



# Active Power Filter and SVG

The invisible health  
of your system





# YOUR ENERGY, IN **TRUSTED** HANDS

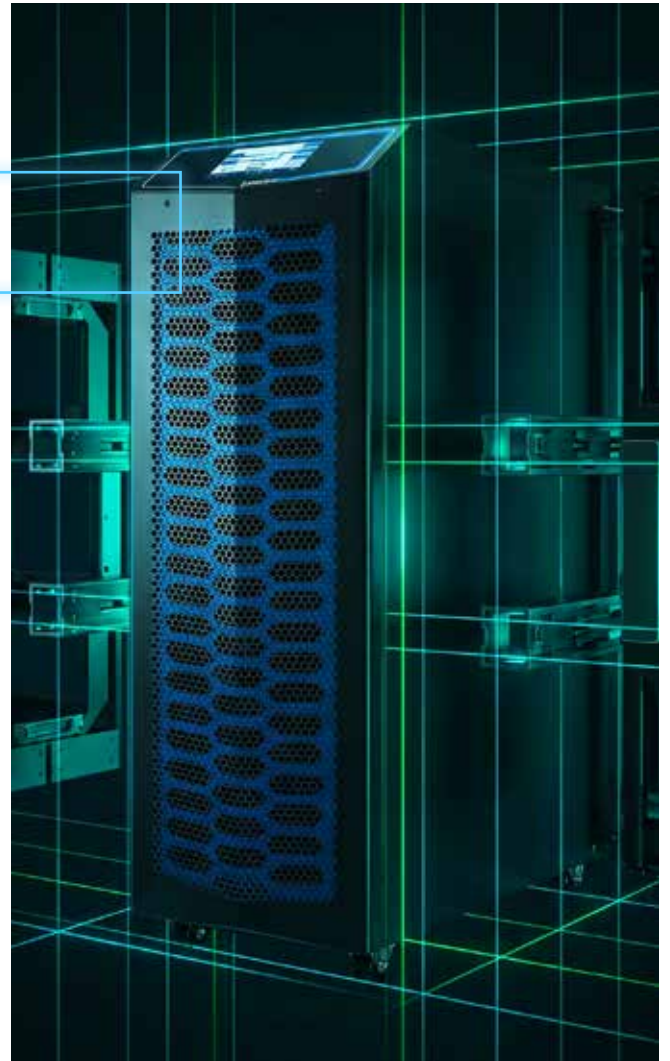
Because when energy is fundamental to your work,  
you don't just look for technology, you look for  
someone who knows how to take care of it.



# COMPANY PILLARS

## Energy keeps the world running.

For over 30 years, AblereX develops and produces UPS and Power Quality solutions for civil applications, industrial systems, and critical infrastructure, guaranteeing reliability even when energy becomes unstable or fails.



Through specialization in vertical markets, cutting-edge production, and local technical presence, we make energy a controlled factor.

**Because when  
the world  
cannot stop,  
every moment  
counts.**

## Commercial support and pre-sales technical assistance.

Our sales network turns local market needs into concrete Ablerex solutions. With expertise in critical systems, multilingual support, and complete technical documentation, we guide customers toward the right configurations for civil and industrial applications.



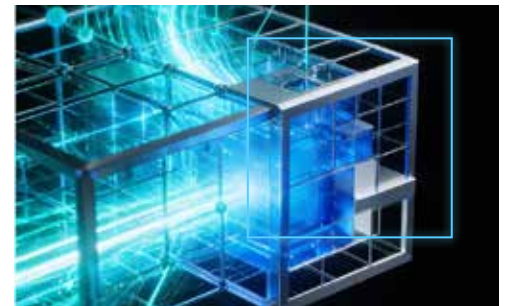
## Ablerex Tech Lab: local technical office for custom solutions.

With engineering teams in Italy and the UK, we deliver custom software, specialized applications, product designs, and direct expert support for customers and OEMs.



## Specialized Power Quality consulting.

In Power Quality, we aim to strengthen our role as experts in on-site analysis, commissioning, and system management. Our EMEA presence enables direct technical dialogue and ensures well-integrated, high-performing solutions.



## Logistics & Warehouse: efficiency and proximity.

Quick response is key to our reliability. With logistics hubs in Ponzano Veneto, Italy, and Rugby, UK, we ensure easier communication, fast deliveries, and stronger technical responsibility across key markets.



## Academy: the value of knowledge.

Through dedicated training areas in Milan and London, we help partners and customers build the skills needed to install, manage, and optimize Ablerex UPS and power quality solutions.



## Service: the real operational continuity.

Our post-sales service ensures continuous operation through remote support and direct assistance. Working with qualified partners, we support issue resolution, load management, and commissioning to maintain Ablerex reliability standards.



## Our production sites represent the operational heart of our vertical specialization.

Not simple assembly lines, but highly automated industrial centers.

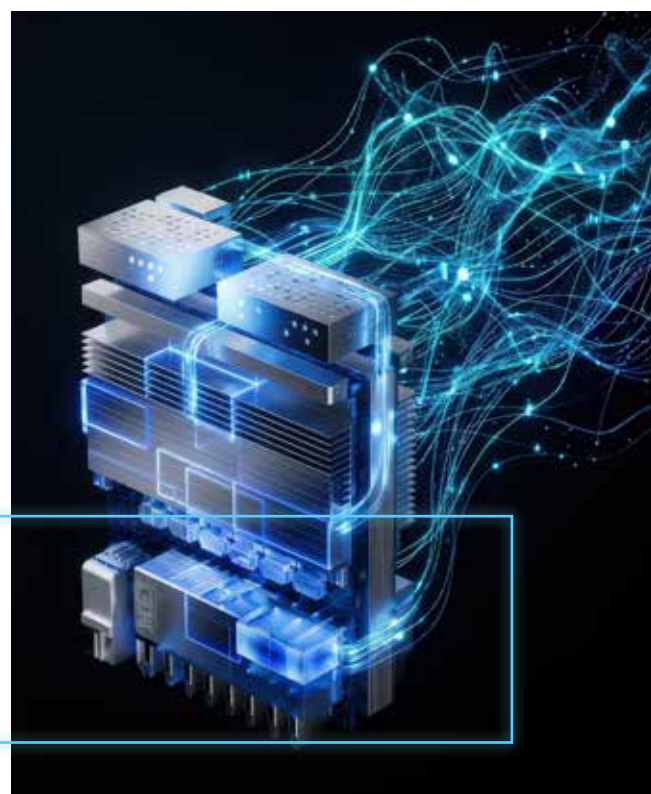


ISO 9001 • ISO 14001 • ISO 14064-1

## Solutions for tomorrow's challenges.

We work to solve tomorrow's problems with solutions that minimize heat generation, enabling tangible energy savings and overall optimization of available spaces.

REDUCTION OF ENERGY CONSUMPTION  
REDUCTION OF HEAT GENERATION  
INCREASED EFFICIENCY  
OPTIMIZATION OF AVAILABLE SPACES



## Our responsibility takes shape close to customers.

Our added value lies in the ability to customize global solutions to respond to the specific challenges of each territory, transforming energy from a potential operational risk into a controlled element.



# ACADEMIC CORNER



## Harmonic distortion: addressing the root cause of equipment degradation and tripping

Harmonics are electrical waveform distortions that occur when voltage or current deviates from a pure sine wave. In an ideal AC system, waveforms follow a smooth fundamental frequency.

Harmonics are additional frequencies that are integer multiples of this fundamental frequency (e.g., 3rd harmonic = 150 Hz, 5th = 250 Hz, 7th = 350 Hz). These frequencies distort the waveform and degrade overall power quality. The level of distortion is quantified by total harmonic distortion (THD), which expresses the percentage of harmonic content relative to the fundamental waveform.

### Causes of harmonics

Harmonics are primarily generated by non-linear electrical loads that draw current in pulses rather than a smooth sinusoidal pattern. Common sources include:

- **Power electronics:** variable frequency drives (VFDs), Uninterruptible Power Supplies (UPS), rectifiers, and battery chargers.
- **IT & office equipment:** computers, servers, and switched-mode power supplies.
- **Lighting:** LED drivers and electronic ballasts.
- **Industrial machinery:** equipment relying on power conversion, such as welding machines and arc furnaces.

