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)
source:out1_pipe1_feed:in1	15.000	90.000
K1_merge:out1_pipe1_back:in1	11.000	-
housing area 1_consumer_0:out1_housing area 1_valve_0:in1	-	52.000
housing area 1_consumer_1:out1_housing area 1_pipe return_0:in1	-	52.000
K2_merge:out1_pipe7_back:in1	12.000	-
industrial area_consumer_0:out1_industrial area_valve_0:in1	-	52.000
industrial area_consumer_1:out1_industrial area_valve_1:in1	-	52.000
industrial area_consumer_2:out1_industrial area_valve_2:in1	-	52.000
sport center_consumer_0:out1_sport center_valve_0:in1	-	52.000
sport center_consumer_1:out1_sport center_pipe return_0:in1	-	52.000
K3_merge:out1_pipe10_back:in1	12.500	-
housing area 2_consumer_0:out1_housing area 2_valve_0:in1	-	52.000
housing area 2_consumer_1:out1_housing area 2_valve_1:in1	-	52.000
housing area 2_consumer_2:out1_housing area 2_valve_2:in1	-	52.000
housing area 2_consumer_3:out1_housing area 2_valve_3:in1	-	52.000
housing area 2_consumer_4:out1_housing area 2_pipe return_3:in1	-	52.000
K4_merge:out1_pipe16_back:in1	12.750	-
housing area 3_consumer_0:out1_housing area 3_valve_0:in1	-	52.000
housing area 3_consumer_1:out1_housing area 3_valve_1:in1	-	52.000
housing area 3_consumer_2:out1_housing area 3_pipe return_1:in1	-	52.000
housing area 4_consumer_0:out1_housing area 4_valve_0:in1	-	52.000
housing area 4_consumer_1:out1_housing area 4_valve_1:in1	-	52.000
housing area 4_consumer_2:out1_housing area 4_valve_2:in1	-	52.000
housing area 4_consumer_3:out1_housing area 4_pipe return_2:in1	-	52.000

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)
source:out1_pipe1_feed:in1	1.000

