

USING SSRS TO CONTROL HEATING IN COMMERCIAL BREWING EQUIPMENT

Background

The commercial brewing process is a constant wave of changes in temperature before they reach the finished product, putting a tremendous amount of focus on the switching and control of the various heating and cooling processes which create the product.

While there are variations for different brewing styles, most include the following stages where heating control and switching is required.

- Malt ingredients (such as barley, etc.) are soaked in hot water (approximately 65 degrees Celsius) to extract their sugars and produce what is called wort.
- The products of the mash run are then boiled in a brew kettle (approximately 100° C to remove contaminants prior to fermentation.
- The resulting wort must then be filtered and rapidly cooled (approx., 20° C), where the yeast for fermentation is added. Following the fermentation process, the product then remains chilled for conditioning and packaging before being distributed, sold and consumed.
- Following the completion of the brewing process, fermenters must also be thoroughly sterilized, often with water heated to more than 120° C.

Commercial brewing equipment has also grown significantly in recent years trying to keep pace with the growth of craft and micro/nano-breweries. In raw numbers, there were less than 4,900 breweries in the U.S. in 2015. In 2021, that number had increased to more than 9,200.

According to the Brewers Association, craft beer sales in the United States account for a 13.1 percent share of the overall market – a share which continues to grow. The volume of craft beer produced in 2021 (more than 24 million barrels) increased nearly 8 percent compared to the prior year, outpacing just a 1 percent growth of the market as a whole.

This continued pattern has put pressure on manufacturers to expand production and drive down labor costs in manufacturing, such as welding and wiring. Because these systems are designed to run for decades – and are often re-sold as breweries expand and grow - reliability over time is a significant consideration.

Solution

Because of the continual starts and stops involved, and the need for precise temperature control to maintain quality and safety, solid state relays are an ideal solution for these switching applications. They are ideal solutions for heating and AC or DC motor control, increasing the efficiency and reliability of commercial brewing equipment over the long-term.





Dual relays – such as the Evolution Duals or DPI Series – have two outputs controlled by two independent DC control inputs, and they are available with different options for input connectors and output terminal configurations, offering great wiring flexibility.

The DPI series also allows for additional efficiencies in manufacturing, with simple push-in connections which reduce the amount of wiring time by up to 40 percent compared to standard relays.

With equipment that is intended to be used on a continual basis for years, the reliability provided by solid state relays (as compared to an electromechanical relay), provides strong differentiation for the end solution.

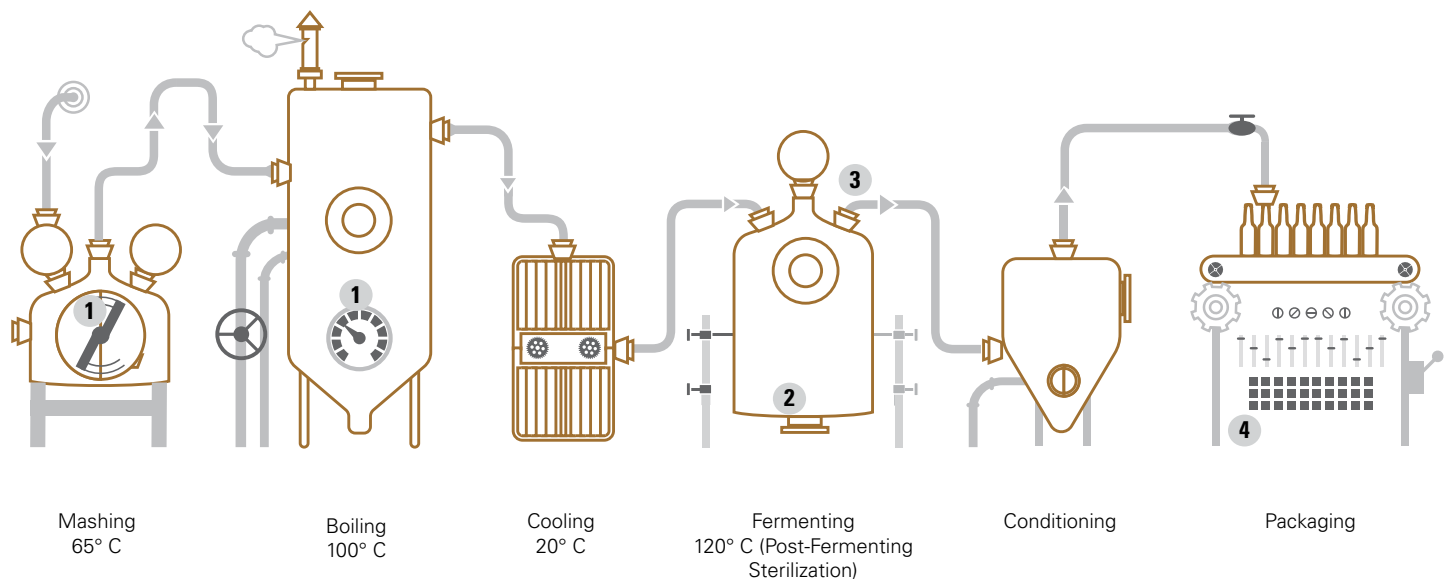


RECOMMENDED PRODUCTS

Reference on Diagram	Product	Features	Function
1	 DPI Series	<ul style="list-style-type: none"> Rating up to 40Amps per channel Fast Push-in Wiring Connection without tools SCR Output for heavy industrial loads 	Heating Controls
2	 Evolution Dual Series	<ul style="list-style-type: none"> 25A & 50A Output rating per channel @ 40°C 24 to 280 & 48 to 600VAC Operating voltage 4-32VDC Control input UL508 Endurance Rating 	Heating Controls
3	 SeriesOne DR	<ul style="list-style-type: none"> 25A & 40A Output rating per channel @ 40°C Quick Connect & Pin Termination Optional LED input status indicator 	Heating and Valve Controls
4	 EL Series	<ul style="list-style-type: none"> Load current ratings from 5 to 30 Amps @ 24-280 VAC Back-to-back SCR output with low off state leakage current Flexible 5, 12 and 24 VDC control voltage options Ideal for tight spaces and cabinets 	Heating Controls



BEER BREWING PROCESS



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