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	T in °C (1)	p in bar (2)
fuel:out1_stoichiometric combustion chamber:in2	25.000	-
ambient:out1_stoichiometric combustion chamber:in1	20.000	1.000

Table 1: Specified connection parameters

1.2 Equations applied

$$0 = T\left(p, h\right) - T_{\text{spec}} \tag{1}$$

$$0 = p - p_{\text{spec}} \tag{2}$$

1.3 Specified fluids

label	myAir (3)	myFuel (4)	myFuel_fg (5)
fuel:out1_stoichiometric combustion chamber:in2	0.000	1.000	0.000
ambient:out1_stoichiometric combustion chamber:in1	1.000	0.000	0.000

Table 2: Specified fluids

1.4 Equations applied

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

$$0 = x_{\text{myFuel}} - x_{\text{myFuel,spec}} \tag{4}$$

$$0 = x_{\text{myFuel}_{\text{fg}}} - x_{\text{myFuel}_{\text{fg}},\text{spec}} \tag{5}$$

2 Components in design mode

2.1 Components of type CombustionChamberStoich

2.1.1 Mandatory constraints

$$0 = \dot{m}_{\text{in},1} + \dot{m}_{\text{in},2} - \dot{m}_{\text{out},1} \tag{6}$$

$$\begin{aligned} 0 =& p_{\text{in},1} - p_{\text{out},1} \\ 0 =& p_{\text{in},1} - p_{\text{in},2} \end{aligned} \tag{7}$$

$$\begin{aligned} &\Delta\dot{m}_{\text{fluid}} = \dot{m}_{\text{in},1} \cdot x_{\text{fluid,in},1} + \dot{m}_{\text{in},2} \cdot x_{\text{fluid,in},2} - \dot{m}_{\text{out},1} \cdot x_{\text{fluid,out},1} \\ &\dot{m}_{\text{fluid}} = \dot{m}_{\text{in},1} \cdot x_{\text{fluid,in},1} + \dot{m}_{\text{in},2} \cdot x_{\text{fluid,in},2} \\ &\dot{m}_{\text{myAir,stoich}} = \dot{m}_{\text{myFuel}} \cdot 16.5497 \end{aligned} \tag{8}$$

$$0 = \Delta\dot{m}_{\text{myAir}} - \dot{m}_{\text{myAir,stoich}} \tag{9}$$

$$0 = \Delta\dot{m}_{\text{myFuel}} - \dot{m}_{\text{myFuel}} \tag{10}$$

$$0 = \Delta\dot{m}_{\text{myFuel,fg}} + \dot{m}_{\text{myFuel}} + \dot{m}_{\text{myAir,stoich}} \tag{11}$$

$$\begin{aligned} 0 =& \sum_i \dot{m}_{\text{in},i} \cdot (h_{\text{in},i} - h_{\text{in},i,\text{ref}}) - \dot{m}_{\text{out},1} \cdot (h_{\text{out},1} - h_{\text{out},1,\text{ref}}) \\ &+ LHV_{fuel} \cdot \left(\sum_i \dot{m}_{\text{in},i} \cdot x_{fuel,\text{in},i} - \dot{m}_{\text{out},1} \cdot x_{fuel,\text{out},1} \right) \\ &\forall i \in \text{inlets} \\ &T_{\text{ref}} = 373.15\,\text{K}\; p_{\text{ref}} = 10^5\,\text{Pa} \end{aligned} \tag{12}$$

2.1.2 Inputs specified

label	lamb (13)	ti (14)
stoichiometric combustion chamber	3.000	20000.000

Table 3: Parameters of components of type CombustionChamberStoich

2.1.3 Equations applied

$$0 = \lambda - \frac{\dot{m}_{\text{air}}}{\dot{m}_{\text{air,min}}} \tag{13}$$

$$\begin{aligned} 0 =& ti - LHV_{\text{fuel}} \cdot \left[\sum_i (\dot{m}_{\text{in},i} \cdot x_{\text{fuel,in},i}) - \dot{m}_{\text{out},1} \cdot x_{\text{fuel,out},1} \right] \\ &\forall i \in \text{combustion inlets} \end{aligned} \tag{14}$$