



Example of a 3-level NPC

## Typical application and trends

- Medium voltage drive up to 3.3kV
- UPS up to 690VAC
- Solar up to 900VDC
- Electric Vehicle

## Conversion stage

- DC/DC mono and bi-directional
- DC/AC mono and bi-directional

## Number of levels

Typical: 3  
Max: 3

## Intellectual Property

Initial patent US4270163A  
expired

## Advantages

- Standard and custom modules available

## Drawbacks

- Unbalanced powerswitch losses (poor distribution)
- Large commutation loops

## Notes

Custom modules look for compensating:

- Poor distribution of losses by using different switches
- Large commutation loops by adding snubber diodes or capacitors