Table 2: Specified fluids

1.4 Equations applied

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

1.5 Referenced values for temperature

label	reference
pipe1_feed:out1_K1_splitter:in1	source:out1_pipe1_feed:in1
pipe2_feed:out1_housing area 1_splitter_0:in1	pipe1_feed:out1_K1_splitter:in1
pipe2_back:out1_K1_valve_0:in1	housing area 1_merge_0:out1_pipe2_back:in1
pipe1_back:out1_sink:in1	K1_merge:out1_pipe1_back:in1
housing area 1_pipe return_0:out1_housing area 1_merge_0:in1	housing area 1_consumer_1:out1_housing area 1_pipe retu
housing area 1_pipe feed_0:out1_housing area 1_consumer_1:in1	housing area 1_splitter_0:out2_housing area 1_pipe feed_0
pipe4_feed:out1_industrial area_splitter_0:in1	K1_splitter:out2_pipe4_feed:in1
pipe7_feed:out1_K2_splitter:in1	industrial area_splitter_2:out2_pipe7_feed:in1
pipe7_back:out1_industrial area_merge_2:in1	K2_merge:out1_pipe7_back:in1
pipe4_back:out1_K1_valve_1:in1	industrial area_merge_0:out1_pipe4_back:in1
industrial area_pipe return_0:out1_industrial area_merge_0:in1	industrial area_merge_1:out1_industrial area_pipe return_
industrial area_pipe feed_0:out1_industrial area_splitter_1:in1	industrial area_splitter_0:out2_industrial area_pipe feed_0
industrial area_pipe return_1:out1_industrial area_merge_1:in1	industrial area_merge_2:out1_industrial area_pipe return_
industrial area_pipe feed_1:out1_industrial area_splitter_2:in1	industrial area_splitter_1:out2_industrial area_pipe feed_1
pipe8_feed:out1_sport center_splitter_0:in1	K2_splitter:out1_pipe8_feed:in1
pipe8_back:out1_K2_valve_0:in1	sport center_merge_0:out1_pipe8_back:in1
sport center_pipe return_0:out1_sport center_merge_0:in1	sport center_consumer_1:out1_sport center_pipe return_0:
sport center_pipe feed_0:out1_sport center_consumer_1:in1	sport center_splitter_0:out2_sport center_pipe feed_0:in1
pipe10_feed:out1_K3_splitter:in1	K2_splitter:out2_pipe10_feed:in1
pipe11_feed:out1_housing area 2_splitter_0:in1	K3_splitter:out1_pipe11_feed:in1
pipe11_back:out1_K3_valve_0:in1	housing area 2_merge_0:out1_pipe11_back:in1
pipe10_back:out1_K2_valve_1:in1	K3_merge:out1_pipe10_back:in1
housing area 2_pipe return_0:out1_housing area 2_merge_0:in1	housing area 2_consumer_1:out1_housing area 2_valve_1:in
housing area 2_pipe feed_0:out1_housing area 2_splitter_1:in1	housing area 2_splitter_0:out2_housing area 2_pipe feed_0
housing area 2_pipe return_1:out1_housing area 2_merge_1:in1	housing area 2_consumer_2:out1_housing area 2_valve_2:in
housing area 2_pipe feed_1:out1_housing area 2_splitter_2:in1	housing area 2_splitter_1:out2_housing area 2_pipe feed_1
housing area 2_pipe return_2:out1_housing area 2_merge_2:in1	housing area 2_consumer_3:out1_housing area 2_valve_3:in
housing area 2_pipe feed_2:out1_housing area 2_splitter_3:in1	housing area 2_splitter_2:out2_housing area 2_pipe feed_2
housing area 2_pipe return_3:out1_housing area 2_merge_3:in1	housing area 2_consumer_4:out1_housing area 2_pipe retu
housing area 2_pipe feed_3:out1_housing area 2_consumer_4:in1	housing area 2_splitter_3:out2_housing area 2_pipe feed_3
pipe16_feed:out1_K4_splitter:in1	K3_splitter:out2_pipe16_feed:in1
pipe17_feed:out1_housing area 3_splitter_0:in1	K4_splitter:out1_pipe17_feed:in1
pipe17_back:out1_K4_valve_0:in1	housing area 3_merge_0:out1_pipe17_back:in1
pipe16_back:out1_K3_valve_1:in1	K4_merge:out1_pipe16_back:in1
housing area 3_pipe return_0:out1_housing area 3_merge_0:in1	housing area 3_consumer_1:out1_housing area 3_valve_1:in
housing area 3_pipe feed_0:out1_housing area 3_splitter_1:in1	housing area 3_splitter_0:out2_housing area 3_pipe feed_0
housing area 3_pipe return_1:out1_housing area 3_merge_1:in1	housing area 3_consumer_2:out1_housing area 3_pipe retu
housing area 3_pipe feed_1:out1_housing area 3_consumer_2:in1	housing area 3_splitter_1:out2_housing area 3_pipe feed_1
pipe21_feed:out1_housing area 4_splitter_0:in1	K4_splitter:out2_pipe21_feed:in1
pipe21_back:out1_K4_valve_1:in1	housing area 4_merge_0:out1_pipe21_back:in1
housing area 4_pipe return_0:out1_housing area 4_merge_0:in1	housing area 4_consumer_1:out1_housing area 4_valve_1:in
housing area 4_pipe feed_0:out1_housing area 4_splitter_1:in1	housing area 4_splitter_0:out2_housing area 4_pipe feed_0
housing area 4_pipe return_1:out1_housing area 4_merge_1:in1	housing area 4_consumer_2:out1_housing area 4_valve_2:in
housing area 4_pipe feed_1:out1_housing area 4_splitter_2:in1	housing area 4_splitter_1:out2_housing area 4_pipe feed_1
housing area 4_pipe return_2:out1_housing area 4_merge_2:in1	housing area 4_consumer_3:out1_housing area 4_pipe retu
housing area 4_pipe feed_2:out1_housing area 4_consumer_3:in1	housing area 4_splitter_2:out2_housing area 4_pipe feed_2

Table 3: Referenced values for temperature

1.6 Equation applied

$$0 = \text{value} - \text{value}_{\text{ref}} \cdot \text{factor} + \text{delta} \tag{4}$$

2 Components in design mode

2.1 Components of type Valve

2.1.1 Mandatory constraints

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

$$0 = x_{fl,\text{in},i} - x_{fl,\text{out},i} \; \forall fl \in \text{network fluids}, \forall i \in [1] \tag{6}$$

$$0 = h_{\text{in},i} - h_{\text{out},i} \; \forall i \in [1] \tag{7}$$

2.2 Components of type Merge

2.2.1 Mandatory constraints

$$0 = \sum \dot{m}_{\text{in},i} - \sum \dot{m}_{\text{out},j} \; \forall i \in \text{inlets}, \forall j \in \text{outlets} \tag{8}$$

$$0 = \sum_i \dot{m}_{\text{in},i} \cdot x_{fl,\text{in},i} - \dot{m}_{\text{out}} \cdot x_{fl,\text{out}} \; \forall fl \in \text{network fluids}, \forall i \in \text{inlets} \tag{9}$$

$$0 = \sum_i (\dot{m}_{\text{in},i} \cdot h_{\text{in},i}) - \dot{m}_{\text{out}} \cdot h_{\text{out}} \; \forall i \in \text{inlets} \tag{10}$$

$$\begin{aligned} 0 &= p_{\text{in},1} - p_{\text{in},i} \; \forall i \in \text{inlets} \setminus \{1\} \\ 0 &= p_{\text{in},1} - p_{\text{out},j} \; \forall j \in \text{outlets} \end{aligned} \tag{11}$$

