

Rotary Steam Control Valves for Food & Beverage Application Solutions

The driving force behind the proper selection of equipment in the food and beverage industry is safety. Food and beverage applications require a variety of process temperature and pressure control requirements to maintain the tight temperature tolerances that help them ensure product quality, production run rates, and safety. Selecting the right steam control system and using best practices for piping and installation can have a huge effect on production rates, downtime, and health & safety of the end users. The implementation of a rotary globe type control valve with a much larger turndown 100:1, than a standard parabolic globe 30:1, will simplify the process and allow tight control and shut off for the application.

By Kevin Rasmussen, President - KEI Steam Solutions Inc.

Steam Temperature Control Valves

Steam control systems, which include control valves, steam traps, and condensate recovery equipment, are critical in many food and beverage applications. Key applications include clean in place (CIP) processes and HTST

(high temperature/short time) pasteurization used in dairy, food, and beverage manufacturing processes. Other widely used steam processes include retort sterilization in canning operations; bottle washers; tempered hot water systems; poultry scalders; steam peelers, blanchers; evaporators; direct



Image Credit: Pennant International Corporation, www.pennantcorp.com.

SIO
VALVES & AUTOMATION

SPECIAL MATERIALS

- TITANIUM
- INCONEL
- HASTELLOY
- MONEL
- 254 SMO
- ALLOY 20
- 904 L
- DUPLEX
- BALL VALVES
- GATE VALVES
- GLOBE VALVES
- CHECK VALVES
- SIZE: 1/2"~36"
- CLASS 150 ~2500

INQUIRY NOW
INFO@SIOVALVE.COM

steam injection; and dryer systems.

These applications all use a temperature controller with a valve to maintain a critical temperature applicable to that process. The valve selection is critical, because processors must maintain very tight temperature control to avoid issues that would otherwise occur, such as bacteria growth, loss of product, and unplanned downtime resulting in operational losses.

For example, HTST pasteurized flows can range from 10,000 pounds to 2,000 pounds of steam required per hour. To maintain proper temperature control with large changes in product flow, operators must use a control valve with varying rangeability and excellent shutoff characteristics.

Improving General Practice

It has become standard for many plants to use a cookie cutter approach for steam isolation on modulating process steam equipment. For example, many systems today incorporate a pneumatically activated quarter turn ball valve to assist in shutting off the steam to the process heat exchanger. Ball valves are typically selected, as the standard globe valve applications in the market have historically leaked. Using an actuated ball valve for isolation on the steam train to the process can lead to water hammering, pressure spikes, loss of product, or bacteria growth.

By contrast, a rotary valve has exceptional rangeability with 100:1 turndown, and shutoff. It can also meet FCI ANSI Class V shutoff standards for critical process applications. This capability eliminates the need for actuated ball valves designed for steam train isolation. The rotary globe incorporates a cam action, low friction plug operation that provides tight shutoff over long service life. The valve's rangeability is 100:1, allowing precise control over a wide range of flow variations. This enables the plant to utilize the same control valve design for all of the facility's steam and fluid control applications. There can be quite an advantage to using one valve style for many applications; it allows for plant standardization and minimal stocking requirements.

CIP Process Valve Solutions

CIP systems for the food and beverage industry utilize steam to heat water through non-contact heating of a heat exchanger, or through direct injection of the steam into the CIP tanks. The rotary globe control valve can be used for heat exchanger temperature control. The turndown allows for maximum temperature and pressure control across a wide range of flow variations. This is critical in CIP heating, where load variations are continuous, and the application requires consistent temperature control throughout

