BOPTEST Testcase 1

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MODEL DESCRIPTION

Testcase 1 is a simple 1R1C network where a single zone is heated or cooled with a prescribed heat flow. The system is controlled with a proportional feedback controller (P-controller) that activates when the zone temperature violates the prescribed lower or upper bound. The heating / cooling power is not generated by a dedicated heating / cooling component but obtained by dividing the signal of the P-controller by a fixed efficiency of 99% and taking the absolute value. Ambient temperature is assumed to have a prescribed sinusoidal profile and is separated by the zone with a fixed thermal resistance.

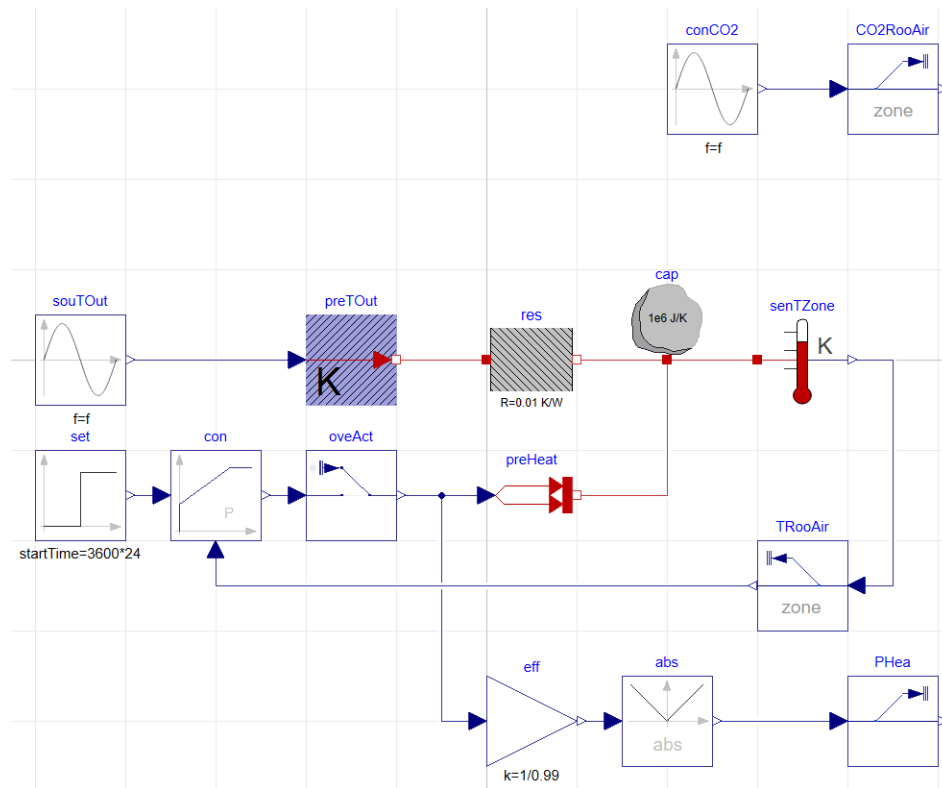Figure 1 illustrates the testcase as implemented in Modelica.

Fig. 1: Figure 6 – Modelica implementation of the 1R1C network.

Important parameters used in the testcase are tabulated for clarity.

Zone capacitance [J/K]	10^6
Zone-ambient resistance [K/W]	0.01