2.3 Components of type Pipe

2.3.1 Mandatory constraints

$$0 = \dot{m}_{\text{in},i} - \dot{m}_{\text{out},i} \; \forall i \in [1] \tag{12}$$

$$0 = x_{fl,\text{in},i} - x_{fl,\text{out},i} \; \forall fl \in \text{network fluids}, \forall i \in [1] \tag{13}$$

2.3.2 Inputs specified

label	hydro_group (14)
pipe1_feed	True
pipe2_feed	True
pipe2_back	True
pipe1_back	True
housing area 1_pipe feed_0	True
housing area 1_pipe return_0	True
pipe4_feed	True
pipe7_feed	True
pipe7_back	True
pipe4_back	True
industrial area_pipe feed_0	True
industrial area_pipe return_0	True
industrial area_pipe feed_1	True
industrial area_pipe return_1	True
pipe8_feed	True
pipe8_back	True
sport center_pipe feed_0	True
sport center_pipe return_0	True
pipe10_feed	True
pipe11_feed	True
pipe11_back	True
pipe10_back	True
housing area 2_pipe feed_0	True
housing area 2_pipe return_0	True
housing area 2_pipe feed_1	True
housing area 2_pipe return_1	True
housing area 2_pipe feed_2	True
housing area 2_pipe return_2	True
housing area 2_pipe feed_3	True
housing area 2_pipe return_3	True
pipe16_feed	True
pipe17_feed	True
pipe17_back	True
pipe16_back	True
housing area 3_pipe feed_0	True
housing area 3_pipe return_0	True
housing area 3_pipe feed_1	True
housing area 3_pipe return_1	True
pipe21_feed	True
pipe21_back	True
housing area 4_pipe feed_0	True
housing area 4_pipe return_0	True
housing area 4_pipe feed_1	True
housing area 4_pipe return_1	True
housing area 4_pipe feed_2	True
housing area 4_pipe return_2	True

Table 4: Parameters of components of type Pipe

label	L	ks	D
pipe1_feed	50	0.000	0.150
pipe2_feed	200	0.000	0.150
pipe2_back	200	0.000	0.150
pipe1_back	50	0.000	0.150
housing area 1_pipe feed_0	150	0.000	0.150
housing area 1_pipe return_0	150	0.000	0.150
pipe4_feed	50	0.000	0.150
pipe7_feed	175	0.000	0.150
pipe7_back	175	0.000	0.150
pipe4_back	50	0.000	0.150
industrial area_pipe feed_0	100	0.000	0.150
industrial area_pipe return_0	100	0.000	0.150
industrial area_pipe feed_1	100	0.000	0.150
industrial area_pipe return_1	100	0.000	0.150
pipe8_feed	75	0.000	0.150
pipe8_back	75	0.000	0.150
sport center_pipe feed_0	100	0.000	0.150
sport center_pipe return_0	100	0.000	0.150
pipe10_feed	450	0.000	0.100
pipe11_feed	60	0.000	0.040
pipe11_back	60	0.000	0.040
pipe10_back	450	0.000	0.100
housing area 2_pipe feed_0	60	0.000	0.040
housing area 2_pipe return_0	60	0.000	0.040
housing area 2_pipe feed_1	60	0.000	0.040
housing area 2_pipe return_1	60	0.000	0.040
housing area 2_pipe feed_2	60	0.000	0.040
housing area 2_pipe return_2	60	0.000	0.040
housing area 2_pipe feed_3	60	0.000	0.040
housing area 2_pipe return_3	60	0.000	0.040
pipe16_feed	30	0.000	0.065
pipe17_feed	250	0.000	0.065
pipe17_back	250	0.000	0.065
pipe16_back	30	0.000	0.065
housing area 3_pipe feed_0	335	0.000	0.050
housing area 3_pipe return_0	335	0.000	0.050
housing area 3_pipe feed_1	100	0.000	0.040
housing area 3_pipe return_1	100	0.000	0.040
pipe21_feed	30	0.000	0.040
pipe21_back	30	0.000	0.040
housing area 4_pipe feed_0	30	0.000	0.040
housing area 4_pipe return_0	30	0.000	0.040
housing area 4_pipe feed_1	10	0.000	0.040
housing area 4_pipe return_1	10	0.000	0.040
housing area 4_pipe feed_2	10	0.000	0.040
housing area 4_pipe return_2	10	0.000	0.040