### Negative effects of harmonics

Harmonics significantly compromise the reliability, efficiency, and safety of electrical systems, leading to:

- **Equipment overheating:** increased RMS current causes overheating in cables, motors, and generators, shortening their lifespan and increasing failure risks.
- **Transformer overloading:** harmonic currents create additional core and copper losses, reducing effective capacity of the transformer.
- **Neutral conductor overload:** triplen harmonics (3rd, 9th, 15th) accumulate in the neutral wire of three-phase systems. This can cause the neutral current to exceed phase currents, leading to severe overheating.
- **System inefficiency:** harmonics reduce the power factor, increase energy losses in distribution equipment, and can cause sensitive measurement or control devices to malfunction.

### The solution: Ablerex active power filter (APF)

To mitigate these harmful effects, modern installations require advanced filtering. The Ablerex APF is a dynamic power quality device designed to eliminate harmonic currents. Unlike traditional passive filters, the APF continuously monitors the network and injects equal but opposite compensating currents to cancel out harmonics in real time.

## Key benefits of the AblereX APF:

- **Real-time compensation:** instantly cancels harmonics and restores a near-sinusoidal current waveform.
- **Reduced THDi:** significantly lowers harmonic distortion, helping installations comply with international standards.
- **Improved reliability:** lowers thermal stress on transformers and cables, extending their operational lifetime.
- **Better efficiency:** eliminates harmonic-related current distortion, improving power factor and system capacity utilization.
- **Flexible & scalable:** can be easily installed in parallel with existing systems and scaled to meet specific mitigation needs.



## The cost of inefficiency: how reactive power limits your electrical infrastructure

Reactive power is a component of electrical power that does not perform useful mechanical work or heat, but is absolutely essential for establishing the electric and magnetic fields required by many AC devices.

In alternating current systems, total power consists of three components:

- **Active power (P):** measured in watts (W), this performs useful, productive work (e.g., lighting, heating, running motors).
- **Reactive power (Q):** measured in volt-amperes reactive (var), this supports the creation of magnetic and electric fields in inductive and capacitive equipment.
- **Apparent power (S):** measured in volt-amperes (VA), this represents the total power supplied by the source.

Reactive power arises when voltage and current become out of phase. The relationship between these three components is expressed by the power factor, which indicates how efficiently electrical power is being utilized.

## Causes of reactive power

Reactive power is primarily generated by loads that require magnetic or electric fields to operate. Common sources include:

- **Inductive loads:** the most common source in electrical networks. Equipment like electric motors, transformers, inductors, and welding machines require magnetizing current, causing a phase shift where current lags behind voltage.
- **Capacitive loads:** elements such as long power cables, power factor correction capacitors, and certain electronics cause current to lead the voltage, producing capacitive reactive power.
- **Non-linear loads:** modern electronic equipment, including Variable Frequency Drives (VFDs) and UPS systems, introduce complex current waveforms that contribute to both reactive power and harmonic distortion.

# ACADEMIC CORNER

## Negative Effects of Reactive Power

While necessary for equipment operation, excessive reactive power "clogs" the electrical system and causes several inefficiencies:

- **Increased system current:** high reactive power forces more total current through the network, leading to conductor overheating, greater energy losses in cables, and reduced overall efficiency.
- **Reduced infrastructure capacity:** transformers, generators, and cables are rated in apparent power (VA). Excessive reactive power "occupies" valuable system capacity, leaving less room for productive active power.
- **Higher energy costs:** utilities frequently impose heavy financial penalties when a power factor of facility falls below a certain limit (typically 0.9 or 0.95).
- **Voltage drops:** it creates additional voltage drops across the distribution system, causing instability that can negatively affect sensitive equipment.
- **Equipment stress:** higher currents accelerate the aging of electrical infrastructure, reducing reliability and driving up maintenance costs.

The solution: Ablerex static var generator (SVG)

To eliminate the negative effects of reactive power, facilities must implement effective power factor correction. The Ablerex SVG is an advanced power electronics device designed for dynamic, real-time reactive power compensation.

Unlike traditional capacitor banks that provide rigid, step-based compensation, the SVG continuously monitors the network and instantly injects or absorbs the exact amount of reactive power required, maintaining an optimal power factor under varying loads.

## Key benefits of the Ablerex SVG:

- **Real-time compensation:** responds instantly to load changes, ensuring the power factor remains close to unity.
- **Elimination of utility penalties:** by consistently maintaining a high power factor, the system avoids reactive power fines from energy providers.
- **Increased efficiency & capacity:** lowers reactive currents, reducing thermal losses and freeing up capacity in transformers and cables for actual productive use.
- **Enhanced voltage stability:** dynamic control helps stabilize voltage levels, which is highly beneficial for fluctuating or dynamic industrial loads.
- **Flexible & scalable:** the design allows for seamless integration into existing electrical systems and easy scaling as compensation needs grow.



## Real-time grid correction: the engineering shift from passive to active power filters

An active power filter is an advanced electronic device that dynamically improves power quality by eliminating harmonics, compensating reactive power, and balancing load currents in real time.

### How the APF works

1. Measurement: continuously monitors the network to identify harmonic, reactive, and unbalanced currents.
2. Calculation: advanced signal processing calculates the exact compensation required.
3. Compensation: injects a current waveform equal in magnitude but opposite in phase to cancel out unwanted components.

**Result: a clean, near-sinusoidal current waveform, reduced THDi, balanced loads, and a power factor close to unity.**

| TECHNOLOGY COMPARISON |                                                                                              |                                                                                         |
|-----------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Solution              | Advantages                                                                                   | Limitations                                                                             |
| Passive filters       | Simple design, lower initial cost.                                                           | Targets specific harmonics only, risks network resonance, cannot adapt to load changes. |
| Capacitor banks       | Cost-effective reactive power compensation.                                                  | Does not eliminate harmonics (can amplify them), relies on rigid, step-based control.   |
| Active power filters  | Eliminates multiple harmonics simultaneously, no resonance risk, dynamic real-time response. | N/A – offers a comprehensive, flexible approach for dynamic loads.                      |

# CASE STUDIES

## APF Wallmount 80 A



Turin - **Chemical manufacturing**  
Location: **Italy**  
APF capacity: **80A x 1 unit**



**Background:** Italy, Turin. The site is a chemical manufacturing facility operating heavy industrial pumps alongside multiple continuous mixing systems.

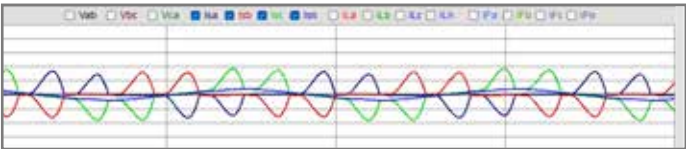
**The problem:** the simultaneous operation of these heavy, non-linear loads created significant power quality issues on the grid. Specifically, the equipment generated current harmonics driving the THDi up to 62%, while the power factor dropped to an inefficient 0.84-0.90.

**The solution:** we installed a compact, 80A wall-mounted Active Power Filter to mitigate the harmonic distortion and correct the power factor.

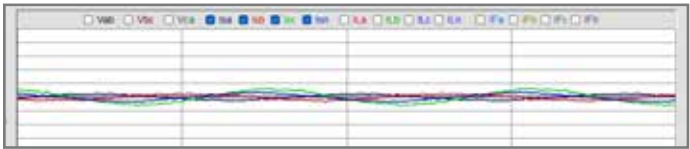
**The result:** post-installation measurements showed excellent improvement. The THDi was successfully reduced to a healthy 4-8%, and the power factor was corrected to nearly 0.94, ensuring a much more stable and efficient electrical network.



### BEFORE



### AFTER



### BEFORE

| Source side |    |   |         |       |   |
|-------------|----|---|---------|-------|---|
| Isa         | 11 | A | THD Isa | 62.56 | % |
| Isb         | 11 | A | THD Isb | 61.05 | % |
| Isc         | 23 | A | THD Isc | 27.28 | % |

### AFTER

| Source side |    |   |         |      |   |
|-------------|----|---|---------|------|---|
| Isa         | 11 | A | THD Isa | 8.94 | % |
| Isb         | 11 | A | THD Isb | 8.10 | % |
| Isc         | 24 | A | THD Isc | 4.38 | % |

# APF Wallmount 60A-60 A



Bristol - Headquarters office

Location: UK

APF capacity: 120A x 1 unit



**Background:** UK, Bristol (One Glass Wharf).

A large corporate business center with high-density loads, including HVAC (VFDs), LED lighting, and thousands of PCs.

