

## Quality in the barrel and in the bottle

### Precise temperature control in wine production

Wine is a cultural heritage. The first winegrowers are documented as early as 300 BC in Egypt and Phoenicia. From there, wine triumphantly spread through Greece and the Roman Empire to Europe. Wine making is a complex process in which the main requirement is the right temperature. A vineyard in the famous Bordeaux growing region relies on JUMO controllers to bottle excellent products.

France is the secret homeland of wine. More than 80,000 growers produce some 45 million hectoliters of wine every year. This is five times the volume produced in Germany. The average French person consumes 53 liters of wine a year, which is more than twice the consumption in Germany.

Good wine is created in a process of 11 steps from harvesting to storing. The fermentation process is particularly important for the wine quality. A distinction is made between alcoholic and malolactic fermentation. During these processes, the sugar that exists in the grapes is converted into alcohol and the dyes are released from the grape skins.

The temperature needs to be constantly monitored and controlled especially in these phases. Control relies on liquidfilled pipes to the fermentation tanks. To start the fermentation, the fermentation vats first need to be slightly heated. Because fermentation is an exothermic process, heat is constantly generated. However, as the temperature rises, the yeast activity drops, and fermentation stops completely at temperatures above +35 °C.

In other words, the fermentation vats need additional cooling to compensate for the generated heat. For each fermentation vat, a controller is required to respond individually to the temperatures. The requirement for the application at the French vineyard was for the controller to switch easily from heating to cooling and from cooling to heating. Automatic switching of the setpoint values was another requirement. In addition, the controllers were required to have an easily visible alarm function.

Controllers from the JUMO Quantrol series, which were especially customized for this application, meet all of these requirements. These devices are operated using four buttons on the front with a defined pressure point. The universal analog input for RTD temperature probes, thermocouples, or current / voltage signals is user programmable. The setpoint value, the actual value, and all parameters are displayed on two seven-segment LED displays (red/green) with one or two decimal place(s). Values can be displayed in

Celsius or Fahrenheit. Up to five relay outputs with a switching capacity of 3A/230 V can be available. The number of relay output depends on the format. The switch position of the relays is displayed using yellow LEDs. These relays can be assigned different alarm functions. An analog output of 0 to 10 V or 0(4) to 20 mA can be used to control valves or thyristor power controllers. Using the binary input, the JUMO Quantrol device settings and operation can be gradually locked, a ramp or timer can be activated, or autotuning can be initiated.

The JUMO Quantrol series is available in three DIN formats. The device can be connected to superordinate systems using the RS485 serial interface. Instead of operating the device from the front, the user can also program the controller using a setup program and USB interface. At the French vineyard that now uses these controllers, each JUMO Quantrol manages a valve, which in turn controls the liquid supply in the heating and cooling circuits. A single key combination makes it easy to switch from heating to cooling; the setpoint values are switched over at the same time. There are separate icons for heating and cooling modes. A second key combination switches the controller on or off. In case of an alarm, the second display toggles between the "ALA" text and the setpoint value.

In France, JUMO RTD temperature probes are deployed in addition to the JUMO Quantrol controllers. The probes have a form B connecting head and an immersion sleeve. In addition to simple startup and operation of the system, the customer was particularly impressed with the potential energy savings that the new plant was able to achieve.



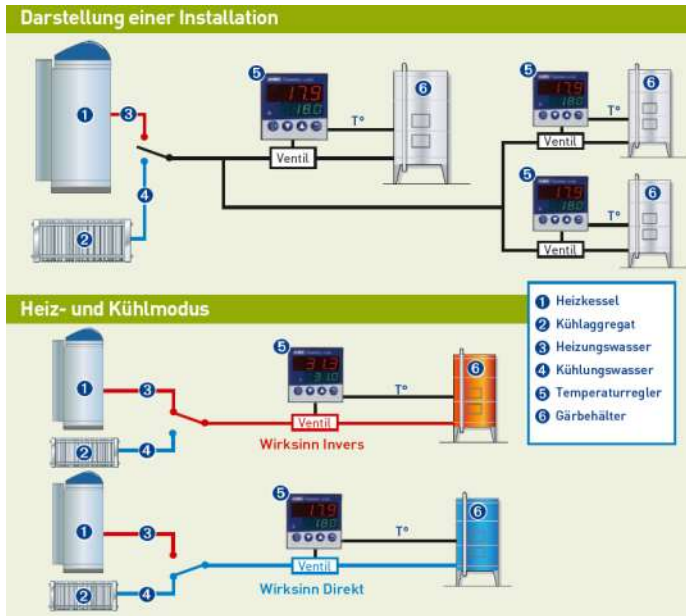


Abbildung 3: JUMO Quantrol

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