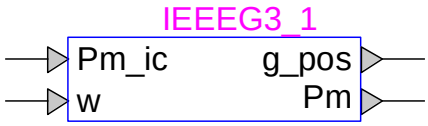
# Exciters and Governors: Governor-Turbine IEEEG3




**Governor-Turbine IEEEG3**



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## 1 Description

This device is an implementation of a general model for steam turbine and governor IEEEG3. 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 6 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. **Time constant $T_G$**: gate servo time constant
2. **Time constant $T_P$**: pilot servo valve time constant
3. **Time constant $T_R$**: dashpot time constant
4. **Permanent droop SIGMA**: permanent droop
5. **Temporary droop DELTA**: temporary droop
6. **Maximum opening velocity $U_0$**: maximum opening velocity

7. **Minimum closing velocity $U_C$**: minimum closing velocity
8. **Maximum valve opening $P_{MAX}$**: maximum valve opening
9. **Minimum valve opening $P_{MIN}$**: minimum valve opening

### 1.2.2 Turbine tab

The turbine tab allows to input:

1. **Time constant $T_W$**: water inertia time constant
2. **Coefficient $A_{11}$**: turbine coefficient
3. **Coefficient $A_{13}$**: turbine coefficient
4. **Coefficient $A_{21}$**: turbine coefficient
5. **Coefficient $A_{23}$**: turbine coefficient

## 2 Initial conditions

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

## 3 References

[1] P. Kundur, “Power System Stability and Control”, McGraw-Hill 1994