**The problem:** heavy reliance on switch-mode power supplies generated significant harmonics (THDi at 20–21%).

While PF was decent (0.94), the harmonic distortion risked overloading neutral conductors.

**The solution:** installed a 120A parallel APF system (two 60A wall-mounted units) configured specifically for targeted harmonic elimination.

**The result:** THDi successfully reduced to a safe 7–8%. PF saw a slight optimization to 0.96, completely eliminating harmonic stress on infrastructure of the building.



## BEFORE

| Source side |     |   |         |       |   |
|-------------|-----|---|---------|-------|---|
| Isa         | 289 | A | THD_Isa | 19.62 | % |
| Isb         | 277 | A | THD_Isb | 21.26 | % |
| Isc         | 303 | A | THD_Isc | 20.65 | % |

## AFTER

| Source side |     |   |         |      |   |
|-------------|-----|---|---------|------|---|
| Isa         | 313 | A | THD_Isa | 8.19 | % |
| Isb         | 306 | A | THD_Isb | 8.54 | % |
| Isc         | 316 | A | THD_Isc | 7.76 | % |

## BEFORE

|           |      |
|-----------|------|
| PFsa      | 0.95 |
| PFsb      | 0.93 |
| PFsc      | 0.93 |
| PFs Total | 0.94 |

## AFTER

|           |      |
|-----------|------|
| PFsa      | 0.97 |
| PFsb      | 0.95 |
| PFsc      | 0.96 |
| PFs Total | 0.96 |

## BEFORE



## AFTER



# CASE STUDIES

## APF 120 A



AirTrunk - Data Centre

Location: **Singapore**

APF capacity: **120A x 6 units**



**Background:** Singapore. The site is the AirTrunk Data Centre, a state-of-the-art hyperscale facility housing vast arrays of high-density computing infrastructure and the extensive precision cooling systems required to maintain optimal operating temperatures.

**The problem:** the facility's immense power consumption is driven heavily by non-linear loads. Specifically, the tens of thousands of switch-mode power supplies packed into the server racks, coupled with the massive VFDs running the chiller plants and computer room air handlers, created substantial grid pollution. These continuous operations pushed the THDi up to 22-25% and dragged the power factor down to an inefficient 0.76. In a hyperscale environment, this level of distortion leads to excessive transformer heating, degraded energy efficiency, and potential instability across the power distribution network.

**The solution:** to effectively manage the harmonic profile across multiple distribution boards, we deployed a targeted mitigation system consisting of 6 units of 120A APF. This provided a flexible 720A total capacity to actively cancel harmonic currents at the source and perform dynamic power factor correction.

**The result:** post-installation measurements demonstrated excellent power quality restoration. The THDi was aggressively reduced to a compliant 3-4%, and the power factor was corrected to a near-perfect 0.99. This optimization significantly lowered thermal stress on the electrical infrastructure, improved the facility's overall energy efficiency, and ensured the absolute reliability required for continuous hyperscale data operations.



# APF 600-700-800-900 A



## Plastic Factory - LEGO Manufacturing Location: Vietnam

APF capacity: **600A x 1 unit -  
700A x 3 units - 800A x 1 units -  
900A x 7 units**

**Background:** Vietnam. The site is a large-scale plastic manufacturing facility for LEGO Manufacturing Vietnam, housing extensive production halls equipped with heavy-duty plastic injection molding machines, automated material handling robotics, and large industrial cooling systems.

**The problem:** the facility's high-volume production relies heavily on non-linear loads, primarily thousands of Variable Frequency Drives and servo motors powering the injection molding machines, extruders, and the central chilling plant. The simultaneous operation of this heavy equipment generated severe current harmonics, pushing the THDi to a concerning 26-30% and causing the power factor to plummet to an inefficient 0.68. This excessive grid pollution threatened to cause severe transformer overheating, reduced the plant's overall energy efficiency, and risked costly interruptions to precision manufacturing processes.

**The solution:** to address the extreme power quality demands of this mega-facility, we engineered and deployed a massive, plant-wide harmonic mitigation system. The installation comprised a total of 12 high-capacity APF units strategically distributed across the electrical network: 1 unit of 600A, 3 units of 700A, 1 unit of 800A, and 7 units of 900A. This provided a monumental combined capacity of 9,800A to dynamically cancel harmonic distortion and provide robust power factor correction at the source.

**The result:** post-installation measurements revealed exceptional grid stabilization across the entire plant. The THDi was dramatically reduced to a safe, compliant 4-5%, while the power factor was corrected to an optimal 0.97. This massive intervention eliminated thermal stress on the electrical infrastructure, maximized energy efficiency, and provided the pristine power quality required for uninterrupted, high-precision toy manufacturing.



# CASE STUDIES

## APF 150 A



**Casino - Marina Bay Sands**

Location: **Singapore**

APF capacity: **150A x 2 units**

**Background:** Singapore. The site is the iconic Marina Bay Sands Casino, a massive entertainment complex featuring an expansive gaming floor densely packed with electronic gaming machines, elaborate LED video walls, and heavy-duty, continuous climate control systems.

**The problem:** the massive concentration of electronic equipment created significant power quality issues. This disruption was primarily caused by the switch-mode power supplies in the gaming machines and displays, combined with the large VFDs running the 24/7 air conditioning network. These combined non-linear loads generated substantial current harmonics, driving the THDi up to 18-21% and dropping the power factor to an inefficient 0.78. Left unaddressed, this distortion risked causing screen flickering on gaming terminals, erratic behavior in sensitive electronics, and excessive thermal stress on the facility's electrical distribution network.

**The solution:** we installed 2 units of 150A APF to specifically target the electrical panels feeding the dense gaming floors and display networks, aggressively mitigating the harmonic distortion and correcting the power factor without interrupting the casino's round-the-clock operations.

**The result:** post-installation measurements showed excellent grid improvement. The THDi was successfully reduced to a clean 4-5%, and the power factor was corrected to a highly efficient 0.98. This guaranteed a perfectly stable, noise-free, and reliable power supply, ensuring maximum uptime and an uninterrupted experience on the gaming floor.



# APF 600-700-800-900 A



## TV Station - Formosa TV

Location: **Taipei, Taiwan**

APF capacity: **150A x 1 unit**



**Background:** Taipei, Taiwan. The site is a major television broadcasting facility for Formosa TV, utilizing a vast array of electronic equipment, including sensitive broadcasting gear, high-intensity LED studio lighting grids, and dense IT server rooms.

**The problem:** the facility's extensive use of non-linear loads created significant power quality issues on the grid. These problems were primarily driven by large-scale dimmable lighting arrays and thousands of switch-mode power supplies (SMPS) running the broadcasting servers and editing suites. These devices generated substantial current harmonics, driving the THDi up to 18-22%, while the power factor dropped to a suboptimal 0.75. This distortion introduced a risk of audio/visual interference and threatened the reliability of critical live broadcast equipment.

**The solution:** we installed a single 150A APF unit tailored to aggressively mitigate the harmonic distortion and correct the power factor without disrupting ongoing studio operations.

**The result:** post-installation measurements showed excellent improvement. The THDi was successfully reduced to a clean 4-5%, and the power factor was corrected to nearly 0.98, ensuring a highly stable, efficient, and noise-free electrical network essential for uninterrupted television broadcasting.





**Legend 100 - 150**  
**Legend 600 - 1200**

# LEGEND APF

## In a world of increasing electrical complexity, Legend is total power stability

Modern facilities are defined by complex, non-linear loads that degrade power integrity at the source. The Legend series is a sophisticated Active Power Filter that serves as your strategic defense of the facility. Legend delivers precise, real-time harmonic elimination and dynamic reactive power compensation for near-unity power factor.

### Benefits

**Elimination of resonance risks:** unlike passive filters, Legend is an active system that does not create a tuned circuit with your impedance of network. This prevents the dangerous amplification of harmonic currents, shielding sensitive electronics and capacitors from catastrophic resonance-induced damage.

