

Line voltage regulator for medium voltage grids with RESIBLOC® technology

Reliable answer to voltage variations

ABB has developed an innovative line voltage regulator with RESIBLOC technology that enables an automatic intervention on voltage fluctuations. This reliable and efficient solution is an economically alternative to conventional network expansion, especially for wind and PV applications.



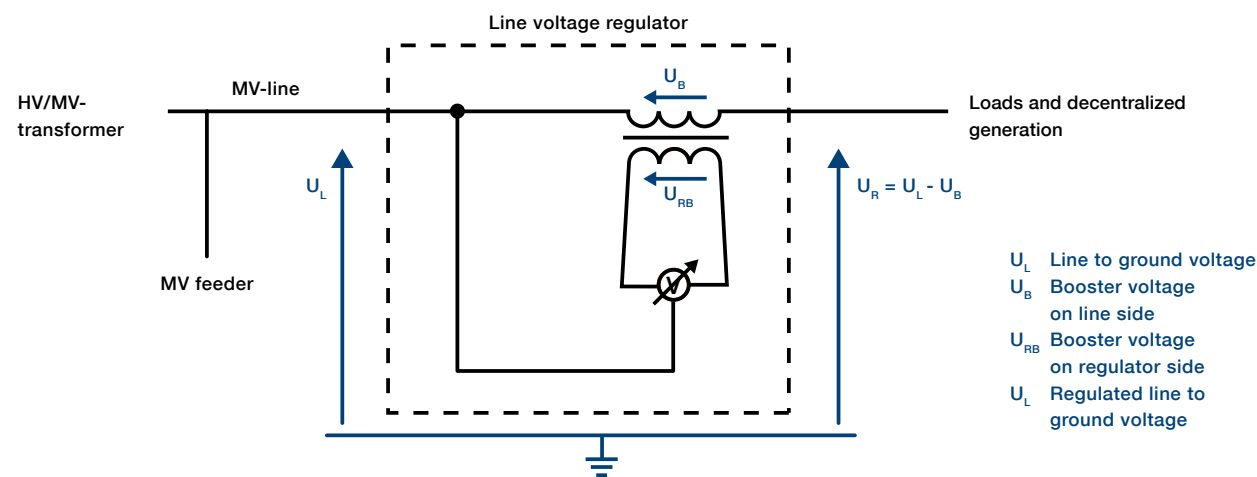
Innovative solution

The increasing amount of power generated by renewable resources, especially wind and photovoltaics, causes changes to the structure of the energy supply. A traditionally centralized system with only a few big producers has changed into a system containing many small producers, which directly feed into the local distribution grid. This can result in large voltage variations, an increased risk of the voltage exceeding the prescribed voltage range, and the need to limit or even interrupt the renewable generation.

To solve this problem, voltage regulators are needed which act reliably in case of large voltage variations and adjust the voltage to a regular level. The ABB line voltage regulator for medium voltage grids solves this problem using a “booster/feeder” technology in combination with mechanical switches. Energy losses are minimal. The voltage regulator is built with ABB’s powerful RESIBLOC® transformers and other ABB components, and fulfils the highest environmental requirements.

Advantages at first sight

- Economic solution as compared to grid expansion
- Autonomous voltage regulation to a given or load-dependent set point
- Connection to the grid control system for remote control or monitoring of the grid
- Use of proven RESIBLOC® technology
- Energy efficient and environmentally friendly
- Meets the requirements of the new EU Ecodesign regulation 548/2014/EU
- Fireproof, completely free of oil
- Optimized voltage steps for good voltage stability and a minimum of switching operations
- Mounted fully-assembled in concrete substation, ready-to connect to the grid
- Simple and fast installation
- Possible to relocate in case of new grid requirements
- Makes the need for replacement of distribution transformers (DT) by regulated DTs obsolete



| Technical characteristics of the line voltage regulator | | | | | |
|---|---|-------|-------|-------|-------|
| Rated power [MVA] | up to 8 | | | | |
| Frequency [Hz] / Phases | 50 / 3 | | | | |
| System voltage [kV] | up to voltage class 24 kV | | | | |
| Insulation class [kV, BIL/AC] | 125 / 50 | | | | |
| Number of steps | 11 | | | | |
| Total voltage regulation range | ±10 % | | | | |
| Step voltage | 2 % (±5 x 2 %) | | | | |
| Number of switching operations (mechanical) | >1'000'000 | | | | |
| Installation location | Outdoor | | | | |
| Installation type | Concrete substation (other solutions on request) | | | | |
| Dimensions (L x W x H) [m³] | 6.6 x 3.3 x 3.6 | | | | |
| Weight (approx.) [t] | 38 | | | | |
| Control modes | Fixed set-point Load-dependent voltage set-point | | | | |
| Energy efficiency | Energy efficiency and losses depend on the actual power P of the line and the regulation step, e.g. at 6% voltage regulation: | | | | |
| | P [MVA] | 2.0 | 4.0 | 6.0 | 8.0 |
| | η [%] | 99.86 | 99.88 | 99.85 | 99.83 |
| | Losses [kW] | 2.9 | 4.6 | 8.7 | 13.9 |
| Sound level Lp (1 m, max.) [dB(A)] | 40 | | | | |

Note:

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