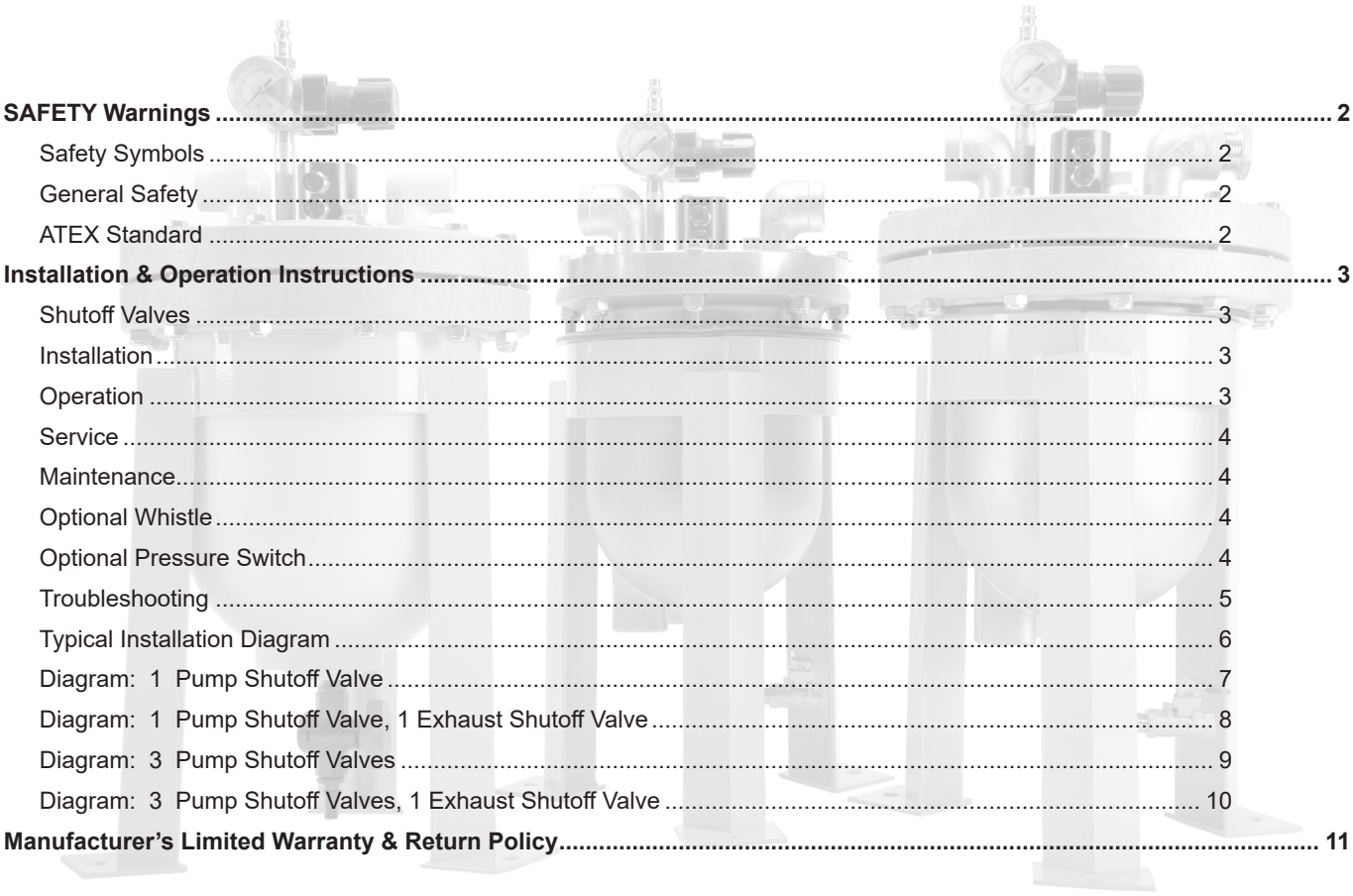
SPILLSTOP™
LEAK CONTAINMENT SYSTEM

BLACOH™
INDUSTRIES

Installation and Operation Manual



SAFETY Warnings

SPILLSTOP should only be installed, operated and repaired by experienced and trained professional mechanics. Read and observe all instructions and safety warnings in this Manual before installing, operating or repairing.

Safety Symbols

The following symbols indicate cautions, warnings and notes that must be observed for safe and satisfactory installation, operation and maintenance.

◈	**WARNINGS**	Danger of serious injury or death could occur if these warnings are ignored.
ⓘ	**CAUTIONS**	Equipment damage, injury or death could occur if these cautions are not observed.
△	**NOTES**	Special instructions for safe and satisfactory installation, operation and maintenance.