**Total voltage integrity:** by neutralizing harmonic currents at the source, APF Legend significantly reduces total voltage harmonic distortion (THDv). This ensures a clean, stable voltage waveform, preventing “flicker”, malfunction, or premature failure of downstream precision equipment.

**Enhanced thermal and energy efficiency:** by filtering out the reactive and harmonic components of current, Legend lowers the overall RMS current flowing through your infrastructure. This directly reduces voltage drops and minimizes the temperature rise in transformers, switchgear, and cabling - extending the service life of your most expensive electrical assets.

**Dynamic power factor optimization:** APF Legend provides instantaneous, step-less reactive power compensation to maintain a near-unity power factor. This maximizes system capacity, eliminates utility penalties, and ensures your facility operates at peak electrical efficiency regardless of load volatility.

## Features

# The “Legend” advantage: next-generation active power filtering

## Unmatched power quality & efficiency

**Innovative CT-less installation:** enables full harmonic mitigation without the need for external current transformers, completely eliminating extra control cables for a simplified setup.

**Comprehensive harmonic mitigation:** eliminates up to 51 orders of harmonic currents generated by nonlinear loads, ensuring clean power delivery. Optional extended range up to the 71st harmonic.

**Dynamic reactive power compensation:** automatically corrects both lagging and leading power factors to optimize system efficiency.

**Intelligent auto-sensing operation:** automatically estimates the required compensation current - no manual supply impedance measurement or complex harmonic spectrum analysis required.

**Advanced architecture:** built on cutting-edge 3-level solid-state power converter technology for superior performance.

**Unmatched versatility:** broad voltage tolerance (157V – 528V) ensures stable harmonic mitigation in any electrical environment.

## Built for Uncompromising Reliability & Safety

**Real-time resonance detection:** equipped with intelligent technology to detect and protect against harmonic resonance in real-time.

**Smart overload prevention:** if load harmonics exceed capacity, the system safely shifts into current-limiting mode rather than shutting down - eliminating the severe overload risks associated with traditional passive filters.

**Auto-recovery overvoltage protection:** automatically disables the module during abnormal voltage spikes and instantly restarts compensation once mains voltage normalizes.

**Global Mode autonomous targeting:** automatically identifies and selects specific harmonic orders to eliminate without manual configuration, while intelligent resonance protection continuously ensures network stability and safety.

**Dynamic Force mode control:** allows precise setting of a target Displacement Power Factor (range: 0.6 lagging to 0.6 leading), dynamically forcing leading capacitive loads into stable lagging inductive profiles.

**Optimized thermal management:** specially designed air inlets and cooling fans aggressively dissipate heat, preventing thermal damage and ensuring the system operates at full capacity.

## Highly scalable & flexible design

**Grow on demand:** easily scale your power quality solution by operating up to 8 APF modules in parallel.

**Streamlined parallel scalability:** utilizes built-in internal communication between units to synchronize operation, eliminating the need for complex parallel CT wiring to reduce cabling and accelerate commissioning.

**Zero-downtime maintenance:** features an optional hot-swappable design, allowing modules to be removed or installed seamlessly without disconnecting the main power supply.

**Versatile integration:** compatible with 3-phase 3-wire and 4-wire setups, offering flexible current transformer placement on either the load side or power side.

**Durable build:** housed in a robust IP30-rated enclosure.

## Intuitive control & seamless connectivity

**10” colorful LCD touch screen:** a user-friendly interface that puts full control at your fingertips. View real-time power parameters, waveforms, and spectrum analysis.

**Deep system diagnostics:** easily configure compensation settings and track system history with an expansive event log that records up to 1,200 data entries.

**Universal communication:** seamlessly integrate into your existing building management or SCADA systems via Ethernet (Modbus TCP), RS-485 (J-Bus/Modbus RTU), and USB interfaces.

**Comprehensive contact options:** includes dedicated inputs/outputs (3 sets out, 1 set in) and an emergency power off (EPO) switch connection for ultimate control and safety.

**All-in-one design:** built-in control module eliminates the need for any external controllers.

## LEGEND 100 - LEGEND 150 TECHNICAL DATA SHEET

| MODEL                     |                               | LEGEND 100                                                                                                                     | LEGEND 150 |
|---------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------|
| SIZE (A)                  |                               | 100                                                                                                                            | 150        |
| ELECTRICAL SPECIFICATIONS | Rated voltage                 | 3 Phase 4 Wires: 157V - 460V (Line to Line)                                                                                    |            |
|                           |                               | 3 Phase 3 Wires: 157V - 528V (Line to Line)                                                                                    |            |
|                           | Phases                        | Three-phase                                                                                                                    |            |
|                           | Frequency                     | 50/60 ±3 Hz (auto-detect)                                                                                                      |            |
|                           | Harmonic correction           | From the 2nd to the 51st (optional extended range up to the 71st harmonic)                                                     |            |
|                           | Power factor correction       | Compensates for leading or lagging power factor loads.<br>Adjustable from 0.6 lagging power factor to 0.6 leading power factor |            |
|                           | Load balancing                | Between two phases and between phase and neutral                                                                               |            |
|                           | Response time                 | 25 µs                                                                                                                          |            |
| ENVIRONMENTAL PARAMETERS  | Operating temperature         | -10°C to +40°C without derating                                                                                                |            |
|                           | Relative humidity             | ≤ 95% (no condensation)                                                                                                        |            |
|                           | Altitude (a.s.l.)             | ≤ 2000 m at rated load current, above 2000m altitude rated load current reduced by 1% per 100m                                 |            |
|                           | Audible noise at 1 m.         | <65 dBA                                                                                                                        |            |
| GENERAL                   | Dimensions (WxDxH) mm         | IP31: 521 x 180 x 945                                                                                                          |            |
|                           |                               | IP30: 521 x 180 x 886                                                                                                          |            |
|                           | Weight (kg)                   | Master: 49.5                                                                                                                   |            |
|                           |                               | Slave: 47.5                                                                                                                    |            |
|                           | Protection class              | IP30/IP31                                                                                                                      |            |
|                           | Connections                   | 4-wire/3-wire                                                                                                                  |            |
|                           | Installation                  | Wall mounting                                                                                                                  |            |
|                           | Type                          | Monolithic                                                                                                                     |            |
|                           | Parallel connection up to (A) | 3600                                                                                                                           |            |
|                           | Max. parallel modules         | 24                                                                                                                             |            |
| CONNECTIVITY              | CT configuration              | Source side CT: closed loop control - load side CT: open loop control                                                          |            |
|                           | Built-in communication ports  | USB, RS485, Modbus RTU, EPO Ethernet port and dry relay contacts (1 in/3 out)                                                  |            |
|                           | User interface                | 10" colour LCD touch screen display                                                                                            |            |
|                           | Software                      | Data monitoring and storage software                                                                                           |            |
| REGULATIONS               | Standards                     | EN61000-6-4, EN55011, CISPR 11, IEC 61000-3-12, IEC 61000-3-11,                                                                |            |
|                           |                               | IEC 61000-6-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4,                                                                    |            |
|                           |                               | IEC 61000-4-5, IEC 61000-4-6, IEC 62477-1, EN 61000-4-8, EN61000-4-34                                                          |            |
|                           | Marking                       | EN 61000-3-4, IEEE 519-1992, EN60146<br>CE, UKCA                                                                               |            |

