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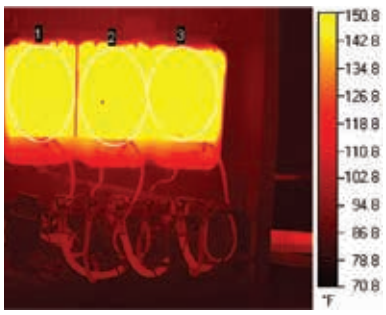
Varmatik SVG Catalogue

Varmatik
SVG

- Energy loss is reduced.
- Efficiency increases.
- The life of the devices used increases.
- We can easily calculate energy losses and excess capacity.
- In researches, it has been observed that when the energy quality is low, the service life of electrical materials decreases.

ONLY SOLUTION
WITHOUT
PROBLEMS

Standard Passive Filters

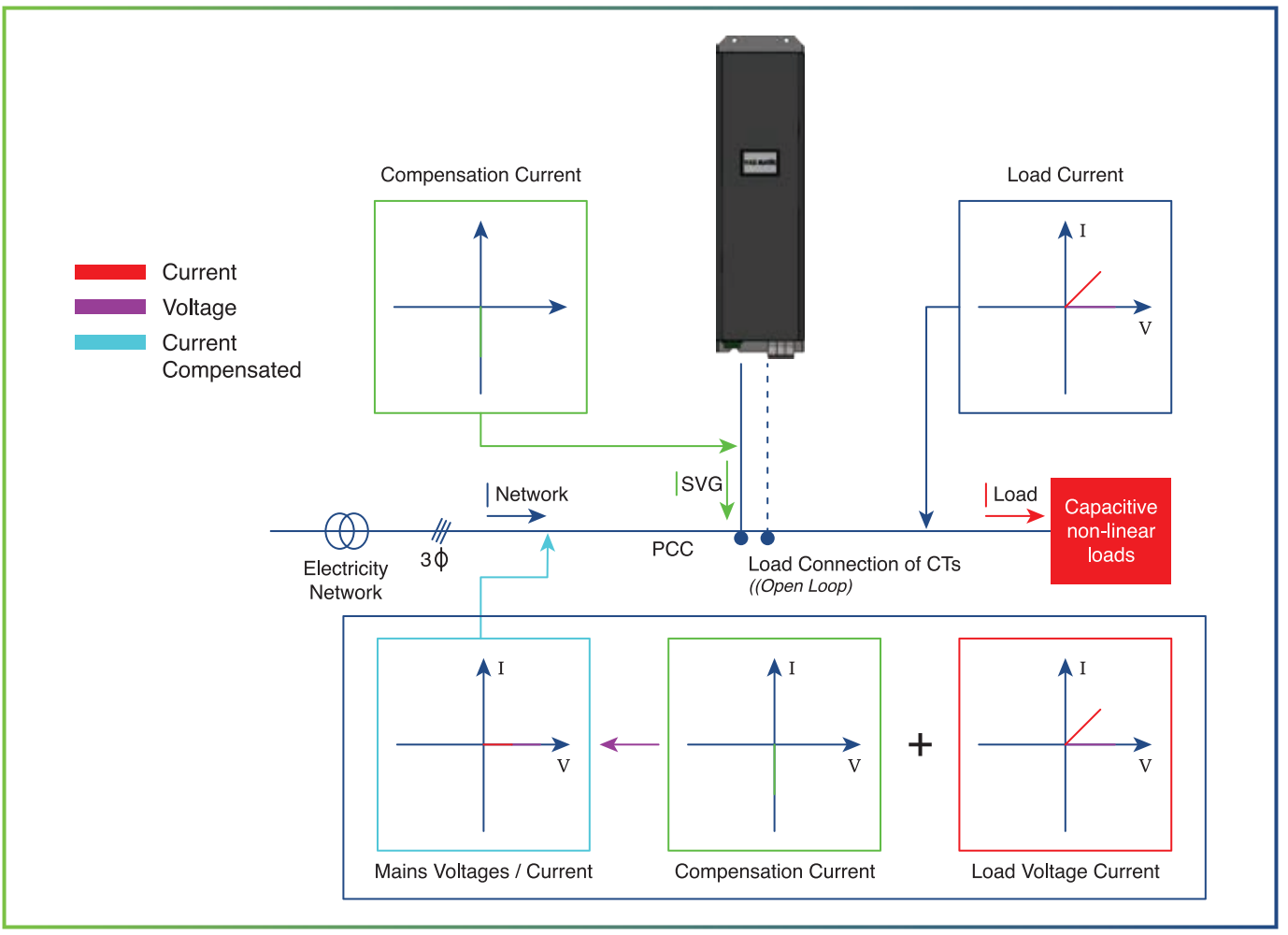


Varmatik

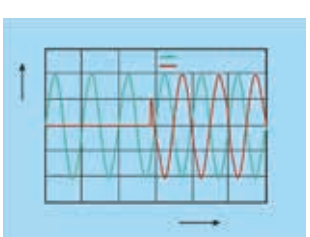
Reactor Temperature

no more

Compensation Problems



Fast Reaction

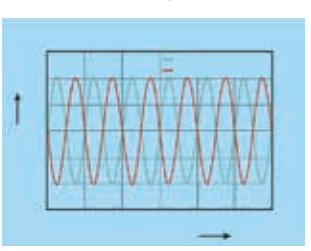


To achieve the target PF, the SVG VARMATIC Series generates reactive power extremely fast when switched on.

High Performance

- reactive power compensation up to cos ϕ = 0.99
- Load balancing between phases
- Fully inductive and capacitive current.

Perfect Compensation

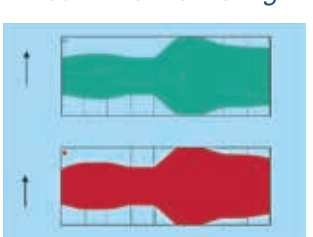