General Safety

- ⓘ **ATEX models must be grounded (earthed) before operation.**
- ◈ Always wear safety glasses and other appropriate safety equipment when installing or repairing SPILLSTOP.
- ⓘ Temperature limit is determined by the liquid inside the SPILLSTOP and materials of construction. SPILLSTOP has no moving parts to generate heat.
- ⓘ DO NOT use SPILLSTOP with incompatible fluids. Consult distributor or factory if you are not sure of the compatibility of fluids with SPILLSTOP.
- ⓘ **Static spark can cause an explosion resulting in severe injury or death. Ground SPILLSTOP and pumping system when pumping flammable fluids or operating in flammable environments.**

ATEX Standard

△ Certain models made for the European market are intended for use in potentially explosive atmospheres and meet the requirements of ATEX directive 2014/34/EU. These models have the AT designation at the end of the part number, comply with ISO 80079-36, and have an ATEX rating of II 2GD Ex h IIB T4 Gb Db. AT models have a grounding lug and must be grounded (earthed) before operation.

Installation & Operation Instructions

Shutoff Valves

Depending on the model, SPILLSTOP includes one to four Shutoff Valves. Additional Shutoff Valves are available from Blacoh.

Pump Shutdown: Installed at the pump inlet, the Pump Shutoff Valve automatically shuts down the pump in the event of a diaphragm failure. A single SPILLSTOP can protect multiple smaller air operated diaphragm pumps (1/2" or 1" models) by routing all of the pump exhausts through the SPILLSTOP and installing additional Pump Shutoff Valves for each pump. It is possible to do this with larger pumps but, there could be a significant reduction in flow due to the restriction added to the pump exhaust.

High Inlet Pressure/Positive Flooded Suction: For applications with positive flooded suction (positive inlet pressure to the pump), it is recommended to install an additional Shutoff Valve on the pump exhaust line to stop fluid in the tank from flowing through the failed diaphragm and out of the pump exhaust when the pump is shut down. For purposes of these instructions, this valve is referred to as an Exhaust Shutoff Valve.

Installation

1. Install the Pump Shutoff Valve directly to the air inlet of the pump (Figure A). This valve can be installed before or after any regulator or lubricator installed in the compressed air line. Refer to Figures B-D for appropriate valve locations and air line connections when installing multiple valves.

   △ **The Pump Shutoff Valve must be installed so that air flows into the valve through Port A (or Port 1 depending on valve design), and exits the valve through Port B (or Port 2) towards the pump.**

2. Install an exhaust hose with a pressure rating at least as high as the system air pressure, from the pump's air discharge port (exhaust) to the SPILLSTOP Inlet connection port. Alternatively, rigid piping may be used; however, a minimum 6" (15.2 cm) length of hose should be used for the connection from the pipe to the Inlet connection port.
3. If using an Exhaust Shutoff Valve when there is positive inlet pressure to the pump, install the Exhaust Shutoff Valve in the pump exhaust line at the SPILLSTOP Inlet connection port (Figures B and D). This valve will close whenever the pump is shut down, regardless of whether the SPILLSTOP is activated or not.
4. Connect 1/4" plastic tubing from the Pump Shutoff Valve to Port 2 of the SPILLSTOP Actuator Valve (Figure 1).

   △ **Since the Pump Shutoff Valve is a normally closed valve, the pump will not operate unless compressed air is supplied to the Pump Shutoff Valve. Air supplied to the Pump Shutoff Valve must flow through the SPILLSTOP Actuator Valve in order for the SPILLSTOP to shut down the pump when a leak is detected.**

5. Connect an air line with a 1/4" (6.4 mm) female quick connect to the 1/4" (6.4 mm) male quick connect on the SPILLSTOP Regulator. The quick connect can be removed for hard plumbing.
6. Adjust the Regulator to a minimum of 40 psi (2.7 bar) to start the pump. If the SPILLSTOP is installed with a Whistle and/or more than two Shutoff Valves, increase pressure to a minimum of 60 psi (4.1 bar).
7. Mounting the SPILLSTOP Stand to the floor or table is not required; however, the Stand includes footpads with holes for this purpose.
8. The SPILLSTOP is now operational. When compressed air is supplied to the pump, the SPILLSTOP will operate normally. Exhaust air from the pump will flow into the SPILLSTOP and out of the SPILLSTOP Silencer/Reclassifier.

Operation

When there is a leak through the pump diaphragm, process fluid enters the pump's air exhaust and is carried to the SPILLSTOP. As process fluid is accumulated in the SPILLSTOP, the internal Float is raised and airflow is shifted through the Actuator Valve from Port 2, the air line connected to the Pump Shutoff Valve, to Port 3 (Figure 1). When this shift occurs, air pressure is removed from the Pump Shutoff Valve which in turn closes the valve to shut down the pump and prevent the spill. At the same time, the air pressure shifted to Port 3 of the Actuator Valve is used to pneumatically power the optional Whistle, Power Switch, and/or an additional Pump Shutoff Valve to automatically start a standby pump.

When the SPILLSTOP triggers a pump shutdown, the most likely cause is a failed pump diaphragm. Excessive moisture laden compressed air can also cause the SPILLSTOP to trigger a shutdown, simulating a failed pump diaphragm.

