Low-Voltage Static Var Generator (SVG) PQvar LV-series

General information

SVG PQvar Series is a product which has rewritten the conventional approach of power factor correction. It is designed to compensate the rapid reactive power requirement, thereby improving the power factor and consequently reducing the costs. SVG PQvar Series monitors the current signal and utilizes three levels inverter topology which generate the reactive part of the measured current to compensate dynamically in order to improve the power factor. It can dynamically compensate power factor from –1 to 1.

Features

- SVG PQvar Series can be considered as a controllable reactive current source, which helps to improve the system power factor to a target value of more than > 0.99 without any over or under compensation.
- SVG PQvar Series has extremely rapid dynamic compensation reaction time, which is less than 50 µs and a state response time of less than15 ms.
- SVG PQvar Series is an active compensation device, which doesn't need capacitor or reactor for reactive power compensation which will avoid the condition of resonance caused by the traditional capacitor banks.
- SVG PQvar Series can compensate both inductive and capacitive reactive power and also provide load balancing.
- SVG PQvar Series can compensate reactive power in any scope and can be installed together with traditional capacitor banks.
- The grid voltage has no influence on the SVG PQvar Series compensation capacity. So even if the system voltage drops down, the required reactive power can be compensated by monitoring its requirement.
- SVG PQvar Series can compensate for the same capacity equivalent to the installed capacity, therefore it requires 20 to 30% lower capacity in comparison with the conventional capacitor banks.
- SVG PQvar Series has been designed to provide highest safety and reliability features.

Typical applications

Some typical applications which require rapid reactive power compensation includes the following:

- Data centers
- UPS systems
- Renewable power generation (e.g. photovoltaics and wind turbines)
- Sensitive equipment manufacturing (e.g. silicon wafer production, semiconductor production)
- Industrial production machines
- Electrical welding systems
- Plastic industry machinery (e.g. extruders, injection molders)

Safety features

- Overload protection
- Internal short-circuit protection
- Overheating protection
- Overvoltage and undervoltage protection
- Inverter bridge protection
- Fan fault alarm

Please read *Important notes* on page 12 and *Cautions* on page 123–127

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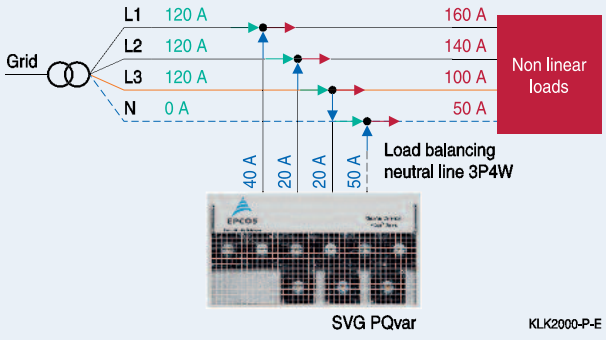
Wall-mounted panel

Floor-mounted panel

Horizontal module

Depending on the customer needs, TDK offers either complete panels, wall mounted cabinets or even modules. The state of the art modular design of SVG PQvar Series offers the advantage of having a minimum downtime in case of a service or maintenance requirement.

SVG PQvar Series load balancing for 3P3W and 3P4W



SVG PQvar Series can balance load between phases and unloaded neutral wire for input voltage connection systems such as three phase three wires (3P3W) and three phase four wires (3P4W). Therefore, it will be a perfect solution with applications having reactive power requirements along with unbalanced loads, which is the case with the electricity distribution in rural areas, some industrial applications and much more.

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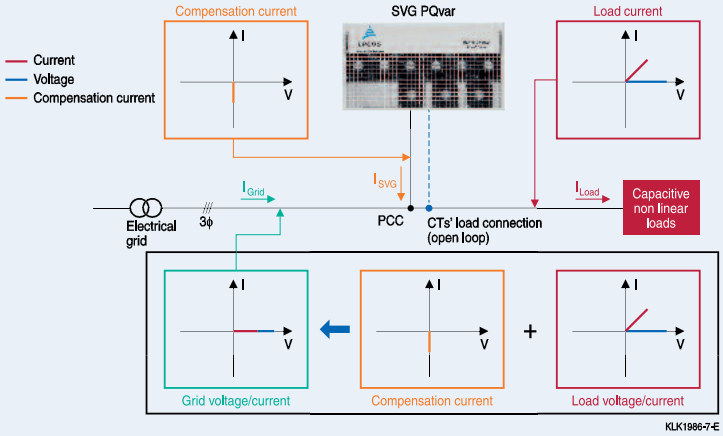
Static Var Generator (SVG) PQvar Series

