

Exciter ST6C_PTI

IEEE Std 421.5-2016 Exciter with static potential and compound source with field current limiter as modeled in PSSE

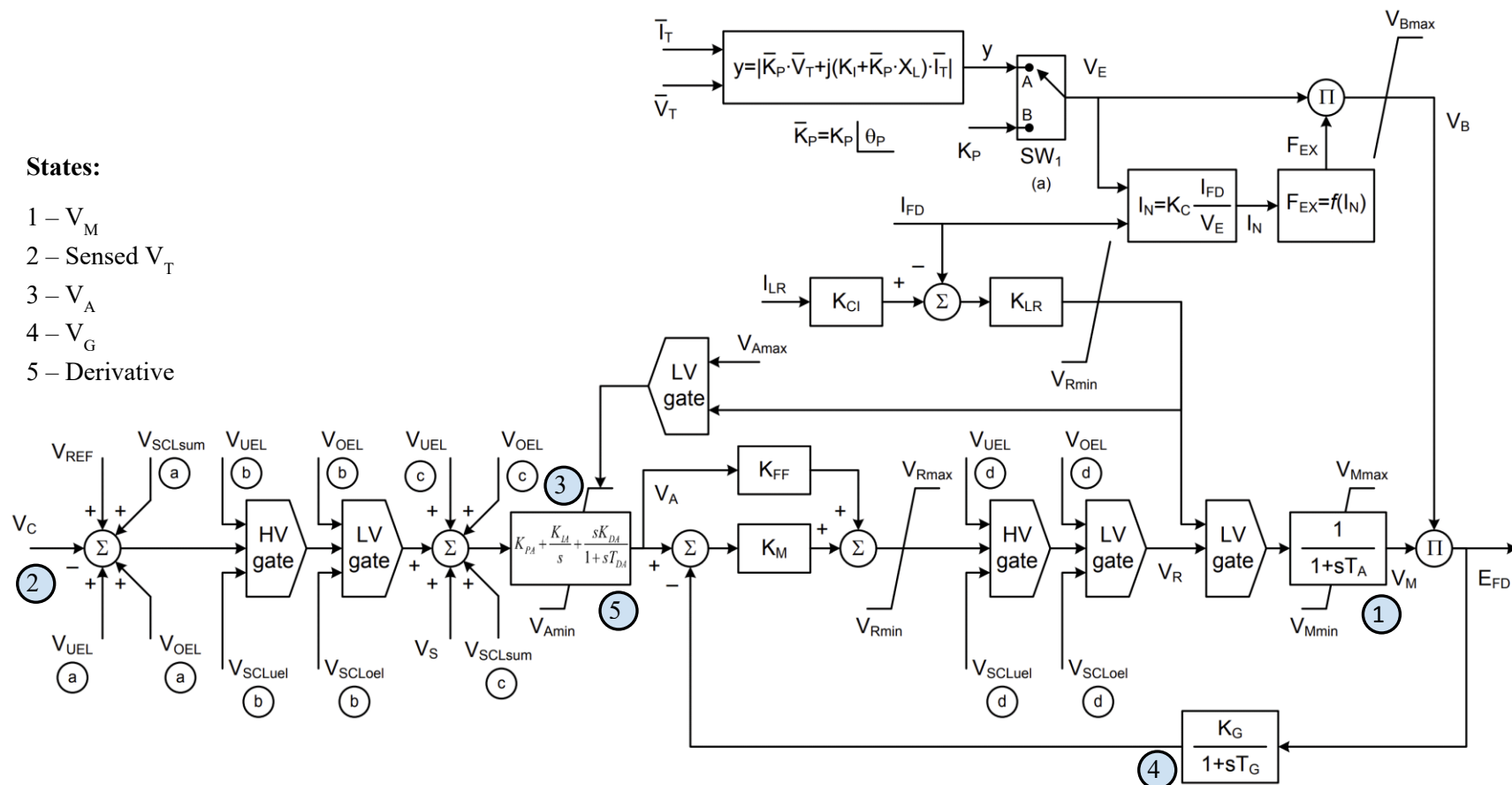
States:

- 1 – V_M
- 2 – Sensed V_T
- 3 – V_A
- 4 – V_G
- 5 – Derivative

The diagram illustrates the control system for the Exciter ST6C_PTI. It features several key components and feedback loops:

- Reference and Sensed Voltages:** The reference voltage V_{REF} is compared with the sensed terminal voltage V_T (State 2) at a summing junction. The resulting error signal is processed through a series of gain blocks and integrators to generate the field voltage V_F .
- Field Current Limiter:** The field current I_{FD} is limited by a block $I_N = K_C \frac{I_{FD}}{V_E}$ to ensure it remains within safe operating limits.
- Generator Model:** The generator's internal voltage V_A (State 3) is calculated based on the field current and the generator's internal dynamics. It is then compared with the terminal voltage V_T to determine the terminal voltage error.
- Terminal Voltage Control:** The terminal voltage error is processed through a series of gain blocks and integrators to generate the terminal voltage V_T (State 4).
- Field Current Feedback:** The field current I_{FD} is fed back to the field current limiter and the terminal voltage control loop.
- Generator Output:** The generator's output voltage V_M (State 1) is calculated based on the terminal voltage and the generator's internal dynamics. It is then compared with the reference voltage V_{REF} to determine the reference voltage error.
- Reference Voltage Control:** The reference voltage error is processed through a series of gain blocks and integrators to generate the reference voltage V_{REF} .

The diagram includes numerous saturation and limit blocks, such as V_{Amax} , V_{Rmin} , V_{Rmax} , V_{Mmax} , and V_{Mmin} , to ensure the system operates within safe limits. The overall system is designed to maintain the generator's terminal voltage and field current within specified limits while providing a stable output voltage.



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Exciter ST6C Footnotes:

