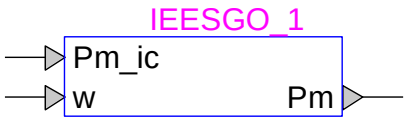
Exciters and Governors: Governor-Turbine IEESGO



Governor-Turbine IEESGO

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1 Description

This device is an implementation of a general model for steam turbine and governor IEESGO. 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 3 pins:

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

1.2 Parameters

The default set of parameters are obtained from [2].

1.2.1 Governor tab

The parameters on the Data tab are:

1. **Governor gain K_1**: Governor gain
2. **Lag time constant T_1**: governor lag time constant
3. **Lead time constant T_2**: governor lead time constant
4. **Lag time constant T_3**: governor lag time constant
5. **Maximum power limit P_{MAX}**: maximum power limit
6. **Minimum power limit P_{MIN}**: minimum power limit

1.2.2 Turbine tab

The turbine tab allows to input:

1. **Time constant T_4**: steam flow time constant
2. **Time constant T_5**: reheater time constant
3. **Time constant T_6**: IP-LP reheater time constant
4. **Reheater fraction of shaft power K_2**: reheater fraction of power shaft
5. **IP-LP fraction of shaft power K_3**: IP-LP power fraction

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