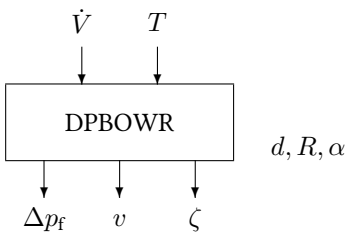


Block DPBOWR

The DPBOWR block calculates the pressure drop of a round bow due to friction of an incompressible one-phase turbulent tubular flow.



Name	DPBOWR
Function	st0021
Inputs	2
Outputs	3
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 Flow velocity v / m s^{-1}
- 3 Zeta value ζ

Parameters

- 1 Tube diameter d / m
- 2 Bow radius R / m
- 3 Angle α / $^{\circ}$

Strings

None

Description If the angle of the knee differs from 90° the ζ value can be approximated by

$$\zeta = \zeta_{90} k_{\alpha}$$

where ζ_{90} denotes the ζ value of a 90° knee. According to Idelchick the correction factor k_{α} satisfies

$$k_{\alpha} = \begin{cases} 0.9 \sin(\alpha) & \alpha \leq 60^{\circ} \\ 0.0646 \alpha^{0.609} & 60^{\circ} < \alpha < 110^{\circ} \\ 0.7 + 0.35 \alpha/90^{\circ} & \alpha \geq 110^{\circ} \end{cases}$$

dpbowr.vseit



The **DPBOWR** block calculates the pressure drop, flow velocity and zeta value for a volume flow of 1800 m³/h and an air temperature of 20 °C as defined through two **CONST** blocks.

The result is displayed by a **SCREEN** block.

1.31784 3.97887 0.14012