## LEGEND 600 - LEGEND 1200 TECHNICAL DATA SHEET

| MODEL                     |                                                                        | LEGEND 600                                                                                                                     | LEGEND 1200      |
|---------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------|
| SIZE (A)                  |                                                                        | 600                                                                                                                            | 1200             |
| ELECTRICAL SPECIFICATIONS | Rated voltage                                                          | 3 Phase 4 Wires: 157V - 460V (Line to Line)                                                                                    |                  |
|                           |                                                                        | 3 Phase 3 Wires: 157V - 528V (Line to Line)                                                                                    |                  |
|                           | Phases                                                                 | Three-phase                                                                                                                    |                  |
|                           | Frequency                                                              | 50/60 ±3 Hz (auto-detect)                                                                                                      |                  |
|                           | Harmonic correction                                                    | From the 2nd to the 51st (optional extended range up to the 71st harmonic)                                                     |                  |
|                           | Power factor correction                                                | Compensates for leading or lagging power factor loads.<br>Adjustable from 0.6 lagging power factor to 0.6 leading power factor |                  |
|                           | Load balancing                                                         | Between two phases and between phase and neutral                                                                               |                  |
|                           | Response time                                                          | 25 µs                                                                                                                          |                  |
| ENVIRONMENTAL PARAMETERS  | Operating temperature                                                  | -10°C to +40°C at rated load current, > +40 °C at reduced load current                                                         |                  |
|                           | Relative humidity                                                      | ≤ 95% (no condensation)                                                                                                        |                  |
|                           | Altitude (a.s.l.)                                                      | ≤ 2000 m at rated load current, above 2000m altitude rated load current reduced by 1% per 100m                                 |                  |
|                           | Audible noise at 1 m.                                                  | <65 dBA                                                                                                                        |                  |
| GENERAL                   | Cabinet Dimensions (WxDxH) mm                                          | 650 x 896 x 1500                                                                                                               | 650 x 896 x 1950 |
|                           | Cabinet weight (kg)                                                    | 145                                                                                                                            | 221              |
|                           | Module Dimensions (WxDxH) mm                                           | Hot-swappable: 500 x 775 x 130<br>Terminal block: 500 x 791 x 130                                                              |                  |
|                           | Module weight (kg)                                                     | 44                                                                                                                             |                  |
|                           | Protection class                                                       | Cabinet: IP20                                                                                                                  |                  |
|                           |                                                                        | Module: IP30                                                                                                                   |                  |
|                           | Connections                                                            | 4-wire/3-wire                                                                                                                  |                  |
|                           | Installation                                                           | Floor standing                                                                                                                 |                  |
|                           | Type                                                                   | Modular                                                                                                                        |                  |
|                           | Parallel connection up to (A)                                          | 3600                                                                                                                           |                  |
|                           | Max. no. of modules per system (100 or 150 A in a mixed configuration) | Up to 4                                                                                                                        | Up to 8          |
|                           | Max. parallel systems                                                  | 6                                                                                                                              | 3                |
|                           | CT configuration                                                       | Source side CT: closed loop control - load side CT: open loop control                                                          |                  |
| CONNECTIVITY              | Built-in communication ports                                           | USB, RS485, Modbus RTU, EPO Ethernet port and dry relay contacts (1 in/3 out)                                                  |                  |
|                           | User interface                                                         | 10" colour LCD touch screen display                                                                                            |                  |
|                           | Software                                                               | Data monitoring and storage software                                                                                           |                  |
| REGULATIONS               | Standards                                                              | EN61000-3-4, IEEE 519-1992, EN60146                                                                                            |                  |
|                           |                                                                        | EN61000-6-4, EN55011, IEC 61000-3-12, IEC 61000-3-11,                                                                          |                  |
|                           |                                                                        | IEC 61000-6-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4,                                                                    |                  |
|                           |                                                                        | IEC 62477-1, IEC 61000-4-5, IEC 61000-4-6,                                                                                     |                  |
|                           |                                                                        | EN 61000-4-8, EN61000-4-34                                                                                                     |                  |
|                           | Marking                                                                | CE, UKCA                                                                                                                       |                  |



**Legend SVG 70 - 100**  
**Legend SVG 400 - 800**

# LEGEND SVG

## Precision. Speed. Profit.

Unlock the full potential of your grid with next-gen SVG.

Traditional PF correction is too slow for modern loads. The Static Var Generator acts as a digital “smart source”, instantly neutralizing reactive power before it hits your bill.

- **Instant correction:** real-time VSC phase alignment.
- **Unity power factor:** eliminate utility penalties permanently.
- **Maximum efficiency:** recover lost capacity in your existing cables and transformers.

Don't just manage your power. Master it.

## Benefits

**The Legend is engineered to deliver peace of mind and measurable operational improvements to your facility.**

**Real-time power factor correction:** unlike capacitor banks, SVG reacts instantly (in milliseconds), keeping your power factor close to 1 under dynamic loads.

**Elimination of utility penalties:** by maintaining a near-unity power factor, you avoid extra charges from the utility company.

**Increased system capacity:** reducing reactive current frees up capacity in your cables, transformers, and generators, allowing you to connect more loads without upgrades.

**Improved voltage stability:** SVG stabilizes voltage fluctuations, which protects sensitive equipment and improves overall system reliability.

**Higher energy efficiency & lower losses:** by minimizing reactive power flow, you reduce  $I^2R$  losses in the network, leading to better efficiency and lower operating costs.

## Features

### Superior Power Quality & Performance

**Dynamic power factor optimization:** smoothly compensates both lagging and leading reactive power (configurable from 0.6 to 0.6). Unlike passive systems that risk over-compensation during low-load periods, the Legend actively monitors your network and injects the exact compensation needed in under 25  $\mu$ s.

**Dynamic Force PF regulation:** enables the precise targeting of a Displacement Power Factor (ranging from 0.6 lagging to 0.6 leading), actively converting leading capacitive networks into stable, inductive lagging profiles.

**Next-generation 3-level architecture:** delivers high efficiency, superior waveform quality, and network stabilization, including automatic correction for unbalanced three-phase utility loads.

**Broad system compatibility:** designed for seamless integration with both 3-Phase 3-Wire and 4-Wire systems.

**Unmatched versatility:** broad voltage tolerance (157V – 528V) ensures stable PF correction in any electrical environment.

### Scalability & space efficiency

**Modular, high-capacity output:** delivers 103kVAR per power module and scales seamlessly up to 2494kVAR in parallel operation to grow alongside your power demands of facility.

**Integrated parallel communication:** enables autonomous synchronization across multiple units without the need for parallel CT wiring, significantly reducing installation cabling and accelerating system commissioning.

**Zero-downtime upgrades:** equipped with hot-scalable power modules, allowing you to expand capacity or perform maintenance without shutting down critical operations.

**Maximized floor space:** the high-power-density design delivers massive compensation power in a fraction of the physical footprint required by traditional, bulky LC (inductor-capacitor) banks.

### Proactive safety & unmatched ROI

**Total system safety & resonance immunity:** eliminates the severe electrical resonance risks associated with traditional passive filters. Because the SVG operates as an active current source, it cannot create harmonic resonance with the grid. Intelligent, closed-loop control and real-time harmonic monitoring provide built-in self-protection, ensuring safe, stable reactive power compensation without amplifying existing network distortion.

**Overload-proof reliability:** guarantees continuous, safe operation even under heavy demand, ensuring your facility never experiences an overload failure.

**Maximized ROI & low maintenance:** built for longevity without the wear-prone mechanical components of traditional systems. This active system lowers energy costs, requires minimal maintenance, and ensures strict utility grid compliance to prevent power factor penalties.

### Intuitive operation & control

**Advanced user interface:** features a user-friendly 10" colorful LCD touch screen for effortless monitoring, parameter adjustments, and system diagnostics.

**Flexible control modes:** accommodates your specific setup by offering both open and closed-loop control, depending on whether your CT location is on the source side or the load side.

**Advanced system tracking:** simplify configuration and monitor performance trends through a comprehensive 1,200-entry event log for detailed historical analysis.

**Universal connectivity:** ensure broad compatibility with standard management systems via Ethernet (Modbus TCP), RS-485 (J-Bus/Modbus RTU), and standard USB interfaces.

**Comprehensive control & safety:** features integrated I/O contacts (1 input, 3 outputs) and a dedicated Emergency Power Off (EPO) interface for secure system management.

