

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.

A diagram showing a grey rectangular block on the left and a white rectangular block labeled 'FDBS' on the right, connected by a horizontal line.

FDBS

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Function	bs0024
Inputs	18
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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 / KW^{-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) / m^3
- 53 Floor area / useful area / m^2
- 3 Area external wall 1 / m^2
- 2 U-value external wall 1 / $\text{W m}^{-2} \text{K}^{-1}$
- 13 Area window north 1 / m^2
- 12 U-value of window north 1 / $\text{W m}^{-2} \text{K}^{-1}$
- 5 Area external wall 2 / m^2
- 4 U-value external wall 2 / $\text{W m}^{-2} \text{K}^{-1}$
- 17 Area window north 2 / m^2
- 16 U-value of window north 2 / $\text{W m}^{-2} \text{K}^{-1}$
- 7 Area external wall 3 / m^2
- 6 U-value external wall 3 / $\text{W m}^{-2} \text{K}^{-1}$
- 9 Area external wall 4 / m^2
- 8 U-value external wall 4 / $\text{W m}^{-2} \text{K}^{-1}$
- 11 Area external wall 5 / m^2
- 10 U-value external wall 5 / $\text{W m}^{-2} \text{K}^{-1}$
- 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 / $\text{W m}^{-2} \text{K}^{-1}$
- 22 Total energy transmission of window east 1
- 24 U-value of window east 2 / $\text{W m}^{-2} \text{K}^{-1}$
- 25 Area window east 2 / m^2
- 26 Total energy transmission of window east 2
- 27 Frame fraction of window east 2 / %
- 28 U-value of window south 1 / $\text{W m}^{-2} \text{K}^{-1}$
- 29 Area window south 1 / m^2
- 30 Total energy transmission of window south 1
- 31 Frame fraction of window south 1 / %
- 32 U-value of window south 2 / $\text{W m}^{-2} \text{K}^{-1}$
- 33 Area window south 2 / m^2
- 34 Total energy transmission of window south 2
- 35 Frame fraction of window south 2 / %
- 36 U-value of window west 1 / $\text{W m}^{-2} \text{K}^{-1}$

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 / $\text{W m}^{-2} \text{K}^{-1}$
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 / $\text{W m}^{-2} \text{K}^{-1}$
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 / $\text{W m}^{-2} \text{K}^{-1}$
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 / $\text{W m}^{-2} \text{K}^{-1}$
55 Initial temperature / $^{\circ}\text{C}$
56 Heating on (0) or off (1)
57 Cooling on (0) or off (1)