Table 5: Parametergroup hydro_group

2.3.3 Equations applied

$$
\begin{aligned}
0 =& p_{\text{in}} - p_{\text{out}} - \frac{8 \cdot |\dot{m}_{\text{in}}| \cdot \dot{m}_{\text{in}} \cdot \frac{v_{\text{in}}+v_{\text{out}}}{2} \cdot L \cdot \lambda\left(Re, ks, D\right)}{\pi^2 \cdot D^5} \\
Re =& \frac{4 \cdot |\dot{m}_{\text{in}}|}{\pi \cdot D \cdot \frac{\eta_{\text{in}}+\eta_{\text{out}}}{2}}
\end{aligned}
\tag{14}
$$

2.4 Components of type Splitter

2.4.1 Mandatory constraints

$$0 = \sum \dot{m}_{\text{in},i} - \sum \dot{m}_{\text{out},j} \; \forall i \in \text{inlets}, \forall j \in \text{outlets} \tag{15}$$

$$0 = x_{fl,\text{in}} - x_{fl,\text{out},j} \; \forall fl \in \text{network fluids}, \forall j \in \text{outlets} \tag{16}$$

$$0 = h_{in} - h_{\text{out},j} \; \forall j \in \text{outlets} \tag{17}$$

$$\begin{aligned} 0 &= p_{\text{in},1} - p_{\text{in},i} \; \forall i \in \text{inlets} \setminus \{1\} \\ 0 &= p_{\text{in},1} - p_{\text{out},j} \; \forall j \in \text{outlets} \end{aligned} \tag{18}$$

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	Q (21)	pr (22)
housing area 1_consumer_0	-50000.000	0.990
housing area 1_consumer_1	-50000.000	0.990
industrial area_consumer_0	-615000.000	0.990
industrial area_consumer_1	-223000.000	0.990
industrial area_consumer_2	-400000.000	0.990
sport center_consumer_0	-580000.000	0.990
sport center_consumer_1	-1000000.000	0.990
housing area 2_consumer_0	-18000.000	0.990
housing area 2_consumer_1	-4000.000	0.990
housing area 2_consumer_2	-4000.000	0.990
housing area 2_consumer_3	-4000.000	0.990
housing area 2_consumer_4	-4000.000	0.990
housing area 3_consumer_0	-140000.000	0.990
housing area 3_consumer_1	-52000.000	0.990
housing area 3_consumer_2	-50000.000	0.990
housing area 4_consumer_0	-50000.000	0.990
housing area 4_consumer_1	-50000.000	0.990
housing area 4_consumer_2	-50000.000	0.990
housing area 4_consumer_3	-50000.000	0.990

Table 6: Parameters of components of type HeatExchangerSimple

2.5.3 Equations applied

$$0 = \dot{m}_{\text{in}} \cdot (h_{\text{out}} - h_{\text{in}}) - \dot{Q} \tag{21}$$

$$0 = p_{\text{in},1} \cdot pr - p_{\text{out},1} \tag{22}$$

3 Busses in design mode

3.1 Bus “network losses”

This bus is used for postprocessing only.

label	$\dot{E}_{\mathrm{comp}}$	$\dot{E}_{\mathrm{bus}}$	η
pipe1_feed	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe2_feed	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe2_back	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe1_back	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 1_pipe feed_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 1_pipe return_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe4_feed	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe7_feed	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe7_back	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe4_back	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
industrial area_pipe feed_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
industrial area_pipe return_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
industrial area_pipe feed_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
industrial area_pipe return_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe8_feed	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe8_back	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
sport center_pipe feed_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
sport center_pipe return_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe10_feed	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe11_feed	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe11_back	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe10_back	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_pipe feed_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_pipe return_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_pipe feed_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_pipe return_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_pipe feed_2	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_pipe return_2	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_pipe feed_3	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_pipe return_3	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe16_feed	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe17_feed	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe17_back	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe16_back	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 3_pipe feed_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 3_pipe return_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 3_pipe feed_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 3_pipe return_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe21_feed	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
pipe21_back	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 4_pipe feed_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 4_pipe return_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 4_pipe feed_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 4_pipe return_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 4_pipe feed_2	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 4_pipe return_2	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000

Table 7: network losses

3.2 Bus "network consumer"

This bus is used for postprocessing only.

label	$\dot{E}_{\mathrm{comp}}$	$\dot{E}_{\mathrm{bus}}$	η
housing area 1_consumer_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 1_consumer_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
industrial area_consumer_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
industrial area_consumer_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
industrial area_consumer_2	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
sport center_consumer_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
sport center_consumer_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_consumer_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_consumer_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_consumer_2	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_consumer_3	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 2_consumer_4	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 3_consumer_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 3_consumer_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 3_consumer_2	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 4_consumer_0	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 4_consumer_1	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 4_consumer_2	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000
housing area 4_consumer_3	$\dot{m}_{\mathrm{in}} \cdot (h_{\mathrm{out}} - h_{\mathrm{in}})$	$\dot{E}_{\mathrm{comp}} \cdot \eta$	1.000

Table 8: network consumer