

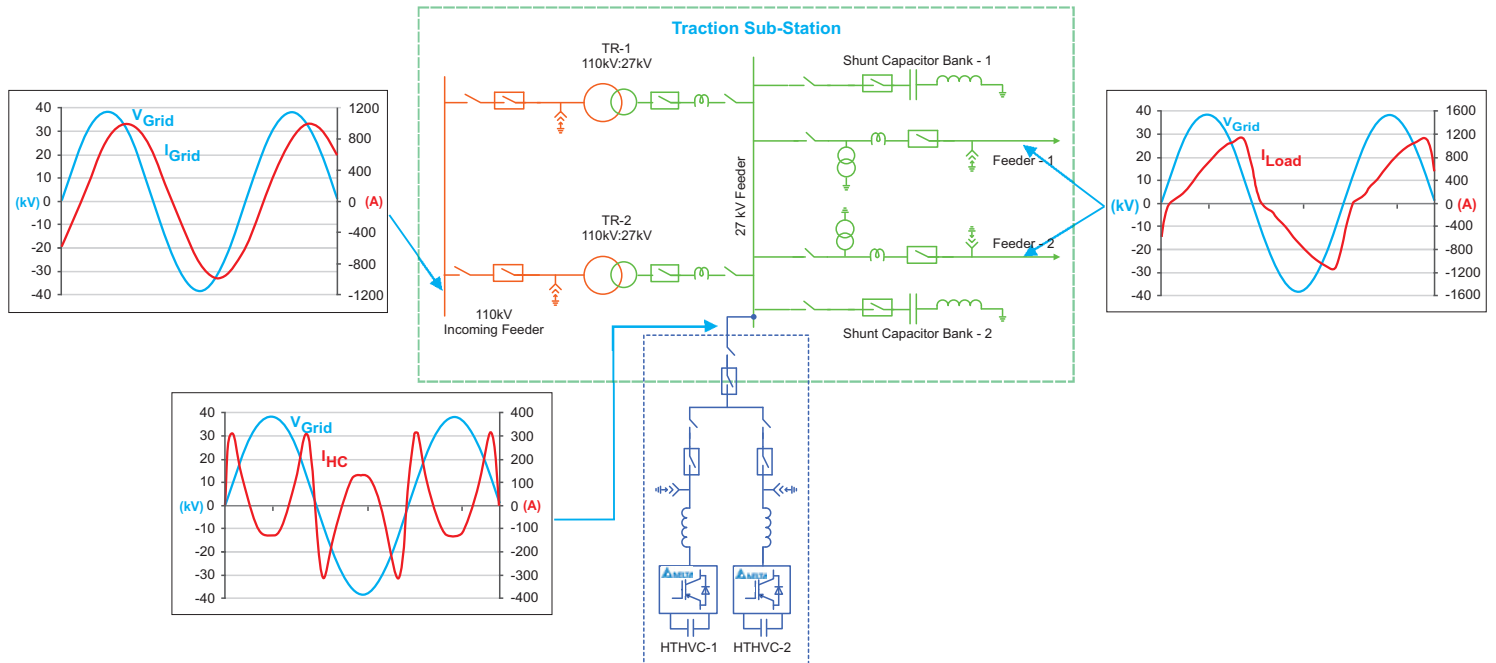
Power Quality Compensating Equipment

Delta iRMS Compensator 1-ph

- » Closed loop dynamic VAR compensation
- » Harmonic mitigation as per IEEE 519-2014
- » Automatic Voltage regulation/support
- » Adaptive, intelligent and automatic mode selection; VAR compensation/Harmonic suppression/Voltage regulation
- » Remote monitoring on Cloud
- » Ensure power factor > 0.95, reduce Maximum Demand (MD)
- » Harmonic Distortion TDDi < 7.5%
- » Regulate feeder voltage @ 25kV
- » Manual or automatic mode selection for function
- » Cloud computing with monitoring

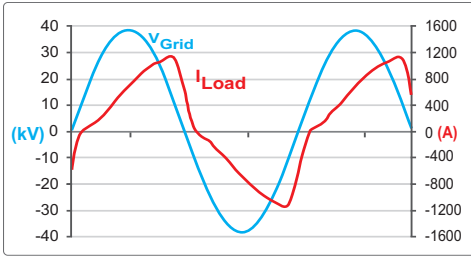
The product is based on IGBTs operating at relatively low switching frequencies (from 150 Hz to 300 Hz) and deploying cascaded H-bridge units. This ensures low switching losses as also near sine wave output at the bus (25kV). The equipment has a rated RMS current (max) that it can feed into the bus irrespective of the bus voltage. The RMS current can either be fundamental, harmonic or a combination of fundamental and harmonic currents. The priorities of compensation can be adaptive/automatic/programmable by the user depending on their specific needs. This provides flexibility in operation and universal application.

