

8.14. Overhead vapor from a distillation column passes through a partial condenser. The uncondensed portion is fed into a vapor-phase reactor. The condensed portion is used for reflux in the distillation column.

The vapor fed to the reactor can also come from a vaporizer which is fed from a surge tank. To conserve energy, it is desirable to feed the reactor with vapor directly from the column instead of from the vaporizer. The only time that the vaporizer should be used is when there is not enough vapor produced by the column.

Sketch a control concept diagram showing:

- Total vapor flow rate to the reactor is flow controlled by valve $V-1$.
- Reflux drum pressure is controlled by valve $V-2$.
- Vaporizer pressure is controlled by valve $V-3$.
- Vaporizer liquid level is controlled by valve $V-4$.
- Column reflux is flow controlled by valve $V-5$.
- Reflux drum level is controlled by valve $V-6$.
- High reflux drum level opens valve $V-7$.
- High vaporizer pressure overrides valve $V-2$.
- High reflux drum pressure overrides valve $V-6$.

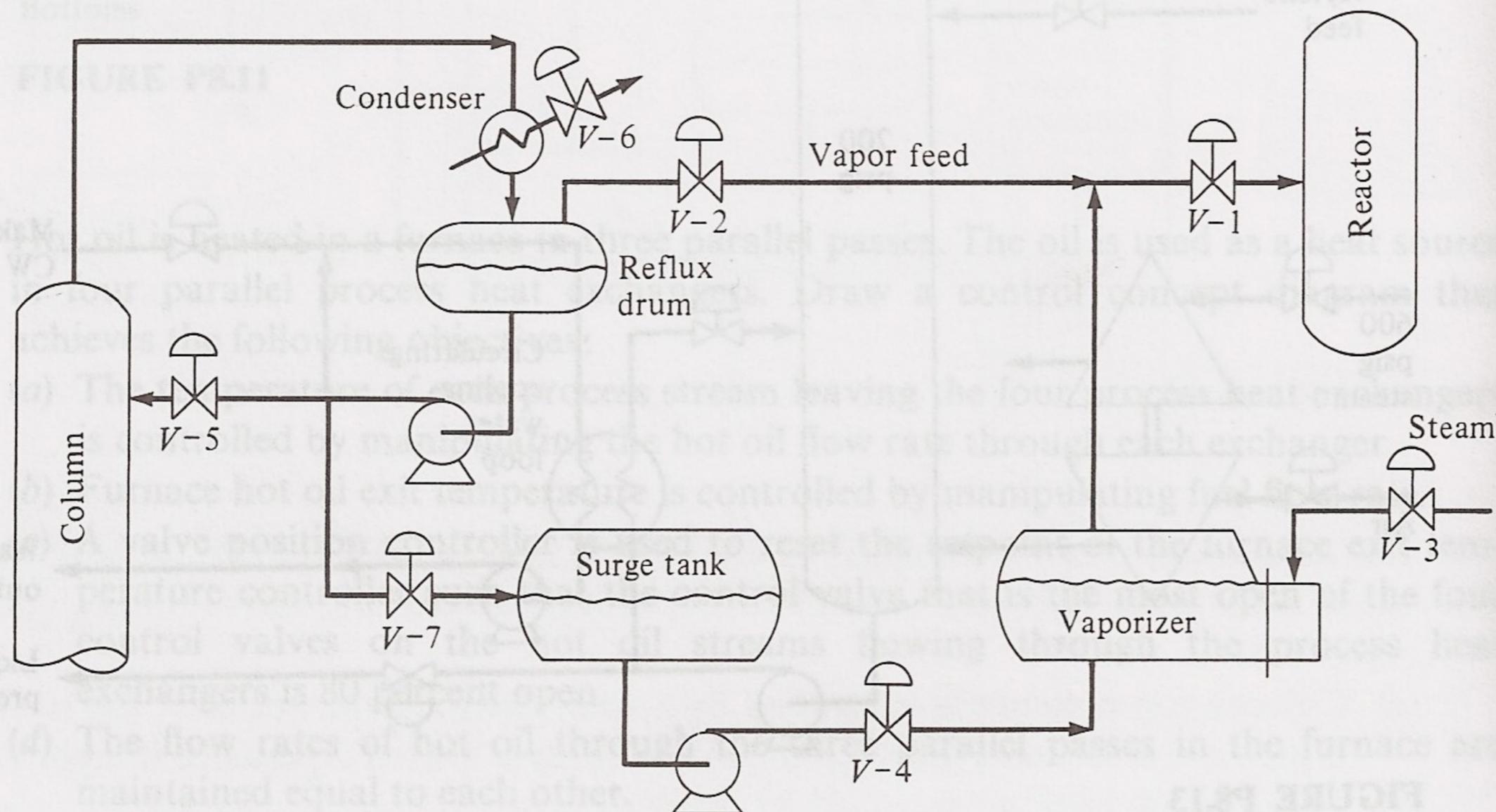


FIGURE P8.14