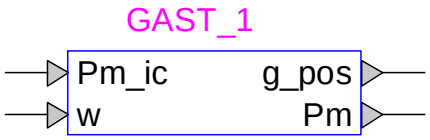
Exciters and Governors: Governor-Turbine GAST



Governor-Turbine GAST

Exciters and Governors: Governor-Turbine GAST 1
1 Description 1
1.1 Pins 1
1.2 Parameters 1
1.2.1 Governor tab 1
1.2.2 Turbine tab 1
2 Initial conditions 2
3 References 2

Tshibain Tshibungu, Jean Mahseredjian, 8/1/2016 2:18 PM

1 Description

This device is an implementation of a general model for steam turbine and governor GAST. 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	Gate 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**: Governor permanent droop
2. **Time constant T_1**: governor time constant

1.2.2 Turbine tab

The turbine tab allows to input:

1. **Time constant T_2**: turbine power time constant
2. **Damping factor D_{TURB}**: turbine damping factor

3. **Gain K_T**: temperature limiter gain
4. **Load limit A_T**: ambient temperature load limit
5. **Maximum power limit V_{MAX}**: maximum turbine power
6. **Minimum power limit V_{MIN}**: minimum turbine power

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.