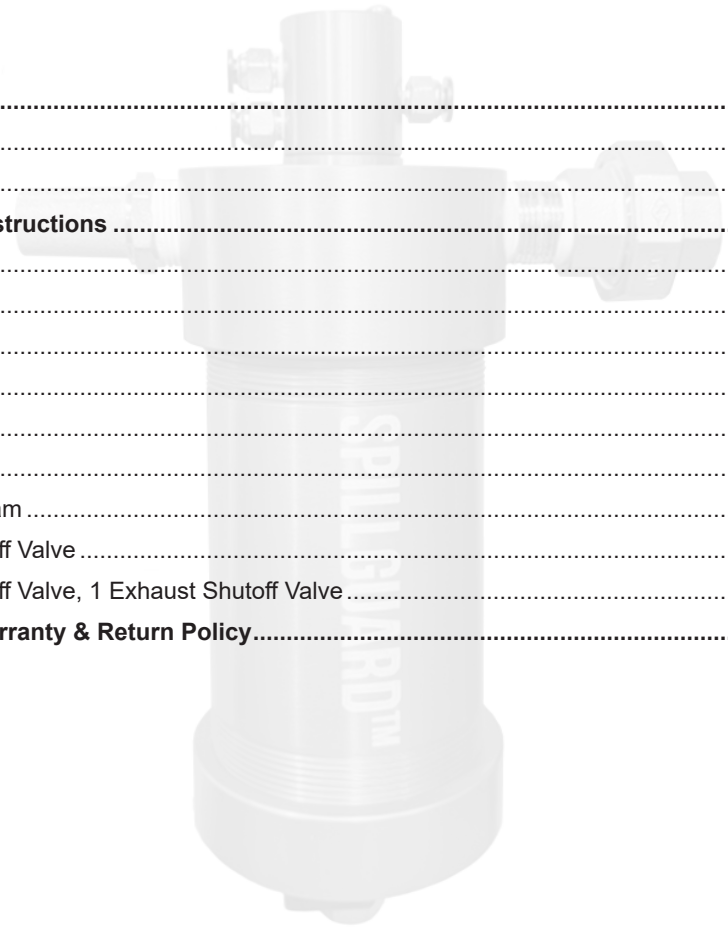
SPILLGUARD™
SPILL PREVENTION

BLACOH™
INDUSTRIES

Installation and Operation Manual



SAFETY Warnings

SPILLGUARD 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

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

Installation & Operation Instructions

Shutoff Valves

The SPILLGUARD includes one Shutoff Valve. 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 SPILLGUARD can protect multiple smaller air operated diaphragm pumps (1/2” models) by routing all of the pump exhausts through the SPILLGUARD 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. It is recommended that 1” and larger pumps are installed with their own SPILLGUARD to maintain maximum pump performance.

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 Figure B 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. The SPILLGUARD can be attached directly to the pump exhaust in place of the muffler. If the pump will not support the weight of the SPILLGUARD or if an Exhaust Shutoff Valve will be used, the SPILLGUARD should be installed away from the pump with a Stand.
3. When using a Stand, 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 SPILLGUARD 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.
4. 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 SPILLGUARD Inlet connection port (Figure B). This valve will close whenever the pump is shut down whether the SPILLGUARD is activated or not.
5. Connect 1/4” plastic tubing from the Pump Shutoff Valve to Port 2 of the SPILLGUARD 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 SPILLGUARD Actuator Valve in order for the SPILLGUARD to shut down the pump when a leak is detected.**

6. 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 SPILLGUARD Regulator. The quick connect can be removed for hard plumbing.
7. The supplied pressure regulator is not adjustable and is factory set to the pressure required (45 psi).
8. Mounting the SPILLGUARD Stand to the floor or table is recommended. The Stand includes footpads with holes for this purpose.
9. The SPILLGUARD is now operational. When compressed air is supplied to the pump, the SPILLGUARD will operate normally. Exhaust air from the pump will flow into the SPILLGUARD and out of the SPILLGUARD Silencer.

Operation

When there is a leak through the pump diaphragm, process fluid enters the pump’s air exhaust and is carried to the SPILLGUARD.
As process fluid is accumulated in the SPILLGUARD, 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.

