

CNG FOR EVERYONE THE WE HAVE TO GO

The energy drain caused by the extravagant use of energy – the main contributor to environmental contamination – calls for the urgent development of alternative energy sources.

Natural gas is an excellent alternative energy, with all the benefits energy has to offer.

With great reservoirs still untapped across the globe, contamination-free, safe-to-use natural gas has emerged as one of the most promising alternative energy sources. It is not only environment-friendly and economical, but also offers promises for long-term supply.

Earth deserves clean preservation. It is our common duty to safely preserve the earth for the next generations.

Kwangshin, a world-class solution provider for CNG, stand right next to you ready to serve you at all times.



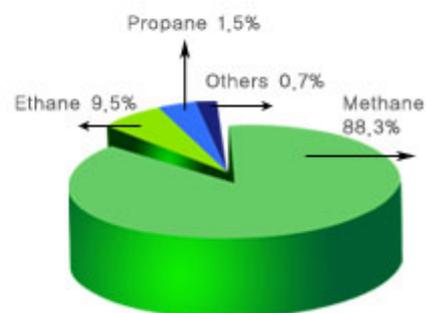
Natural Gas

This is a mixture of low-quality hydrocarbon produced under the ground such as the sea-bed, oil field, etc. This is combustible gas of which main contents are methane (CH₄) and its size gets reduced to 1/1600, when cooled to -162°C for storing and reservation. At this temperature, it becomes LPG (Liquefied Natural Gas). Then, the LPG goes through vaporization process, is provided through supply pipes and used for power production, industrial and home purposes.

Natural gas is well distributed over the world unlike petroleum fuels concentrated on the Middle East, and its quantity is sufficient enough for long-term supply and replacement for petroleum gas.



Natural gas composition ratio



> Safety

Natural gas is lighter than the air (0.65 compared to the air) and therefore quickly gets spread when exposed. Besides, the combustion lower limit (lower limit of combustible density of fuel in the air) is higher than other fuels (approximately 4.5%) and the natural ignition temperature is also higher than other fuels, making it relatively safer fuel.

> Economical fuel

The natural gas is better in thermal efficiency than electricity or gasoline. The supply through underground pipes gives it superior stability and makes it economical fuel by saving storing and precipitation cost.

> CNG charging system

CNG (Compressed Natural Gas) charging system supplies natural gas to NGV (Natural Gas Vehicle) which uses the natural gas as their operation fuel.

Especially, NGV completely replaces petroleum energy with natural gas, and when the clean fuel is used, the exhaled gas includes 30~50% less of NO and CO gas, 20~30% less of CO₂ and no SO gas at all. Its octane value is 130, higher than 96 of gasoline, so that engine compression ratio gets improved and fuel consumption is reduced. Ignition at low temperatures and knocking resistance are superb.

The nation-wide distribution pipe networks reduce the delivery cost of the fuel.

| Charging system composition

> CNG Compressor ①

- In fuel pipes, this compresses the low-pressured gas to high pressure (250bar) and supplies it to the storage containers or to dispensers.
- There should be a unit that releases the high-pressure gas remaining in the pipes, when the compressor is stopped.
- There should be a heat exchanger that lowers temperatures raised by gas compression heat, and a filter that removes dirt included.

> Priority Panel ②

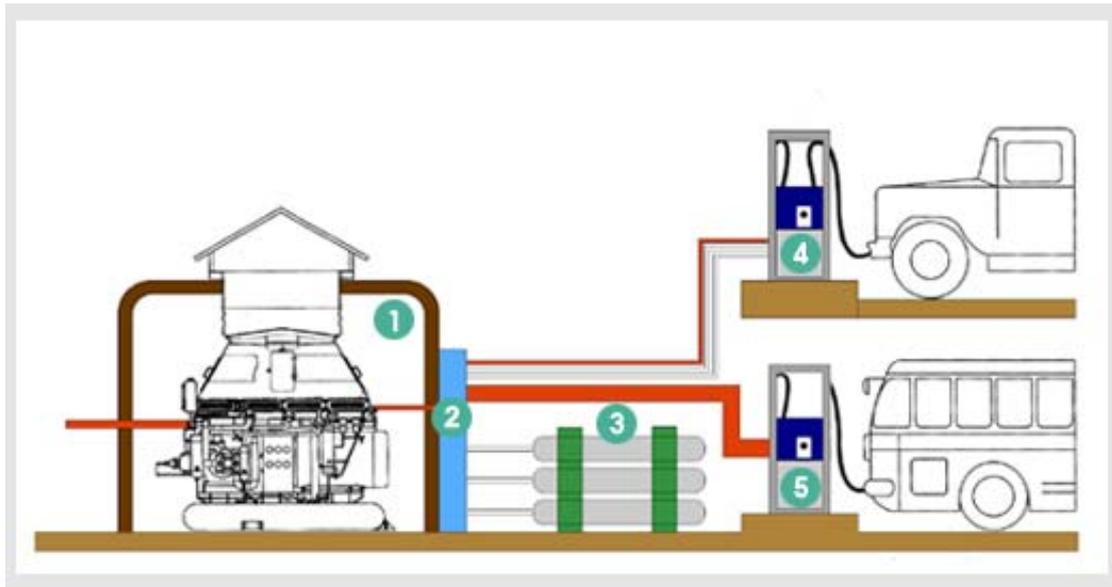
- Priority banks of compressed high-pressure gas containers shall be determined.
- This supplies fuels from containers to dispensers.
- Superior panel selection may save energy and improve charging speed.

> Storage ③

- This stores compressed high-pressure gas from the compressor and supplies the fuel to the dispenser when needed.
- This is an ASME or DOT type container, and buffer or cascade types are mainly applied.
- When 3-line system is applied, 6 cylinders (high bank-1, medium bank-2, low bank-3) are basically applied for charging efficiency maximization.

> Dispenser (4 Time Fill, 5 Very Fast Fill)

- Through the fuel gates of automobiles, this supplies compressed gas at 200bar for fuel.
- Single hose model and Dual hose model are available. Very fast fill type and Time fill type are available.



A RANGE OF CNG FUELING SYSTEMS TO SUIT ALL APPLICATIONS



PRIORITY PANEL

CNG fueling system generally uses Cascade method or Buffer method. The advantage of the Cascade method proposed by Kwangshin is that it is possible to fuel more vehicles with a compressor of the same capacity.



STORAGE

Kwangshin's storage cylinders are comprised of 6 cylinders designed in ASME specification, each of which has the internal capacity of 1,300 liters. The 6 cylinders are comprised of one high bank, two medium banks and three low banks, and each cylinder can store gas in 250bar.



DISPENSER

The CNG Dispenser of Kwangshin injects natural gas into vehicles at the pressure of 200bar. The 3-line system is the basic specification, but single line system is also available.



SCADA SYSTEM

Kwangshin's SCADA System is a device that can monitor, record and control the condition of the equipment with a computer, which is being operated using PLC. In addition, those data can be monitored from a remote location using the Internet environment.



CARD KEY SYSTEM

The Card Key System provided by Kwangshin is a POS system with reliability, efficiency and convenience. It is a PAM device with perfect compatibility. No other fueling device has better compatibility. Designed for the Windows environment for use convenience, the Kwangshin Card Key System is the most reliable and scalable system on the market.

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