Delta's 25kV 6MVA 1-ph solution (Harmonic suppression as priority)

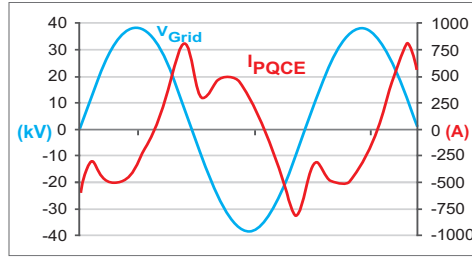


Harmonic and reactive power compensation

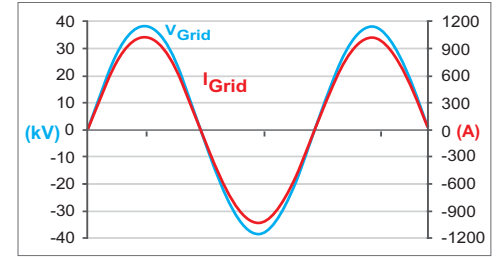
The HT product from Delta directly connects to the 25 kV bus at the TSS (without the transformer) providing a maximum specified RMS current compensation (240 A in the case of 6 MVA rating) irrespective of the bus voltage. The 240 A can totally be fundamental (i.e. reactive power compensation either leading or lagging), or totally harmonic, or a combination of both fundamental and harmonic currents. With the HT solution in place, transformer loss is completely saved and in addition overall copper losses is also extremely low to achieve the best possible efficiency.



Feeder current



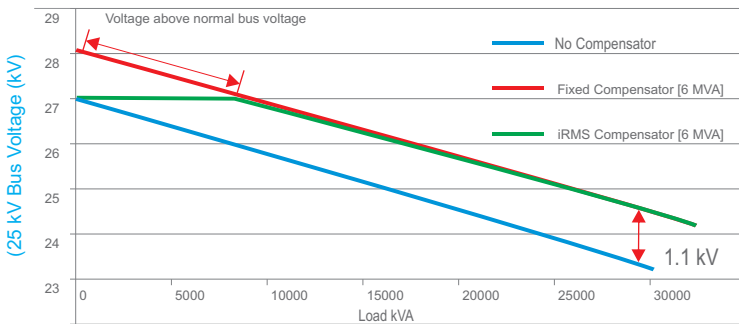
iRMS compensator current



Grid current after compensation

Improved voltage profile of 25 kV at TSS

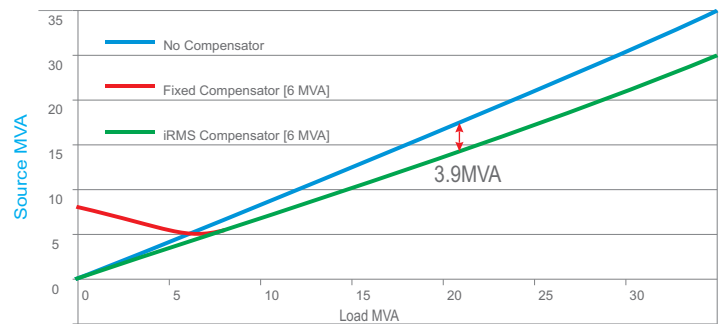
The reactive power compensation at the 25 kV bus does boost the bus voltage depending on the reactive power injection and the source impedance. For the typical case of a TSS with 21.6 MVA transformer with 12% impedance, the voltage profile with and without dynamic reactive power compensation for varying loads with a power factor of 0.8 lag is depicted in the following chart:



From the above graph it is seen that the 25 kV bus voltage is boosted by an average of about 1000 V during heavily loaded condition (10 MVA to 30 MVA), leading to corresponding reduction in load current as also source current - thereby reducing the copper losses in transformer and line OHE losses.

Reduction in Maximum Demand (MD)

The reactive power compensation, apart from improving the source power factor, reduces the apparent power drawn from the source considerably – thereby reducing the maximum demand recorded at the metering point (the primary side of the traction transformer). For varying loads at a given power factor of 0.8 lag, the apparent power drawn from source is depicted in the following graph:



At light loads, the fixed compensation solution leads to high amount of apparent power drawn from source, thereby resulting in reduction in the average power factor recorded by the metering system. With Delta's iRMS compensator, reduction in Max. Demand shall also enable significant saving in energy bill.

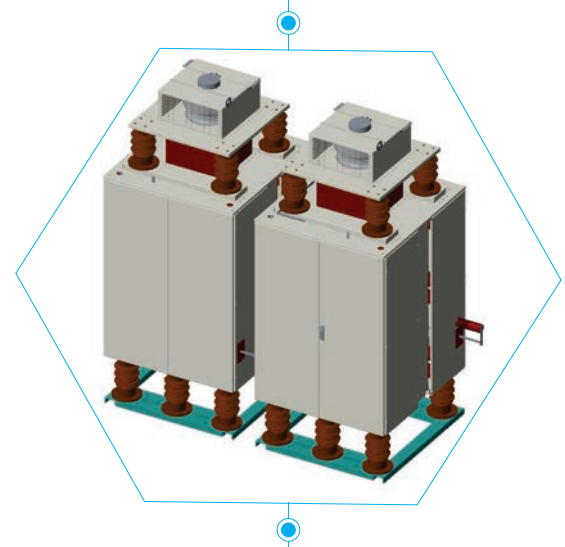
Product Datasheet

25kV 1-ph 6MVA iRMS Compensator	
Nominal voltage	25 kV
Max voltage	30 kV
Rated power	6 MVA
Rated current	2x 120A _{RMS} (240) A _{RMS}
Overload	1.1 p.u.
Grid frequency	50 Hz±10%
Connection	1-phase
System loss	<= 1 % (full load)
Harmonics compensation	3 rd to 13 th
Ambient temperature	-10°C to +50°C
Pollution degree	3
Cooling type	Forced air



For more product information and sales inquiries, please contact
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Higher load capacity | Improved Voltage | Reduced kVA demand



Improved Power Factor | Reduced System losses | Cost Saving