**All-in-one design:** built-in control module eliminates the need for any external controllers.

## LEGEND SVG 70 - LEGEND SVG 100 TECHNICAL DATA SHEET

| MODEL                     |                                  | LEGEND SVG 70                                                                                                                  | LEGEND SVG 100 |
|---------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------|
| SIZE (KVAR)               |                                  | 69                                                                                                                             | 103            |
| ELECTRICAL SPECIFICATIONS | Rated voltage                    | 3 Phase 4 Wires: 157V - 460V (Line to Line)                                                                                    |                |
|                           |                                  | 3 Phase 3 Wires: 157V - 528V (Line to Line)                                                                                    |                |
|                           | Phases                           | Three-phase                                                                                                                    |                |
|                           | Frequency                        | 50/60 ±3 Hz (auto-detect)                                                                                                      |                |
|                           | Harmonic correction              | From the 2nd to the 25th                                                                                                       |                |
|                           | Power factor correction          | Compensates for leading or lagging power factor loads.<br>Adjustable from 0.6 lagging power factor to 0.6 leading power factor |                |
|                           | Load balancing                   | Between two phases and between phase and neutral                                                                               |                |
|                           | Response time                    | 25 µs                                                                                                                          |                |
| ENVIRONMENTAL PARAMETERS  | Operating temperature            | -10°C to +40°C without derating                                                                                                |                |
|                           | Relative humidity                | ≤ 95% (no condensation)                                                                                                        |                |
|                           | Altitude (a.s.l.)                | ≤ 2000 m at rated load current, above 2000m altitude rated load current reduced by 1% per 100m                                 |                |
|                           | Audible noise at 1 m.            | <65 dBA                                                                                                                        |                |
| GENERAL                   | Dimensions (WxDxH) mm            | IP31: 521 x 180 x 945                                                                                                          |                |
|                           |                                  | IP30: 521 x 180 x 886                                                                                                          |                |
|                           | Weight (kg)                      | Master: 49.5                                                                                                                   |                |
|                           |                                  | Slave: 47.5                                                                                                                    |                |
|                           | Protection class                 | IP30/IP31                                                                                                                      |                |
|                           | Connections                      | 4-wire/3-wire                                                                                                                  |                |
|                           | Installation                     | Wall mounting                                                                                                                  |                |
|                           | Type                             | Monolithic                                                                                                                     |                |
|                           | Parallel connection up to (KVAR) | 2494                                                                                                                           |                |
|                           | Max. parallel modules            | 24                                                                                                                             |                |
|                           | CT configuration                 | Source side CT: closed loop control - load side CT: open loop control                                                          |                |
| CONNECTIVITY              | Built-in communication ports     | USB, RS485, Modbus RTU, EPO Ethernet port and dry relay contacts (1 in/3 out)                                                  |                |
|                           | User interface                   | 10" colour LCD touch screen display                                                                                            |                |
|                           | Software                         | Data monitoring and storage software                                                                                           |                |
| REGULATIONS               | Standards                        | EN61000-6-4, EN55011, CISPR 11, IEC 61000-3-12, IEC 61000-3-11,                                                                |                |
|                           |                                  | IEC 61000-6-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4,                                                                    |                |
|                           |                                  | IEC 61000-4-5, IEC 61000-4-6, IEC 62477-1, EN 61000-4-8, EN61000-4-34                                                          |                |
|                           |                                  | EN 61000-3-4, IEEE 519-1992, EN60146                                                                                           |                |
|                           | Marking                          | CE, UKCA                                                                                                                       |                |

## LEGEND SVG 400 - LEGEND SVG 800 TECHNICAL DATA SHEET

| MODEL                     |                                                                          | LEGEND SVG 400                                                                                                                 | LEGEND SVG 800   |
|---------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------|
| SIZE (kVAR)               |                                                                          | 415                                                                                                                            | 831              |
| ELECTRICAL SPECIFICATIONS | Rated voltage                                                            | 3 Phase 4 Wires: 157V - 460V (Line to Line)                                                                                    |                  |
|                           |                                                                          | 3 Phase 3 Wires: 157V - 528V (Line to Line)                                                                                    |                  |
|                           | Phases                                                                   | Three-phase                                                                                                                    |                  |
|                           | Frequency                                                                | 50/60 $\pm$ 3 Hz (auto-detect)                                                                                                 |                  |
|                           | Harmonic correction                                                      | From the 2nd to the 25th                                                                                                       |                  |
|                           | Power factor correction                                                  | Compensates for leading or lagging power factor loads.<br>Adjustable from 0.6 lagging power factor to 0.6 leading power factor |                  |
|                           | Load balancing                                                           | Between two phases and between phase and neutral                                                                               |                  |
|                           | Response time                                                            | 25 $\mu$ s                                                                                                                     |                  |
| ENVIRONMENTAL PARAMETERS  | Operating temperature                                                    | -10°C to +40°C at rated load current, > +40 °C at reduced load current                                                         |                  |
|                           | Relative humidity                                                        | $\leq$ 95% (no condensation)                                                                                                   |                  |
|                           | Altitude (a.s.l.)                                                        | $\leq$ 2000 m at rated load current, above 2000m altitude rated load current reduced by 1% per 100m                            |                  |
|                           | Audible noise at 1 m.                                                    | <65 dBA                                                                                                                        |                  |
| GENERAL                   | Cabinet Dimensions (WxDxH) mm                                            | 650 x 896 x 1500                                                                                                               | 650 x 896 x 1950 |
|                           | Cabinet weight (kg)                                                      | 145                                                                                                                            | 221              |
|                           | Module Dimensions (WxDxH) mm                                             | Hot-swappable: 500 x 775 x 130<br>Terminal block: 500 x 791 x 130                                                              |                  |
|                           | Module weight (kg)                                                       | 44                                                                                                                             |                  |
|                           | Protection class                                                         | Cabinet: IP20                                                                                                                  |                  |
|                           |                                                                          | Module: IP30                                                                                                                   |                  |
|                           | Connections                                                              | 4-wire/3-wire                                                                                                                  |                  |
|                           | Installation                                                             | Floor standing                                                                                                                 |                  |
|                           | Type                                                                     | Modular                                                                                                                        |                  |
|                           | Parallel connection up to (kVAR)                                         | 2494                                                                                                                           |                  |
|                           | Max. no. of modules per system (69 or 103 kVAR in a mixed configuration) | Up to 4                                                                                                                        | Up to 8          |
|                           | Max. parallel systems                                                    | 6                                                                                                                              | 3                |
|                           | CT configuration                                                         | Source side CT: closed loop control - load side CT: open loop control                                                          |                  |
| CONNECTIVITY              | Built-in communication ports                                             | USB, RS485, Modbus RTU, EPO Ethernet port and dry relay contacts (1 in/3 out)                                                  |                  |
|                           | User interface                                                           | 10" colour LCD touch screen display                                                                                            |                  |
|                           | Software                                                                 | Data monitoring and storage software                                                                                           |                  |
| REGULATIONS               | Standards                                                                | EN61000-3-4, IEEE 519-1992, EN60146                                                                                            |                  |
|                           |                                                                          | EN61000-6-4, EN55011, IEC 61000-3-12, IEC 61000-3-11,                                                                          |                  |
|                           |                                                                          | IEC 61000-6-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4,                                                                    |                  |
|                           |                                                                          | IEC 62477-1, IEC 61000-4-5, IEC 61000-4-6,                                                                                     |                  |
|                           |                                                                          | EN 61000-4-8, EN61000-4-34                                                                                                     |                  |
|                           | Marking                                                                  | CE, UKCA                                                                                                                       |                  |

