Software Information

- Please check, whether your inputs, the equations applied and the charactersitics are displayed correctly.
- You are welcome to send your feedback via `https://github.com/oemof/tespy/issues`.
- LaTeXpackages required are:
  - graphicx
  - float
  - hyperref
  - booktabs
  - amsmath
  - units
  - cleveref
- To supress these messages, call the model documentation with the keyword draft=False.

TESPy Version:	0.4.1 - dev
Commit:	69f00d6e@dev
CoolProp version:	6.4.0
Python version:	3.7.6 (default, Jan 8 2020, 20:23:39) [MSC v.1916 64 bit (AMD64)]

1 Connections in offdesign mode

1.1 Specified connection parameters

label	p in bar (1)	T in °C (2)	m in kg/s (3)
ambient air:out1_compressor:in1	1.000	20.000	-
economizer:out1_chimney:in1	1.020	-	-
cooling water backflow:out1_condenser:in2	5.000	15.000	-
condenser:out2_cooling water feedflow:in1	-	-	1213.429
district heating backflow:out1_district heating condenser:in2	10.000	50.000	-
district heating condenser:out2_district heating feedflow:in1	-	90.000	-

Table 1: Specified connection parameters

1.2 Equations applied

$$0 = p - p_{\mathrm{spec}} \tag{1}$$

$$0 = T\left(p, h\right) - T_{\mathrm{spec}} \tag{2}$$

$$0 = \dot{m} - \dot{m}_{\mathrm{spec}} \tag{3}$$

1.3 Specified fluids

label	Ar (4)	CH4 (5)	CO2 (6)	H2O (7)	N2 (8)	O2 (9)
ambient air:out1_compressor:in1	0.013	0.000	0.000	0.000	0.755	0.231
fuel source:out1_fuel compressor:in1	0.000	0.960	0.040	0.000	0.000	0.000
superheater:out2_ls sink:in1	0.000	0.000	0.000	1.000	0.000	0.000
cooling water backflow:out1_condenser:in2	0.000	0.000	0.000	1.000	0.000	0.000
district heating backflow:out1_district heating condenser:in2	0.000	0.000	0.000	1.000	0.000	0.000

Table 2: Specified fluids

1.4 Equations applied

$$0 = x_{\mathrm{Ar}} - x_{\mathrm{Ar,spec}} \tag{4}$$

$$0 = x_{\mathrm{CH4}} - x_{\mathrm{CH4,spec}} \tag{5}$$

$$0 = x_{\mathrm{CO2}} - x_{\mathrm{CO2,spec}} \tag{6}$$

$$0 = x_{\mathrm{H2O}} - x_{\mathrm{H2O,spec}} \tag{7}$$

$$0 = x_{\mathrm{N2}} - x_{\mathrm{N2,spec}} \tag{8}$$

$$0 = x_{\mathrm{O2}} - x_{\mathrm{O2,spec}} \tag{9}$$

1.5 Referenced values for mass flow

label	reference	factor in -	delta in $^{kg}/_{s}$
evaporator:out2_drum:in2	drum:out2_superheater:in2	4	0

Table 3: Referenced values for mass flow

1.6 Equation applied

$$0 = \text{value} - \text{value}_{\text{ref}} \cdot \text{factor} + \text{delta} \tag{10}$$

1.7 Referenced values for pressure

label	reference	factor in -	delta in bar
fuel source:out1_fuel compressor:in1	ambient air:out1_compressor:in1	1	0
ls source:out1_steam turbine high pressure:in1	superheater:out2_ls sink:in1	1	0

Table 4: Referenced values for pressure

1.8 Equation applied

$$0 = \text{value} - \text{value}_{\text{ref}} \cdot \text{factor} + \text{delta} \tag{11}$$

1.9 Referenced values for enthalpy

label	reference	factor in -	delta in $^{kJ}/_{kg}$
ls source:out1_steam turbine high pressure:in1	superheater:out2_ls sink:in1	1	0

Table 5: Referenced values for enthalpy

1.10 Equation applied

$$0 = \text{value} - \text{value}_{\text{ref}} \cdot \text{factor} + \text{delta} \tag{12}$$

1.11 Referenced values for temperature

label	reference	factor in -	delta in °C
fuel source:out1_fuel compressor:in1	ambient air:out1_compressor:in1	1	0

Table 6: Referenced values for temperature

1.12 Equation applied

$$0 = \text{value} - \text{value}_{\text{ref}} \cdot \text{factor} + \text{delta} \tag{13}$$

2 Components in offdesign mode

2.1 Components of type Compressor

2.1.1 Mandatory constraints

$$0 = \dot{m}_{\mathrm{in},i} - \dot{m}_{\mathrm{out},i} \; \forall i \in [1] \tag{14}$$

$$0 = x_{fl,\mathrm{in},i} - x_{fl,\mathrm{out},i} \; \forall fl \in \text{network fluids}, \forall i \in [1] \tag{15}$$

2.1.2 Inputs specified

label	eta_s_char (16)
compressor	True
fuel compressor	True

Table 7: Parameters of components of type Compressor

2.1.3 Equations applied

$$0 = (h_{\mathrm{out}} - h_{\mathrm{in}}) \cdot \eta_{\mathrm{s,design}} \cdot f(X) - (h_{out,s} - h_{in}) \tag{16}$$