When the SPILLGUARD triggers a pump shutdown, the most likely cause is a failed pump diaphragm. Excessive moisture laden compressed air can also cause the SPILLGUARD 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 SPILLGUARD.
2. Drain the contents of the SPILLGUARD into a container appropriate for the process fluid being pumped by opening the Drain Valve on the bottom of the SPILLGUARD. A tube or hose should be attached to the Drain Valve when draining fluid.
3. If fluid drained from the SPILLGUARD is water condensation only, no further action is necessary. Close the Drain Valve and turn on the air supply to the pump and SPILLGUARD to restart the pump.
4. If the process fluid being pumped is found in the SPILLGUARD, the pump must be repaired immediately to minimize internal damage and the SPILLGUARD must be serviced.

Service

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

1. Disconnect all air supply to the pump and SPILLGUARD. Remove the SPILLGUARD 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. 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). Connect the Regulator to the air supply.

Maintenance

The SPILLGUARD 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 SPILLGUARD.
2. Remove the Silencer from on the SPILLGUARD exhaust and fill the SPILLGUARD with approximately 1.5 cups (.35L) of water.
3. Turn on the air supply to the pump and SPILLGUARD. **The pump should not operate.**
4. Turn off all air supply to the pump and replace the Silencer.
5. Drain the water from the SPILLGUARD into an appropriate container by opening the Drain Valve on the bottom of the SPILLGUARD. 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 SPILLGUARD. The pump should operate normally.

Troubleshooting

If either the pump or the SPILLGUARD 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 SPILLGUARD requires a constant and separate source of compressed air to function properly. Ensure that minimum 50 psi air is being supplied to the SPILLGUARD regulator.
2. Disconnect all air supply to the pump and SPILLGUARD. Connect an air line to the Regulator and disconnect the plastic tube at Port 2 of the Actuator Valve. 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 SPILLGUARD completely from the pump and system, and restart the pump.
    a. If the pump does not operate normally after removing the SPILLGUARD, 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 SPILLGUARD Inlet connection port. Do not connect SPILLGUARD Shutoff Valve(s).
    a. Check that pump exhaust is entering the SPILLGUARD through the Inlet connection port and exiting through the SPILLGUARD exhaust port.
    b. Start the pump to ensure the pump operates normally.
5. Disconnect all air supply to the pump and SPILLGUARD. Remove the SPILLGUARD 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. Air should be flowing from Port 2.
    b. Activate the SPILLGUARD by pushing the Float up or raise the Float by turning the SPILLGUARD upside down. Air should stop flowing from Port 2.
    c. If air does not stop flowing from Port 2 when the SPILLGUARD is activated, the Actuator Valve may be clogged or damaged and should be cleaned or replaced.
6. Reassemble the SPILLGUARD and reconnect Shutoff Valve(s). Connect the Regulator to a minimum of 40 psi (2.7 bar) air supply to restart the pump.
7. Ensure SPILLGUARD 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 SPILLGUARD 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 SPILLGUARD 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 SPILLGUARD and reinstall the valve. Verify that the pump's exhaust is connected to Port A and the SPILLGUARD is connected to Port B. Reapply compressed air to the SPILLGUARD to start the pump. If the pump is not operating normally, the valve may be undersized for the application. Contact Blacoh for assistance.
10. Please ensure the drain valve remains closed during Operation, this will ensure proper performance of the SPILLGUARD.

