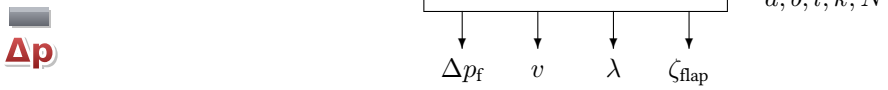
Block DPCH

The DPCH block calculates the pressure drop in a rectangular channel due to friction of an incompressible one-phase turbulent tubular flow from the empirical Colebrook-White equation and the hydraulic diameter. It is possible to include a flap in the channel.



Name	DPCH
Function	st0007
Inputs	2 . . . [3]
Outputs	4
Parameters	4 . . . [5]
Strings	0
Group	S

Inputs

1 Volume flow $\dot{V}$ / $\mathrm{m^3\,h^{-1}}$
2 Air temperature T / °C
3 Flap angle δ / ° (Open: $\delta = 0°$. Closed: $\delta = 90°$)

Outputs

1 Pressure drop Δp_f / Pa
2 Flow velocity v / $\mathrm{m\,s^{-1}}$
3 Tube friction number λ / $\mathrm{m\,s^{-1}}$
4 Zeta value of flap position ζ_flap

Parameters

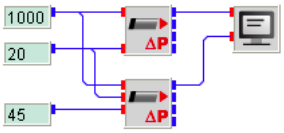
1 Side length a / m
2 Side length b / m
3 Length l / m
4 Channel roughness k / mm
5 Number of flaps N (either zero, or up to three)

Strings

None

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dpch.vseit



Two rectangular air channels with side lengths 0.3 and 0.2 m and a length of 1 m are simulated for a volume flow of 1000 m^3/h and air temperature 20 °C as defined through two CONST blocks.

The upper DPCH block has no flaps while the lower block is assumed to have one flap at an opening angle of 45 ° as set by a third CONST block. The air temperature is set to 25 °C.

The SCREEN block displays the pressure drops in Pascal.

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1.14992 219.52522
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