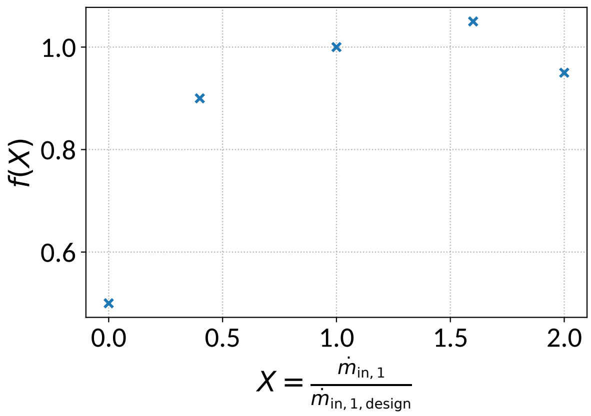

Figure 1: Characteristics of compressor (eq. 16)

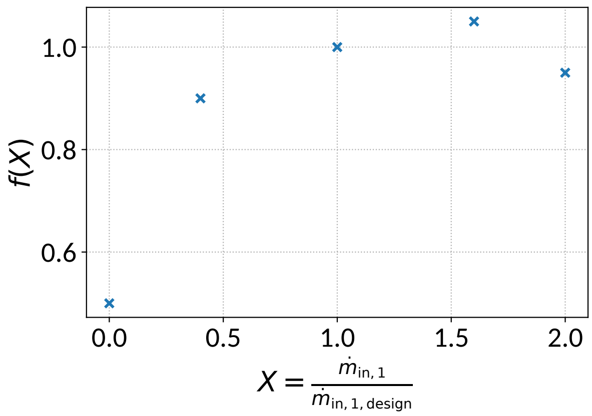

Figure 2: Characteristics of fuel compressor (eq. 16)

2.2 Components of type CombustionChamber

2.2.1 Mandatory constraints

$$0 = \dot{m}_{\mathrm{in,1}} + \dot{m}_{\mathrm{in,2}} - \dot{m}_{\mathrm{out,1}} \tag{17}$$

$$\begin{aligned} 0 =& p_{\mathrm{in,1}} - p_{\mathrm{out,1}} \\ 0 =& p_{\mathrm{in,1}} - p_{\mathrm{in,2}} \end{aligned} \tag{18}$$

$$\begin{aligned} \Delta\dot{m}_{\mathrm{fluid}} &= \dot{m}_{\mathrm{in,1}} \cdot x_{\mathrm{fluid,in,1}} + \dot{m}_{\mathrm{in,2}} \cdot x_{\mathrm{fluid,in,2}} - \dot{m}_{\mathrm{out,1}} \cdot x_{\mathrm{fluid,out,1}} \\ \dot{m}_{\mathrm{fluid,m}} &= \frac{\dot{m}_{\mathrm{in,1}} \cdot x_{\mathrm{fluid,in,1}} + \dot{m}_{\mathrm{in,2}} \cdot x_{\mathrm{fluid,in,2}}}{M_{\mathrm{fluid}}} \\ \dot{m}_{\mathrm{H,m}} &= \dot{m}_{\mathrm{CH4,m}} \cdot 4 \\ \dot{m}_{\mathrm{C,m}} &= \dot{m}_{\mathrm{CH4,m}} \cdot 1 \\ \dot{m}_{\mathrm{O2,m,stoich}} &= \frac{\dot{m}_{\mathrm{H,m}}}{4} + \dot{m}_{\mathrm{C,m}} \end{aligned} \tag{19}$$

$$0 = \Delta \dot{m}_{\mathrm{Ar}} \tag{20}$$

$$0 = \Delta \dot{m}_{\mathrm{CH4}} - \dot{m}_{\mathrm{CH4,m}} \cdot M_{\mathrm{CH4}} \tag{21}$$

$$0 = \Delta \dot{m}_{\mathrm{CO2}} + \dot{m}_{\mathrm{C,m}} \cdot M_{\mathrm{CO2}} \tag{22}$$

$$0 = \Delta \dot{m}_{\mathrm{H2O}} + \frac{\dot{m}_{\mathrm{H,m}}}{2} \cdot M_{\mathrm{H2O}} \tag{23}$$

$$0 = \Delta \dot{m}_{\mathrm{N2}} \tag{24}$$

$$0 = \Delta \dot{m}_{\mathrm{O2}} - \dot{m}_{\mathrm{O2,m,stoich}} \cdot M_{\mathrm{O2}} \tag{25}$$

$$\begin{split}
0 = &\sum_i \dot{m}_{\mathrm{in},i} \cdot \left(h_{\mathrm{in},i} - h_{\mathrm{in},i,\mathrm{ref}}\right) - \dot{m}_{\mathrm{out},1} \cdot \left(h_{\mathrm{out},1} - h_{\mathrm{out},1,\mathrm{ref}}\right)\\
&+ LHV_{fuel} \cdot \left(\sum_i \dot{m}_{\mathrm{in},i} \cdot x_{fuel,\mathrm{in},i} - \dot{m}_{\mathrm{out},1} \cdot x_{fuel,\mathrm{out},1}\right)\\
&\forall i \in \mathrm{inlets}\\
&T_{\mathrm{ref}} = 298.15\,\mathrm{K}\; p_{\mathrm{ref}} = 10^5\,\mathrm{Pa}
\end{split} \tag{26}$$