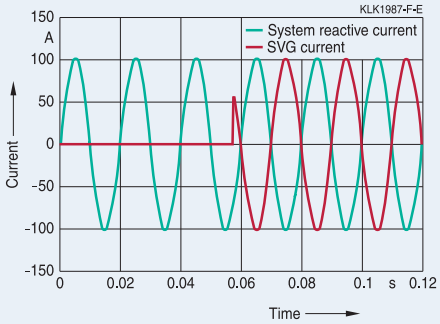
Compensation of reactive power with SVG PQvar Series



SVG PQvar Series compensation performance

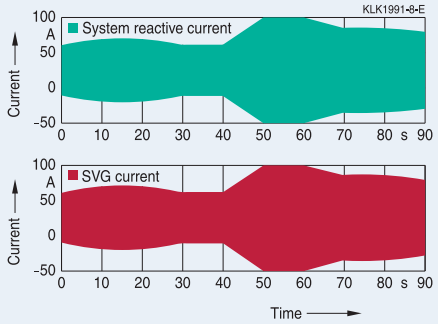
Fast reaction

Extremely rapid reactive power generation, in order to achieve target PF, right at the SVG PQvar Series switch on.



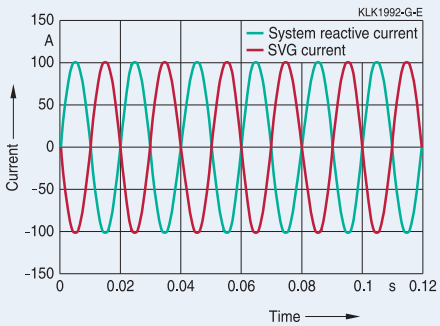
Real-time tracking

While system reactive current changes, SVG PQvar Series also can generate dynamic real time compensation current to satisfy the changing power system requirement.



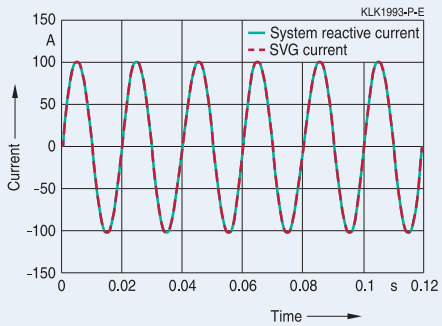
Perfect compensation

SVG PQvar Series identifies the system reactive power requirement and generates a reactive current same in magnitude but opposite in phase to ensure perfect compensation result.



Reverse and overlapping

The reversed waveform of reactive current generated by SVG PQvar Series overlaps with the power system reactive current.



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Technical data and specifications of low-voltage SVG PQvar Series

Rated voltage (range)	240 V (173 … 263 V)	400 V (228 … 456 V)	480 V (384 … 552 V)	600 V (420 … 690 V)	690 V (483 … 793 V)
Individiual module capacity (kvar)	30, 60, 120	30, 50, 100, 200	40, 80	50, 100	60, 120
Mains frequency	50/60 Hz (range: 45 … 62 Hz)				
Parallel operation	Unlimited				
Response time	< 15 ms				
Overall efficiency	> 97%				
Power grid structure	3P3W / 3P4W				
Current transformers	150/5 … 10000/5				
Circuit topology	3 level				
Cooling mode	Smart air cooling: 110 L/sec to 500 L/sec, depending upon the models				
Target power factor	Adjustable from –1 … +1				
Cabinet mounting	Floor-mounted, wall-mounted				
Communication ports	RS485, CAN, and network port				
Communication protocols	Modbus and PMBus				
Noise level	< 65 dB (depending on the model)				
Protection functions	Overvoltage, undervoltage, short-circuit, inverter bridge inverse, over-compensation				
Operating temperature	–10 … +40 °C (higher temperatures with derating)				
Relative humidity	5 … 95%, non-condensing				
Protection class	IP20 (other IP classes are customizable)				
Panel color	RAL7035 light grey				
Altitude	1500 m, 1% derating per 100 m plus				
EMC requirements	EN 61000_6_2(2005)/ EN55011, GROUP1, CLASS A IEC 61000_6_2(1999)/ CISPR11, GROUP1, CLASS A				
Compliance with standards	EN 50178:1997/ IEC 50178:1997, EN 50091-3/ IEC 62040-3/ AS 62040-3(VFI SS 111)				

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400 V SVG PQvar Series – modules