Follow the steps below when a pump shutdown occurs:

1. Turn off all air supply to the pump and SPILLSTOP.
2. Drain the contents of the SPILLSTOP into a container appropriate for the process fluid being pumped by opening the Drain Valve on the bottom of the SPILLSTOP. A tube or hose should be attached to the Drain Valve when draining fluid.
3. If fluid drained from the SPILLSTOP is water condensation only, no further action is necessary. Close the Drain Valve and turn on the air supply to the pump and SPILLSTOP to restart the pump.
4. If the process fluid being pumped is found in the SPILLSTOP, the pump must be repaired immediately to minimize internal damage and the SPILLSTOP must be serviced.

Service

The SPILLSTOP must be serviced after every pump shutdown before being put back into operation. To service the SPILLSTOP:

1. Disconnect all air supply to the pump and SPILLSTOP. Remove the SPILLSTOP lid and flush internal areas with water or cleaner appropriate for the process fluid being pumped.
   a. Connect an air line to the Regulator and disconnect the plastic tube at Port 2 of the Actuator Valve. Adjust the Regulator to a minimum of 40 psi (2.7 bar). Air should be flowing from Port 2.
   b. Activate the SPILLSTOP by pushing the Float up or raise the Float by turning the SPILLSTOP upside down. Air should **stop** flowing from Port 2.
   c. If air does not stop flowing from Port 2 when the SPILLSTOP is activated, the Actuator Valve may be clogged or damaged and should be cleaned or replaced.
2. Reassemble the SPILLSTOP and reconnect the Shutoff Valve(s). Adjust the Regulator to a minimum of 40 psi (2.7 bar) to restart the pump. If the SPILLSTOP is installed with a Whistle and/or more than two Shutoff Valves, increase pressure to a minimum of 60 psi (4.1 bar).

Maintenance

The SPILLSTOP is normally maintenance free; however, a function test should be performed at least every 90 days to ensure proper operation. To perform a function test:

1. Turn off all air supply to the pump and SPILLSTOP.
2. Open the Test Port Plug on the SPILLSTOP lid and fill the SPILLSTOP with approximately 2 cups (.47L) of water.
3. Turn on the air supply to the pump and SPILLSTOP, and adjust the Regulator to a minimum of 40 psi (2.7 bar).
   The pump should not operate.
4. Turn off all air supply to the pump and replace the Test Port Plug.
5. Drain the water from the SPILLSTOP into an appropriate container by opening the Drain Valve on the bottom of the SPILLSTOP. A tube or hose should be attached to the Drain Valve when draining fluid.
6. Close the Drain Valve and turn on the air supply to the pump and SPILLSTOP. The pump should operate normally.

Optional Whistle

Connected to the tubing installed on Port 3 of the Actuator Valve, the pneumatic Whistle will sound an auditory alarm alerting personnel that the primary pump has failed and SPILLSTOP has shut down the pump (Figure 1). When SPILLSTOP triggers a pump shutdown, air pressure is shifted from Port 2 to Port 3 of the Actuator Valve to pneumatically power the Whistle. The Whistle comes pre-installed from the factory if ordered with the SPILLSTOP. When ordered separately, the Whistle Kit (part number 50-98K) includes the Whistle, tube tee and 15 feet of 1/4” tubing. To install the Whistle Kit:

1. Attach the Whistle to the tubing provided and connect to Port 3 of the Actuator Valve. If the SPILLSTOP includes a Pressure Switch and/or an additional Shutoff Valve for a backup pump, use the tee provided with the Kit to install the Whistle in the tubing connecting those devices to Port 3. The tee can be inserted at any point in the tubing.

   IMPORTANT! The length of tube from the tee to the Whistle must be the same as the length of tube from the tee to the Pressure Switch and/or the backup pump Shutoff Valve. The Whistle consumes a high volume of compressed air and if not installed properly, can prevent the Pressure Switch and/or the backup pump Shutoff Valve from activating.
2. Test the Whistle before putting the SPILLSTOP into operation:
   a. Connect an air line to the Regulator and adjust the Regulator to a minimum of 40 psi (2.7 bar). If the SPILLSTOP is installed with more than two Shutoff Valves, increase pressure to a minimum of 60 psi (4.1 bar).
   b. Activate the SPILLSTOP by pushing the Float up or raise the Float by turning the SPILLSTOP upside down. Air should start flowing through the tube connected to Port 3 to sound the Whistle and, if installed, the Pressure Switch should activate.

Optional Pressure Switch

Connected to the tubing installed on Port 3 of the SPILLSTOP Actuator Valve, the pneumatic-to-electric Pressure Switch is used to power a warning light or other electrical device when the primary pump has failed and SPILLSTOP has shut down the pump (Figure 1). When SPILLSTOP triggers a pump shutdown, the device connected to the Pressure Switch will be powered on. When the SPILLSTOP is put back into operation after a pump shutdown, the device will be powered off.