2.2.2 Inputs specified

label	lamb (27)
combustion	2.500

Table 8: Parameters of components of type CombustionChamber

2.2.3 Equations applied

$$\begin{split}
0 = \frac{\dot{m}_{\mathrm{fuel,m}}}{\dot{m}_{\mathrm{O_2,m}} \cdot \left(n_{\mathrm{C,fuel}} + 0.25 \cdot n_{\mathrm{H,fuel}}\right)} - \lambda\\
\dot{m}_{\mathrm{fluid,m}} = \frac{x_{\mathrm{fluid}} \cdot \dot{m}}{M_{\mathrm{fluid}}}
\end{split} \tag{27}$$

2.3 Components of type Turbine

2.3.1 Mandatory constraints

$$0 = \dot{m}_{\mathrm{in},i} - \dot{m}_{\mathrm{out},i}\ \forall i \in [1] \tag{28}$$

$$0 = x_{fl,\mathrm{in},i} - x_{fl,\mathrm{out},i}\ \forall fl \in \text{network fluids},\ \forall i \in [1] \tag{29}$$

2.3.2 Inputs specified

label	eta_s_char (30)	cone (31)
gas turbine	True	True
steam turbine high pressure	True	True
steam turbine low pressure	True	True

Table 9: Parameters of components of type Turbine

2.3.3 Equations applied

$$0 = -\left(h_{\text{out}} - h_{\text{in}}\right) + \eta_{\text{s,design}} \cdot f\left(X\right) \cdot \left(h_{\text{out,s}} - h_{\text{in}}\right) \tag{30}$$

$$0 = \frac{\dot{m}_{\text{in,design}} \cdot p_{\text{in}}}{p_{\text{in,design}}} \cdot \sqrt{\frac{p_{\text{in,design}} \cdot v_{\text{in}}}{p_{\text{in}} \cdot v_{\text{in,design}}} \cdot \frac{1 - \left(\frac{p_{\text{out}}}{p_{\text{in}}}\right)^2}{1 - \left(\frac{p_{\text{out,design}}}{p_{\text{in,design}}}\right)^2}} - \dot{m}_{\text{in}} \tag{31}$$

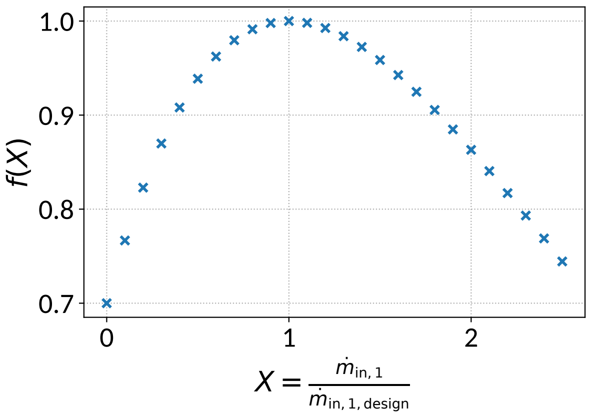

Figure 3: Characteristics of gas turbine (eq. 30)

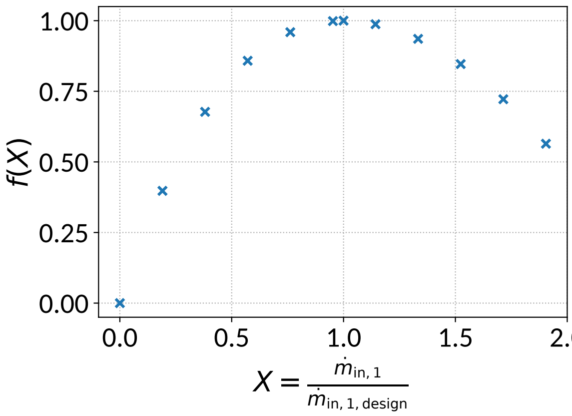

Figure 4: Characteristics of steam turbine high pressure (eq. 30)

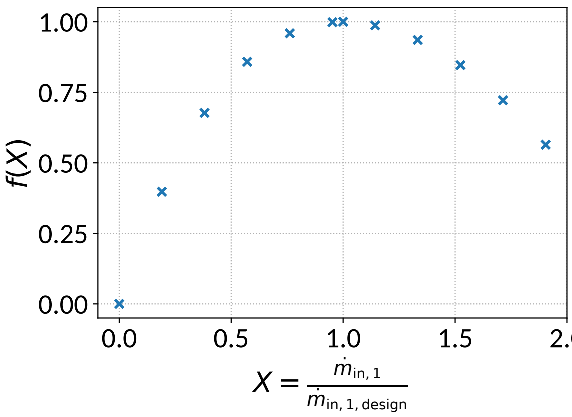

Figure 5: Characteristics of steam turbine low pressure (eq. 30)

2.4 Components of type HeatExchanger

2.4.1 Mandatory constraints

$$0 = \dot{m}_{\text{in},i} - \dot{m}_{\text{out},i} \; \forall i \in [1, 2] \tag{32}$$

$$0 = x_{fl,\text{in},i} - x_{fl,\text{out},i} \; \forall fl \in \text{network fluids}, \forall i \in [1, 2] \tag{33}$$

$$0 = \dot{m}_{\text{in},1} \cdot \left(h_{\text{out},1} - h_{\text{in},1}\right) + \dot{m}_{\text{in},2} \cdot \left(h_{\text{out},2} - h_{\text{in},2}\right) \tag{34}$$