SVG VARMATIC Series defines the reactive power requirement of the system and generates a reactive current of the same magnitude but in opposite phase to guarantee a perfect compensation result.

Quick Reply

-Can respond to load changes in less than 15 ms.
-Accurate power factor correction adjusts the output current capacity stably without overcompensation or undercompensation.

Real Time Monitoring

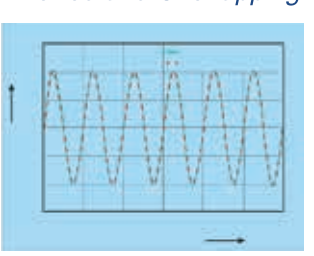


If the system reactive current changes, the SVG VARMATIC Series can also generate dynamic real-time balancing current to meet changing power system requirements.

Modular Design

- The SVG VARMATIK Series is based on a unit mounting system.
- The maximum rated capacity of a single module is 100 kVar
- Customisable cabinet and maximum output capacity of the cabinet is 1000 kV.
- Easily operated, maintained and transported.

Inverted and Overlapping

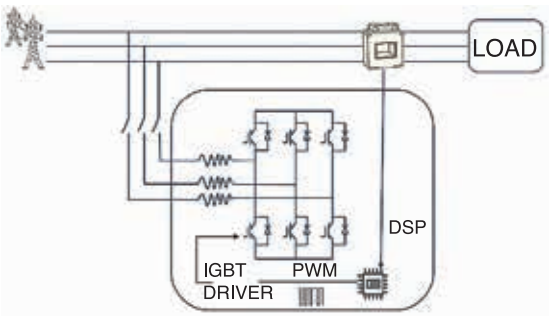


The inverse waveform of the reactive current generated by the SVG VARMATIC Series coincides with the power system reactive current.

