Block UBBHKWSG

Calculates the performance of a CHP system

This is the first version of UBBHKWSG by Maryam Zirak in January 2021. SG (BHKWWG) stands for *Stromgeführt* (Electricity driven). In this version, thermal and electrical efficiency are defined as parameter.

The efficiency curve in partial operation is defined as quadratic equation, $ax^2 + bx + c$. The coefficients, a,b and c, are defined as parameters in this model.

For heat-driven CHP, see UBBHKWWG.



UBBHKWSG

Name	UBBHKWSG
Function	ubbhkwsg
Inputs	3
Outputs	5
Parameters	14
Strings	0
Group	S

Inputs

1 Power Demand, kW
2 inlet Water temperature, feed to CHP, degree C
3 Output Water temperature,targeted for the heating network, degree C

Outputs

1 Mass flow of water,kg per hour
2 Heat generation, kW
3 Electric generation, kW
4 Fuel demand, cubic meters
5 Water temperature, outlet, degree C

Parameters

1	Nominal electric output performance, kW
2	Nominal heat output, kW
3	lower limit for output thermal power, per cent of nominal maximum thermal output
4	Coefficient a_1 for electrical efficiency (ele) curve when ele=$a_1x^2 + b_1x + c_1$ and x is the ratio of electrical output to nomminal electrical output
5	Coefficient b_1 for electrical efficiency (ele) curve when $ele = a_1x^2 + b_1x + c_1$ and x is the ratio of electrical output to nomminal electrical output
6	Coefficient c_1 for electrical efficiency (ele) curve when $ele = a_1x^2 + b_1x + c_1$ and x is the ratio of electrical output to nomminal electrical output
7	Coefficient a_2 for thermal efficiency (n_{th}) curve when $n_{th} = a_2x^2 + b_2x + c_2$ and x is the ratio of electrical output to nomminal electrical output
8	Coefficient b_2 for thermal efficiency (n_{th}) curve when $n_{th} = a_2x^2 + b_2x + c_2$ and x is the ratio of electrical output to nomminal electrical output
9	Coefficient c_2 for thermal efficiency (nth) curve when $n_{th} = a_2x^2 + b_2x + c_2$ and x is the ratio of thermal output
10	thermal efficiency at full load operation, per cent
11	electrical efficiency at full load operation, per cent
12	Heat capayity of Water or medium in CHP, kJ per kg per K
13	Fuel lower heating value, kWh per kg
14	Gas density, kg per cubic meters

Strings

None