2.4.2 Inputs specified

label	zeta1 (35)	zeta2 (36)	kA_char (37)
superheater	0.009	9405.952	True
evaporator	0.011	-	True
economizer	0.015	0.000	True

Table 10: Parameters of components of type HeatExchanger

2.4.3 Equations applied

$$0 = \begin{cases} p_{\mathrm{in},1} - p_{\mathrm{out},1} & |\dot{m}_{\mathrm{in},1}| < 0.0001\,\mathrm{kg/s} \\ \frac{\zeta}{D^4} - \frac{(p_{\mathrm{in},1}-p_{\mathrm{out},1})\cdot\pi^2}{8\cdot\dot{m}_{\mathrm{in},1}\cdot|\dot{m}_{\mathrm{in},1}|\cdot\frac{v_{\mathrm{in},1}+v_{\mathrm{out},1}}{2}} & |\dot{m}_{\mathrm{in},1}| \geq 0.0001\,\mathrm{kg/s} \end{cases} \tag{35}$$

$$0 = \begin{cases} p_{\mathrm{in},2} - p_{\mathrm{out},2} & |\dot{m}_{\mathrm{in},2}| < 0.0001\,\mathrm{kg/s} \\ \frac{\zeta}{D^4} - \frac{(p_{\mathrm{in},2}-p_{\mathrm{out},2})\cdot\pi^2}{8\cdot\dot{m}_{\mathrm{in},2}\cdot|\dot{m}_{\mathrm{in},2}|\cdot\frac{v_{\mathrm{in},2}+v_{\mathrm{out},2}}{2}} & |\dot{m}_{\mathrm{in},2}| \geq 0.0001\,\mathrm{kg/s} \end{cases} \tag{36}$$

$$\begin{aligned} 0 =& \dot{m}_{\mathrm{in},1} \cdot (h_{\mathrm{out},1} - h_{\mathrm{in},1}) \\ &+ kA_{\mathrm{design}} \cdot f_{\mathrm{kA}} \cdot \frac{T_{\mathrm{out},1} - T_{\mathrm{in},2} - T_{\mathrm{in},1} + T_{\mathrm{out},2}}{\ln \frac{T_{\mathrm{out},1}-T_{\mathrm{in},2}}{T_{\mathrm{in},1}-T_{\mathrm{out},2}}} \\ f_{\mathrm{kA}} =& \frac{2}{\frac{1}{f(X_1)} + \frac{1}{f(X_2)}} \end{aligned} \tag{37}$$

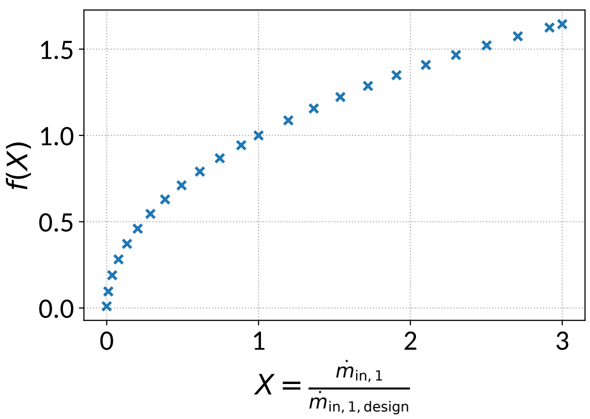

Figure 6: Characteristics of superheater (eq. 37)

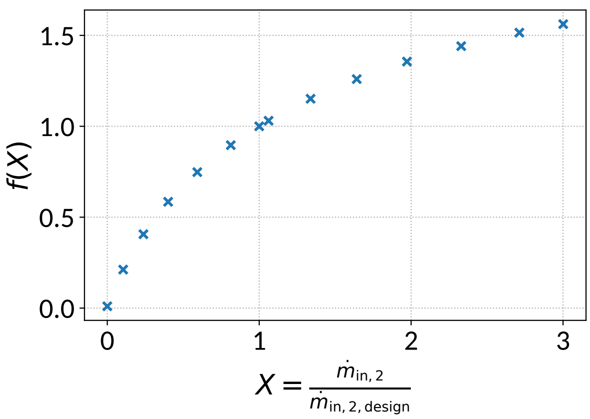

Figure 7: Characteristics of superheater (eq. 37)

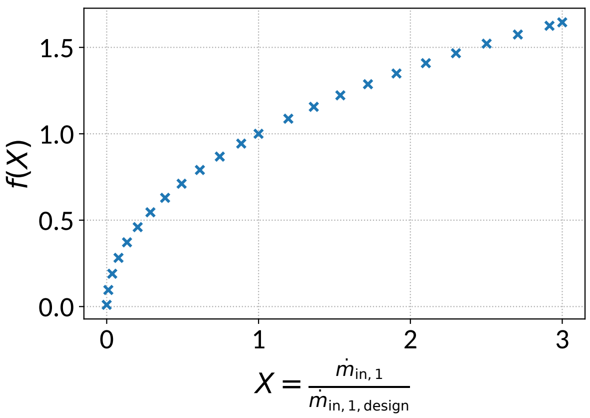

Figure 8: Characteristics of evaporator (eq. 37)