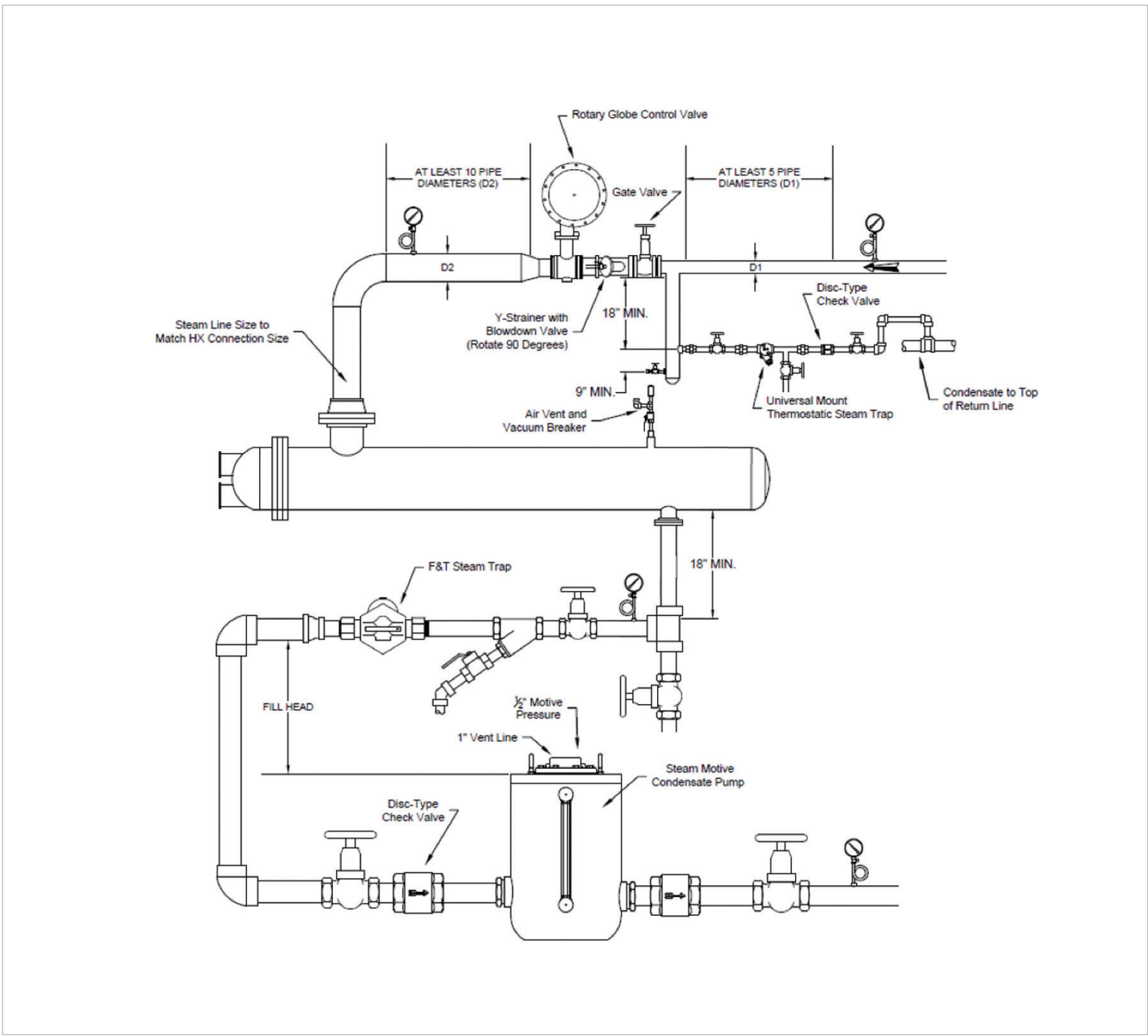


Figure 1.

the flow variations. The application requires very tight shutoff when the system is not in operation, so there is no steam and condensate losses and degradation of the heat exchanger.

Figure 1 shows an example of a best practice installation for a CIP process heat exchanger utilizing a rotary control valve. This installation allows for reliability on the entire system.

Final Notes

A rotary control valve provides tight process temperature control and isolation in one valve. Proper piping layout before and after the control valve to the heat exchanger ensures performance will be optimal.

■ ABOUT THE AUTHOR



Kevin Rasmussen is the President of KEI Steam Solutions Inc. KEI is the

exclusive distributor for Pennant Rotary Control Valves in the USA. He has a BSME from BS Mechanical Engineering, from the University of Wisconsin.

Instant Data.

Quote, drawings and kit numbers
in seconds, not days.

VAWORKS LIVE



Learn more & get your free account at vaworkslive.com

