

# Three-converter system with three different types of Grid Forming Converters

## Test case description

The studied test case is a simple system with three converters and one fully resistive load, as depicted in Fig. 1.

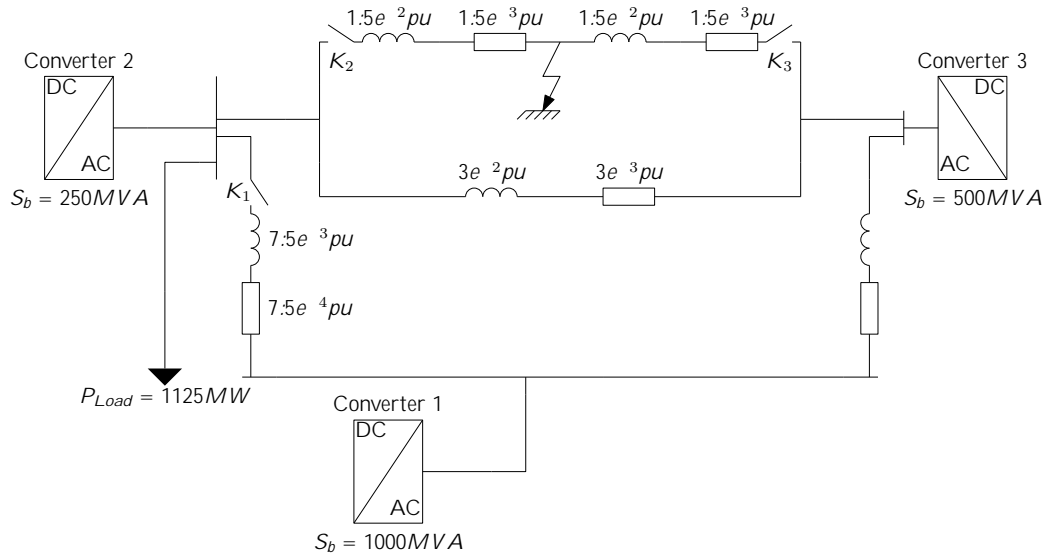


Figure 1: Structure of the three-converter system

Each converter has a different control: the 1 000 MW converter is using a matching control, the 500 MW a dVOC control and the 250 MW an improved droop control. The network consists in four RL lines, linking together the different converters. The general structure of the converters and their control

is presented in Fig. 2. The current and voltage loops are common to the three converters while the external loop is different. Three events are simulated:

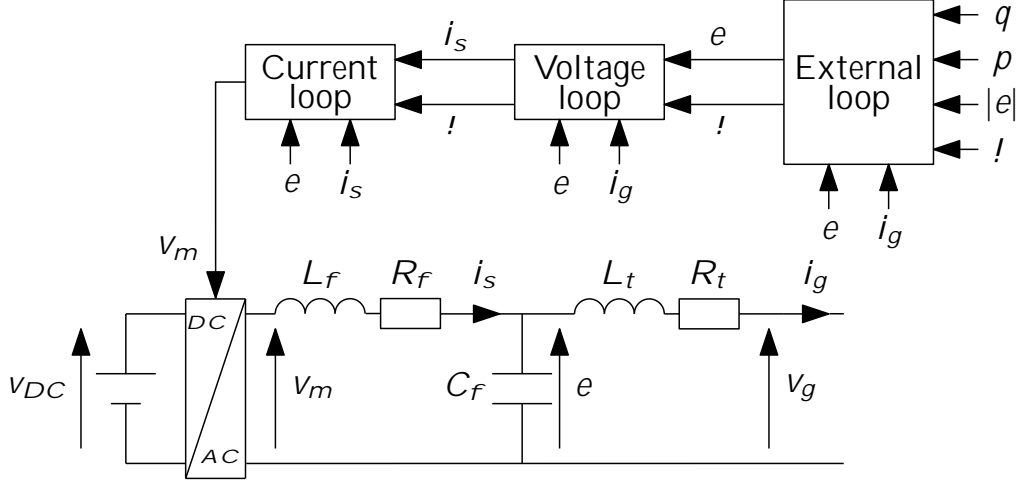


Figure 2: Structure of the grid forming converter and its control

- At  $t = 0.5s$ , the line connecting the bus 1 and the bus 2 is disconnected ( $K_1$  is opened).
- At  $t = 1.5s$ , a short-circuit is applied at the middle of the line connecting bus 2 and bus 4.
- At  $t = 1.65s$ , the short-circuited line connecting bus 2 and bus 4 is disconnected to clear the fault ( $K_2$  and  $K_3$  are opened).

## Results

The currents in the three converters during the whole simulation are presented in Fig. 3.

