



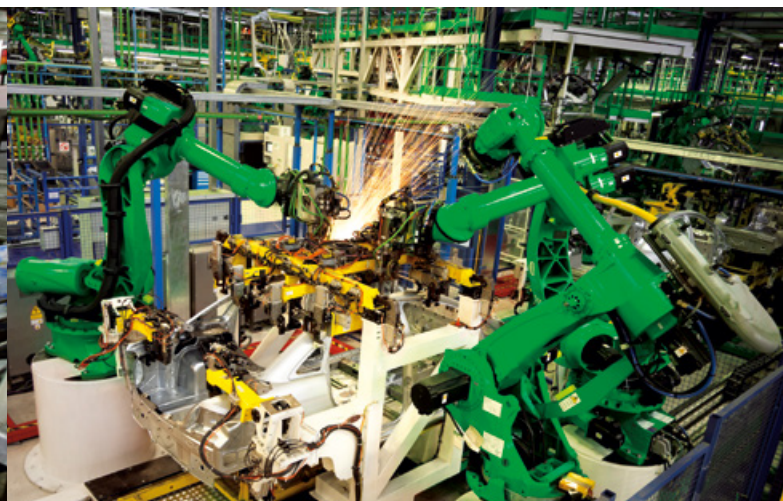
ADF

Restoring the perfect wave

 **COMSYS**
Creating Value through Power Quality™



Comsys ADF Technology helps to save energy and lower costs in industrial applications.



ADF is an active solution that instantaneously restores the wave form.

Restores the perfect wave

By continuously injecting exactly the right amount of compensation current power quality problems can be avoided.

Traditionally fixed, electro-mechanical and semiconductor controlled filters and/or compensators have been used to limit or minimize power quality problems in the network.

They operate mainly on a fixed or stepped basis using passive elements. All these solutions suffer from the same drawbacks – they add losses, are installation specific and have no ability to adapt to or follow dynamic load changes.

The Active Dynamic Filter (ADF) eliminates loss creating behaviors such as harmonics, flicker, voltage variations, resonances and reactive energy using a highly dynamic, stepless digitally controlled compensation and filtering approach. By continuously monitoring the network and injecting exactly the right amount of compensation current – at exactly the right time – the most efficient and accurate solution to any power quality problem can be achieved.

This approach enables the current waveform to be restored instantaneously, the current consumption to be lowered and changes in load or installation conditions to be fully compensated at all times.

For modern facilities, where load and network change constantly, this solution not only represents an opportunity, but is a necessity.

Introducing the ADF Technology

The ADF Family of products is a line of state-of-the-art active filters. They can compensate almost any load or problem by actively following the load, and dynamically generating compensation current. The figure below shows the principle of operation.

