xylem
Let's Solve Water

From Barrel to Bar: A Beer Pump Application Guide

FLOJET
a xylem brand

Introduction

In a competitive environment, it is essential that a "live" product like beer reaches the consumer in prime condition in order to retain its flavor and the characteristics that make it unique, just as the brewer intended. The beer also needs to be dispensed at a rate that supports venue business levels, and the skill level of the serving staff behind the bar.

To meet the above requirements, one of the most effective methods of packaging beer is in stainless steel or aluminium kegs. Kegs transport and dispense mass quantities of beer without impacting its quality or taste by protecting it from exposure to oxygen and sunlight. Kegs also allow the beer to be dispensed easily and quickly for more fast and efficient service.

Because space in the bar is often limited, kegs are normally stored remote from the bar area, so the beer needs to be moved from the cellar or storeroom to the tap on the bar. However, the taste of every beer dispensed from a keg that's stored remotely can be hit or miss depending on the distance it needs to travel and the temperature at which it has been stored.

With so many variables at play, having the right beer dispense system is critical to ensuring the perfect pour – from the barrel to the bar, every time.

Perfecting the Pour

Typically, systems that push beer through dispensing systems are CO_2 gas or blended gas assisted, which is why it can be challenging to perfect the pour. To transport the beer from the keg to the bar, gas pressure above the level required to maintain the beer at brewery standard is applied to the top surface of the beer, pushing the beer through the tubing to the bar.

Head pressure, as recommended by the brewer, effectively delivers the beer to the glass over short line distances. The further the keg is from the bar, the greater the applied gas pressure needs to be – this means recommended head pressure plus added pressure transports the beer from the keg to the glass. Whenever the head pressure applied to the beer exceeds the equilibrium pressure recommended by the brewer, it is easy for the incorrect pressure to be set. This results in conditions where the pressure is either too high or too low.

Over time, excess pressure leads to more CO_2 being absorbed by the beer. This is known as 'over carbonation' and has two major drawbacks:

- **Foaming:** CO_2 released on dispense leads to too much foam on the beer head, making it difficult to dispense.
- **Flavor:** Too much foam impacts the texture and taste of the beer, resulting in a negative experience for the consumer.

The opposite of 'over carbonation' is under carbonation or flat beer. This occurs when the pressure applied to the keg is too low. In 'under carbonation' conditions, the CO_2 gas in the beer escapes in the keg until the equilibrium pressure is reached. The result is a flat beer, which destroys the taste and texture of the beer, spoiling the experience of the end customer.

The beer pump was developed to overcome such challenges. Unlike traditional (non-pump) dispense methods, the pressure on the keg remains constant at the equilibrium pressure. Maintaining constant equilibrium pressure on any keg means the taste of the beer remains exactly as the brewer intended and the consumer gets a distinct, satisfying, truly enjoyable glass of beer with every pour.

Did you know?

Beer has a natural carbonation level that is essential for texture and taste.

The point where the pressure on the beer is just enough to keep the CO_2 in the beer is called the **'equilibrium pressure'.**

If the beer is maintained at equilibrium pressure, its texture and taste will be exactly as the brewer intended it to be.

Perfecting the Pour

The use of beer pumps, particularly in environments where excess top pressure is required to traverse a distance, allows an installer and operator to maintain equilibrium pressure in any given circumstance. There is no need to put extra pressure on the beer to effectively move it through the system. Instead, 'drive' pressure is applied to the pump to move the beer. The drive pressure effectively acts like a car accelerator – the more you put into the pump, the quicker it operates.

Beer pumps consist of an air chamber, where the drive pressure comes in, and two wet chambers where the beer passes through. The two wet chambers are separated by seals known as diaphragms. Because of this design, the drive gas never comes into contact with the beer. A special shuttle valve forces the air pressure behind each of the diaphragms in turn, allowing one piston to gently suck the beer in, while the other pushes it out the other side.

This push-pull action draws the beer from the keg and gently pushes it through the tubing to the bar. When the dispense tap is opened, pressure in the line drops below the drive pressure in the air chamber so the pump runs, feeding the beer line to the bar. When the faucet is closed, the pressure in the line rises to a point where the beer pump stops. It remains stopped until the faucet is opened again to dispense beer.

Benefits of Beer Pumps

- Beer is maintained at equilibrium pressure, preventing over carbonation
- Beer can be moved over longer distances, allowing kegs to be stored remotely
- Dispense speed can be adapted to meet business demand and skill level of serving staff
- Dispense speed and presentation is consistent with every pour
- The perfect pour prevents beer wastage, saving money
- Less CO_2 is used as the beer pump can be driven using a compressor

Did you know?

If every faucet on a bar wastes just **one drip tray** of beer each day, and that bar or restaurant trades for **312 days** in a year, an equivalent of **58.5 gallons (468 pints) of beer** are wasted.

