

Technical Information

C-LVR Compact Line Voltage Regulator for medium voltage grids

Reliable answer to voltage variations

Hitachi Energy offers an innovative liquid Compact MV Line Voltage Regulator

The Hitachi Energy Compact line voltage regulator that enables an automatic intervention on voltage fluctuations. This reliable and efficient solution is an economic alternative to the conventional network expansion.

Innovative solution

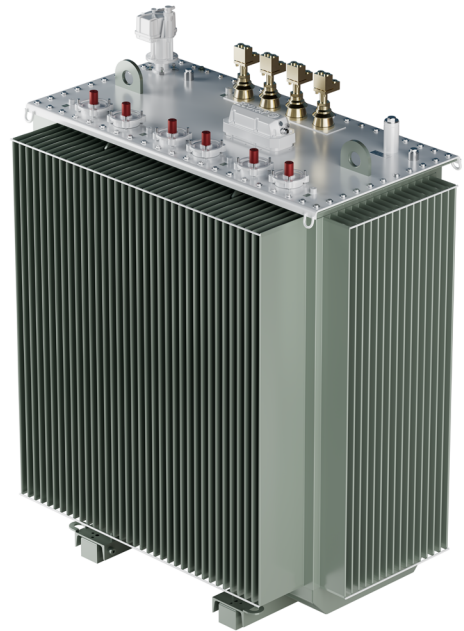
The increasing amount of power generated by renewable resources, especially wind and photovoltaics, causes changes to the structure of the energy supply. A traditionally centralized system with only a few central producers has changed into a system with many distributed suppliers, who feed directly into the local distribution net. At the same time, sudden increase in daily energy consumption (Heat Pumps, EV charges) takes place. These can cause large voltage variations with an increased risk of the voltage exceeding the allowed voltage range. Often the renewable power generation must be limited or even interrupted.

Voltage regulators help to act reliable in case of voltage variations and adjust the voltage to a permitted level.

The Hitachi Energy C-LVR solves this problem combining "booster/feeder" active parts, interference voltage regulator based on standard on load tap changer and distribution transformer (optional) in one compact, distribution transformer tank and allows to retrofit in the existing CSS.

Key features and Advantages:

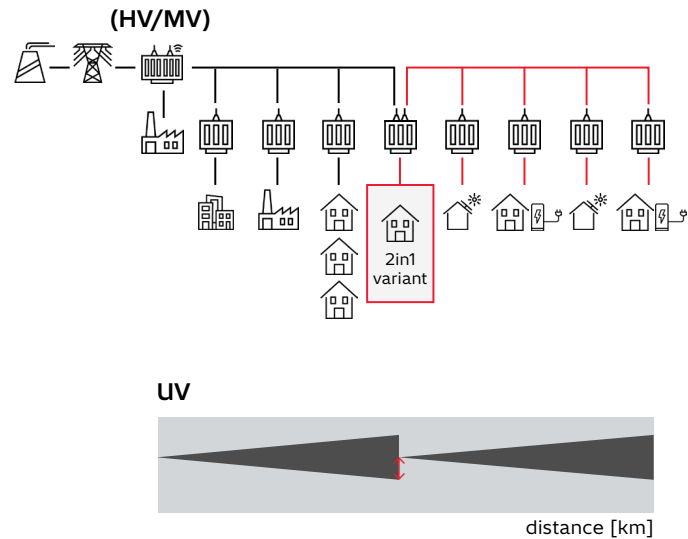
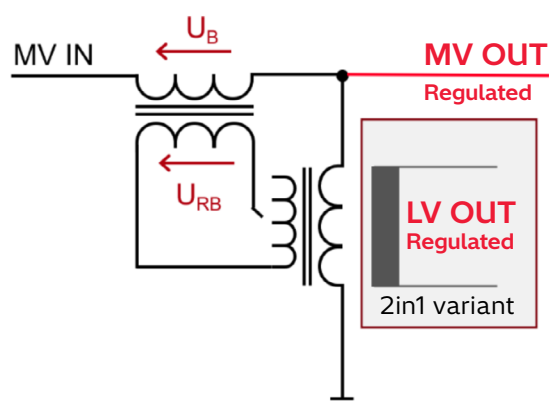
- Complement Hitachi Energy portfolio of voltage regulator solutions (along distribution transformer with on load tap changer and Dry LVR for ratings above 8 MVA).
- The regulative physically takes place in the "feeder" by standard OLTC to regulate by interference MV in "booster".



- The entire solution fits in one oil distribution transformer tank, able to regulate voltage for up to 8 MVA grid.
- Retrofittable. Compact footprint comparable to standard 1600 kVA - enable installation of C-LVR in standard cabinets / existing CSS.
- 2in1 Function: The compact LVR combines the simplicity, standardization and function of a traditional distribution transformer, with an impactful LVR regulation in a single product.
- Economical: one C-LVR can eliminate necessity of replacement even dozen of OLTC DTRs and/or heavily investments in cabling.
- Link to the grid control system for remote control or a monitoring of the grid is possible
- Enables a higher utilization of the existing infrastructure, especially in rural areas - where the voltage criteria is the dominant limiting factor.

Diagram of C-LVR

(U_B = Booster voltage on the line side,
 U_{RB} = Booster voltage on regulator side)



C-LVR in medium voltage grid

Technical characteristics of the C-LVR

Variant:	C-LVR+DTR (2in1)	C-LVR
MV/MV rated transfer power	Up to 6 MVA	Up to 8 MVA
Active parts ("booster" / "feeder")	360 kVA / 360 kVA + 630 kVA	480 kV / 480 kVA + 5 kVA
Available Power for LV (400V)	630 kVA	5 kVA (auxiliary / testing)
Frequency / Phases	50 Hz / 3	
MV Voltage	Up to 24 kV	
Tap changer regulation	Automatic OLTC +/- 6% in 9 steps (1,5%)	
Number of switching operations (mechanical)	> 500.000	
Insulation liquid	Mineral Oil, Synthetic and natural esters	
Dimension L x W x H	~2 m x ~1,1 m x ~2,3 m	
Weight	~6100 kg	~5600 kg
Operation temperature	-25 OC - +40 OC	

Contact your Hitachi Energy representative for other requirements

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