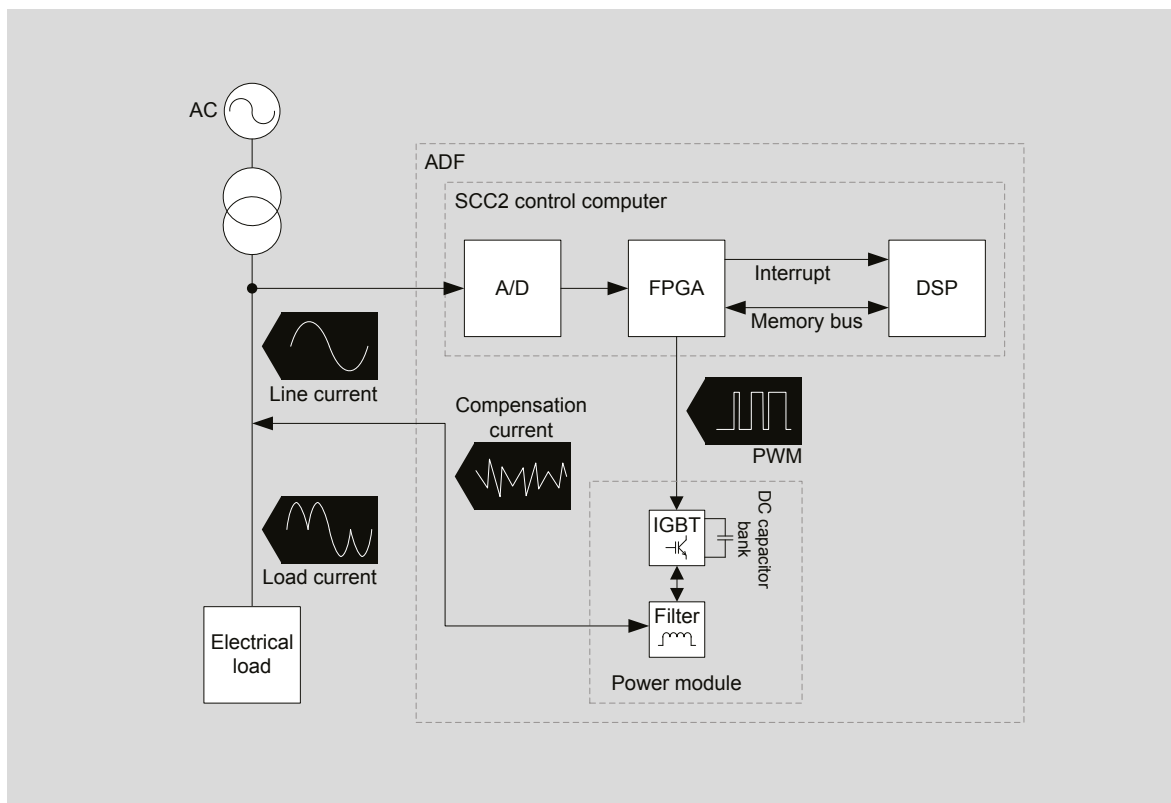
By measuring voltage and current at the load, the network conditions are monitored continuously. The control computer calculates the needed compensation current, which is generated by the power processor. The power processor can be seen as a very large digital current generator.

Following the load continuously, actively and dynamically is what makes the ADF superior. Even during increased load or changing conditions, the power quality will always be kept at its optimum. Since the ADF is connected in parallel with the load, commissioning and maintenance of the ADF can be performed during normal operation of the facility.

The ADF Family will co-exist with, integrate with and build upon existing compensation solutions, no matter their type. The ADF Family of power conditioners will protect your investment by building upon the already installed infrastructure and leveraging its function.



ADF P300 automation panel with the SCC2 control computer.



The principle of the ADF Technology.

The members in the ADF Concept



ADF P300 – industrial standard cost-efficient modular active filter. Built from the start with a modular approach, the ADF P300 will grow with the needs of the customer. When more power is needed, modules can be added. When even more power is needed, cabinets can be added. The ADF P300 Family of filters is suitable for harmonics, dynamic reactive compensation including inductive generation, load balancing and flicker compensation up to several MVA. The operating voltage is either up to 480V, or up to 690V. The standard ADF P300 is air-cooled.

ADF P300N – 4-wire version, which is capable of compensating zero-sequence harmonics. All other features and abilities are identical to the standard ADF P300.

ADF P100 – wall mounted, cost-efficient and compact form-factor active filters. Shares all features except modularity with the ADF P300. Excels in applications where low installation cost is required and where space is at a premium. Like the ADF P300, power can be expanded by adding cabinets. Suitable for harmonics, dynamic reactive compensation, and load balancing.

ADF P200 – specialized, wide-bandwidth air-cooled active filter capable of compensation up to the 5 kHz range and capable of damping resonances. The ability to actively dampen and suppress resonances is unique in the industry. The ADF P200 works equally well with harmonics as with interharmonics. The extremely fast response time makes the ADF P200 suitable for the most demanding applications.



ADF P300W – water cooled version, which is available in voltages up to 690V. The water cooled version is especially suitable to demanding applications in harsh environments.

