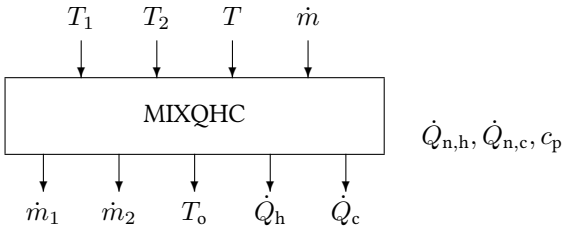
Block MIXQHC

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

Outputs

1. Mass flow fluid one $\dot{m}_1$ / kg s^{-1}
2. Mass flow fluid two $\dot{m}_2$ / kg s^{-1}
3. Outlet temperature T_{o} / °C
4. Auxiliary heating power $\dot{Q}_{\mathrm{h}}$ / W
5. Auxiliary cooling power $\dot{Q}_{\mathrm{c}}$ / W

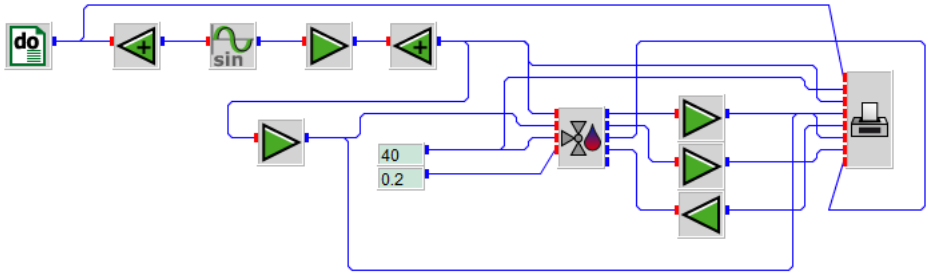
Parameters

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

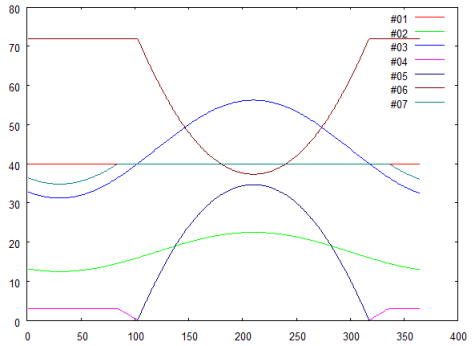
Strings

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).