

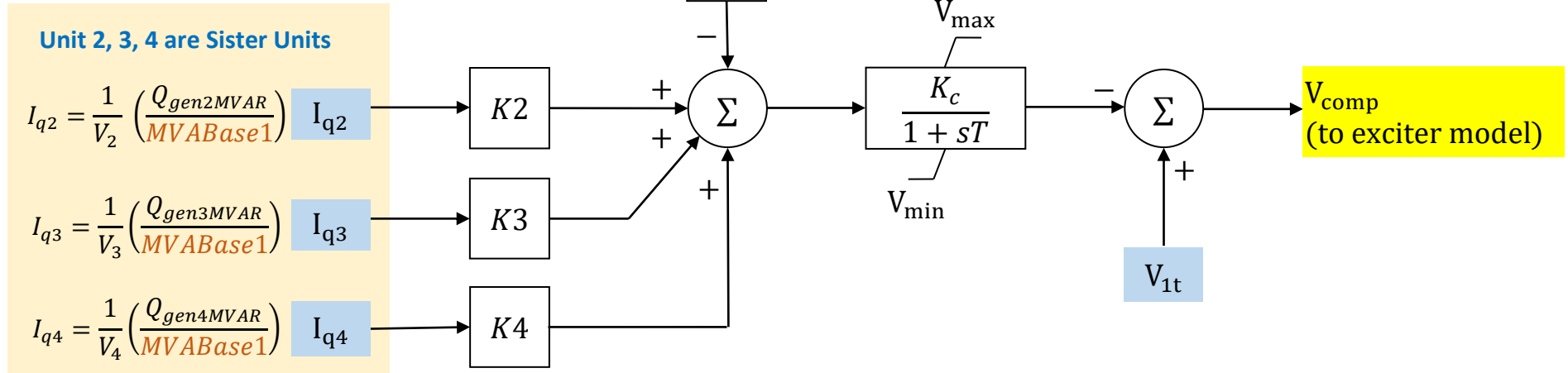
Voltage Compensator CCOMP4

Voltage Compensator CCOMP4 Cross-Current Compensation Model

A separate CCOMP4 model must be used for each machine that participates in cross compensation together. On each individual CCOMP4 model however, the machine MVA Base for the generator to which this model is assigned is used for all 4 equations *MVABase1*. So if machines have different MVABases, be careful

$$I_{q1} = \frac{1}{V_1} \left(\frac{Q_{gen1MVAR}}{MVABase1} \right)$$

Unit 1 is the generator to which the model is assigned.



This model was designed in 2015 in the WECC Model Validation Working Group and implemented in the PowerWorld Simulator and GE PSLF software tools using the sign conventions shown above. When added to PSS/E later, the name in the DYR is CCOMP4A, and the sign convention on K1 is different as the negative sign on the output of K1 is flipped to positive sign in the PSS/E model. Also, the current inputs into the model in PSS/E are the negative of the inputs shown here because PSS/E uses the “reactive current” while PowerWorld and PSLF use the “current that gives reactive power”. Because of the equation $S = VI^*$, the complex conjugate gives a sign difference between these conventions. The PSS/E model also uses a positive sign at the summation block leaving Kc. Because the PSS/E implementation uses a the negative what is shown as Iq values here, but then uses a positive sign at the summation block, that ends up being equivalent. Thus the only conversion between a DYR file is that the sign on K1 must be flipped.