

Capacitors Vs. Hybrid & S.V.G

This table is not a representation to show one system superior to the others, but rather a quick reference to compare and understand each system. Our recommendations are always based on a site visit and from analysing data taken over a period of time. To see what a site visit includes, check out our power factor servicing page on our website.

	CAPACITOR BASED	HYBRID SYSTEM	FULL ACTIVE SVG
COST PER UNIT	LOW	MEDIUM	HIGH
LEADING OR LAGGING POWER FACTOR	LAGGING	BOTH	BOTH
EXACT kVAR REQUIREMENTS	✗	✓	✓
REAL TIME COMPENSATION	✗	✓	✓
CAPACITOR TYPE	DRY	ELECTROLYTIC & DRY	ELECTROLYTIC
CAPACITOR ZERO SWITCHING	✗	✓	✓
HEAT GENERATED	MODERATE	MODERATE	MED-HIGH
EASE OF FUTURE ADDITIONS / FLEXIBILITY	✓	✓	DIFFICULT
COST OF EXPANSION	LOW	LOW	HIGH
STILL WORKS WITH PARTIAL LOSS OF POWER	✓	✓	✗
REPAIRED/MAINTAINED ON SITE	✓	✓	✗
IMPROVES SYSTEM RESONANCE	MINIMAL	MEDIUM	✓

The different types of power factor units are capacitor based, hybrid, and full SVG. Each type of unit has clear advantages and drawbacks, but when a system is put to the right scenario, the benefits outweigh the system drawbacks. A site visit by one of our technicians will determine which system, or a combination of systems will best suit the site requirements.

To further understand each system, please check out our whitepapers page on our website.

Advantages of a Capacitor Based System:

- Easily expandable - future proof
- Cooler & quieter operation
- Able to handle dirtier environments without adverse effects
- Easy to service with readily available parts, can be serviced by most industrial electricians
- Reliable & long service life
- Effective performance can still be achieved if individual components fault
- Thyro switched steps can react within 20mS to changes to load
- Can be serviced from the front, without taking the system off line
- Can be installed against a wall
- Simple installation and commissioning
- Only need one CT in MSB

Advantages of Static Var generator (SVG) and Active Harmonic Filters (AHF)

- Very fast response, and corrects each phase independently
- Corrects harmonic frequencies (up to 13th for SVG, and 50th for AHF)
- Can correct leading and lagging power factor to 0.99
- Comes in wall mounted configuration up to 100kVar (or 150A AHF)
- Some parts are replaceable in NZ by our technicians

Disadvantages of a Capacitor Based System:

- Standard switching systems respond slower than electronic systems
- can be susceptible to certain harmonics damaging capacitors
- Large and heavy
- Can only correct all phases at the same rate
- Cannot correct leading power factor
- Cannot correct harmonic frequencies

Disadvantages of Static Var generator (SVG) and Active Harmonic Filters (AHF)

- Expansion past one unit requires a separate HMI controller
- Needs 3 CTs in MSB
- At full load, the fan noise can be too loud for quiet environments
- Create more heat than capacitor based systems, needing extra air-conditioning for large units
- Normally need an on-site commissioning by an expert technician
- Cabinet mounted units need rear and front access and ventilation
- Requires a clean environment
- Complete shutdown of unit for any small failure
- Needs expert repair technicians or return to factory for repairs

