

# C

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## Twenty-three Machine System

The twenty-three machine test system in [CIGRÉ 1995] is intended for studies of transient and voltage stability. Using the model for small disturbance analysis motivates some modifications. These are partly related to the system itself and partly to the model that was delivered with the program EUROSTAG by the supplier Tractebel.

Two cases of steady state at the load flow situation LF\_029 in [CIGRÉ 1995] are used for the damping analysis. In the base case the network is intact, while in the contingency case the double-circuit line N4044-N4045 out of service which reduces damping.

In order to make the AVRs of the generators active in both cases, the generator buses are changed from PQ type to PV type. This improves the voltage profile in the contingency case considerably, but activates the reactive power limitation at five generators. The impact of these limitations is unclear, but by choosing different voltage setpoints they can be avoided (nominal value in parenthesis):

N1022	129 kV	(130 kV)
N1043	121.5 kV	(130 kV)
N4021	415 kV	(400 kV)
N4031	405 kV	(400 kV)
N4062	409 kV	(400 kV)

The turns ratio of all transformers is set to the nominal value 1 p.u./p.u.

To create a greater challenge to the damping systems, damping is reduced by turning off the power system stabilizers at all thermal power plants.

The current limiters that are of central importance for the voltage stability study in [CIGRÉ 1995] are of no interest for small disturbance analysis. They are therefore removed from the exciter models leading to the model in Figs C.1 and C.2.

The MVA base in EUROSTAG is 100 MVA.

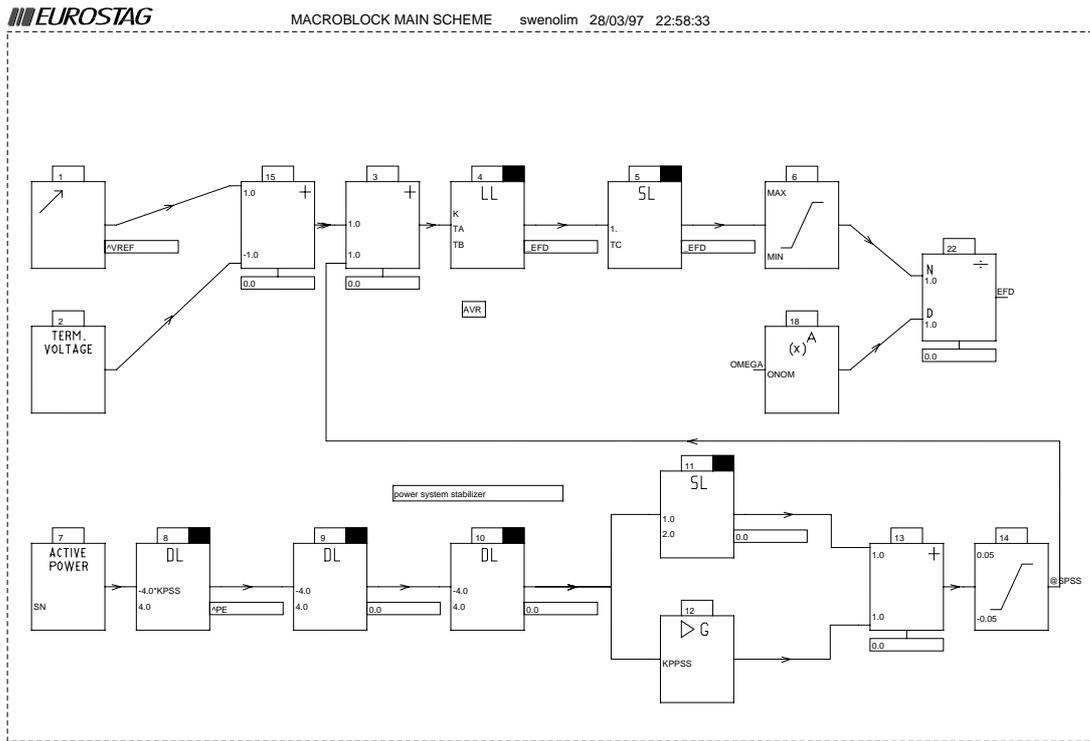


Fig. C.1 Main block diagram of the exciter model

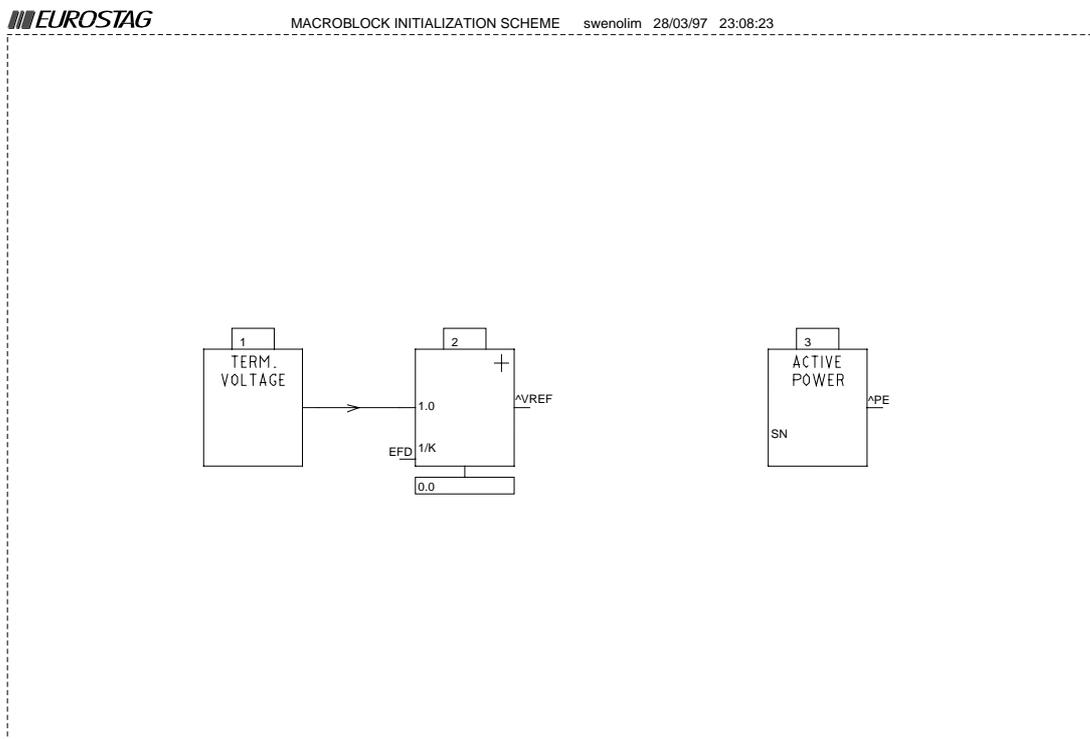


Fig. C.2 Block diagram for initialization of the exciter model