Solution Spotlight

Xylem Flojet G56 Beerjet

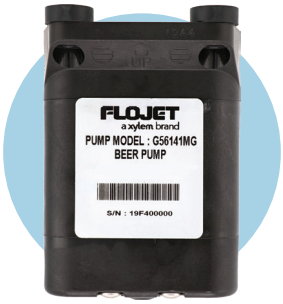
Designed to take the variability out of beer dispensing systems, Xylem's Flojet G56 Beerjet pump offers enhanced beer quality – from the top to the bottom of every barrel – without impacting taste. Powered by gas or compressed air, the beer is pushed through the lines to the tap without the gas or air ever coming into contact with the beer. The result? A perfect pour, from the barrel to the bar, every time. Key product features include:

- Can traverse up to 800 feet (224 metres) horizontally through a single line
- Can deliver beer neatly over 100 feet (30 metres) vertically through a single line
- Can dispense across multiple taps (up to three) from a single line
- Can dispense 300 gallons (2,400 pints) of draft beer per hour
- Has a service life of more than 70,000 gallons (560,000 pints)

The Flojet G56 Beerjet pump is also easy to clean and maintain, and can be used as a line-cleaning pump. By disconnecting the keg coupler and submerging it in a line cleaning solution, the pump will gently draw the solution in and pump it through the system right through to the faucet.

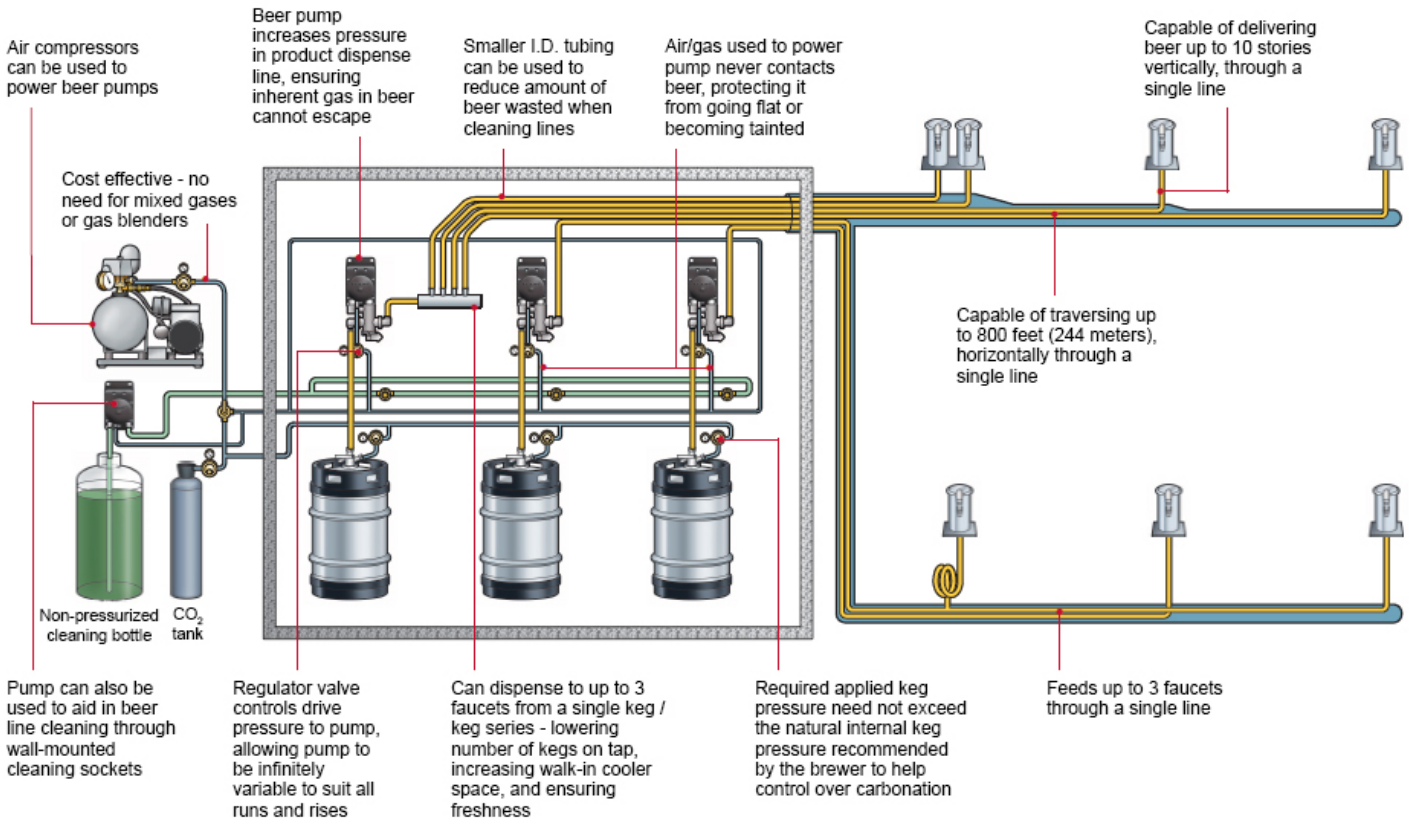
Compatible with the Flojet Line Buddy flow reversal valve, operators can optimize line cleaning processes by running cleaning solutions through the Flojet G56 Beerjet pump in both directions. Running a cleaning solution through a beer system in alternating directions – from the faucet to the tap and back again – has been found to optimize line and pump sanitation. Flow reversal valves are an important accessory in beer pump systems.