1. The Pressure Switch has three blade-type electrical contact points.
   a. Connect the common, usually white wire of the electrical device to the common (COM) blade on the Pressure Switch.
   b. Connect the live, usually black wire of the electrical device to the normally open (N.O.) blade connection.
2. Attach the air tube to Port 3 of the Actuator Valve and connect to the Pressure Switch’s barb connection.

3. Test the Pressure Switch before putting the SPILLSTOP into operation.
    a. Connect an air line to the Regulator and adjust the Regulator to a minimum of 40 psi (2.7 bar). If the SPILLSTOP is installed with a Whistle and/or more than two Shutoff Valves, increase pressure to a minimum of 60 psi (4.1 bar).
    b. Activate the SPILLSTOP by pushing the Float up or raise the Float by turning the SPILLSTOP upside down. Air should start flowing through the tube connected to Port 3 of the Actuator Valve and the Pressure Switch should power on the electrical device.

Troubleshooting

If either the pump or the SPILLSTOP do not operate normally after installation, maintenance or service, follow the steps below in the order shown to source and fix the problem.

1. The SPILLSTOP requires a constant and separate source of compressed air to function properly. With the pump in operation and air supplied to the SPILLSTOP, adjust the Regulator and verify the gauge reads 40 psi (2.7 bar) or higher.
2. Disconnect all air supply to the pump and SPILLSTOP. Connect an air line to the Regulator and disconnect the plastic tube at Port 2 of the Actuator Valve. Adjust the Regulator to a minimum of 40 psi (2.7 bar). Air should be flowing from Port 2.
    a. If air is not flowing from Port 2, the Actuator Valve may be clogged or damaged and should be cleaned or replaced.
    b. If air is flowing from Port 2, check the tubing to the Pump Shutoff Valve to ensure air can flow from the Actuator Valve to the Shutoff Valve during normal operation.
3. Disconnect the air line to the Regulator. Uninstall the SPILLSTOP completely from the pump and system, and restart the pump.
    a. If the pump does not operate normally after removing the SPILLSTOP, refer to the pump manual or contact the pump manufacturer for instructions to repair the pump.
4. Disconnect all air supply to the pump and reinstall the exhaust hose from the pump's air discharge port (exhaust) to the SPILLSTOP Inlet connection port. Do not connect SPILLSTOP Shutoff Valve(s).
    a. Check that pump exhaust is entering the SPILLSTOP through the Inlet connection port and exiting through the Test Port Plug.
    b. Start the pump to ensure the pump operates normally.
5. Disconnect all air supply to the pump and SPILLSTOP. Remove the SPILLSTOP lid and flush internal areas with water or cleaner appropriate for the process fluid being pumped.
    a. Connect an air line to the Regulator and disconnect the plastic tube at Port 2 of the Actuator Valve. Adjust the Regulator to a minimum of 40 psi (2.7 bar). Air should be flowing from Port 2.
    b. Activate the SPILLSTOP by pushing the Float up or raise the Float by turning the SPILLSTOP upside down. Air should stop flowing from Port 2.
    c. If air does not stop flowing from Port 2 when the SPILLSTOP is activated, the Actuator Valve may be clogged or damaged and should be cleaned or replaced.
6. Reassemble the SPILLSTOP and reconnect Shutoff Valve(s). Adjust the Regulator to a minimum of 40 psi (2.7 bar) to restart the pump.
    a. If the SPILLSTOP is installed with a Whistle and/or more than two Shutoff Valves, increase pressure to a minimum of 60 psi (4.1 bar).
7. Ensure SPILLSTOP Shutoff Valve(s) open when the system is operating.
    a. To visually inspect a valve, it is possible to see the piston lift approximately 0.25" from its seat when viewed through Port B.
    b. To mechanically inspect a valve, connect a fitting to Port A and supply compressed air to that fitting. If air escapes Port B, the valve is open.
8. Disconnect all air supply to the pump and SPILLSTOP and reinstall the Pump Shutoff Valve. Verify that compressed air is supplied to Port A and that the pump's air inlet is connected to Port B. Reapply compressed air to the SPILLSTOP to start the pump. If the pump does not operate normally, the valve may be undersized for the application. Contact Blacoh for assistance.
9. If using an Exhaust Shutoff Valve, disconnect all air supply to the pump and SPILLSTOP and reinstall the valve. Verify that the pump's exhaust is connected to Port A and the SPILLSTOP is connected to Port B. Reapply compressed air to the SPILLSTOP to start the pump. If the pump is not operating normally, the valve may be undersized for the application. Contact Blacoh for assistance.

