Fuel Gas Booster Compressor

Application Bulletin 34

Fuel gas booster compressors provide gaseous fuel (natural gas, bio-gas, or similar) to a gas turbine or piston type engine. These engines operate best with a steady supply of fuel gas at a constant pressure. The system shown in the following diagram provides a steady supply of fuel gas at a constant pressure by using two tanks and a back pressure control valve (also called a back pressure regulator).

Depending on the compression ratio required, single- or two-stage compressors can be used in this system. For compression ratios of 5:1 or less, single-stage compressors are typically used. Higher than 5:1 compression ratios require two-stage compressors.

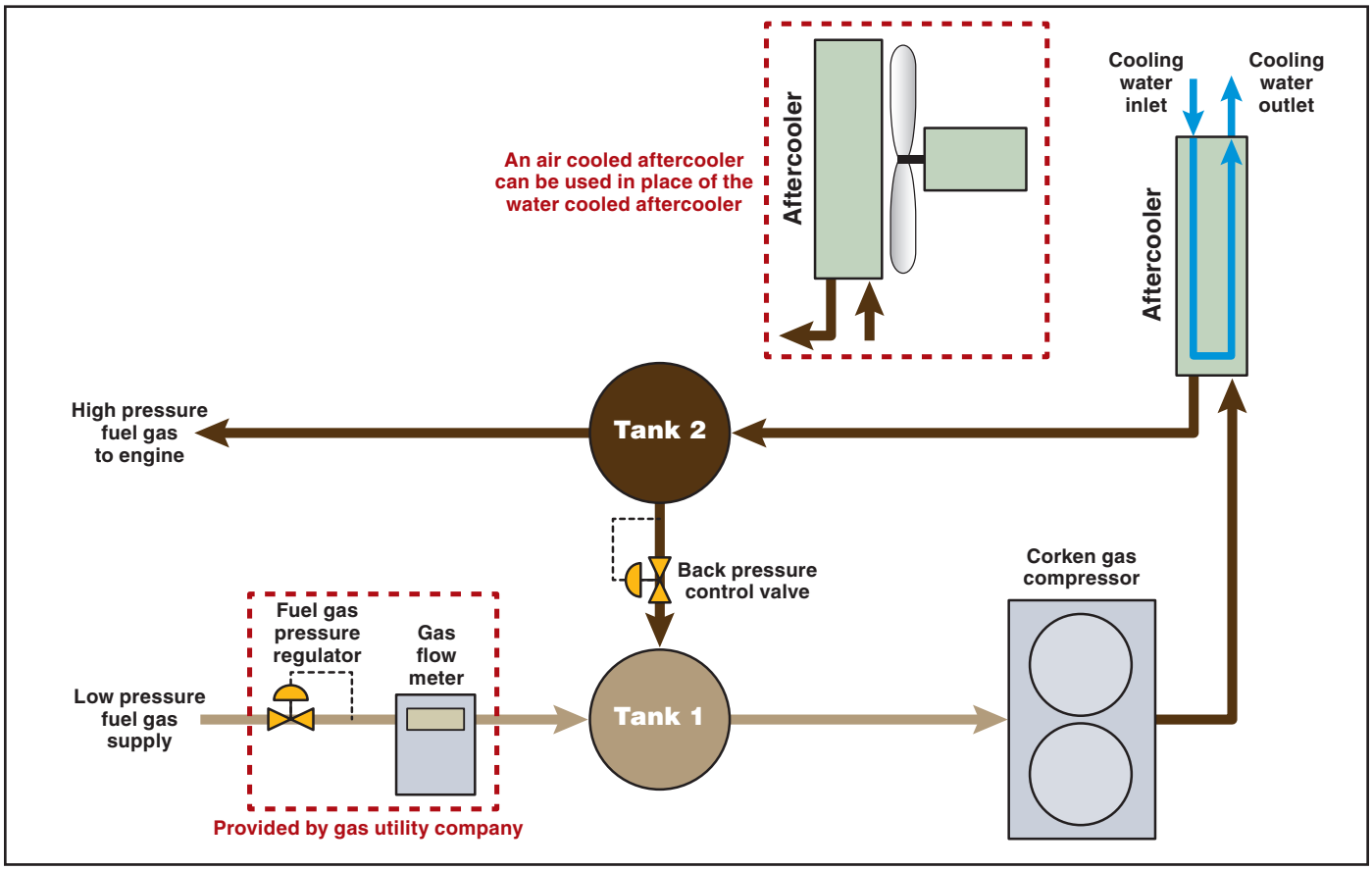
Air cooled or water cooled intercoolers & aftercoolers can be used depending on the availability of cooling water at the site.

Pulsation dampening is not required for the compressor, but the regulators, gas meters, and engines work best with minimal gas pulsations. In addition to providing tank storage, the tanks protect these pulsation-sensitive components by dampening pulsations generated by the gas compressor.

Corken HG601AA fuel gas compressor package.

To see the fuel gas booster compressor configurations offered by Corken, review the diagrams below:

Fuel Gas Booster Compressor (Single Stage, Air Cooled)



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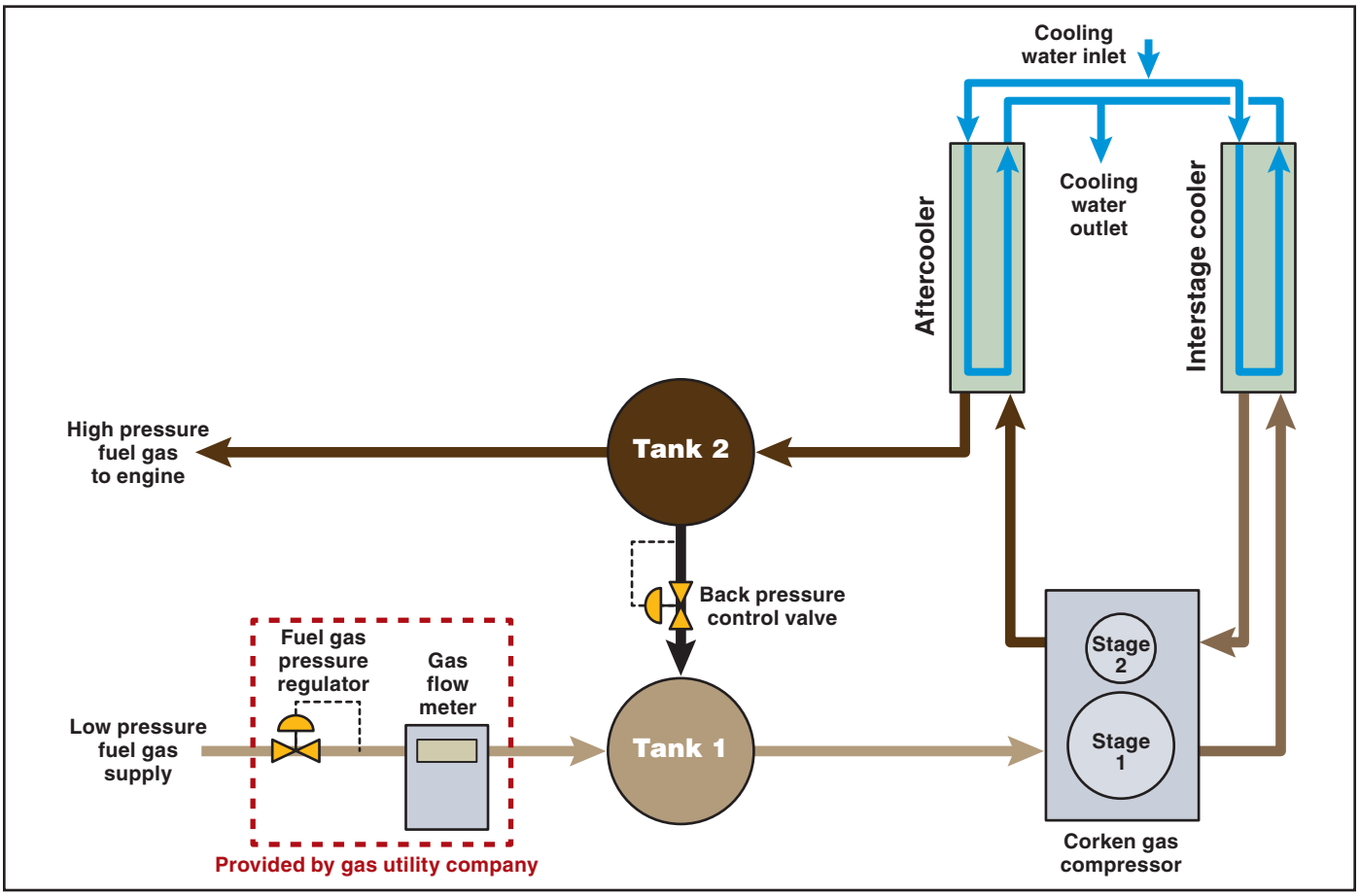
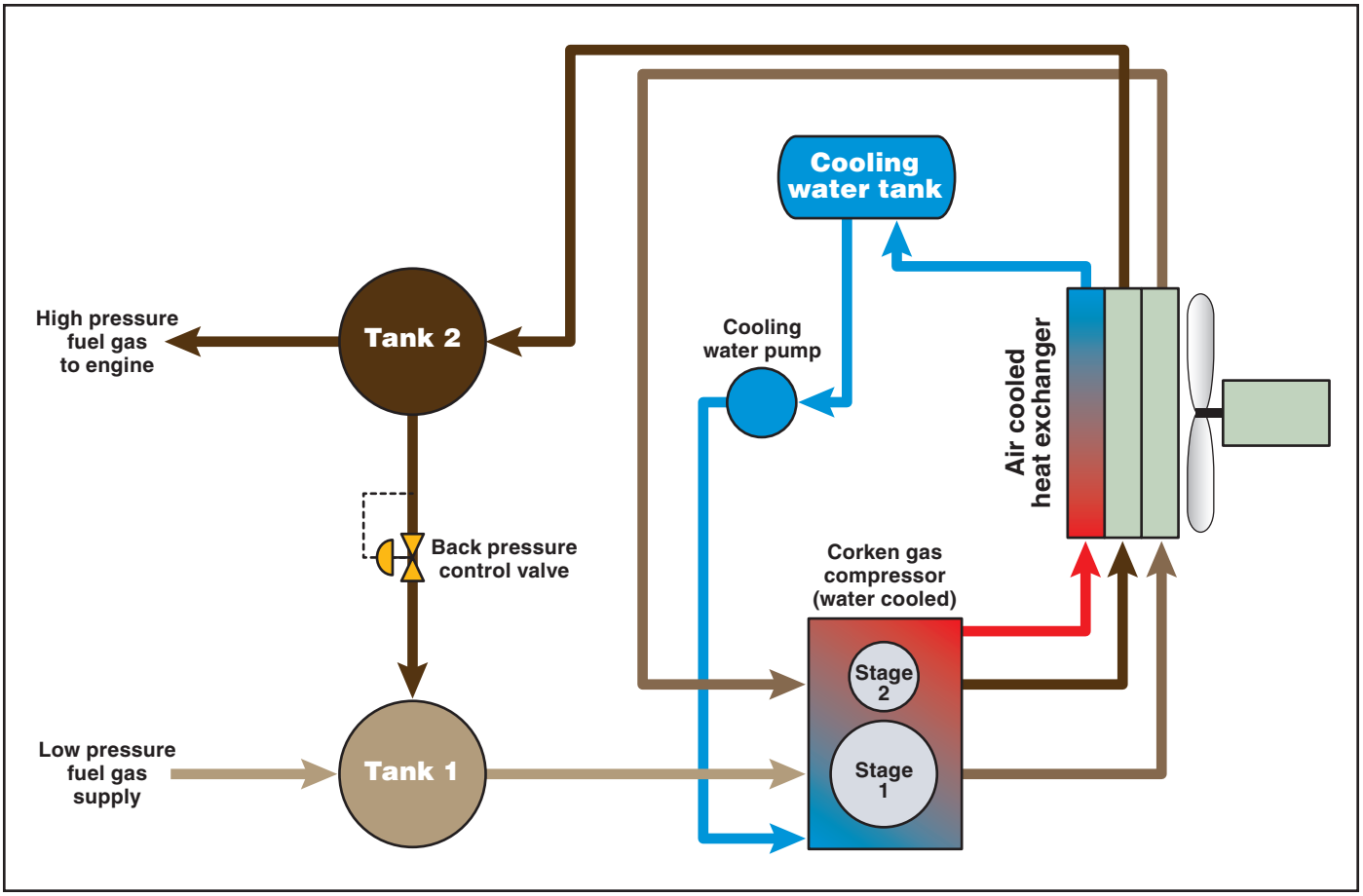
Fuel Gas Booster Compressor (Two Stage, Air Cooled)



Fuel Gas Booster Compressor (Two Stage, Water Cooled)



Factors to Consider:

- Size the compressor for about 110% of the maximum fuel gas usage. This ensures there is always flow through the back pressure control valve (no flow through the pressure control valve = no pressure control).
- To dampen pulsations, the volume of tank one should be at least ten times the swept piston displacement.

  Example: the model D491 has two 4 inch diameter cylinders with a 3 inch stroke.

  Thus, the swept volume is as follows:

  4 inch diameter (squared) x (3.14/4) x 3 inch stroke x 2 cylinders = 75.3 cubic inches

  The minimum volume tank for pulsation suppression is as follows:

  75.3 cubic inches x 10 = 753 cubic inches (3.3 gallons or 12.5 liters)

  NOTE: This is a “rule of thumb” type calculation that has been in use for many years. If equipment is in use that is particularly sensitive to pulsation, a more thorough calculation may be necessary.
- For best pulsation dampening, there should be at least one change of flow direction in the tanks (for example, in the side, and out the top).
- The volume of tank 2 is not critical but should provide some gas storage in addition to the volume needed to dampen pulsations. There is no rule of thumb for this tank volume, but it should be larger than tank one.

Back pressure control valve.

Tank serves as both pulsation dampener and inlet liquid trap (discharge tank by others)

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