# COMPARISON TABLE

| FEATURE                          | ACTIVE FILTER (APF/SVG)                                                                                   | PASSIVE FILTER (CAPACITOR BANKS)                                                                                              |
|----------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Composition                      | IGBT Inverter (Solid-state technology).                                                                   | Combinations of inductors (L), capacitors (C), and contactors.                                                                |
| Response Time                    | Instantaneous (<10 ms). Reacts immediately to rapid load fluctuations.                                    | Slow (Seconds to Minutes). Relies on mechanical contactors closing and switching delays.                                      |
| Compensation Resolution          | Stepless and exact. Provides exactly the kVAR needed (e.g., precisely 32 kVAR).                           | Stepped (Blocks). Compensates in fixed steps (e.g., 25 kVAR at a time), causing over/under-compensation.                      |
| Operation Principle              | Inject anti-harmonic/reactive current to perfectly cancel out downstream issues.                          | Absorb harmonic current. May accidentally absorb harmonics from neighboring facilities on the grid.                           |
| Resonance                        | No resonance risk. Completely independent of supply properties.                                           | High resonance risk. Can cause harmful resonances with the grid; strongly dependent on network impedance.                     |
| Performance During Voltage Drops | Stable. Continues injecting full rated current even if grid voltage drops.                                | Degrades. Reactive power output drops drastically if grid voltage dips (output is proportional to the square of the voltage). |
| Component Aging                  | No effect on performance. The digital controller automatically adapts to any minor internal aging.        | Performance drop. Capacitor aging changes the tuning frequency, reducing filtering effectiveness over time.                   |
| Maintenance & Wear               | Low maintenance. Solid-state technology with no moving parts (only fans/filters to clean).                | High maintenance. Mechanical wear on contactors; capacitors degrade and require frequent replacement.                         |
| Leading Power Factor             | No leading power factor problems. Can compensate both inductive (lagging) and capacitive (leading) loads. | AC capacitors generate leading reactive power, causing heavy leading power factor penalties when the load is light.           |
| Overload Protection              | Cannot be overloaded. Output is digitally limited to its maximum rating safely.                           | Easily overloaded. Grid harmonics or changes in factory load can blow fuses or destroy capacitors.                            |
| Future Adaptability              | Future-proof. Easily handles new loads; settings can be changed via software.                             | Rigid. Requires expensive hardware retrofits or complete replacement if factory loads change.                                 |
| Cost Profile                     | Higher initial investment, but much lower Total Cost of Ownership (TCO).                                  | Cheaper upfront, but higher hidden costs (maintenance, replacements, potential downtime).                                     |
| Weight & Dimensions              | Light, compact, and often modular (wall-mount or rack-mount).                                             | Heavy, bulky, and requires large floor-standing cabinets.                                                                     |

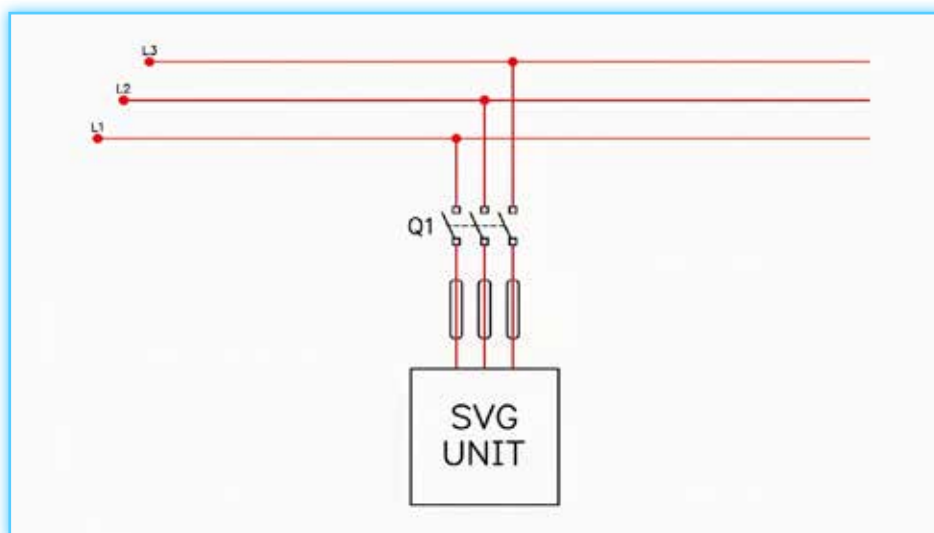
## Fewer components. Less complexity. More value.

The SVG solution represents a concrete evolution compared to traditional compensation systems. Its integrated architecture helps simplify installation, optimize available space, and make the system more organized, flexible, and ready for future needs.

One intelligent solution instead of a more complex structure: the advantage is already visible from the diagram.

### SVG - Direct and Streamlined Connection

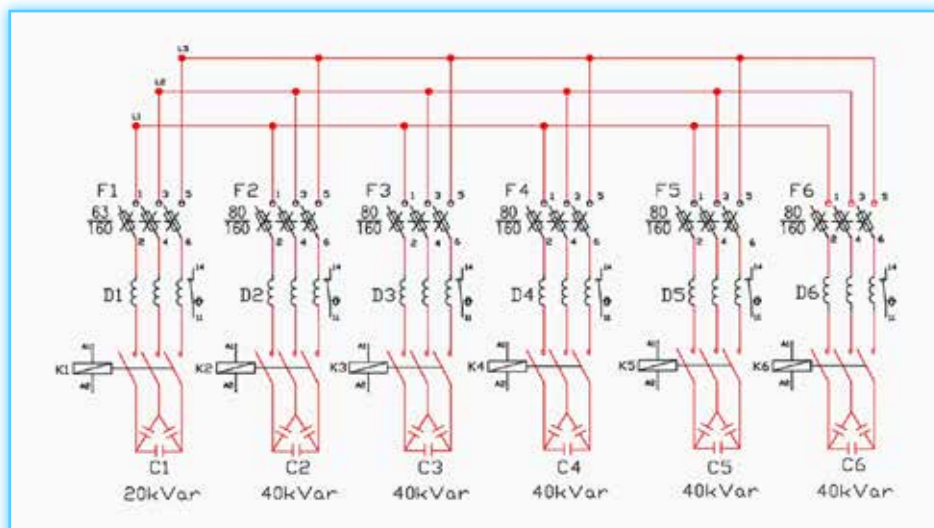
The SVG unit connects directly to the three-phase network through a clear and minimal electrical layout. This configuration highlights the essential nature of the system: one dedicated device managing the compensation function in a straightforward way.



### Capacitor Banks - Multiple Switching Stages

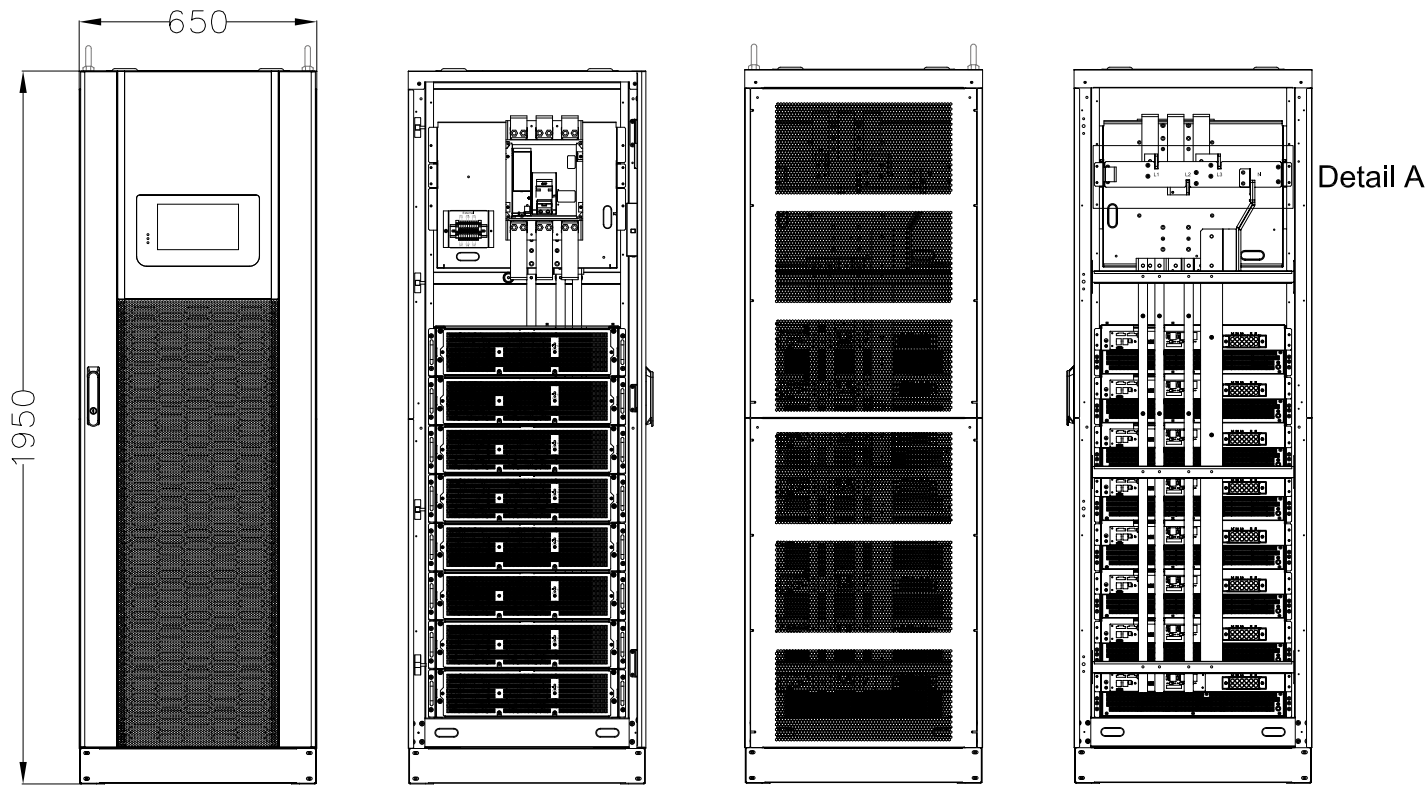
The capacitor bank layout shows a traditional step-based configuration, with several capacitor groups, fuses, contactors, and control elements.

