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Bulk Reagent Dispense System – Waste Principle of Operation

The bulk dispense system uses vacuum pressure to drain unwanted reagents from troughs on the liquid handler deck into 2L waste containers. Each pair of waste containers serves four troughs. After experiments, unwanted reagents are evacuated into the waste containers using house vacuum.

When a particular trough requires draining, the system opens the corresponding waste solenoid valve, allowing vacuum pressure to pull liquid from the trough into the waste container. Inline capacitive sensors detect the presence of liquid in the tubing between the troughs and waste containers and signal when the waste valves should close, halting drainage for the specific trough.

Vacuum sensors monitor the pressure within the waste containers to ensure the waste valves are turned off promptly, preventing them from remaining open and overheating. Additionally, capacitive sensors on the waste containers track liquid levels and halt drainage if the containers reach full capacity, ensuring safe operation.

To prevent unintended drainage caused by gravity or height differences between the troughs, waste containers, and valve positions, check valves are installed in the vacuum line. These valves ensure that liquid drainage occurs only when vacuum pressure is actively applied, preventing backflow or uncontrolled drainage.

Bulk Dispense: Waste Drain Plumbing

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