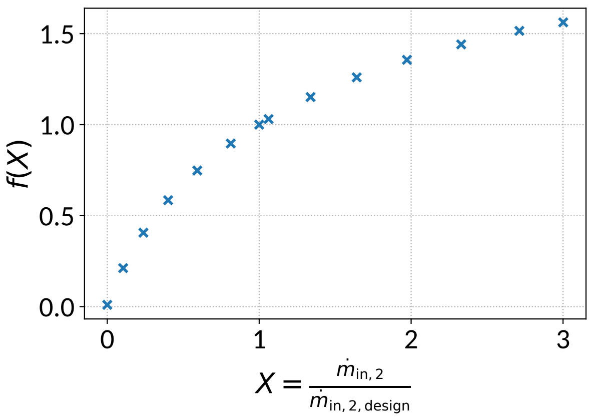

Figure 9: Characteristics of evaporator (eq. 37)

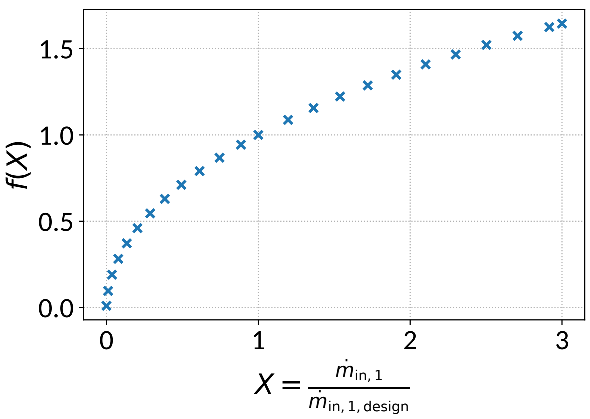

Figure 10: Characteristics of economizer (eq. 37)

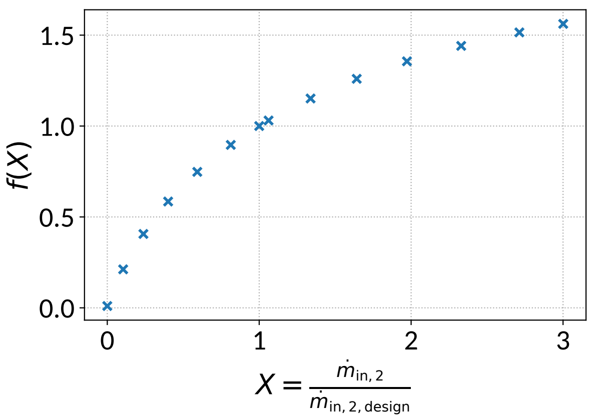

Figure 11: Characteristics of economizer (eq. 37)

2.5 Components of type Drum

2.5.1 Mandatory constraints

$$0 = \sum \dot{m}_{\text{in},i} - \sum \dot{m}_{\text{out},j} \; \forall i \in \text{inlets}, \forall j \in \text{outlets} \tag{38}$$

$$0 = x_{fl,\text{in},1} - x_{fl,\text{out},j} \; \forall fl \in \text{network fluids}, \forall j \in \text{outlets} \tag{39}$$

$$0 = \sum_i \left(\dot{m}_{\text{in},i} \cdot h_{\text{in},i}\right) - \sum_j \left(\dot{m}_{\text{out},j} \cdot h_{\text{out},j}\right) \; \forall i \in \text{inlets} \; \forall j \in \text{outlets} \tag{40}$$

$$\begin{gathered} 0 = p_{\text{in},1} - p_{\text{in},i} \; \forall i \in \text{inlets} \setminus \{1\} \\ 0 = p_{\text{in},1} - p_{\text{out},j} \; \forall j \in \text{outlets} \end{gathered} \tag{41}$$

$$\begin{aligned} 0 =& h_{\text{out},1} - h\left(p_{\text{out},1}, x = 0\right) \\ 0 =& h_{\text{out},2} - h\left(p_{\text{out},2}, x = 1\right) \end{aligned} \tag{42}$$

2.6 Components of type Splitter

2.6.1 Mandatory constraints

$$0 = \sum \dot{m}_{\mathrm{in},i} - \sum \dot{m}_{\mathrm{out},j} \; \forall i \in \mathrm{inlets}, \forall j \in \mathrm{outlets} \tag{43}$$

$$0 = x_{fl,\mathrm{in}} - x_{fl,\mathrm{out},j} \; \forall fl \in \text{network fluids}, \forall j \in \mathrm{outlets} \tag{44}$$

$$0 = h_{in} - h_{\mathrm{out},j} \; \forall j \in \mathrm{outlets} \tag{45}$$

$$\begin{split}0 = p_{\mathrm{in},1} - p_{\mathrm{in},i} \; \forall i \in \mathrm{inlets} \setminus \{1\}\\ 0 = p_{\mathrm{in},1} - p_{\mathrm{out},j} \; \forall j \in \mathrm{outlets}\end{split} \tag{46}$$

2.7 Components of type Condenser

2.7.1 Mandatory constraints

$$0 = \dot{m}_{\mathrm{in},i} - \dot{m}_{\mathrm{out},i} \; \forall i \in [1, 2] \tag{47}$$

$$0 = x_{fl,\mathrm{in},i} - x_{fl,\mathrm{out},i} \; \forall fl \in \text{network fluids}, \forall i \in [1, 2] \tag{48}$$

$$0 = \dot{m}_{\mathrm{in},1} \cdot (h_{\mathrm{out},1} - h_{\mathrm{in},1}) + \dot{m}_{\mathrm{in},2} \cdot (h_{\mathrm{out},2} - h_{\mathrm{in},2}) \tag{49}$$