Different Combinations

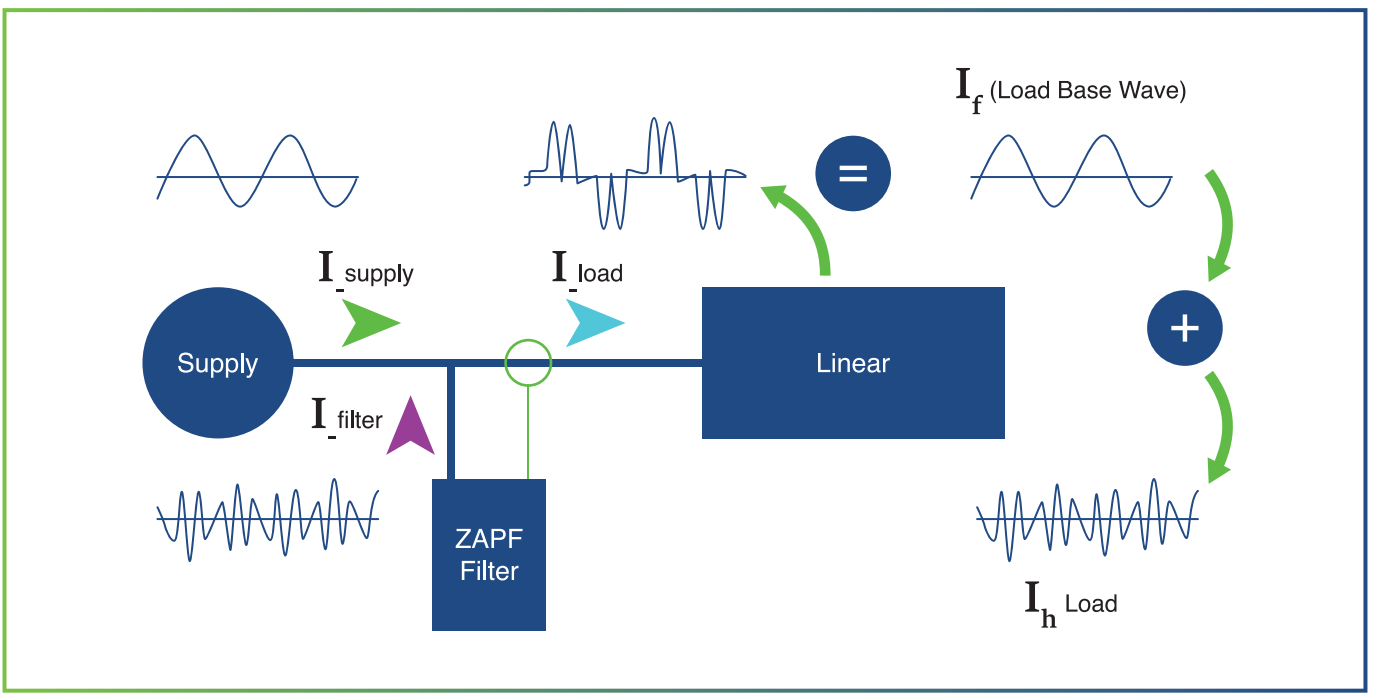
- SVG VARMATIC Series with capacitor bank
- SVG VARMATIC Series with AHF
- SVG VARMATIC Series (reactive power and harmonic compensation)

