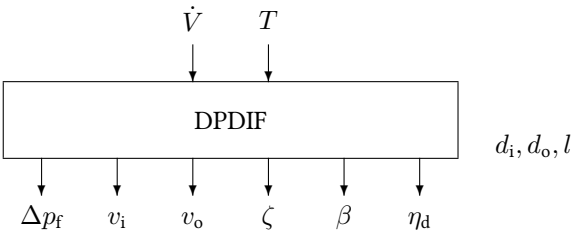


Block DPDIF

The DPDIF block calculates the pressure drop in a diffuser due to friction of an incompressible one-phase turbulent tubular flow.



Name	DPDIF
Function	st0018
Inputs	2
Outputs	6
Parameters	3
Strings	0
Group	S

Inputs

- 1 Volume flow $\dot{V}$ / $\text{m}^3 \text{h}^{-1}$
- 2 Air temperature T / $^{\circ}\text{C}$

Outputs

- 1 Pressure drop Δp_f / Pa
- 2 Inlet flow velocity v_i / m s^{-1}
- 3 Outlet flow velocity v_o / m s^{-1}
- 4 Zeta value ζ
- 5 Opening angle β / $^{\circ}$
- 6 Diffuser efficiency η_d

Parameters

- 1 Inlet diameter d_i / m
- 2 Outlet diameter d_o / m
- 3 Length l / m

Strings

None

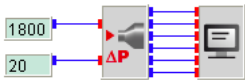
Description The ζ value of a diffuser can be found from

$$\zeta = \left(1 - \left(\frac{v_2}{v_1}\right)^2\right) (1 - \eta_d) = \left(1 - \left(\frac{A_1}{A_2}\right)^2\right) (1 - \eta_d)$$

Values for the diffuser efficiency due Baumgarth/Hoerner/Reeker are given in the following table.

β	3	6	8	10	12	14	16	20	24	30	40
η_d	0.97	0.92	0.89	0.85	0.81	0.77	0.73	0.64	0.53	0.36	0.08

dpdif.vseit



A diffuser with length 1 m is simulated with an inlet diameter of 0.25 m and an outlet diameter of 0.4 m. The volume flow is set to 1800 m³/h at an air temperature of 20 °C as defined through two **CONST** blocks.

The **SCREEN** block displays all outputs of the **DPDIF** block.

6.34972 10.18592 3.97887 0.10302 8.57831 0.87843