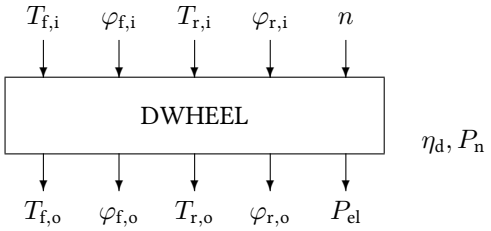
Block DWHEEL

The DWHEEL block simulation a desiccant wheel.





Name	DWHEEL
Function	st0004
Inputs	5
Outputs	5
Parameters	2
Strings	0
Group	S

Inputs

1 Fresh air inlet temperature $T_{f,i}$ / °C
2 Fresh air inlet relative humidity $\varphi_{f,i}$
3 Regeneration air inlet temperature $T_{r,i}$ / °C
4 Regeneration air inlet relative humidity $\varphi_{r,i}$
5 Rotational speed n / r.p.m.

Outputs

1 Fresh air outlet temperature $T_{f,o}$ / °C
2 Fresh air outlet relative humidity $\varphi_{f,o}$
3 Regeneration air outlet temperature $T_{r,o}$ / °C
4 Regeneration air outlet relative humidity $\varphi_{r,o}$
5 Electricity consumption P_{el} / W

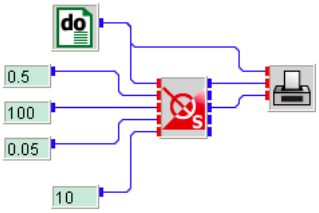
Parameters

1 Dehumidification efficiency η_d
2 Nominal electricity consumption P_n / W

Strings

None

dwheel.vseit



A desiccant wheel with a dehumidification efficiency of 0.8 and a nominal electricity consumption of 50 W is simulated by the DWHEEL block.

The fresh air inlet temperature is varied by a DO block between 10 and 40 °C in steps of 1 °C. The fresh air outlet temperature is plotted as a function of the fresh air inlet temperature together with the regeneration air outlet temperature by a PLOT block.

The other inputs of the DWHEEL block are defined through CONST blocks to a relative humidity of the fresh air of 50 percent, a regeneration air inlet temperature of 100 °C, a regeneration air inlet humidity of 5 percent, and a rotational speed of the rotor of 10 r.p.m.

