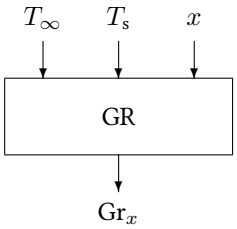
Block GR

The GR block calculates the Grashof number for air as an ideal gas.

Gr



Name	GR
Function	st0033
Inputs	3
Outputs	1
Parameters	0
Strings	0
Group	S

Inputs

1	Fluid temperature T_∞ / °C
2	Surface temperature T_s / °C
3	Length x / °C

Outputs

1	Grashof number Gr_x

Parameters

None

Strings

None

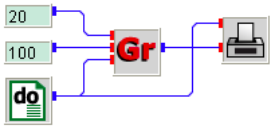
Description

The Grashof number is defined as

$$\mathrm{Gr}_x = \frac{g x^3 \beta \Delta T}{\nu^2}$$

where g is gravitational acceleration 9.81 $\mathrm{m\,s^{-2}}$, x is a characteristic length, $\beta = 1/T$ the thermal extension coefficient, ΔT the temperature difference between fluid and surface, and ν the kinematic viscosity.

gr.vseit



The Grashof number is plotted by a PLOT block as a function of lenghth, for a fluid temperature of 20 °C and a surface temperature of 100 °C, both set by CONST blocks.

