

White Street Brewing

Brewhouse Automation Description

The following describes the different levels of brewhouse automation that Specific Mechanical Systems offers at this time. The general architecture of the system includes a touch screen graphical human/machine interface (HMI) which is capable of remote access through a customer supplied connection to the web. The touch screen is an interface to the programmable logic control board (PLC) which enables different parts of the brewhouse system.

There are 3 levels of brewhouse control (level 1 being the lowest, level 3 being the highest level of automation).

Level 1: Touch Screen Control Panel / Basic Temperature & Motor Control

Sparge/hydration

Temperature and flow of the sparge water can be set through the HMI. The set point may be adjusted at any time. Temperature blending is achieved through hot and cold liquor tank control valve modulation. Flowrate control is achieved through supply header throttling valve modulation.

Pump Control

The start/stop of the pump motor is done through the HMI. The speed of the pump may be adjusted via the HMI. The speed of the pump is displayed on screen as a % of maximum. Pumps controlled include the brewhouse process pumps (3) and the hot and cold liquor pumps.

Rake Control

The start/stop of the rake motor is done through the HMI. The speed of the rakes may be adjusted via the HMI. The speed of the motor is displayed on screen as a % of maximum. Variable pitch rakes are operated manually in level 1. Level 3 upgrade will add control functionality to the rakes.

Hot liquor, Cold liquor, Cellar temperature control

The desired setpoint and temperature of the hot liquor tank, the cold liquor tank, unit tanks and the bright tanks are displayed on screen. The set points may be adjusted at any time.

Chiller interlocks

The temperature of the glycol loop is displayed on screen. If the temperature falls above or below a predetermined set point, an alarm is generated. A stacklight is included on the control panel that is illuminated when an alarm is present. Solenoid valves are disabled in the event of a chiller loop temperature fault.

Remote software upgrade

Installed software, utilizing a customer supplied internet connection, can be upgraded remotely to allow Level 2 and 3 software upgrades.

Notes:

Level 1 includes the PLC inputs and outputs to allow later upgrade of Levels 2 and 3.

Level 2: Valve control

Knockout temperature control

The desired setpoint and temperature of wort knockout is displayed on the HMI. A modulating valve controls the flow of cooling water to achieve the desired knockout temperature. The setpoint can be adjusted at any time.

Wort and Hot/Cold Liquor Valves control

All wort and liquor valves can be opened and closed via the HMI. Installed manual (Level 1) butterfly valve handles will be removed and pneumatic actuators with pilot valves provided.

Kettle Steam Valve control

The kettle steam valve is controlled via the HMI. This upgrade includes the supply of one actuated steam valve.

Boil-Over Protection

A sensor in the kettle determines if the resulting foam of boiling wort begins to rise and the steam valve will close automatically to prevent boil-over. A manual reset is required to allow steam valve to open.

Lighting Control

Vessel lights are controlled individually via the HMI touchpanel.

Level 3: System Monitoring, Lauter tun control and Grain handling

Alarms

If the temperature of any vessel strays above or below designated set points, an alarm is displayed on screen and an alert may be sent via email or text message to one or multiple addresses (depending on the severity of the alarm). A stacklight is included on the control panel that is illuminated when an alarm is present.

Trending

Temperatures are able to be recorded and displayed in a trend graph. This graph may be adjusted to specify different timeframes.

Spent Grain Equipment Control

The rake pitch (used to grain out) and spent grains conveyor are controlled via the HMI to transfer the spent grains from the lauter tun.

Runoff and Rake Control

The runoff valve position and lauter tun rake speed are controlled on the HMI. A differential pressure sensor indicates how "packed" the grain bed is and allows the operator to adjust the rake speed and runoff valve position accordingly. The turbidity sensor provides the operator with a numeric representation of wort clarity. The operator can then choose to vorlauf or adjust other runoff parameters. The flow from the grant is controlled automatically by level switches inside the grant.

Notes:

Onsite electrical and mechanical work not included in scope.

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