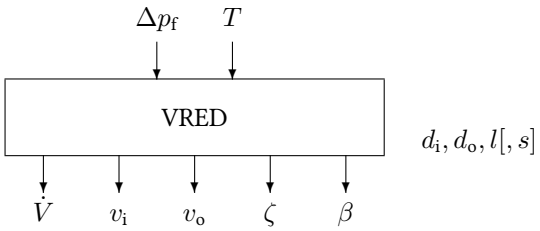
Block VRED

The VRED block calculates the volume flow in a reducer due to friction of an incompressible one-phase turbulent tubular flow.





Name	VRED
Function	st0020
Inputs	2
Outputs	5
Parameters	3 . . . [4]
Strings	0
Group	S

Inputs

1 Pressure drop Δp_f / Pa
2 Air temperature T / °C

Outputs

1 Volume flow $\dot{V}$ / $\mathrm{m^3\,h^{-1}}$
2 Inlet flow velocity v_i / $\mathrm{m\,s^{-1}}$
3 Outlet flow velocity v_o / $\mathrm{m\,s^{-1}}$
4 Zeta value ζ
5 Closing angle β / $\mathrm{m\,s^{-1}}$

Parameters

1 Inlet diameter d_i / m
2 Outlet diameter d_o / m
3 Length l / m
4 Sharpness s (evaluated only if PARAMS(3) = 0)
  0 Sharp edge
  1 Broken edge
  2 Round edge

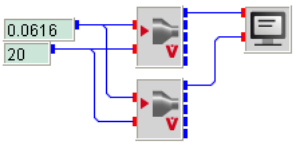
3 Smooth, round edge

Strings

None

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vred.vseit



Two VRED blocks with different edge sharpnesses are comapred for a pressure drop of 0.0616 Pa and an air temperature of 20 °C as defined by two CONST blocks.

The inlet diameter is set to 0.4, the outlet diameter to 0.25 m, respectively. The length of the reducer is assumed to be zero, i. e., a 90 ° reducer is simulated.

The SCREEN block displays the resulting volume flows.

```
103.08892 162.99789
```