1. Operating Principles

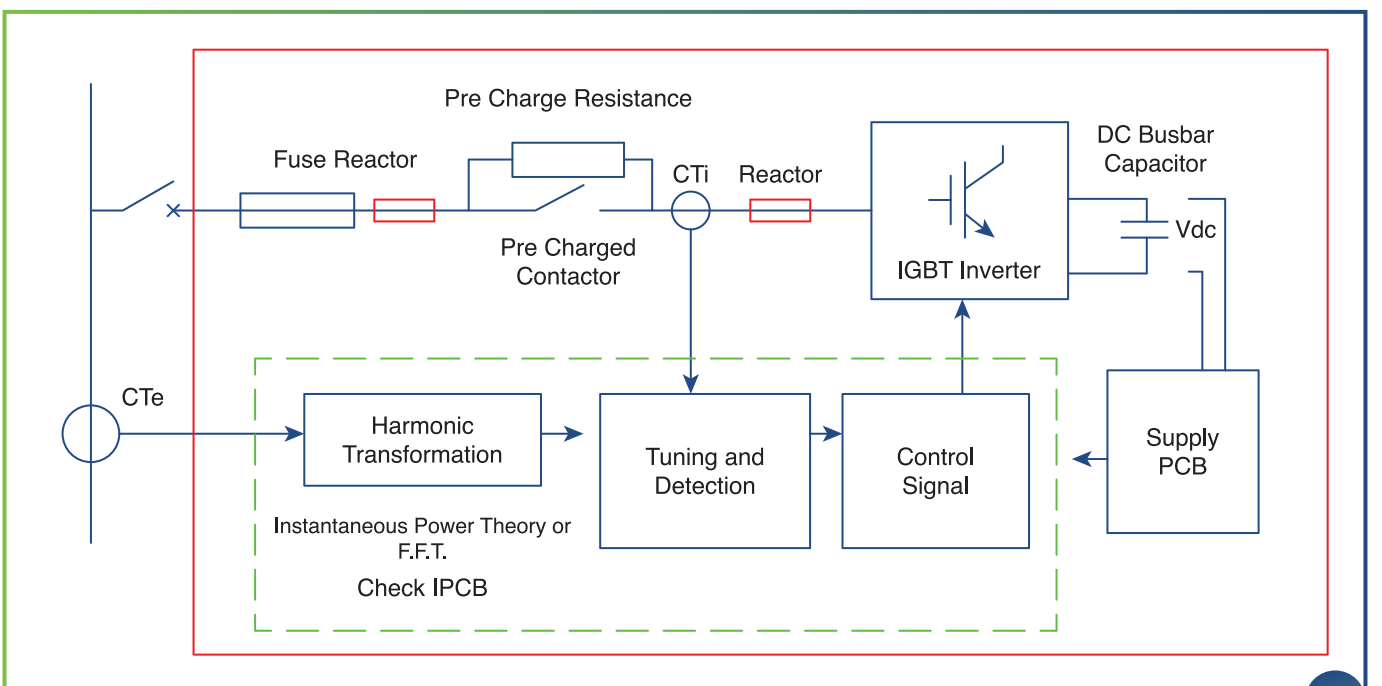


The external CT senses the load current, the DSP monitors the instruction current and calculates the reactive power change rate through the Instantaneous Reactive Power Algorithm. Then the DSP sends PWM signal to the IGBT driver board, which can switch the IGBT on and off to generate inductive or capacitive compensation current. At the same time, CT detects the output current and the compensation result is sent back to DSP, then the next round of logic control is performed to realise the stable power grid.

