# DSTATCOM for load compensation

Mr. Anurag SD Rai, Dept. of Electrical & Electronics Engineering
Rabindranath Tagore University, Bhopal

**ABSTRACT**

The main of this paper is to study the effect of DSTATCOM so that Voltage and current can be compensated, reducing current related power quality issues. Distributed static compensators are very popular in calculating the most common linear and nonlinear loads DSTATCOM for voltage stability. DSTATCOM is a voltage converter (VSC) based device with a voltage source behind the reactor. Single-phase load compensation is used to reduce the reactive and harmonic parts of the load current.

**Keywords-** voltage source converter, single phase compensation, harmonics.

## INTRODUCTION

In modern trends, voltage system compensators (DSTATCOM) minimize power system problems such as voltage drop, swell, and harmonics. Various power devices include DSTATCOM (distribution static compensator), DVR (dynamic voltage restorer), UPQC (unified power quality conductor)[1]–[4]. Current-related power quality issues are mitigated by shunt compensators. Here we show the structure of the load compensator and use DSTATCOM to examine the three-phase load of the output voltage and current waveform.

In modern trends, voltage system compensators (DSTATCOM) alleviate power system problems such as voltage drop, swelling, and harmonics. Various power tools include DSTATCOM (circuit static compensator), DVR (dynamic voltage restore), UPQC (integrated power quality controller)[5]–[7]. Current power-related quality issues are mitigated by shunt compensators. Here we show the structure of the load compensator and use DSTATCOM to investigate the loads of three levels of the output voltage and current waveform[8], [9].

## WORKING METHODOLOGY-

Inverter from IGBT and GTO DC: -Inverter that generates output voltage waveform controlled by phase angle size and output and weakens reactive flow is responsible for compensation. LC filter is required. -LC filters that reduce harmonics that shift inverter output impedance are used, and multiple parallel inverters allow split flow. Harmonics present in system type and inverter output.

Figure 1 shows a schematic diagram of a single-phase load compensator. In this figure, the voltage source provides the load, which may not be connected. The connection point between the load and the source is the common connectivity (PCC) at which the feeder does not participate in the source. It represents the resistance of the interface inductor due to finite Q factor and inverter loss. One end of the compensator is fully connected at the PCC through the interface inductor, and the other end is connected to the load ground. A DC capacitor is supplied to the DC side of the compensator.

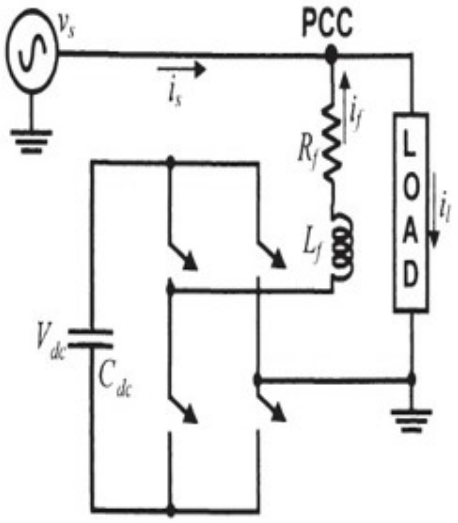


**Fig 1 SCHEMATIC DIAGRAM OF SINGLE PHASE COMPENSATOR**

## RESULT AND CONCLUSION

DSTATCOM is used for mitigating harmonic current reduction, along with the reactive power compensation. With this load compensation, the power system should work smoothly and properly. one can find the reference current and reference voltage. Reduce harmonics and other power quality issues. Provide a better power system. In modern trends, the use of compensators is increasing in many countries. Ideal device for power systems.

## References

[1] C. Kumar and M. K. Mishra, "A voltage-controlled DSTATCOM for power-quality improvement," *IEEE Trans. Power Deliv.*, 2014.

[2] H. M. Khodr, J. Martinez-Crespo, M. A. Matos, and J. Pereira, "Distribution systems reconfiguration based on OPF using benders decomposition," *IEEE Trans. Power Deliv.*, 2009.

[3] K. R. Devabalaji, K. Ravi, and D. P. Kothari, "Optimal location and sizing of capacitor placement in radial distribution system using Bacterial Foraging Optimization Algorithm," *Int. J. Electr. Power Energy Syst.*, 2015.

[4] J. Horta, D. Kofman, D. Menga, and A. Silva, "Novel market approach for locally balancing renewable energy production and flexible demand," in *2017 IEEE International Conference on Smart Grid Communications, SmartGridComm 2017*, 2018.

[5] L. S. Czarnecki and T. N. Toups, "Working and reflected active powers of three-phase loads," in *12th Conference-Seminar: International School on Nonsinusoidal Currents and Compensation, ISNCC 2015 - Conference Proceedings*, 2015.

[6] R. C. Redondo, N. R. Melchor, M. Redondo, and F. R. Quintela, "Instantaneous active and reactive powers in electrical network theory: A review of some properties," *Int. J. Electr. Power Energy Syst.*, vol. 53, no. 1, pp. 548–552, 2013.

[7] C. A. Arbugeri, T. B. Lazzarin, and S. A. Mussa, "Instantaneous active and reactive

power in six-phase systems," in *2015 17th European Conference on Power Electronics and Applications, EPE-ECCE Europe 2015*, 2015.

[8] A. Chaoui, F. Krim, J. P. Gaubert, and L. Rambault, "DPC controlled three-phase active filter for power quality improvement," *Int. J. Electr. Power Energy Syst.*, 2008.

[9] A. Boussaid, A. L. Nemmour, L. Louze, and A. Khezzar, "A novel strategy for shunt active filter control," *Electr. Power Syst. Res.*, 2015.