

An introduction to...

# Portable pumping skids

**A**erospace, medical oxygen, beverage gas, disaster relief response and oil fields are just a few unique applications where the need for remote or portable cylinder filling or high pressure gas delivery is required.

'Portable' means that the systems are self-contained, with all pumping components installed, but are able to be moved if the application requires.

CryoVation, LLC has been building various types of portable systems for many years. These systems fall into three general types or categories:

**- Unattended Operation** – An automated system that senses reserve gas pressure and automatically controls pump and vaporiser operation to restore full pressure. Liquid is usually supplied from dedicated, on-site vessels.

**- Manual Control, high capacity** – Provides pump, vaporiser, vacuum pump (optional) and controls for up to 15,000 SCFH (425 m<sup>3</sup>/hr). May be either ground or trailer-mounted with liquid supplied

from dedicated or transportable ISO vessels.

**- Manual Control, low capacity** – Provides pump, vaporiser, vacuum pump (optional) and controls for up to 5,000 SCFH (140 m<sup>3</sup>/hr). Usually these are permanently installed in the building or truck/trailer. Liquid is supplied from dedicated mini-bulk or portable, 180 litre type liquid cylinders.

These systems commonly include a cryogenic, high pressure pump, ambient vaporizer, vacuum pump, controls (PLC or manual) and fill manifolding. Electrical controls may range from basic manual on/off controls to semi-automated touch-screen control, to fully automated PLC control. Gases may include oxygen, argon, nitrogen and/or carbon dioxide.

The systems designed for unattended operation are traditionally utilised in an end-user application, for applications ranging from high pressure nitrogen for plastic injection moulding, to various manufacturing processes that require medium to high pressure at higher flow rates than can be supplied from delivered cylinders.

What benefits do portable pumping skids provide? Industrial gas distributors who would like to start filling their own pure and mixed gases (argon/CO<sub>2</sub>) cylinders, but lack the investment capital or city approval for large bulk vessels, or are

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limited by space, can choose to go with a manual, portable Mix Gas Filling System that includes both the cryogenic and CO<sub>2</sub> pumps. This is also commonly used by beverage gas distributors who are filling their own nitrogen/CO<sub>2</sub> (beer gas) mixes.

The manual type systems have also improved recently to include optional semi-automated control systems that give the operator the freedom to select a 'recipe' and let the system automatically monitor the vent, vacuum and fill cycles, alert the operator as steps are achieved, and shut-off the pump automatically when the desired temperature-compensated pressure is achieved.

Another variation of the portable system is the 'Mobile Filling System'. CryoVation, for example, has fabricated many truck and trailer filling units for over-the-road transit to a fill location. This concept brings the filling equipment to the site instead of transporting cylinders to a fill facility and then returning them when filled. These systems often include 250-500 gallon vessels on-board that supply liquid to the pump and may also be used to fill portable liquid dewars. This concept has worked well for filling small oxygen cylinders on-site to reduce cost, a customer's inventory and the turn-around time. □



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A range of different portable pumping systems are available, meeting the needs of different installations, environments and portability demands.

WITH THANKS...

gasworld would like to thank CryoVation LLC for contributing this month's equipment profile. The Florida-based US company's focus is to provide the customer with a complete solution for the filling of liquid, industrial, medical and specialty gases.  
[www.cryovation.com](http://www.cryovation.com)