1.1 Mathematical Model $i1=(i1+\Sigma ih)+(-\Sigma ih)$



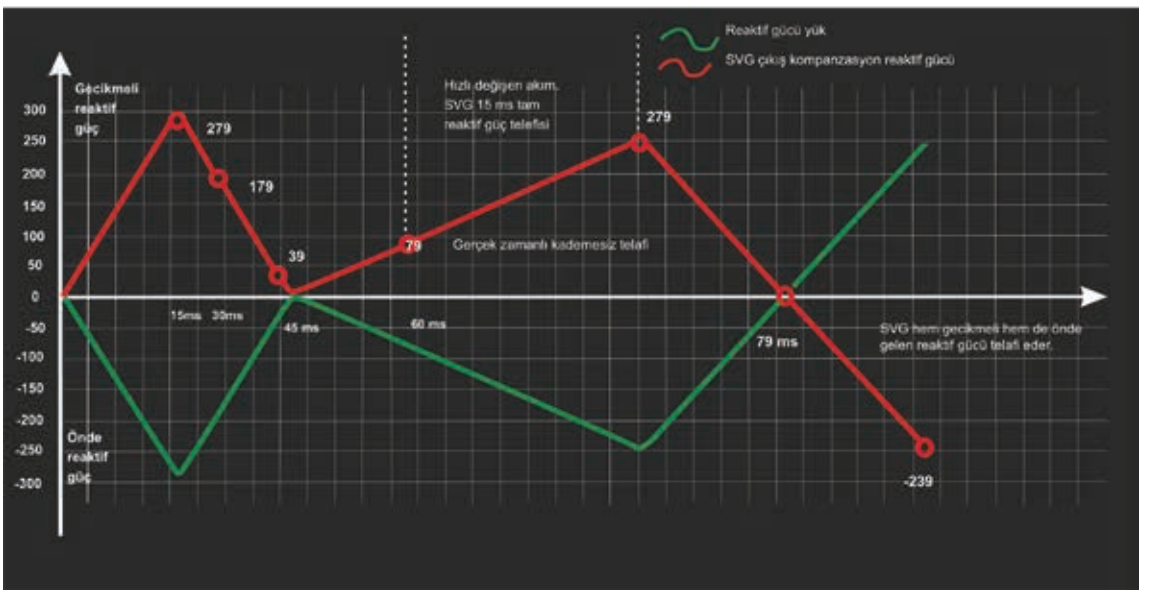
1.2 Flow Diagram



2. Advantages

Superior Performance (PFC 0.99&-1~1~1 Compensation)

VARMATIK adopts inverter-based technology, an active solution for power factor correction, which can realise over and under stepless compensation. PFC operation is performed within 15 ms with both inductive reactive power and capacitive reactive power and always maintains PF 0.99, regardless of how much or how fast the reactive power of the system changes.



Increasing your Power Factor to 0.999

VARmatik manufacturer heavy duty Static Var Generator (SVG), which can quickly and continuously compensate both inductive and capacitive reactive power and correct load imbalance. With sufficient capacity, SVG provides excellent fundamental power factor improvement performance. Basic Power Factor (Cosϕ) ≥ 0.999 (improves PF both leading and lagging)

Operation Mode	Waveform Phase Position Shape	Notes
No load	U_I U_S (a) U_I=U_S	Does not compensate in case of UI-US
Inductive Operation	U_S U_I I_L (b) U_I<Us	Can output continuous inductive current in case of UI<US
Capacitive Operation	U_I U_S I_L (c) U_I>U_s	If UI>US SVG can continuously output capacitive current

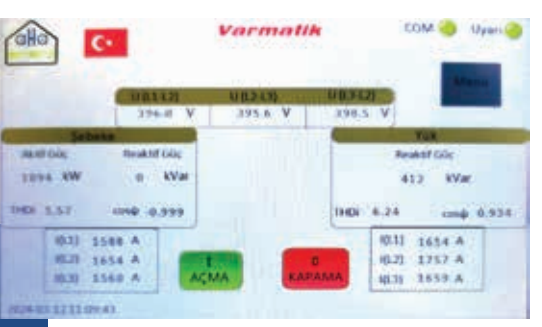
High Reliability (long lifetime and normal operation in 15% THDV environment) VARMATIK (average time between failures) can operate for over 15 years with metal film capacitors. Moreover, VARMATIC can compensate leading and lagging power factor and has tolerance on high THDI, THDU system.

3. Module Design

(Small Size)

VARMATIK has an ultra-compact design that allows it to be easily installed and replaced. The wall and rack-mounted design with a minimum footprint makes it flexible to integrate into the system, with its high density, 1 unit of 100kVar varmatic can be placed in a single cabinet, saving up to 50% space compared to standard passive filter compensation.

Commercial infrastructure: hospital, railway station, airport, commercial building, theme park, wharf, IDC etc. Industrial: water treatment, drilling systems, oil & gas, food processing, car accessories manufacturer, power supply manufacturer, irrigation, wind farm etc.



Sample Work Screen

4. Varmatik Static Var Generator Features

- Multifunctional: Reactive power and unbalance compensation.
- Excellent reactive compensation: High speed, Precise (-0.99≤Cosϕ≤0.99), Stepless, Bidirectional (capacitive and inductance) compensation.
- Excellent imbalance correction: Both negative and zero sequence reduce current.
- Wide input voltage and frequency range adapts to harsh electrical environments.
- Low thermal loss (≤3% of nominal SVG capacity), efficiency ≥ 97%.
- High stability: Infinite impedance to the grid avoids the problem of harmonic resonance.
- Flexible application: Standard or customised cabinet embedded modular design.
- Easy installation and maintenance: Easy installation for replacement and expansion of SVG module.
- Wide capacity range: 33kVar or 100 kVar modules for a single cabinet.
- Environmental compatibility: -10~50°C temperature, compatible with solar PV systems, diesel generators.