Type	Reactive power kvar	System voltage min./max. V		Connection variant	Approx. weight kg	Approx. dimensions (w x d x h) mm	Ordering code
PQSM8030V300	30	228	456	3P4W	23	500 × 515 × 180	B44066F8030V300
PQSM8050V300	50	228	456	3P4W	28	500 × 546 × 190	B44066F8050V300
PQSM8100V300	100	228	456	3P4W	44	500 × 605 × 269	B44066F8100V300
PQSM8200V300	200	228	456	3P4W	115	530 × 690 × 370	B44066F8200V300
PQSM6030V300	30	228	456	3P3W	23	500 × 515 × 180	B44066F6030V300
PQSM6050V300	50	228	456	3P3W	28	500 × 546 × 190	B44066F6050V300
PQSM6100V300	100	228	456	3P3W	44	500 × 605 × 269	B44066F6100V300
PQSM6200V300	200	228	456	3P3W	115	530 × 690 × 370	B44066F6200V300

400 V SVG PQvar Series – 3P4W systems[1)]

Type	Reactive power kvar	System voltage min./max. V		Mounting variant	Approx. weight kg	Approx. dimensions (w x d x h) mm	Ordering code
PQSW8030V344	30	228	456	Wall-mounted	23	500 × 180 × 540	B44066F8030V344
PQSW8050V344	50	228	456	Wall-mounted	28	500 × 190 × 571	B44066F8050V344
PQSW8100V344	100	228	456	Wall-mounted	44	500 × 273 × 638	B44066F8100V344
PQSW8200V344	200	228	456	Wall-mounted	115	500 × 370 × 690	B44066F8200V344
PQSF8100V315	100	228	456	Floor-mounted	297	600 × 1000 × 2200	B44066F8100V315
PQSF8150V315	150	228	456	Floor-mounted	332	600 × 1000 × 2200	B44066F8150V315
PQSF8200V315	200	228	456	Floor-mounted	359	600 × 1000 × 2200	B44066F8200V315
PQSF8250V315	250	228	456	Floor-mounted	394	600 × 1000 × 2200	B44066F8250V315
PQSF8300V315	300	228	456	Floor-mounted	421	600 × 1000 × 2200	B44066F8300V315
PQSF8400V315	400	228	456	Floor-mounted	483	600 × 1000 × 2200	B44066F8400V315
PQSF8500V325	500	228	456	Floor-mounted	780	1800 × 1000 × 2200	B44066F8500V325
PQSF8600V325	600	228	456	Floor-mounted	842	1800 × 1000 × 2200	B44066F8600V325
PQSF8700V325	700	228	456	Floor-mounted	904	1800 × 1000 × 2200	B44066F8700V325
PQSF8800V325	800	228	456	Floor-mounted	966	1800 × 1000 × 2200	B44066F8800V325

[1)] All wall mounted systems include a 4.3" TFT color control / display unit (touch screen).
All floor mounted systems include a 7" TFT color control / display unit (touch screen). External current transformers are not included.

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Low-Voltage Static Var Generator (SVG)
PQvar LV-series

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400 V SVG PQvar Series – 3P3W systems[1)]							
Type	**Reactive power** kvar	**System voltage min./max.** V		**Mounting variant**	**Approx. weight** kg	**Approx. dimensions (w x d x h)** mm	**Ordering code**
PQSW6030V344	30	228	456	Wall-mounted	23	500 × 180 × 540	B44066F6030V344
PQSW6050V344	50	228	456	Wall-mounted	28	500 × 190 × 571	B44066F6050V344
PQSW6100V344	100	228	456	Wall-mounted	44	500 × 273 × 638	B44066F6100V344
PQSW6200V344	200	228	456	Wall-mounted	115	500 × 370 × 690	B44066F6200V344
PQSF6100V315	100	228	456	Floor-mounted	297	600 × 1000 × 2200	B44066F6100V315
PQSF6150V315	150	228	456	Floor-mounted	332	600 × 1000 × 2200	B44066F6150V315
PQSF6200V315	200	228	456	Floor-mounted	359	600 × 1000 × 2200	B44066F6200V315
PQSF6250V315	250	228	456	Floor-mounted	394	600 × 1000 × 2200	B44066F6250V315
PQSF6300V315	300	228	456	Floor-mounted	421	600 × 1000 × 2200	B44066F6300V315
PQSF6400V315	400	228	456	Floor-mounted	483	600 × 1000 × 2200	B44066F6400V315
PQSF6500V325	500	228	456	Floor-mounted	780	1800 × 1000 × 2200	B44066F6500V325
PQSF6600V325	600	228	456	Floor-mounted	842	1800 × 1000 × 2200	B44066F6600V325
PQSF6700V325	700	228	456	Floor-mounted	904	1800 × 1000 × 2200	B44066F6700V325
PQSF6800V325	800	228	456	Floor-mounted	966	1800 × 1000 × 2200	B44066F6800V325

[1)] All wall mounted systems include a 4.3" TFT color control / display unit (touch screen).
All floor mounted systems include a 7" TFT color control / display unit (touch screen). External current transformers are not included.

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