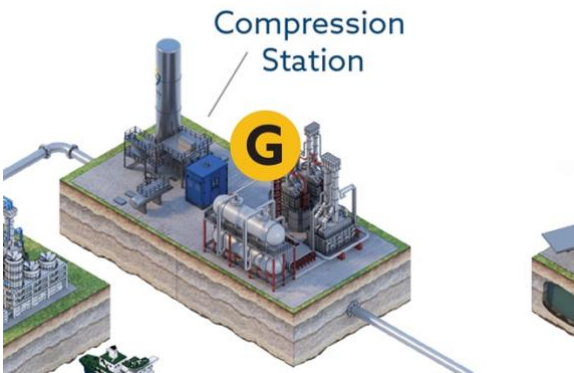


Section 7: ZEVAC® for Compressor Stations



Problem Description

As gas travels along a pipeline, its pressure begins to decrease due to friction caused by the pipeline itself. Therefore, the gas must be repressurized throughout the line in order to allow the transportation to remain as efficient as possible. Because of this, compressor stations are installed along transmission and gathering pipeline systems at various locations across the pipeline network.

Because the stations have a lower pressure at the inlet and higher pressure at the outlet, they “recompress” the natural gas within the line and allow it to continue through the line. Often, they operate at varying pressures ranging from 200 psig to as high as 1500 psig. A typical station consists of an inlet pipeline, a fuel gas system, a liquid handling system, various compression units, a compression yard pipeline, and a discharge pipeline. In order to maintain their efficiency and safety, compressors must be taken offline for maintenance periodically.



Figure 44: Compressor station

ZEVAC presents a helpful solution for a number of applications within a compressor station because the ZEVAC technology can be installed as a standalone unit that is hard piped within a certain building or it can also be delivered via truck and trailer to any unit that needs to be blown down. ZEVAC has the capability to serve both the inlet and outlet streams of the compressor station and as compressor stations commonly include an air compressor building, the air is readily available onsite provided it can be regulated to properly operate the ZEVAC unit. When rules and regulations change over time, ZEVAC helps ensure the station stays in compliance.

For hard pipe installations, all gas blow downs within the station can be brought to a common manifold, allowing for a reduction in the number of ZEVAC units required to be installed onsite. The ZEVAC unit inlet is connected to the manifold and discharged into the downstream piping. The footprint of the ZEVAC unit allows it to be designed and installed in buildings without requiring special considerations. ZEVAC can also be connected to a flanged connection and is suitable for Class 1, Div. 1 operations, which allows it to be installed and operated within any compressor station building. Careful consideration should be given to where the ZEVAC discharge is connected to avoid discharging a contaminated stream (i.e., filter separator inlet) into a clean product stream (i.e., compressor outlet) during a drawdown.

To support emergency operations and repair, ZEVAC can be used to draw down a pipe segment at any hour of the day, without a permit and without interruption to any other portion of the facility. Normally, a blowdown of the compressor unit is loud and obnoxious, and the nearby vicinity must be alerted and cleared before the blowdown procedure. This means nearby projects or work activities must be halted until the procedure is complete. With ZEVAC, none of these considerations need to be made since there is no blowdown or venting to the surrounding area. This allows other projects to continue and the station to continue operations.

Illustrated Checklist and Diagram – Portable Install

Prior to using a ZEVAC system, it is important to identify the procedural steps that need to take place in order to have a successful drawdown at a compressor site. These major procedural steps include:

1. Identification of isolation valves for intake and discharge points.
2. Close valves to the isolation segment to be depressurized.
3. Connect the ZEVAC unit to the pipeline connections using flex hose, appropriate fittings, and the air compressor. Ensure the whip checks are in place and open the tap valves. Purge air from the ZEVAC hoses and equipment before starting actual recompression. Install suction and injection as far upstream as possible.

- Record starting pressure of the intake segment and the discharge portion of pipe.

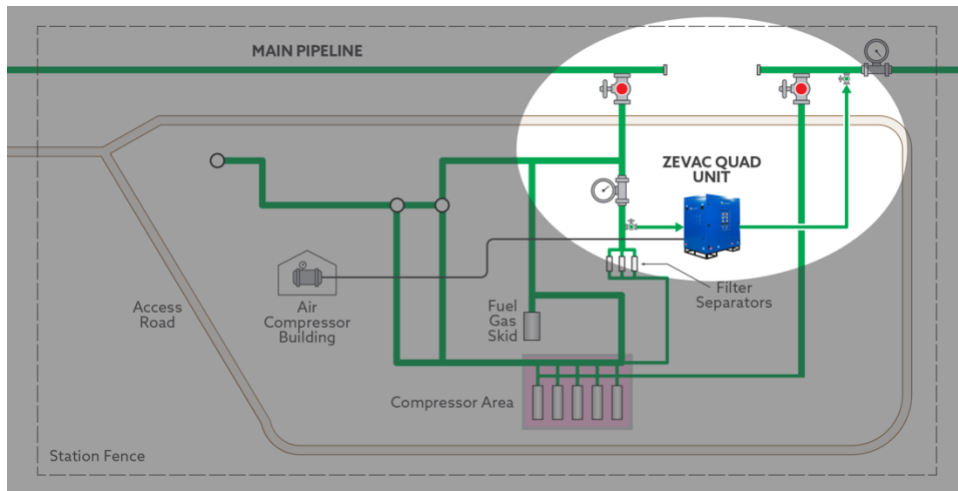


Figure 45: Diagram of compressor station drawdown (Image 1 of 4)

- Turn on ZEVAC equipment and air compressor to begin drawdown.

