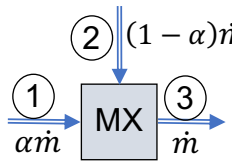
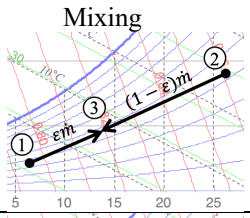
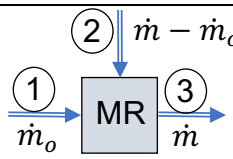
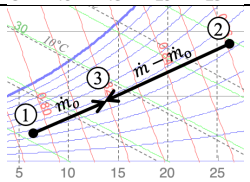
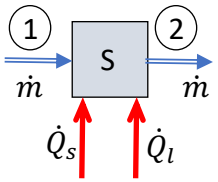
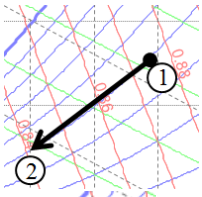
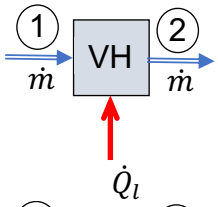
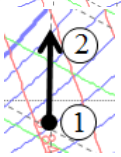
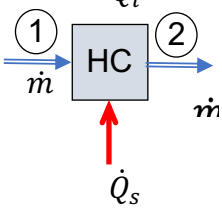
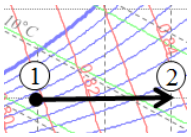
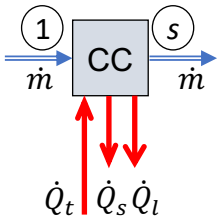
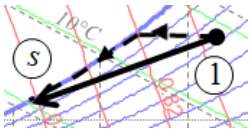
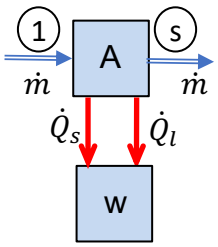
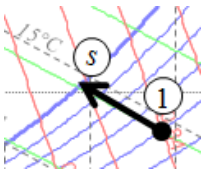
Process	Bloc diagram	Representation	Model
Mixing with given ratio			$\begin{cases}\dot{m}c\theta_3 = \alpha\dot{m}c\theta_1 + (1-\alpha)\dot{m}c\theta_2 \\ \dot{m}lw_3 = \alpha\dot{m}lw_1 + (1-\alpha)\dot{m}lw_2\end{cases}$ inputs: $\theta_1, \theta_2, w_1, w_2$ outputs: θ_3, w_3 parameter: $\dot{m}$
Mixing with given mass flow rate			$\begin{cases}\dot{m}c\theta_3 = \dot{m}_o c\theta_1 + (\dot{m}-\dot{m}_o)c\theta_2 \\ \dot{m}lw_3 = \alpha\dot{m}lw_1 + (\dot{m}-\dot{m}_o)lw_2\end{cases}$ inputs: $\theta_1, \theta_2, w_1, w_2$ outputs: θ_3, w_3 parameter: $\dot{m}$
Processes with sensible and/or latent heat transfer			
Without phase change			
General process			$\begin{cases}\dot{m}c\theta_2 = \dot{m}c\theta_1 + \dot{Q}_s \\ \dot{m}lw_2 = \dot{m}lw_1 + \dot{Q}_l\end{cases}$ inputs: $\theta_1, w_1, \dot{Q}_s, \dot{Q}_l$ outputs: θ_2, w_2 parameter: $\dot{m}_{as}$
Vapor humidification			$\dot{m}lw_2 = \dot{m}lw_1 + \dot{Q}_l$ inputs: $w_1, \dot{Q}_l$ outputs: w_2 parameter: $\dot{m}$ Note: $\dot{Q}_l = \dot{m}_w l$
Heating / cooling			$\dot{m}c\theta_2 = \dot{m}c\theta_1 + \dot{Q}_s$ inputs: $\theta_1, \dot{Q}_s,$ outputs: θ_2 parameters: $\dot{m}$
With phase change			
Condensation (cooling with dehumidification)			$\begin{cases}\dot{m}c\theta_s + \dot{Q}_s = \dot{m}c\theta_1 \\ \dot{m}lw_s + \dot{Q}_l = \dot{m}clw_1 \\ w_s - f(\theta_s) = 0 \\ \dot{Q}_s + \dot{Q}_l = \dot{Q}_t\end{cases}$ inputs: $\theta_1, w_1, \dot{Q}_t$ outputs: $\theta_s, r_s, \dot{Q}_s, \dot{Q}_l$ parameter: $\dot{m}$ Notes 1) condensed water: $\dot{m}_w = \dot{Q}_l/l$ 2) cooling coil total load: $\dot{Q}_t$
Adiabatic evaporation or condensation			$\begin{cases}c\theta_s + lw_s = c\theta_1 + lr_1 \\ w_s - f(\theta_s) = 0\end{cases}$ inputs: θ_1, w_1 outputs: θ_s, w_s Notes 1) $\dot{Q}_s = -\dot{Q}_l$ are outputs 2) $\dot{Q}_l = \dot{m}_w l$ 3) $\dot{m}_w = \dot{m}(w_1 - w_s)$