Figure 1

Typical Installation Diagram

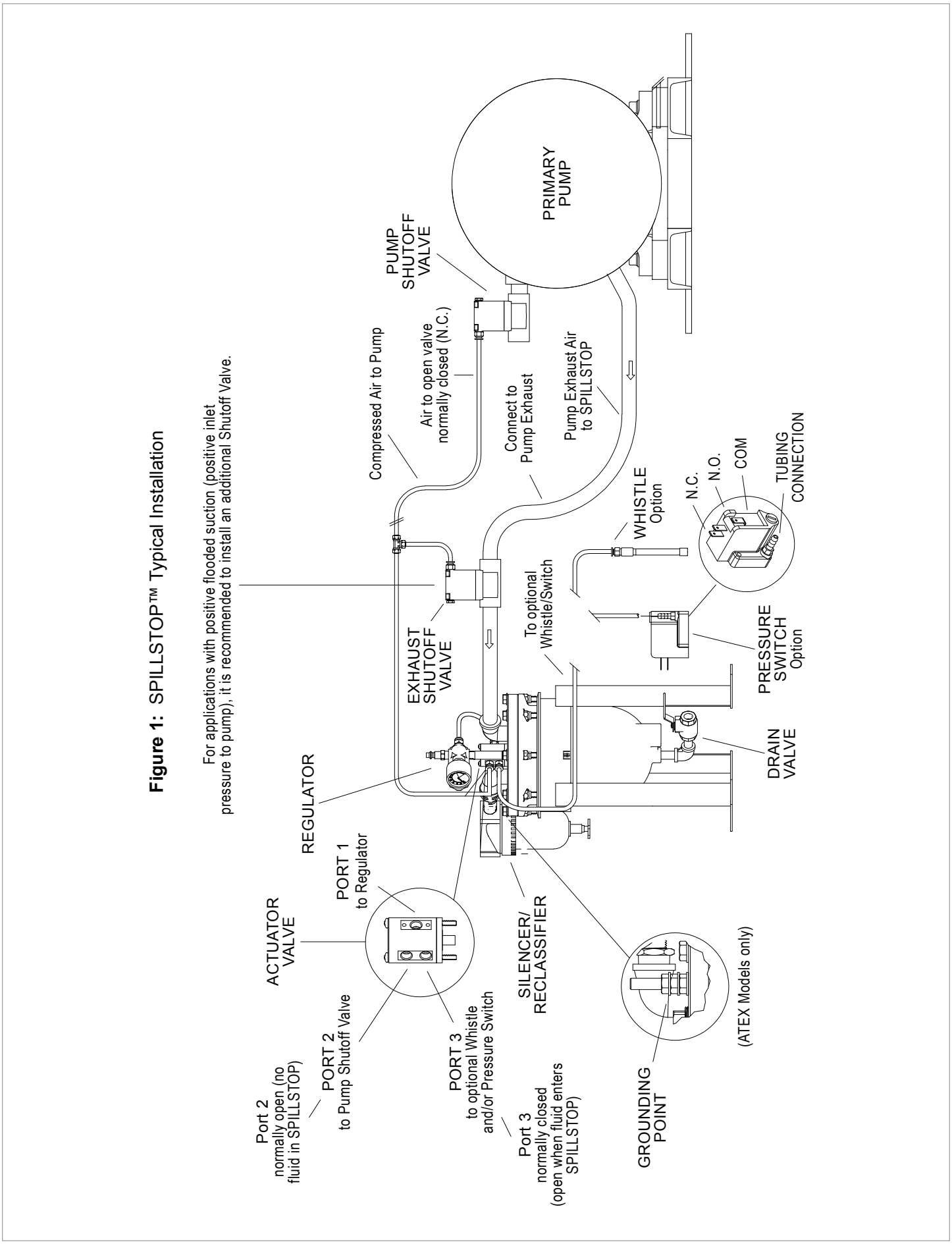


Figure A

Diagram: 1 Pump Shutoff Valve

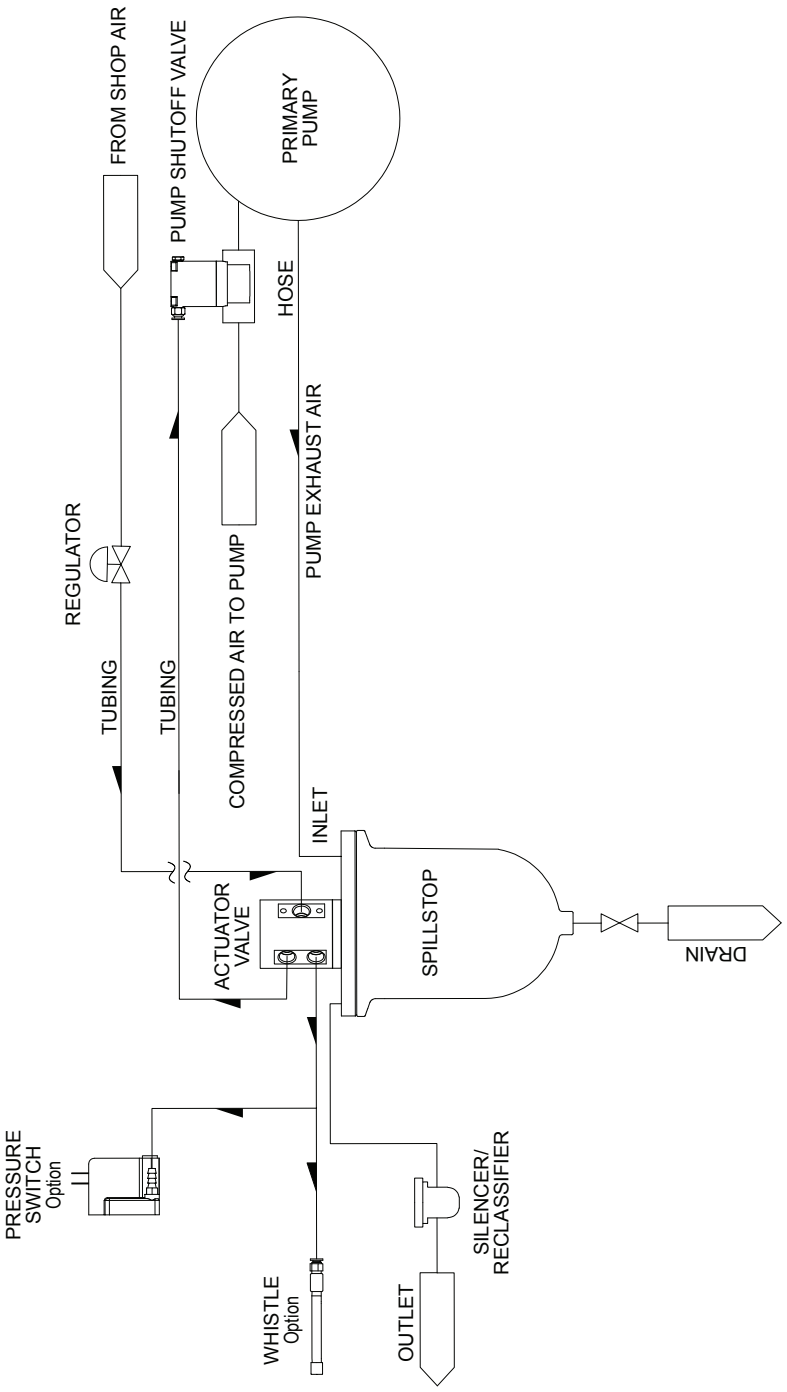


Figure A: SPILLSTOP™ Installation Diagram 1 Pump Shutoff Valve

