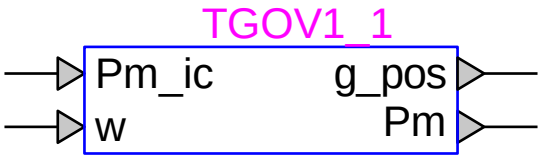
Exciters and Governors: Governor-Turbine TGOV1



Governor-Turbine TGOV1

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1 Description

This device is an implementation of a simplified steam turbine and governor. This device is implemented as described in [1]. Implementation details can be viewed by inspecting the subcircuit of this device.

1.1 Pins

This device has 4 pins:

Pin name	Type	Description	Units
Pm_ic	Input	Steady-state mechanical power at t = 0, for initialization	pu
w	Input	Mechanical speed	pu
g_pos	Output	Valve position	pu
Pm	Output	Turbine mechanical power	pu

1.2 Parameters

The default set of parameters are obtained from [1].

1.2.1 Governor tab

The parameters on the Data tab are:

1. **Permanent droop R**: Permanent droop
2. **Time constant T_1**: time constant
3. **Maximum valve position V_{max}**: maximum valve position limit

4. **Minimum valve position V_{min}**: minimum valve position limit

1.2.2 Turbine tab

The turbine tab allows to input:

1. **Time constant T_2**: time constant that equals to the product of the reheater time constant and the fraction of the turbine power developed by the high-pressure turbine stage.
2. **Time constant T_3**: reheater time constant
3. **Turbine damping coefficient D_T**: Turbine damping coefficient

2 Initial conditions

The initial output is equal to the generator mechanical power (base for power) at t = 0 s.

3 References

[1] "Dynamic Models for Turbine-Governors in Power System Studies," Technical report PES-TR1. IEEE Power & Energy Society Jan 2013.

[2] P. Kundur, "Power System Stability and Control", McGraw-Hill 1994