2.7.2 Inputs specified

label	pr1 (50)	zeta2 (51)	kA_char (52)	subcooling (53)
district heating condenser	0.990	120.302	True	True
condenser	0.990	8.358	True	True

Table 11: Parameters of components of type Condenser

2.7.3 Equations applied

$$0 = p_{\mathrm{in},1} \cdot pr1 - p_{\mathrm{out},1} \tag{50}$$

$$0 = \begin{cases} p_{\mathrm{in},2} - p_{\mathrm{out},2} & |\dot{m}_{\mathrm{in},2}| < 0.0001 \, \mathrm{kg/s} \\ \frac{\zeta}{D^4} - \frac{(p_{\mathrm{in},2} - p_{\mathrm{out},2}) \cdot \pi^2}{8 \cdot \dot{m}_{\mathrm{in},2} \cdot |\dot{m}_{\mathrm{in},2}| \cdot \frac{v_{\mathrm{in},2} + v_{\mathrm{out},2}}{2}} & |\dot{m}_{\mathrm{in},2}| \geq 0.0001 \, \mathrm{kg/s} \end{cases} \tag{51}$$

$$\begin{split}0 = &\dot{m}_{\mathrm{in},1} \cdot (h_{\mathrm{out},1} - h_{\mathrm{in},1})\\ &+ kA_{\mathrm{design}} \cdot f_{\mathrm{kA}} \cdot \frac{T_{\mathrm{out},1} - T_{\mathrm{in},2} - T_{\mathrm{sat}}(p_{\mathrm{in},1}) + T_{\mathrm{out},2}}{\ln \frac{T_{\mathrm{out},1} - T_{\mathrm{in},2}}{T_{\mathrm{sat}}(p_{\mathrm{in},1}) - T_{\mathrm{out},2}}}\\ f_{\mathrm{kA}} = &\frac{2}{\frac{1}{f(X_2)} + \frac{1}{f(X_2)}}\end{split} \tag{52}$$

$$0 = h_{\mathrm{out},1} - h(p_{\mathrm{out},1}, x = 0) \tag{53}$$

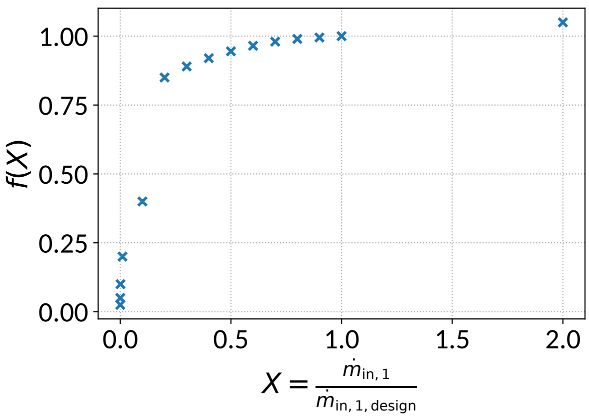

Figure 12: Characteristics of district heating condenser (eq. 52)

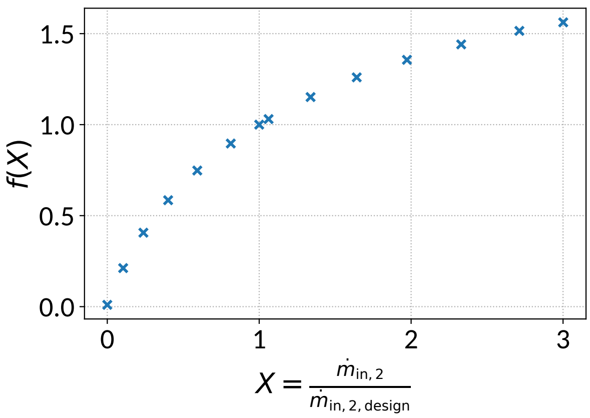

Figure 13: Characteristics of district heating condenser (eq. 52)

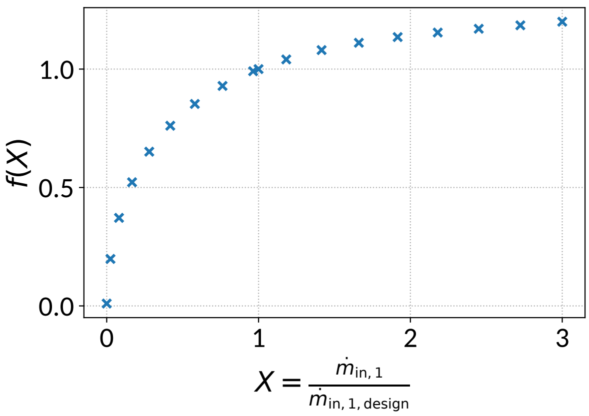

Figure 14: Characteristics of condenser (eq. 52)