Each stage operates as a separate section, creating a more articulated electrical scheme.



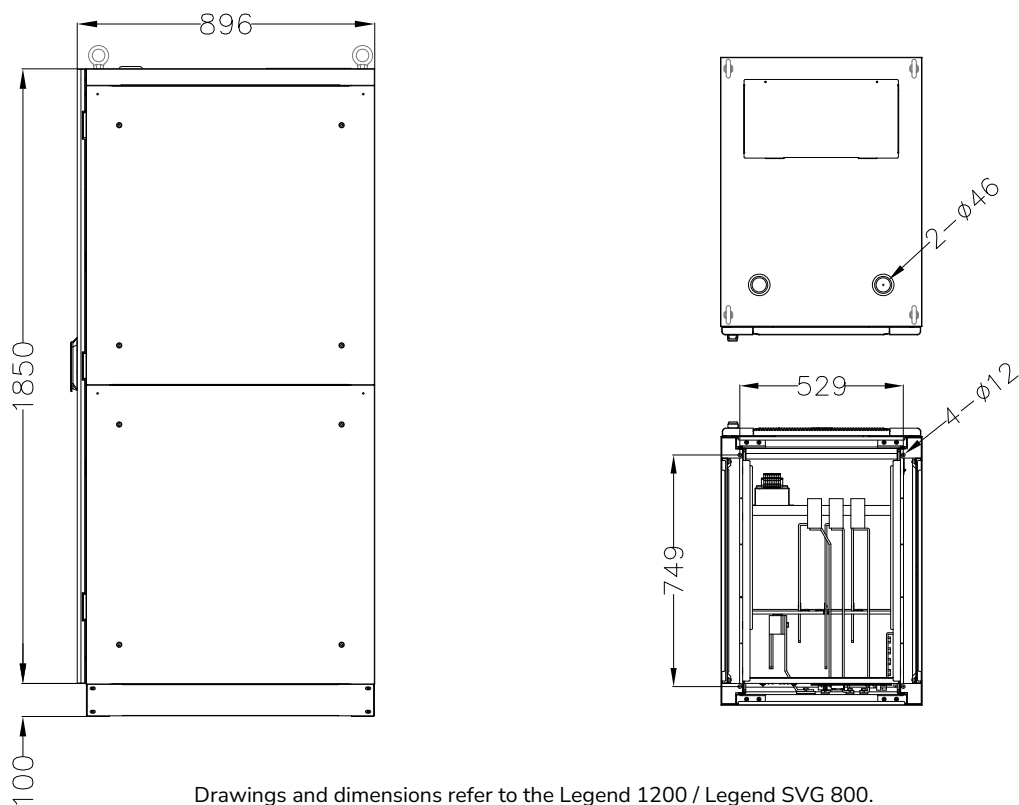
# DRAWINGS

## Legend & Legend SVG



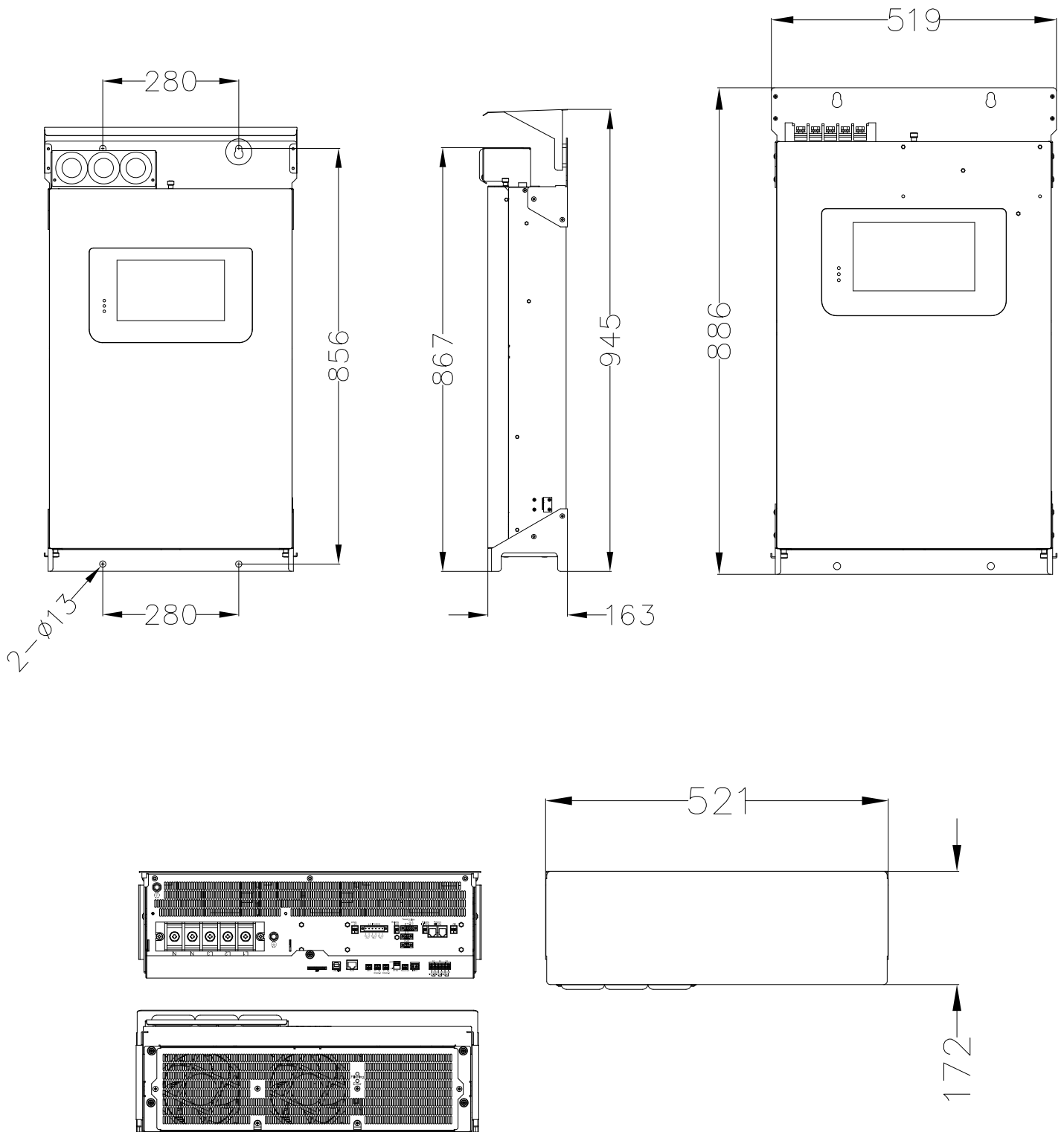
Front Internal View

Back Internal View



Drawings and dimensions refer to the Legend 1200 / Legend SVG 800.

## Legend & Legend SVG Wall Mount





**AblereX Electronics Italy Srl**

Viale Milanofiori · Strada 6 · Palazzo N1  
20089 Rozzano (MI) - IT  
info@ablerex.eu · Ph. +39 02 36696420  
www.ablerex.eu

**AblereX Electronics Ltd**

19 The Circle Queen Elizabeth Street,  
London, Greater London SE1 2JE - UK  
info@ablerex.uk · Ph. +44 (0) 7920 058834  
www.ablerex.uk