

Three-level——complex and powerful algorithms + circuits

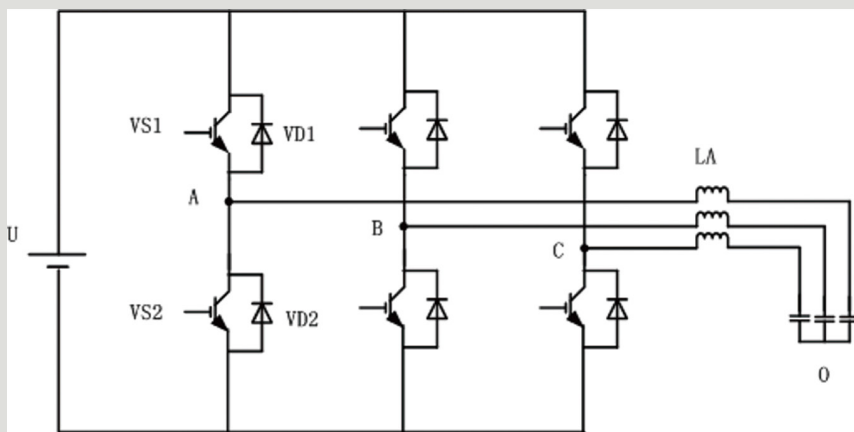
Selection of three-level IGBTs

In a three-level inverter circuit, the DC voltage U is shared by two switch devices. In this case, the voltage shared by each switch device (such as an IGBT) on each bridge arm is a half of the input DC voltage.

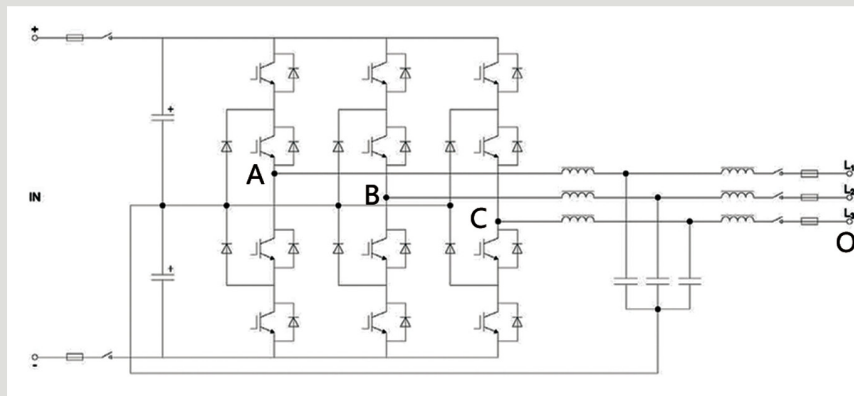
- Switching loss of low-voltage IGBTs used in a three-level inverter circuit is much less than that of high-voltage IGBTs that are of the same voltage class but used in a two-level inverter circuit.
- If the current is given, a power semiconductor device (IGBT) with lower rated voltage has better conduction and switching characteristics.



Sinexcel three-level AHF

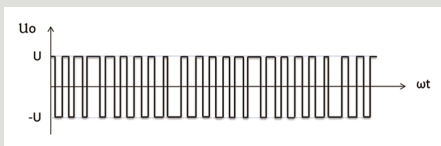


Traditional two-level inverter circuit



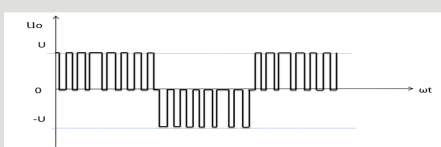
Innovative three-level inverter circuit

Significance of adding zero-point clamping



Phase voltage (AO) waveforms output from a two-level inverter circuit

Values of the output voltage are two levels U and $-U$



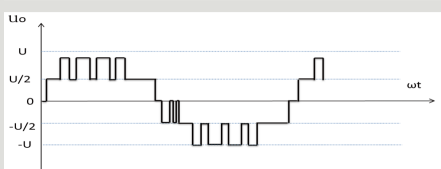
Line voltage (AB) waveforms output from the two-level inverter circuit

Values of the output voltage are three levels U , 0 , and $-U$



Phase voltage waveforms output from a three-level inverter circuit

Values of the output voltage are three levels U , 0 , and $-U$



Line voltage waveforms output from a three-level inverter circuit

Values of the output voltage are five levels U , $U/2$, 0 , $-U/2$, and $-U$

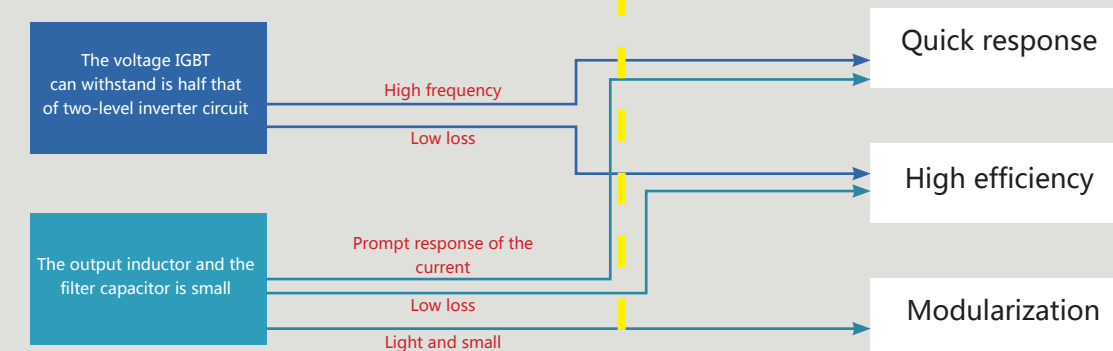
Topology of a three-level inverter

The phase voltage has three level states, and there is one more level than a traditional two-level inverter. The line voltage has five level states, and there are two more levels than a traditional two-level inverter.



Creative hardware design of two-level

Technology of two-level inverter circuit can



Sinexcel three-level static var generator SVG