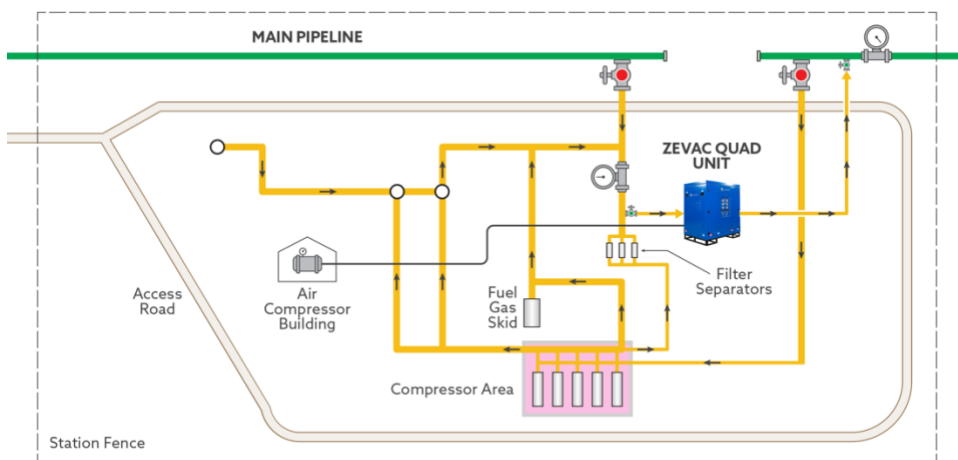


Figure 46: Diagram of compressor station drawdown (Image 2 of 4)

- Monitor pressure at the discharge point and intake section to ensure discharge does not cause over-pressurization of the discharge side pipe system and intake does not go below the desired pressure. **Note:** The Under Pressure Cut Off Switch (UPCO) and Over Pressure Cut Off Switch (OPCO) are designed to ensure the unit shuts off before reaching MAOP or desired draw down pressure.

7. Once desired pressure is reached, stop the ZEVAC equipment and air compressor.

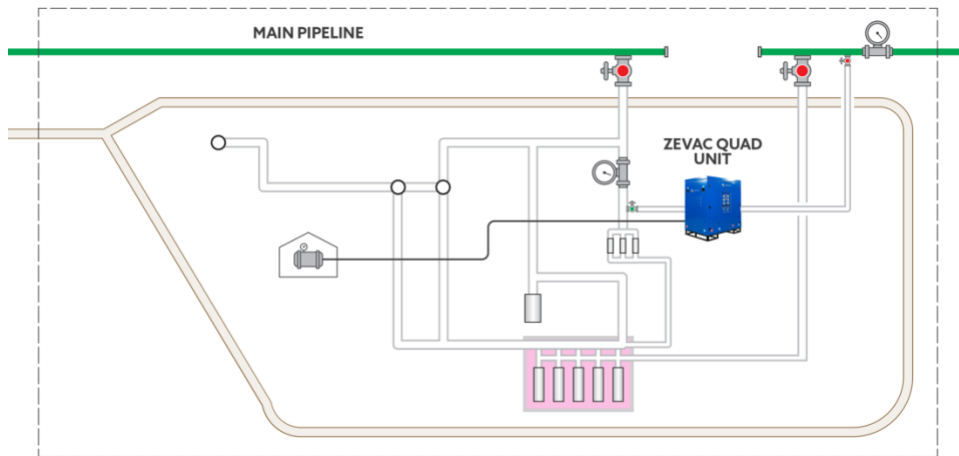


Figure 47: Diagram of compressor station drawdown (Image 3 of 4)

8. Record final pressure readings in the intake section and discharge section of the pipe.
9. Close tap valves and disconnect ZEVAC and air compressor equipment.

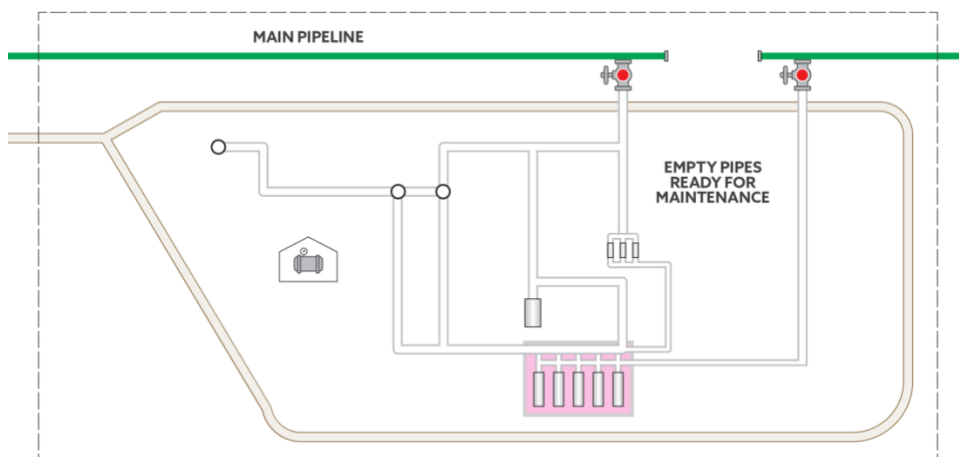


Figure 48: Diagram of compressor station drawdown (Image 4 of 4)

10. Proceed with the required maintenance.

Logic Diagram for Permanent Install:

