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Compressed Natural Gas Storage Vessel

48 inch Spherical Design



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The 48-inch inside diameter, 33.5-cf spherical CNG storage vessel is for the commercial dispensing of compressed natural gas to motor vehicles at CNG fuel stations. The vessel can supply CNG at up to 5,500 psi to a fill-up nozzle.

The vessel assembly is custom designed for the end users, and is designed using the specifications and requirements from ASME Section VIII, Division 2, for National Board registration.

With relief and control valves installed, the unit is 85.2 in (2.165 m) tall with 54.5 inch (1.382 m) outside diameter. The empty assembly weighs 7,910-lb and 8,445-lb fully loaded with CNG.

The pressure vessel design employs a 3.250 inch (82.55 mm) thick spherical shell, and specially designed 1/2, 3/4 and 1-inch NPT couplings. The pressure relief valve nozzle has the same design as the other nozzles, except it has 3/4-inch NPT thread.

The vessel has a conventional skirt type support structure.

A drain line with a high pressure needle valve is located at the bottom of the vessel for easy maintenance cleanout.

An optionally provided high pressure "lock out" valve can be used to close off the vessel's relief nozzle during scheduled maintenance operations. This valve's use in design and practice are prescribed in ASME Section VIII, Division 2.

The vessel is designed for maximum allowable working pressure of 5,500 psi, at 120° F and a minimum design metal temperature of 0° F at 5,500 psi. Analysis of cyclic pressure loadings between 5,500 and 3,500 psi yields a vessel life of 40 years, which exceeds the ISO 11439 requirement of 20-years. The design also incorporates strength requirements for wind and seismic loads.



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