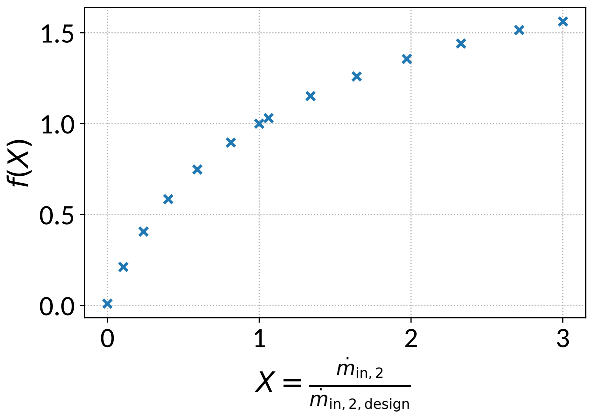

Figure 15: Characteristics of condenser (eq. 52)

2.8 Components of type Pump

2.8.1 Mandatory constraints

$$0 = \dot{m}_{\mathrm{in},i} - \dot{m}_{\mathrm{out},i} \; \forall i \in [1] \tag{54}$$

$$0 = x_{fl,\mathrm{in},i} - x_{fl,\mathrm{out},i} \; \forall fl \in \text{network fluids}, \forall i \in [1] \tag{55}$$

2.8.2 Inputs specified

label	eta_s_char (56)
feed water pump 1	True
feed water pump 2	True

Table 12: Parameters of components of type Pump

2.8.3 Equations applied

$$0 = (h_{\mathrm{out}} - h_{\mathrm{in}}) \cdot \eta_{\mathrm{s,design}} \cdot f\left(X\right) - (h_{out,s} - h_{in}) \tag{56}$$

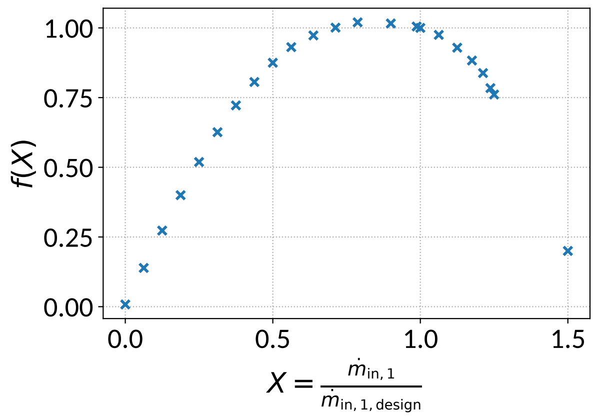

Figure 16: Characteristics of feed water pump 1 (eq. 56)

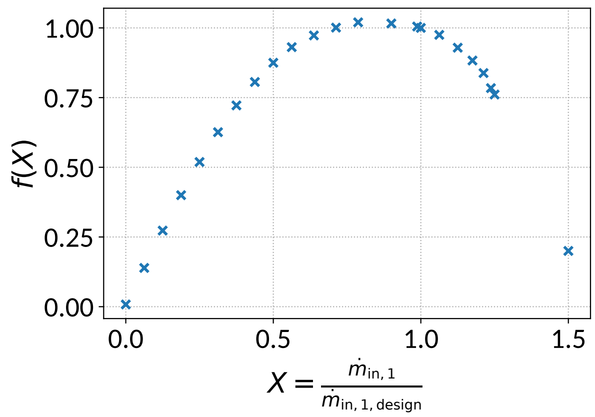

Figure 17: Characteristics of feed water pump 2 (eq. 56)

2.9 Components of type Merge

2.9.1 Mandatory constraints

$$0 = \sum \dot{m}_{\mathrm{in},i} - \sum \dot{m}_{\mathrm{out},j} \; \forall i \in \mathrm{inlets}, \forall j \in \mathrm{outlets} \tag{57}$$

$$0 = \sum_i \dot{m}_{\mathrm{in},i} \cdot x_{fl,\mathrm{in},i} - \dot{m}_{\mathrm{out}} \cdot x_{fl,\mathrm{out}} \; \forall fl \in \text{network fluids}, \forall i \in \mathrm{inlets} \tag{58}$$

$$0 = \sum_i \left(\dot{m}_{\mathrm{in},i} \cdot h_{\mathrm{in},i}\right) - \dot{m}_{\mathrm{out}} \cdot h_{\mathrm{out}} \; \forall i \in \mathrm{inlets} \tag{59}$$

$$\begin{aligned} 0 &= p_{\mathrm{in},1} - p_{\mathrm{in},i} \; \forall i \in \mathrm{inlets} \setminus \{1\} \\ 0 &= p_{\mathrm{in},1} - p_{\mathrm{out},j} \; \forall j \in \mathrm{outlets} \end{aligned} \tag{60}$$

2.10 Components of type Valve

2.10.1 Mandatory constraints

$$0 = \dot{m}_{\mathrm{in},i} - \dot{m}_{\mathrm{out},i} \; \forall i \in [1] \tag{61}$$

$$0 = x_{fl,\mathrm{in},i} - x_{fl,\mathrm{out},i} \; \forall fl \in \text{network fluids}, \forall i \in [1] \tag{62}$$

$$0 = h_{\mathrm{in},i} - h_{\mathrm{out},i} \; \forall i \in [1] \tag{63}$$

3 Busses in offdesign mode

3.1 Bus "power output"

This bus is used for postprocessing only.

