Block FDBS

The FDBS block calculates the heating consumption of a zone via the numerical solved differential equation of a resistant-capacity element. FDBS is short for Fast Dynamic Building Simulation.



Name	FDBS
Function	bs0024
Inputs	18
Outputs	3
Parameters	55 . . . [57]
Strings	0
Group	S

Inputs

1 Second of the year / s
2 External ambient temperature / °C
3 Global radiation on vertical surface north direction / $W\,m^{-2}$
4 Global radiation on vertical surface east direction / $W\,m^{-2}$
5 Global radiation on vertical surface south direction / $W\,m^{-2}$
6 Global radiation on vertical surface west direction / $W\,m^{-2}$
7 Global radiation on horizontal surface / $W\,m^{-2}$
8 Target temperature / °C
9 Internal gains / W
10 Effective air ventilation rate / h^{-1}
11 Temperature of first adjacent zone / °C
12 Total thermal resistance to first adjacent zone / $K\,W^{-1}$
13 Temperature of second adjacent zone / °C
14 Total thermal resistance to second adjacent zone / $K\,W^{-1}$
15 Temperature of third adjacent zone / °C
16 Total thermal resistance to third adjacent zone / $K\,W^{-1}$

17	Temperature of fourth adjacent zone / °C
18	Total thermal resistance to fourth adjacent zone / $\mathrm{K\,W^{-1}}$

Outputs

1	Operative internal temperature / °C
2	Heating energy demand per timestep / kWh
3	Cooling energy demand per timestep / kWh

Parameters

52	Net zone volume (air-volume) / $\mathrm{m^3}$
53	Floor area / useful area / $\mathrm{m^2}$
3	Area external wall 1 / $\mathrm{m^2}$
2	U-value external wall 1 / $\mathrm{W\,m^{-2}\,K^{-1}}$
13	Area window north 1 / $\mathrm{m^2}$
12	U-value of window north 1 / $\mathrm{W\,m^{-2}\,K^{-1}}$
5	Area external wall 2 / $\mathrm{m^2}$
4	U-value external wall 2 / $\mathrm{W\,m^{-2}\,K^{-1}}$
17	Area window north 2 / $\mathrm{m^2}$
16	U-value of window north 2 / $\mathrm{W\,m^{-2}\,K^{-1}}$
7	Area external wall 3 / $\mathrm{m^2}$
6	U-value external wall 3 / $\mathrm{W\,m^{-2}\,K^{-1}}$
9	Area external wall 4 / $\mathrm{m^2}$
8	U-value external wall 4 / $\mathrm{W\,m^{-2}\,K^{-1}}$
11	Area external wall 5 / $\mathrm{m^2}$
10	U-value external wall 5 / $\mathrm{W\,m^{-2}\,K^{-1}}$
14	Total energy transmission of window north 1
15	Frame fraction of window north 1 / %
18	Total energy transmission of window north 2
19	Frame fraction of window north 2 / %
20	U-value of window east 1 / $\mathrm{W\,m^{-2}\,K^{-1}}$
22	Total energy transmission of window east 1
24	U-value of window east 2 / $\mathrm{W\,m^{-2}\,K^{-1}}$
25	Area window east 2 / $\mathrm{m^2}$
26	Total energy transmission of window east 2
27	Frame fraction of window east 2 / %
28	U-value of window south 1 / $\mathrm{W\,m^{-2}\,K^{-1}}$
29	Area window south 1 / $\mathrm{m^2}$
30	Total energy transmission of window south 1
31	Frame fraction of window south 1 / %
32	U-value of window south 2 / $\mathrm{W\,m^{-2}\,K^{-1}}$
33	Area window south 2 / $\mathrm{m^2}$
34	Total energy transmission of window south 2
35	Frame fraction of window south 2 / %
36	U-value of window west 1 / $\mathrm{W\,m^{-2}\,K^{-1}}$

37 Area window west 1 / m^2
38 Total energy transmission of window west 1
39 Frame fraction of window west 1 / %
40 U-value of window west 2 / $W\,m^{-2}\,K^{-1}$
41 Area window west 2 / m^2
42 Total energy transmission of window west 2
43 Frame fraction of window west 2 / %
44 U-value of window horizontal 1 / $W\,m^{-2}\,K^{-1}$
45 Area window horizontal 1 / m^2
46 Total energy transmission of window horizontal 1
47 Frame fraction of window horizontal 1 / %
48 U-value of window horizontal 2 / $W\,m^{-2}\,K^{-1}$
49 Area window horizontal 2 / m^2
50 Total energy transmission of window horizontal 2
51 Frame fraction of window horizontal 2 / %
54 Specific thermal capacity / $W\,m^{-2}\,K^{-1}$
55 Initial temperature / °C
56 Heating on (0) or off (1)
57 Cooling on (0) or off (1)