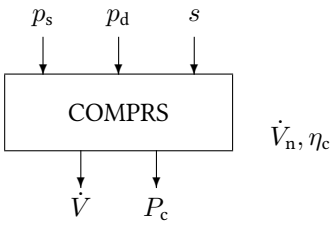
Block COMPRS

The COMPRS block simulates an isothermal compressor.





Name	COMPRS
Function	se0017
Inputs	3
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Parameters	2
Strings	0
Group	S

Inputs

1 Pressure at inlet cross section p_s / bar
2 Pressure at outlet cross section p_d / bar
3 Switch s on (1) off (0)

Outputs

1 Actual volume flow $\dot{V}$ / $m_n^3\,s^{-1}$
2 Power consumption of the compressor P_c / W

Parameters

1 Nominal volume flow $\dot{V}_n$ / $m_n^3\,s^{-1}$
2 Efficiency η_c

Strings

None

Description

It is assumed that the gas is an ideal gas. Hence, the power consumption of the compressor is

$$P_c = \frac{1}{\eta_c} \dot{V} p_s p_0 \ln \frac{p_d}{p_s}$$

where

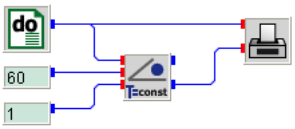
p_0 conversion factor (10^5 Pa/bar)

The outputs are set to

$$\dot{V} = \begin{cases} \dot{V}_n & \text{if } s \in [0.5, 1.5) \\ 0 & \text{else} \end{cases}$$

and P_c (or 0), respectively.

comprs.vseit



A compressor with a nominal flow of 0.5×10^{-3} m_n^3/s and an efficiency of 0.5 works against a high pressure of 60 bar, set by a CONST block.

A DO block varies the inlet pressure from 0 to 60 bar is steps of 0.1 bar. Another CONST block ensures that the compressor is switched on all the time.

A PLOT block shows the resulting electrical power consumption of the compressor.