label	$\dot{E}_\text{comp}$	$\dot{E}_\text{bus}$	η
gas turbine	$\dot{m}_\text{in} \cdot (h_\text{out} - h_\text{in})$	$\dot{E}_\text{comp} \cdot \eta$	$f(X)$ (18)
compressor	$\dot{m}_\text{in} \cdot (h_\text{out} - h_\text{in})$	$\dot{E}_\text{comp} \cdot \eta$	1.000
fuel compressor	$\dot{m}_\text{in} \cdot (h_\text{out} - h_\text{in})$	$\frac{\dot{E}_\text{comp}}{\eta}$	$f(X)$ (19)
steam turbine high pressure	$\dot{m}_\text{in} \cdot (h_\text{out} - h_\text{in})$	$\dot{E}_\text{comp} \cdot \eta$	$f(X)$ (18)
feed water pump 1	$\dot{m}_\text{in} \cdot (h_\text{out} - h_\text{in})$	$\frac{\dot{E}_\text{comp}}{\eta}$	$f(X)$ (19)
steam turbine low pressure	$\dot{m}_\text{in} \cdot (h_\text{out} - h_\text{in})$	$\dot{E}_\text{comp} \cdot \eta$	$f(X)$ (18)
feed water pump 2	$\dot{m}_\text{in} \cdot (h_\text{out} - h_\text{in})$	$\frac{\dot{E}_\text{comp}}{\eta}$	$f(X)$ (19)

Table 13: power output

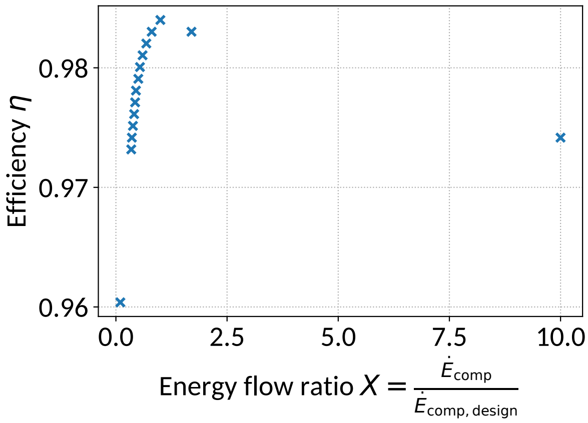

Figure 18: Bus efficiency characteristic

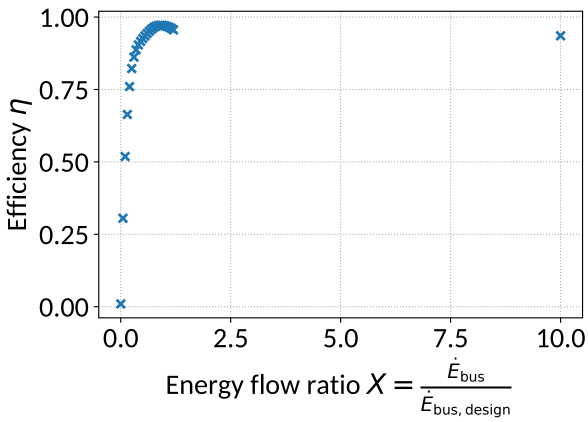

Figure 19: Bus efficiency characteristic

3.2 Bus “gas turbine power output”

Specified total value of energy flow: $\dot{E}_\text{bus} = -105822222.941\,\text{W}$

$$0 = \dot{E}_\text{bus} - \sum_i \dot{E}_{\text{bus},i} \tag{64}$$

label	$\dot{E}_\text{comp}$	$\dot{E}_\text{bus}$	η
gas turbine	$\dot{m}_\text{in} \cdot (h_\text{out} - h_\text{in})$	$\dot{E}_\text{comp} \cdot \eta$	1.000
compressor	$\dot{m}_\text{in} \cdot (h_\text{out} - h_\text{in})$	$\dot{E}_\text{comp} \cdot \eta$	1.000

Table 14: gas turbine power output

3.3 Bus “heat output”

Specified total value of energy flow: $\dot{E}_\text{bus} = -10000000.000\,\text{W}$

$$0 = \dot{E}_\text{bus} - \sum_i \dot{E}_{\text{bus},i} \tag{65}$$

label	$\dot{E}_\mathrm{comp}$	$\dot{E}_\mathrm{bus}$	η
district heating condenser	$\dot{m}_\mathrm{in,1} \cdot \left(h_\mathrm{out,1} - h_\mathrm{in,1}\right)$	$\dot{E}_\mathrm{comp} \cdot \eta$	1.000

Table 15: heat output

3.4 Bus "heat cond"

This bus is used for postprocessing only.

label	$\dot{E}_\mathrm{comp}$	$\dot{E}_\mathrm{bus}$	η
condenser	$\dot{m}_\mathrm{in,1} \cdot \left(h_\mathrm{out,1} - h_\mathrm{in,1}\right)$	$\dot{E}_\mathrm{comp} \cdot \eta$	1.000

Table 16: heat cond

3.5 Bus "heat input"

This bus is used for postprocessing only.

label	$\dot{E}_\mathrm{comp}$	$\dot{E}_\mathrm{bus}$	η
combustion	$LHV_\mathrm{fuel} \cdot \left[\sum_i \left(\dot{m}_{\mathrm{in,}i} \cdot x_{\mathrm{fuel,in,}i}\right) - \dot{m}_\mathrm{out,1} \cdot x_\mathrm{fuel,out,1}\right]$	$\dot{E}_\mathrm{comp} \cdot \eta$	1.000

Table 17: heat input