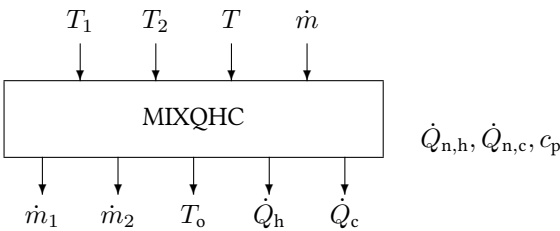


Block MIXQHC

The MIXQHC block simulates a mass flow mixer with auxiliary heating and cooling devices.



Name	MIXQHC
Function	st0011
Inputs	4
Outputs	5
Parameters	3
Strings	0
Group	S

Inputs

- 1 Temperature fluid one $T_1 / ^\circ\text{C}$
- 2 Temperature fluid two $T_2 / ^\circ\text{C}$
- 3 Mix temperature $T / ^\circ\text{C}$
- 4 Total mass flow $\dot{m} / \text{kg s}^{-1}$

Outputs

- 1 Mass flow fluid one $\dot{m}_1 / \text{kg s}^{-1}$
- 2 Mass flow fluid two $\dot{m}_2 / \text{kg s}^{-1}$
- 3 Outlet temperature $T_o / ^\circ\text{C}$
- 4 Auxiliary heating power $\dot{Q}_h / \text{W}$
- 5 Auxiliary cooling power $\dot{Q}_c / \text{W}$

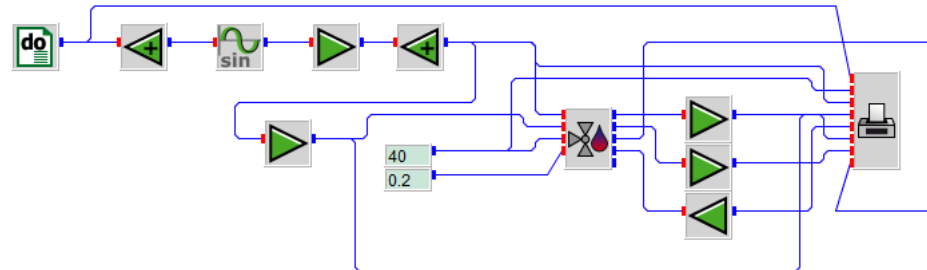
Parameters

- 1 Nominal power of auxiliary heater $\dot{Q}_{n,h} / \text{W}$
- 2 Nominal power of auxiliary cooler $\dot{Q}_{n,c} / \text{W}$
- 3 Specific heat of fluid $c_p / \text{J kg}^{-1} \text{K}^{-1}$

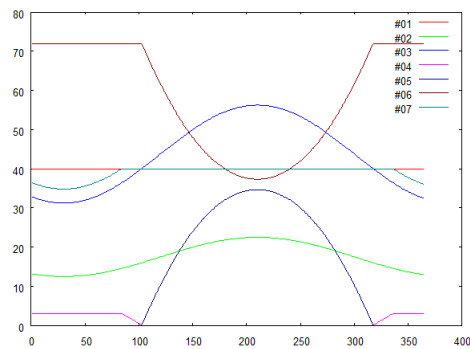
Strings

None

mixqhc.vseit



A **DO** block with parameters 1, 365, and 1 runs through the days of one year in order to create a test profile for the temperature of a fluid via a **SIN** block and some gains and offsets. The resulting profile can be seen as green curve number two in the output of the **PLOT** block.



The test signal is connected to the first input of the **MIXQHC** block. The second fluid temperature follows the same profile but is multiplied by a factor 2.5. The desired mix temperature is set constant to 40 °C and the desired total mass flow is 0.2 kg/s.

The outputs of the **MIXQHC** block are scaled through two **GAIN** blocks and an **ATT** block so that they fit into one diagram.

It can be seen that the required mix temperature of 40 °C cannot be reached in the winter months. Hence, some auxiliary heating power is required (magenta curve number four).