Figure 1

Typical Installation Diagram

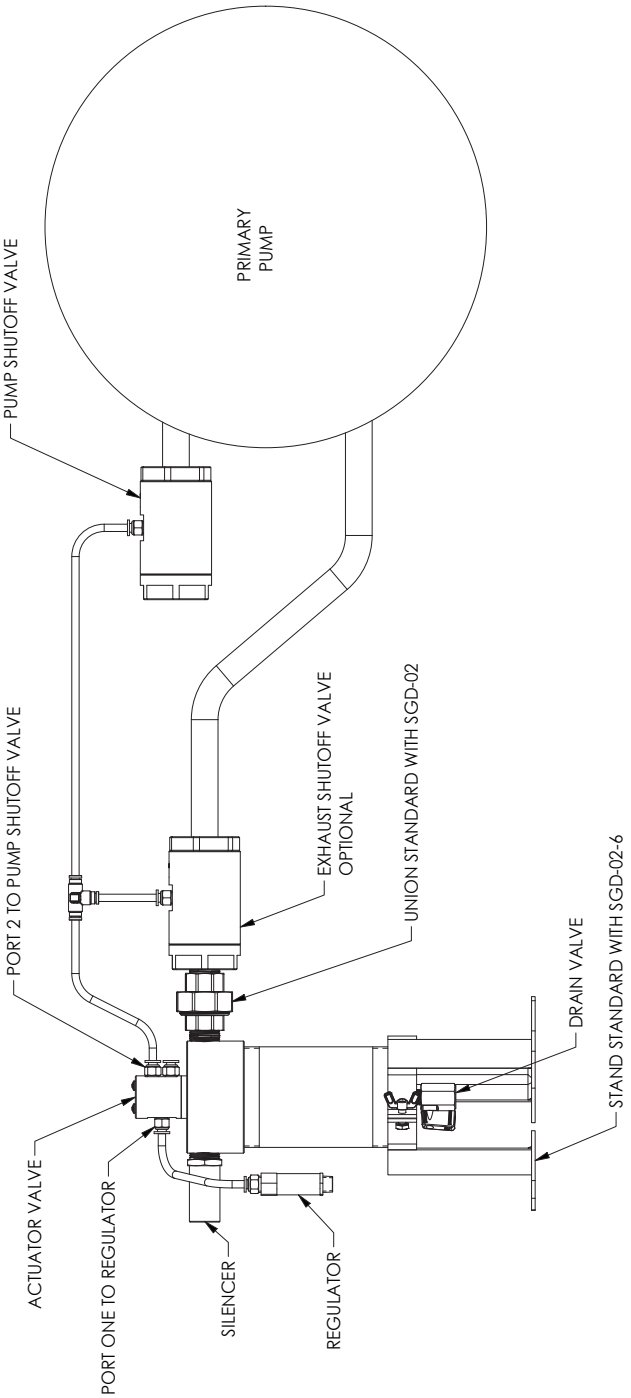


Figure A

Diagram: 1 Pump Shutoff Valve

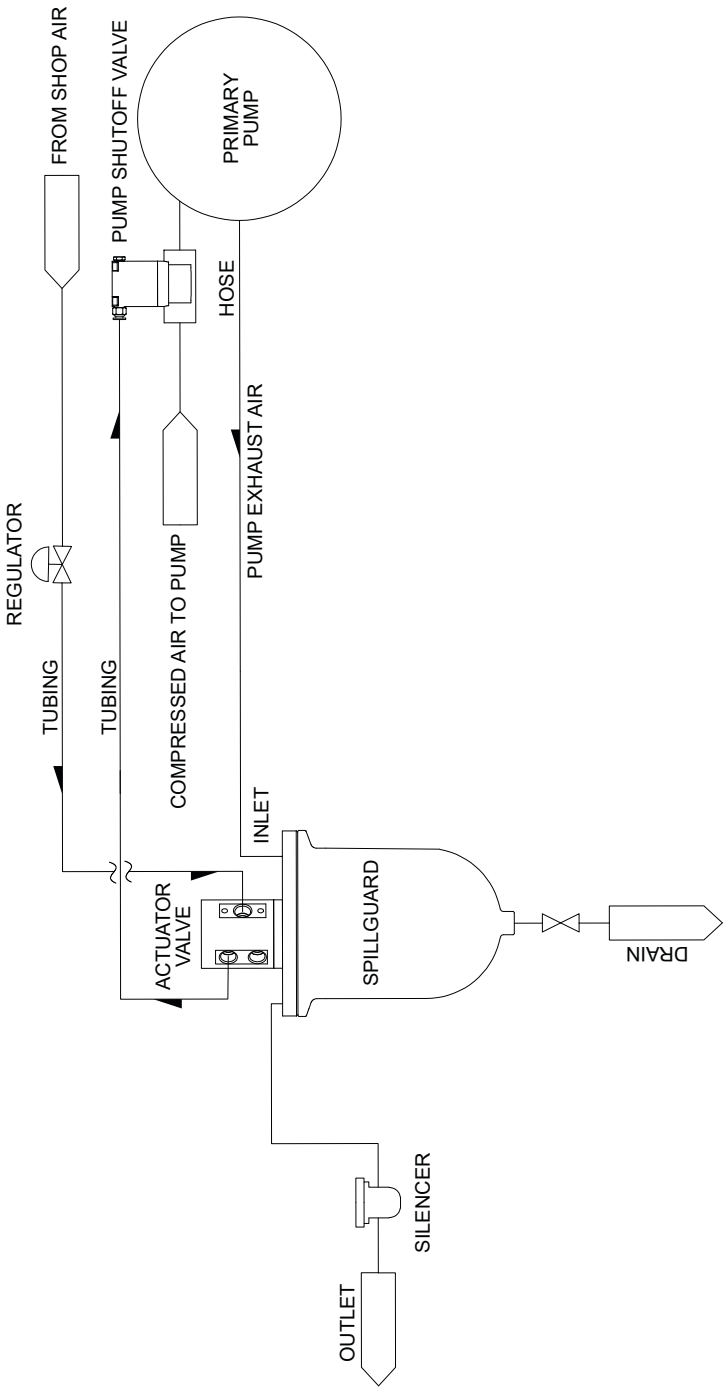


Figure A: SPILLGUARD™ Installation Diagram 1 Pump Shutoff Valve

Figure B

Diagram: 1 Pump Shutoff Valve, 1 Exhaust Shutoff Valve

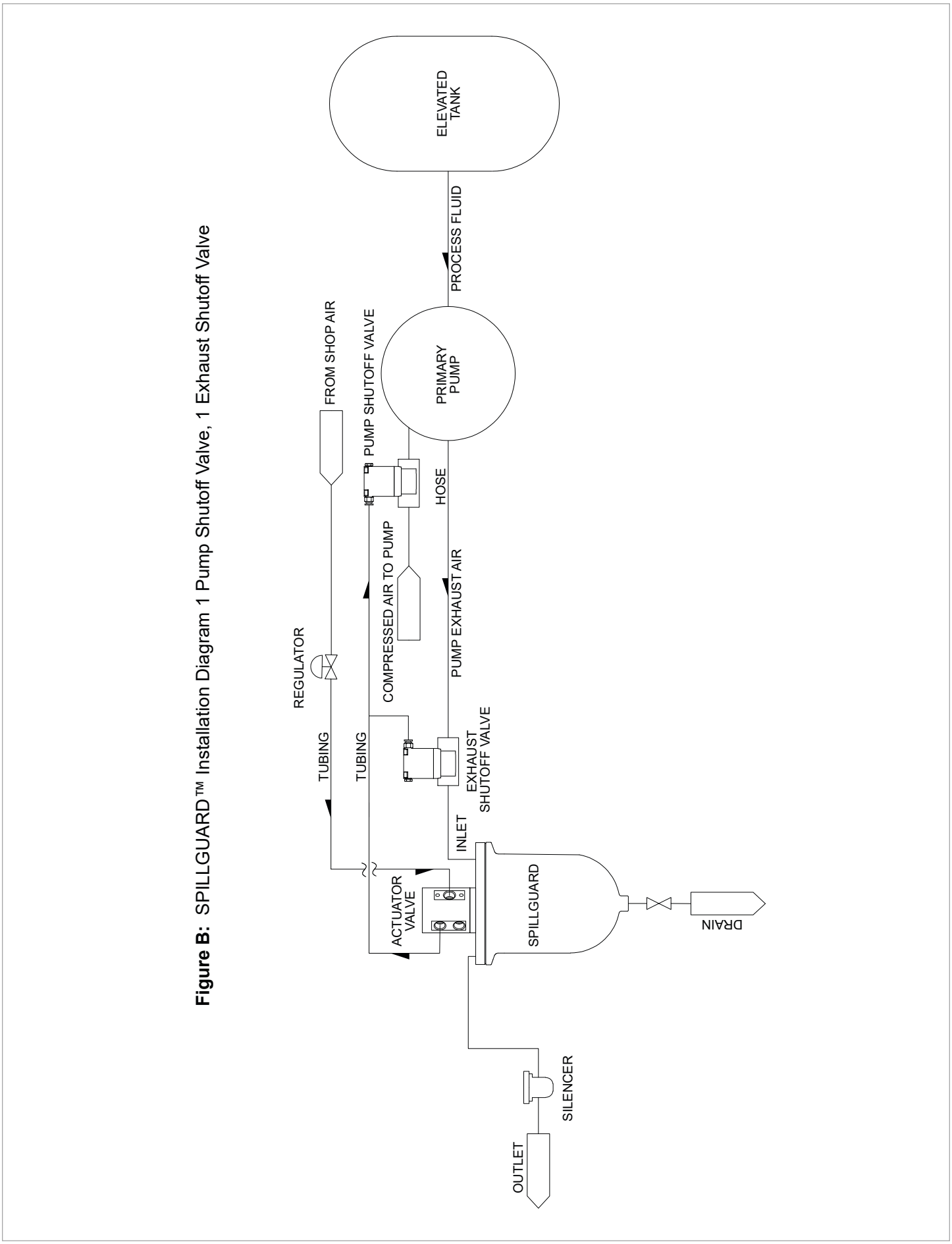


Figure B: SPILLGUARD™ Installation Diagram 1 Pump Shutoff Valve, 1 Exhaust Shutoff Valve

Manufacturer’s Limited Warranty & Return Policy

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

BLACOH™
INDUSTRIES

PROUDLY MANUFACTURED IN THE USA

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