with a control panel to allow for remote operation of multiple drip traps either automatically or manually. The remote control station can also be specified with status lights and/or alarm contacts.

Model 247D LOW PROFILE HIGH PRESSURE DRIP TRAP

The Model 247D Low Profile High Pressure Drip Trap is also rated for a maximum working pressure of 100 psig (688 kPa). This unit is typically installed at low points in the gas piping downstream of booster blowers or compressors. It is ideal for tight or confined spaces in blower skid or compressor skids. It also provides for a larger reservoir capacity.

The unit operates the same way as the Model 247. It includes double-seal ball plug valves and locking lever which isolates the gas line connection before opening the drain port, to prevent gas from escaping.

For automatic operation, the plug valves will come equipped with actuators and a timer that are set to operate the FILL and DRAIN valves of each chamber at set intervals . The possibility of leaving both FILL and DRAIN valves open or closed is avoided via an electrical interlock between the FILL actuator and DRAIN actuator. The FILL valve is open and the DRAIN valve is closed at the start of the cycle.

Like the Model 246AT and 247AT, THE 247DAT may be specified with a control panel to allow for remote operation of multiple drip traps either automatically (as above) or manually. The remote control station can also be specified with status lights and/or alarm contacts.

WHICH MODEL SHOULD YOU SPECIFY?

Operating Pressure

The first thing to note would be the operating pressure of the line where the drip trap will be installed and note the maximum working pressures of the different models Varec offers.

Design Guidelines

The next thing to look at would be design guidelines to follow when specifying drip traps. There are several design standards to consider when deciding on which model would be the most suitable and practical for the specific installation. The following can serve as a guideline to use. However, it is important to note check with local (City or County) or State standards that may or could potentially apply.

A. Water Environment Federation, Manual of Practice No. 8

MOP 8 states that drip traps should be installed on each sediment trap and at low points in the gas system. The manual notes that float-controlled automatic drip traps require frequent maintenance to keep the valve from sticking open causing gas to leak.

They recommend that this could be suitable for outdoor installation as long as local codes and safety considerations permit.

We have made several design improvements to our Model 245 Drip Trap to improve its operation. If the client is installing this unit indoors in a classified are, it is highly recommended that they install gas detection units in the building.

B. Great Lakes-Upper Mississippi River Board of State Public Health and Environmental Managers (GLUMRB)- Recommended Standards for Wastewater Treatment Facilities(10-State Standard)

The member states or provinces that follow this specific guideline are:

ILLINOIS	ONTARIO, CANADA
NEW YORK	MICHIGAN
INDIANA	PENNSYLVANIA
OHIO	MINNESOTA
IOWA	WISCONSIN

The standard does not permit the use of float-controlled condensate (drip) traps or the Varec Model 245 Automatic Drip Trap.

C. NFPA 820 – Standard for Fire Protection in Wastewater Treatment and Collection Facilities

Drip Traps are potentially installed all over the plant. It is therefore important to note the area classification of where the drip trap will be installed.

NFPA 820 states the following:

A. When the drip traps are installed in underground tunnels with Ventilation D *(Refer to NFPA 820 for definition of ventilation D)*, the 10 foot radius around the drip trap will be classified Division 1.

B. When the drip traps are installed in underground tunnels with Ventilation C *(Refer to NFPA 820 for definition of ventilation D)*, the 10 foot radius surrounding the drip trap will be classified Division 2.

It is common for drip traps to be installed indoors in digester control buildings which are typically classified areas. This is done primarily to protect them from weather.

The Model 246, Model 245, Model 247 and Model 247D are mechanical devices and therefore do not carry a rating.

The Model 246AT, 247AT and 247DAT comes with electric actuator(s) rated for Class 1, Divs. 1 and 2, or is explosion-proof. The timer is also provided in a NEMA 7 (Explosion-proof) Enclosure which makes it ideal for classified areas.

It is also important to note that on all drip traps, there is a certain amount of gas that is trapped in the reservoir that will escape when the drain line is opened. On the Model 247, 247D, 247AT and 247DAT high pressure drip traps, the DRAIN valve must be opened slowly to avoid being sprayed. On the electric actuated version, make sure there is piping directed to a drain.

If a drip trap will be installed outdoors in cold weather conditions, Varec recommends that the line be heat traced and insulated. Varec Biogas offers special insulating jacket for our drip traps. Please consult our insulating jacket literature for additional information.

Confined Spaces and skid mounted

The Model 247D drip trap is ideal for tight or confined spaces because it can be installed low to the ground. This unit is typically installed at low points in the gas piping downstream of booster blowers or compressors. The 247D is ideal for blower and compressor skids because it can be installed on the skid with the compressor or blower and provides a larger reservoir for condensate collection. It is also perfect for use with multi-stage compressors where the water must be drained from two chambers with different pressures.

Ease of Operation

Both the Model 245, 246AT, 247AT and 247DAT drip traps provide the advantage of removing condensate from the reservoir automatically.

When specifying the Model 245 Drip Trap, it is important to note the area or locale it will be installed in.

The Model 246AT and 247AT adds a dimension of sophisticated operation to the drip trap. This is recommended in large MGD plants that has a centralized Distribution Control System (DCS). This will allow the plant to remotely operate and monitor the drip traps at several locations.

The above are some guidelines to follow to help you decide on which model to specify.

The most important rule or guideline to follow is safety and peace of mind. We have made design improvements on our entire Drip Trap product line to always ensure 100% safe and reliable operation. This means that regardless of which model you specify, there is peace of mind that the product will work when properly specified.

Please consult your local Varec Biogas Sales Representative for assistance on specific drip trap application questions.

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