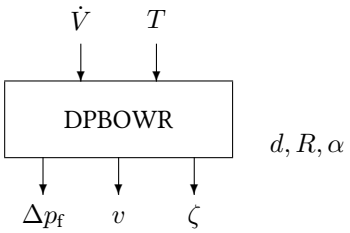
Block DPBOWR

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



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Function	st0021
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Group	S

Inputs

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

Outputs

1	Pressure drop Δp_f / Pa
2	Flow velocity v / $\mathrm{m\,s^{-1}}$
3	Zeta value ζ

Parameters

1	Tube diameter d / m
2	Bow radius R / m
3	Angle α / °

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

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

dpbowr.vseit



The DPBOWR block calculates the pressure drop, flow velocity and zeta value for a volume flow of 1800 m^3/h and an air temperature of 20 °C as defined through two CONST blocks.

The result is displayed by a SCREEN block.

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1.31784     3.97887     0.14012
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