Figure B

Diagram: 1 Pump Shutoff Valve, 1 Exhaust Shutoff Valve

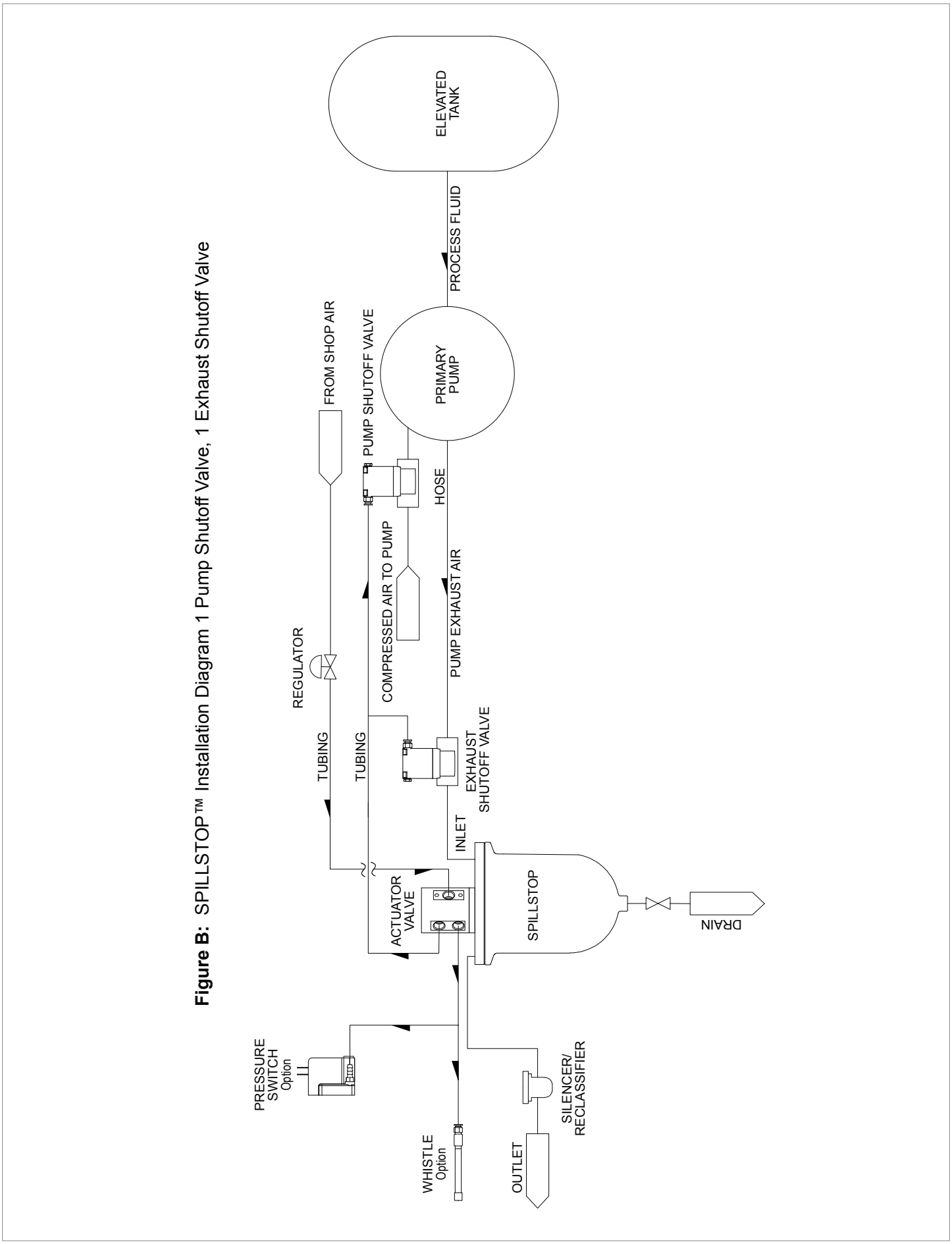


Figure B: SPILLSTOP™ Installation Diagram 1 Pump Shutoff Valve, 1 Exhaust Shutoff Valve