Top Tip: A multiple beer faucet system using Flojet G56 Beerjet pumps with the Flojet Line Buddy flow reversal valves allows for multiple lines to be cleaned at one time!



Pumping in Action

When properly installed, beer pumps can traverse a horizontal distance of up to 800 feet (244 meters) and deliver beer up to 10 stories vertically – all through a single line. They can also dispense to up to three separate faucets from a single keg. While every application is different, the below illustration outlines the typical schematic of how a beer pump system works in a live setting.



Installation Tips

- Clean, dry gasses (CO_2, N_2, blended gasses or compressed air) should be applied at 15-90 PSI for gas inlet operating pressure. Calculations for gas pressure additions are used as a starting point to power the pump. Only the equilibrium pressure specified by the brewer should be maintained on the keg
- For optimal results, beer pumps must be mounted directly inside the cooler or cellar wall. Universal mounting brackets can be used to aid installation
- When using a CO_2 or N_2 exhaust, gas must vent outside of the cooler or cellar into a space that is well ventilated, preventing buildup of CO_2 or N_2. Always check gas or liquid connections to prevent against gas or beer leaks within the system
- To improve system efficiency, 'Foam On Beer' (FOB) detectors are recommended. Installing FOBs on each beer line stops pumping action when the keg or tank is empty, which also supports key change overs
- For multi pump installations, incorporating a flow reversal valve will help clean lines in a loop, using the beer pump to drive the cleaning solution through the system rather than needing a separate pump
- When installing the system, it is important to ensure that the dispense rate, which is determined by setting the drive gas pressure on each pump, is set to match the skill level of serving staff
- If you have any application questions before, during or after installation, always contact your solution provider

Beer Pumps Myths

1. Beer pumps cannot be cleaned.

   False!

Beer pumps are easily cleaned. Furthermore, using a beer pump to clean the beer lines eliminates the need for a separate pump and connections for line cleaning. Dropping the tap/keg coupler into a cleaning solution and drawing the line cleaner through the pump and lines assures the pump is cleaned each time you clean the lines. This approach also assures the keg line and FOB are cleaned, preventing any buildup between the keg and the pump.

2. Beer pumps add gas to or spoil the beer.

   False!

Beer pumps consist of an air chamber where the drive pressure enters, and two wet chambers where the beer passes through, separated by seals known as diaphragms. Air or gas that's used to power the pump never contacts beer. Because the gas used to power the pumps never contacts the beer from the keg there is no danger of affecting the quality of the beer in the keg or in the lines from the keg to the faucet. Bottom line – Flojet G56 Beerjet beer pumps pose no risk of over carbonation, beer going flat, tainting the beer, or altering the taste of the beer in any way.

3. Alcohol damages the elastomers in the beer pump.

   False!

Flojet pumps have been successfully pumping beer and alcohol for many years. In fact, all materials used in Flojet G56 Beerjet beer pumps are carefully selected and tested to assure reliability and compatibility with liquids being pumped and liquids used for cleaning.

Beer Pumps Myths

4. Beer pumps should only be used for distances greater than 200 feet or extreme rise.

   False!

Do not use length or vertical rise as the guideline. The important thing is to do what is best for the beer. Calculations will identify when a higher keg pressure will be required. If a higher keg pressure is required, use of a blended gas may work without impacting the taste of the beer, however you may find that the use of a beer pump provides the best assurance for your customer to deliver the best beer consistently, regardless of type or brand.

5. Beer pumps cannot be used with nitrogen infused beer.

   False!

Beer pumps are used successfully around the world with nitrogenated beers. Flojet G56 Beerjet beer pumps are designed and all materials are selected to be compatible with and reliable in operation. The complete adjustability of the pump allows for use with all beer types and ciders.

6. Beer pumps consume more gas per keg than driving beer with added gas pressure.

   False!

Gas consumption is essentially the same and keg yield will be higher using beer pumps. If compressed air is used, gas consumption and costs will be lower.

Get In Touch

Whether you have a question, want to get a quote or just want to provide feedback, we're here to help and listen. See our entire beverage portfolio online and send us a message on www.xylem.com.

Xylem |'zīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xylem.com

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