Features	Typical Applications	Main Benefits
- Compensate inductive and capacitive reactive power - Active load balancing - Voltage 240...690 V - Reactive power range per module: 30...100 kVar - Filter power per panel: Up to 1000 kVar	*Applications requiring fast reactive power compensation,* - Data centres, UPS systems - Green energy production systems - Industrial production machines - Office buildings and shopping centres	*Costs* - Improvement of the power factor and thus reduction of costs *Electrical* - Fast response time < 15 ms - Dynamic reaction time less than 50 µs *Safety* - High safety and reliability - Integrated overload, overvoltage and undervoltage protection

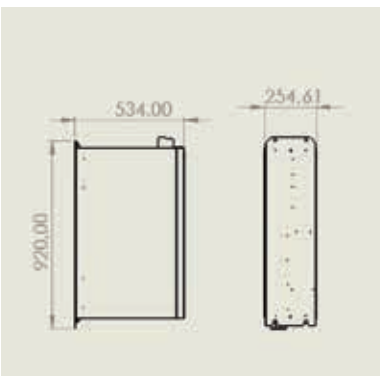
Technical Data and Specifications

Nominal Voltage (range)	400V (350...415V)	690V (480...790V)
Individual Module Capacity (kVar)	33,100	50,100
Dimensions (mm, H x W x D)	920 x 250 x 540	
Mains Frequency	50/60 Hz (range: 45 ... 65 Hz)	
Parallel Work	Single screen up to 10 modules	
Overall Productivity	> %97	
Power Grid Structure	3P3W	
Current Transformers	150/5 ... 10 000/5	
Cooling Mode	Intelligent air cooling: 900 m3/h to 1800 m3/h depending on models	
Target Power Factor	Adjustable between -1 ... +1	
Cabinet Assembly	Floor mounted, wall mounted	
Communication Ports	RS485 and network port	
Communication Protocols	Modbus - ethernet remote connection	
Noise Level	72 db	
Operating Temperature	-10 ... +40 (higher temperatures with depreciation)	
Relative Humidity	5% ... 95%, non-condensing	
Protection Class	IP20 (other IP grades can be customised)	
Panel Colour	Grey black	
Altitude	1500 m, plus 1% depreciation per 100 m	
EMC Requirements	EN 6100_6_2(2005) / EN55011, GRUP1, SINIF A IEC 61000_6_2 (1999)	
Compliance with Standards	CE-	

PFC Solution - SVG VARMATIC with Advanced Multi-Controller (dsp)	
Operating Voltage	400 VAC
Compensation Performance	
Target PF	–1 … +1
Reactive Power Compensation Ratio	> 99 per cent (target is PF 1)
Response Time	< 15 ms
Reaction Time	< 50 µs
Capacitor Switching Performance	
Compensation Method	Three-phase / split / mixed compensation
Capacitance Coding Method	Optional
Capacitor Switching Method	Bulk / normal / loop / individual
Switching Type	İGBT
External Ports	
RS485 Port 1	Communication with SVG modules
RS485 Port 2	External communication port
Network Port	External communication port
USB Input	Historical data
Temperature Detection	Operating temperature or ambient temperature of the measuring system
Fan Controlling Dry Contact	Checking the SVG cooling fan
Alarm Indicator Dry Contact	For reserved external alarm indication
Control Output - Contact Steps	Designed according to demand
Reserved Dry Contact	Optional
Communication Protocol	Modbus
Protection Functions	Undervoltage, overvoltage, under frequency, over frequency, phase error, high harmonic voltage, SVG overload, SVG over temperature
View	4.3" touch screen
Installation Requirements	
Installation Requirements	< %3
Protection Class	IP41 for front panel and IP20 for rear panel
Working Environment	
Ambient Temperature	–20 … +50 °C
Altitude	≤ 2500 m
Humidity	≤ %95
Storage Temperature	–40 … +70 °C
CT rate	150/5… 10000/5

5. Dimensions

Varmatik 33, 100 kVar dimensions of the module is as follows.



Weight of Varmatik SVG Module is 45 kg

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