Figure C

Diagram: 3 Pump Shutoff Valves

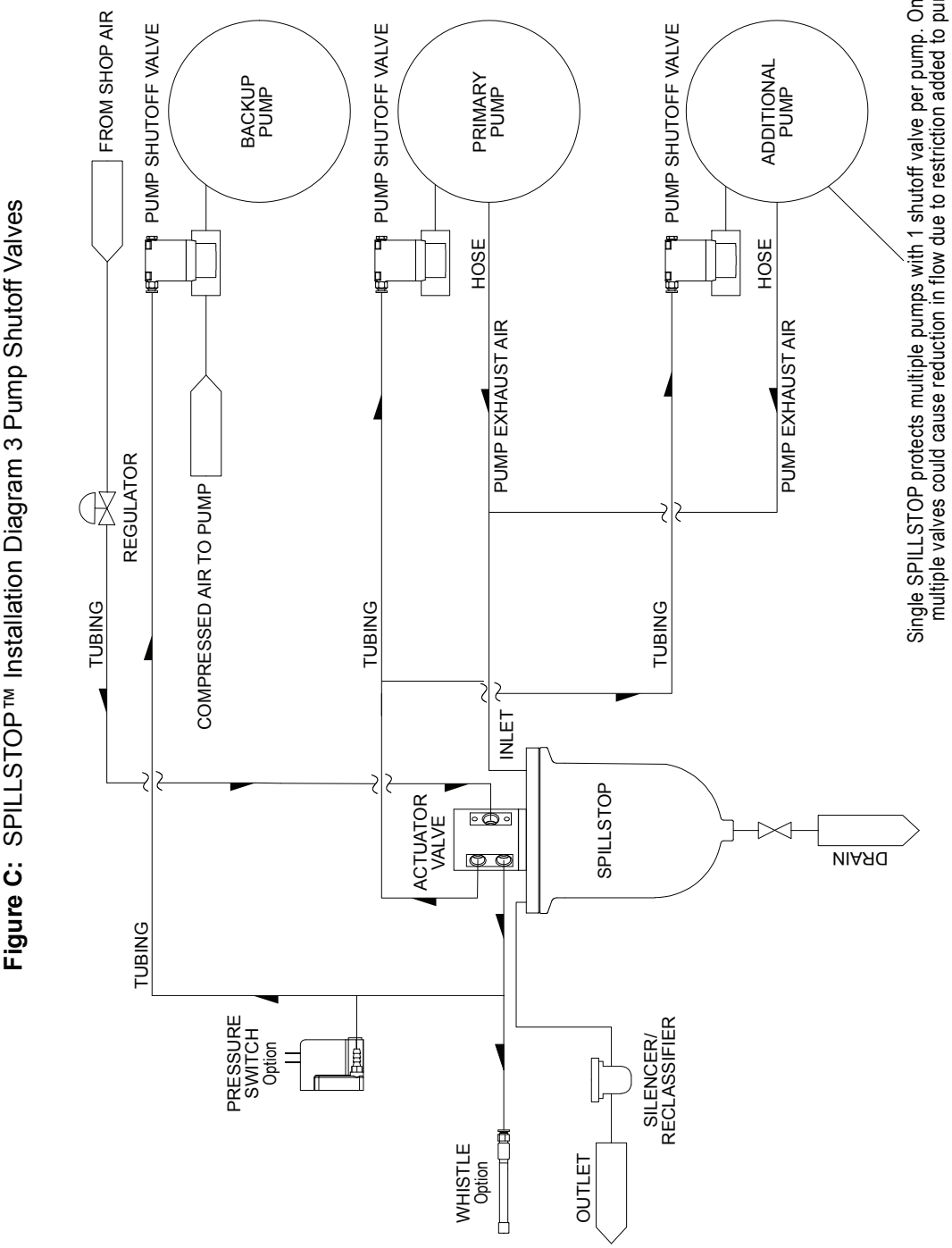


Figure C: SPILLSTOP™ Installation Diagram 3 Pump Shutoff Valves

Figure D

Diagram: 3 Pump Shutoff Valves, 1 Exhaust Shutoff Valve

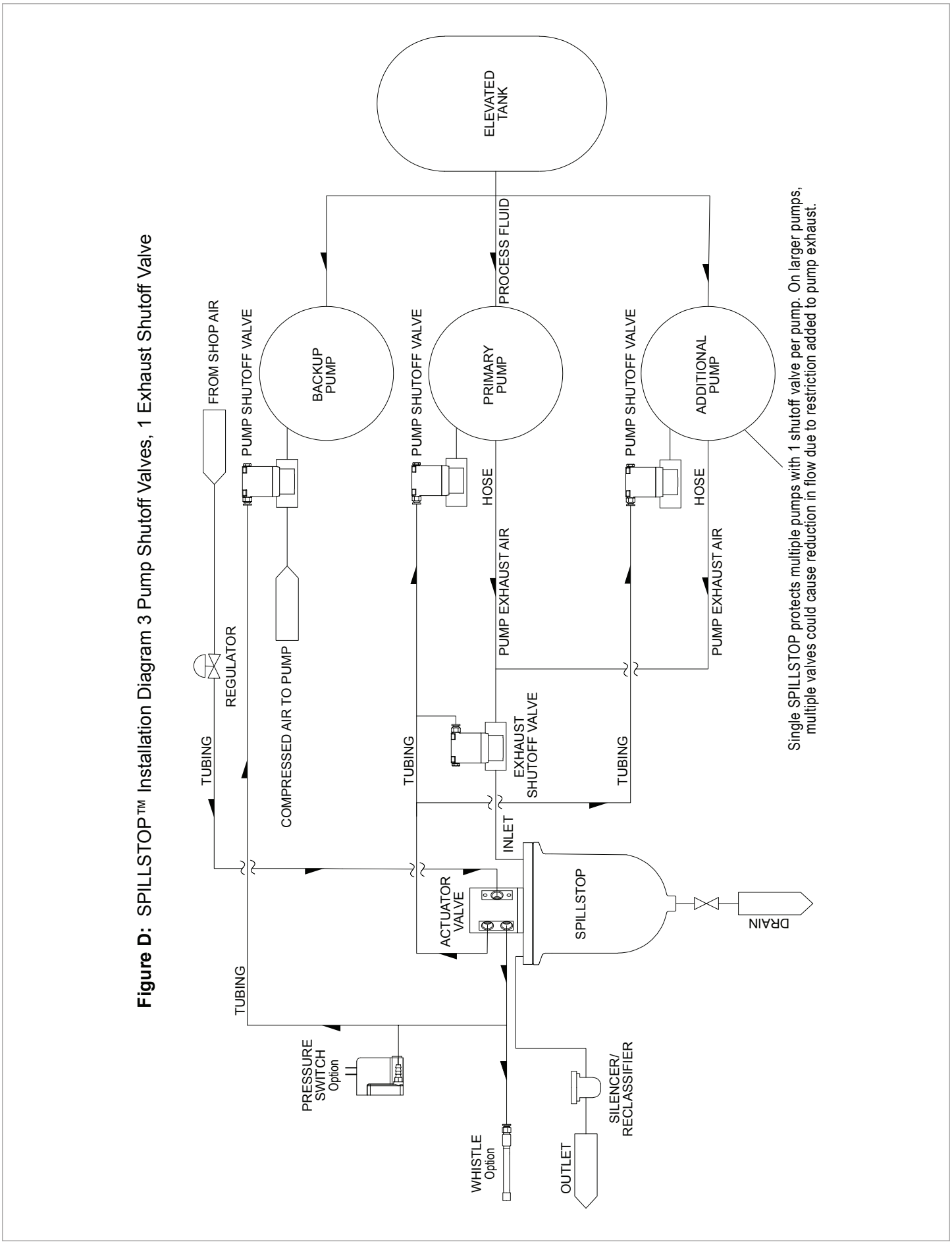


Figure D: SPILLSTOP™ Installation Diagram 3 Pump Shutoff Valves, 1 Exhaust Shutoff Valve

Manufacturer's Limited Warranty & Return Policy

Details regarding warranty and return policy are available on Blacoh's website at Blacoh.com

BLACOH™
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