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:	0.4.0 - dev
Commit:	d918f10d@feature/self_documenting_models
CoolProp version:	6.4.0
Python version:	3.8.0 (default, Oct 28 2019, 16:14:01) [GCC 8.3.0]

1 Connections in design mode

1.1 Specified connection parameters

label	p in bar (1)	T in °C (2)
cycle closer:out1_turbine:in1	100.000	500.000
cooling water inlet:out1_condenser:in2	5.000	20.000
condenser:out2_cooling water outlet:in1	-	30.000

Table 1: Specified connection parameters

1.2 Equations applied

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

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

1.3 Specified fluids

label	water (3)
cycle closer:out1_turbine:in1	1.000
cooling water inlet:out1_condenser:in2	1.000

Table 2: Specified fluids

1.4 Equations applied

$$0 = x_{\text{water}} - x_{\text{water,spec}} \tag{3}$$

2 Components in design mode

2.1 Components of type CycleCloser

2.1.1 Mandatory constraints

$$0 = p_{\text{in},i} - p_{\text{out},i} \; \forall i \in [1] \tag{4}$$

$$0 = h_{\text{in},i} - h_{\text{out},i} \; \forall i \in [1] \tag{5}$$

2.2 Components of type Turbine

2.2.1 Mandatory constraints

$$0 = \dot{m}_{\text{in},i} - \dot{m}_{\text{out},i} \; \forall i \in [1] \tag{6}$$

$$0 = x_{fl,\text{in},i} - x_{fl,\text{out},i} \; \forall fl \in \text{network fluids}, \forall i \in [1] \tag{7}$$

2.2.2 Inputs specified

label	eta_s (8)
turbine	0.900

Table 3: Parameters of components of type Turbine

2.2.3 Equations applied

$$0 = -\left(h_{\text{out}} - h_{\text{in}}\right) + \left(h_{\text{out,s}} - h_{\text{in}}\right) \cdot \eta_{\text{s}} \tag{8}$$

2.3 Components of type Condenser

2.3.1 Mandatory constraints

$$0 = \dot{m}_{\text{in},i} - \dot{m}_{\text{out},i} \; \forall i \in [1, 2] \tag{9}$$

$$0 = x_{fl,\text{in},i} - x_{fl,\text{out},i} \; \forall fl \in \text{network fluids}, \forall i \in [1, 2] \tag{10}$$

$$0 = \dot{m}_{\text{in},1} \cdot \left(h_{\text{out},1} - h_{\text{in},1}\right) + \dot{m}_{\text{in},2} \cdot \left(h_{\text{out},2} - h_{\text{in},2}\right) \tag{11}$$

2.3.2 Inputs specified

label	ttd_u (12)	pr1 (13)	pr2 (14)	subcooling (15)
condenser	5.000	1.000	0.980	True

Table 4: Parameters of components of type Condenser

2.3.3 Equations applied

$$0 = ttd_{\text{u}} - T_{\text{sat}}\left(p_{\text{in},1}\right) + T_{\text{out},2} \tag{12}$$

$$0 = p_{\text{in},1} \cdot pr1 - p_{\text{out},1} \tag{13}$$

$$0 = p_{\text{in},2} \cdot pr2 - p_{\text{out},2} \tag{14}$$

$$0 = h_{\text{out},1} - h\left(p_{\text{out},1}, x = 0\right) \tag{15}$$

2.4 Components of type Pump

2.4.1 Mandatory constraints

$$0 = \dot{m}_{\text{in},i} - \dot{m}_{\text{out},i} \; \forall i \in [1] \tag{16}$$

$$0 = x_{fl,\text{in},i} - x_{fl,\text{out},i} \; \forall fl \in \text{network fluids}, \forall i \in [1] \tag{17}$$

2.4.2 Inputs specified

label	eta_s (18)
pump	0.800

Table 5: Parameters of components of type Pump

2.4.3 Equations applied

$$0 = -\left(h_{\text{out}} - h_{\text{in}}\right) \cdot \eta_{\text{s}} + \left(h_{\text{out,s}} - h_{\text{in}}\right) \tag{18}$$

2.5 Components of type HeatExchangerSimple

2.5.1 Mandatory constraints

$$0 = \dot{m}_{\text{in},i} - \dot{m}_{\text{out},i} \; \forall i \in [1] \tag{19}$$

$$0 = x_{fl,\text{in},i} - x_{fl,\text{out},i} \; \forall fl \in \text{network fluids}, \forall i \in [1] \tag{20}$$

2.5.2 Inputs specified

label	pr (21)
steam generator	0.950

Table 6: Parameters of components of type HeatExchangerSimple

2.5.3 Equations applied

$$0 = p_{\text{in},1} \cdot pr - p_{\text{out},1} \tag{21}$$

3 Busses in design mode

3.1 Bus “total output power”

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

$$0 = \dot{E}_{\text{bus}} - \sum_i \dot{E}_{\text{bus},i} \tag{22}$$

label	$\dot{E}_{\text{comp}}$	$\dot{E}_{\text{bus}}$	η
turbine	$\dot{m}_{\text{in}} \cdot \left(h_{\text{out}} - h_{\text{in}}\right)$	$\dot{E}_{\text{comp}} \cdot \eta$	$f\left(X\right)$ (1)
pump	$\dot{m}_{\text{in}} \cdot \left(h_{\text{out}} - h_{\text{in}}\right)$	$\frac{\dot{E}_{\text{comp}}}{\eta}$	$f\left(X\right)$ (2)

Table 7: total output power

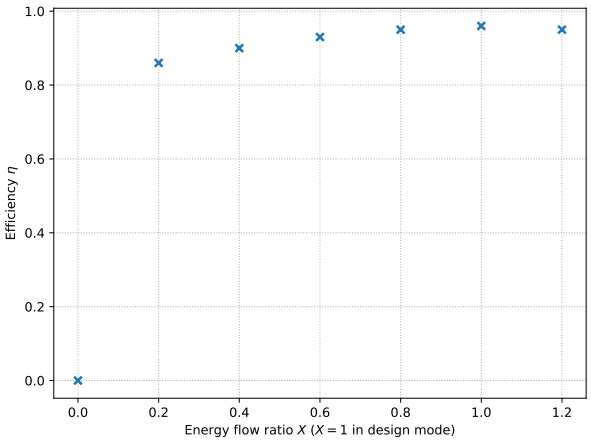

Figure 1: Bus efficiency characteristic

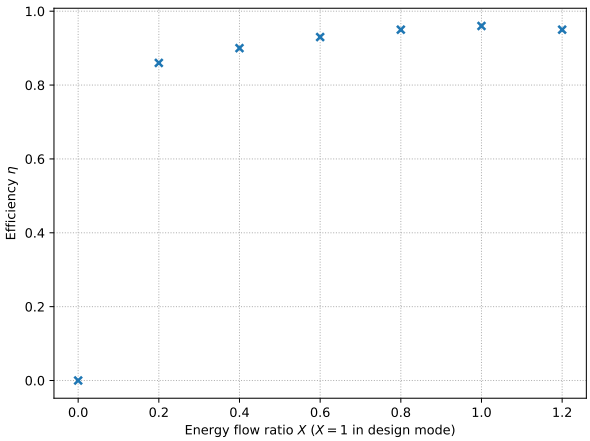

Figure 2: Bus efficiency characteristic