ADF P700 – heavy-duty active filter with integrated medium voltage connection, available only with water cooling. The ADF P700 is based on ADF P300W components, but also includes step-up transformers, air conditioning, heating, and a container-shaped building. The ADF P700 is a turnkey solution suitable for heavy-duty industrial applications such as flicker control in electric arc furnaces.

Flexibility with modules

The ADF System is built up on modules and is easy to expand with more capacity. You can start with one power processor and enlarge with one or two more processors in the same cabinet. For further capacity you can add additional cabinets.



Easy to expand capacity by adding new processors and cabinets.

Industry-leading technology – ready for the smart grid

Selecting Comsys as your Power Quality partner means getting access to the most advanced compensation technology in the world. The ADF Family can be used for the standard problems of harmonic mitigation, load balancing and dynamic reactive compensation. But the technology is also able to handle resonances, flicker and voltage control, making the ADF Technology an industry leader.

By combining the ADF Technology with an easy-to-use web interface, accessible from a standard IT network, integrating supervision, control and logging in a single interface, the ADF Technology is not only part of the smart grid, but an important building block.



Versatile use



The current waveform is restored instantaneously with the ADF and lower power consumption.



The ADF eliminates harmonics, flicker, voltage variations, resonances and reactive energy.

Applications

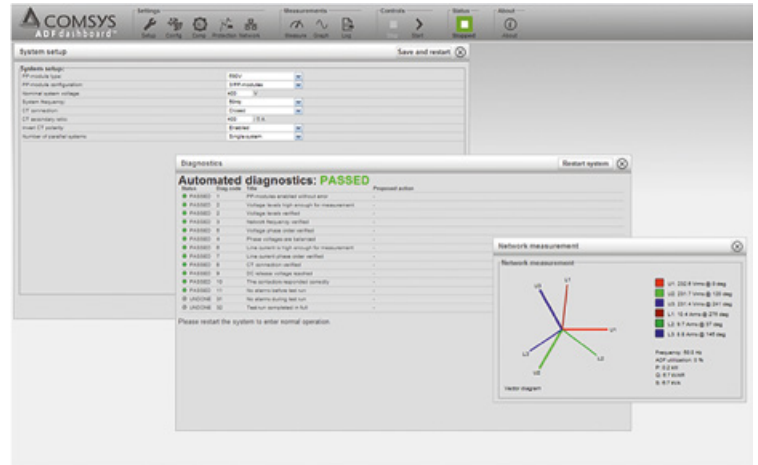
The ADF Family is suitable for most industrial filtering applications. The following are a few examples:

Problem	Applications	Benefits
Harmonics	VFDs DC-drives UPS loads Pump stations Waste water treatment Marine Offshore Semiconductor manufacture Hospitals Cranes	Meet industry regulation limits Reduce impact on other equipment Protect the investment by freeing up capacity Save energy Reduce neutral currents Fast changing harmonics are easily dealt with Commutation notches are reduced
Flicker	Welding lines Weak networks Generator applications Electric Arc Furnaces	Reduce flicker levels to acceptable values Improve welding efficiency and quality Eliminate disturbance and voltage drops Increase reliability due to reduced voltage drops
Resonances	Smart grids Wind power Solar parks Weak networks Marine Offshore	Eliminate resonances allowing production to run undisturbed Otherwise incompatible machinery will now work together Eliminate component failure Eliminate production interruptions
Unbalance	IT applications Welding Lighting	By balancing the load, the efficiency of the installation improves Eliminate highly loaded single phases
Reactive	IT loads UPS loads Dynamic loads Capacitive loads Solar parks X-ray, MRI	Restore power factor under dynamic loads Restore capacitive power factors ADFs are more cost-efficient than inductive compensation Keep the voltage stable with very fast reactive compensation Increase reliability due to reduced voltage drops

Easy handling

Easy to install

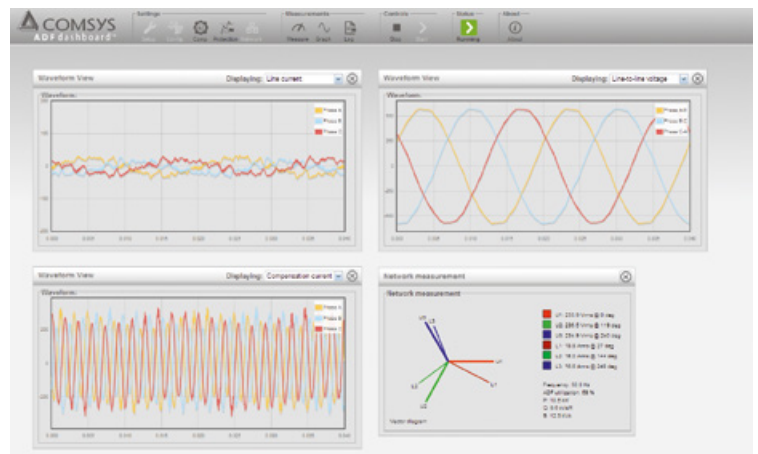
Connecting the ADF to the network is simple. Automated, integrated and intelligent commissioning tools and diagnosis make the ADF easy to commission. The tools are web based and require no installation of any special software on the host PC – a modern browser and a network cable is all that is needed. If any mistakes are made during commissioning, such as connecting the current transducers in the wrong way, the diagnosis tool will automatically detect this and suggest a remedy.



The tools are web based and require no special software.

Easy to supervise

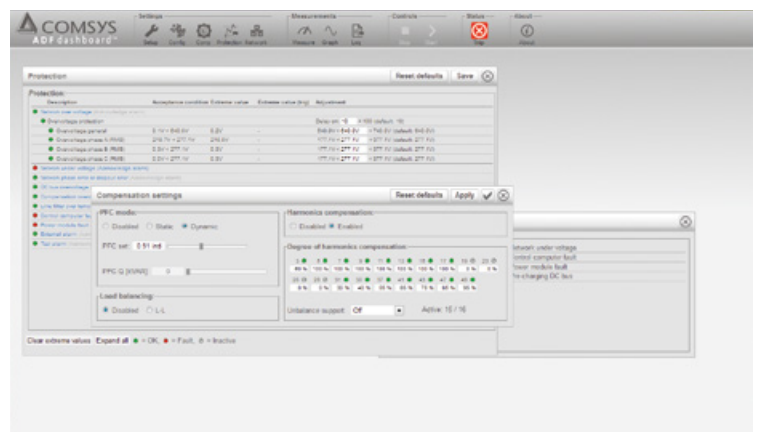
Supervision is as simple as installation. The ADF can be supervised via the internal company network, allowing for simple supervision and operation. Inputs and outputs can be remotely configured, allowing for integration into the existing supervision control.



Simple supervision and operation via the internal company network.

Easy to maintain

During maintenance, the modular and intelligent construction of the ADF Family makes the units easy to maintain. Spare parts are more easily interchanged and all components are accessible. Upgrades are simplified due to the modular construction. In large installation, a smaller number of spare parts are needed due to the similarity of small and large ADF units.



Detailed error analysis in the integrated Web application.

Better output in production with ADF power quality solutions

Comsys is your partner for power quality. Our business idea is to create value for our customers by improving their power quality. We develop solutions for improving power quality – our core technology, ADF.

We offer a full range of ADF power quality systems and customized solutions.

Contact us to discuss how we can improve your power quality and eliminate production interference.



Agent:



Comsys AB, Fältspatvägen 4, SE-224 78 Lund, Sweden
Tel +46 10 209 6800, Fax +46 10 209 6805
info@comsys.se www.comsys.se

Comsys AB does not assume any responsibility for use of any product or method described and also reserves the right to make changes at any time without prior notice in order to improve design and supply the best possible products.