

COMPANY PROFILE



CONDO D2211704

PROLOG

We are a mid-size German company working since many years in the field of Power Quality. Having a long-standing experience of more than 65 years, we offer a high level of expertise in this niche area to improve the quality of power delivered to our customers. The industrial systems in the modern distribution grids are getting increasingly complex and diverse. In such an environment, it is not only necessary to deliver power in sufficient quantity but in sufficient quality. Even a seemingly simple product, such as voltage, has not always ensured compliance with quality criteria, even if every single part of the power supply and every load is built according to the relevant standards. Insufficient voltage quality leads to expensive production losses and loss of warranty on machines and equipment used.

Our Company, Condensator Dominit GmbH, is the only company who can offer you a complete range of solutions and products in the field of Power Quality under the brand of GridClass® technology. In order to ensure perfect quality of voltage for your applications, we have necessary tools in our toolbox to solve the problems such as voltage sags, resonances, switching frequencies, reactive power, voltage fluctuations and other non-harmonic voltage distortions. Our team comprises of engineers, expert technicians, and physicists, to provide our customers with in-

**DOMINIT TO DOMINIT –
OVER 65 YEARS OF EXPERIENCE**

1950

Dominit Werke

Market innovation from

First of its kind React

Market Introduction:

novative, user-friendly, and solution-oriented systems. The past of the company lies into the manufacturing of classical compensation system and has earned a reputable name into the field of clean feed-in of modern renewable energy such as wind, solar and water energy. But the industrial users rely particularly on specialists from Sauerland when the topic of grid quality comes into the picture.

*Do you have a power supply problem?
Your machine doesn't work as desired?
Your network suffers from voltage dips?
Something is strange in your network?*

We have the solution to get over that problem. Promised!
Providing a profound consultation and technical expertise based on high ecological and economical standards is our core competence and passion. In this brochure, we give you a quick overview of our product portfolio.

Dr. rer. nat. Christian Dresel



om Brilon:
ive Power Compensation System
First High Voltage Filter System

1973

Lepper Doiminit, later ASEA-Lepper,
from 1982 ASEA Kondensatoren
Product launch: First controlled
Low-Voltage Filter System

NETWORK PHENOMENA AND ITS CONSEQUENCES – CORRECT SOLUTION – FITTING PRODUCT

FLICKER, VOLTAGE SAGS AND SWELLS, AND VOLTAGE UNBALANCE

Flicker, voltage sags and swells and voltage unbalances are changes in the effective value of voltage. This effects can lead to production outages which are costly and unplanned. If the voltage drops below 85% of the nominal voltage, it could lead to the tripping of contactors, frequency converters and switching power supplies. With our GridClass® products THYRA and OSKAR®, we take care of such problems irrespective of the source.

HARMONIC VOLTAGE DISTORTIONS

With an increasing number of non-linear loads such as Switched Mode Power Supplies (SMPS), rectifiers, Variable Frequency Drives (VFD), which bear a non-linear characteristic, resulting into non-sinusoidal current consumption. This results into the generation of harmonics voltages whose frequency are the integer multiples of the network frequency, which in turn determines the order of that respective harmonic. Any device or equipment, whether mechanical or electrical, can only be loaded completely under defined conditions. Furthermore, industrial networks are subject to relevant standards which must be complied with. In case of networks not conforming these standards, the warranty claims are voided, since the equipment manufacturers are not obliged if there is no standard power supply. But from the customer's point of view, it is a functional defect of that device or equipment. With our GridClass® products SOFIA®, MIA® and MIKA, the „harmonics“ are filtered and customer's power supply network is optimized and stabilized.

RESONANCE VOLTAGE DISTORTIONS

In addition to the harmonic voltage distortions, whose frequencies are the integer multiples of fundamental frequency, there are some more reasons for the distortion of the voltage waveforms. Self-commutated power converters of all types supply high-frequency voltage distortions based on the switching frequency of power electronics to the connected power supply. Thyristor controllers can produce commutation noddges of different depths up to double zero crossings. Network resonances caused by the interaction of capacitive and inductive components produce in some cases serious and destructive overvoltages. In virtually all cases where a resonance point exists, the resonance is either permanently excited by nonlinear loads or activated by switching processes.

1988

ABB Capacitors

Product launch: COMFIL Combi-Filter Systems, DYNACOMP Dynamic Compensator, Active Harmonic Filter PQF, SCOMP encapsulated HS-System with arc fault test
Market Innovation: ALFC Flicker compensation

In both cases, the non-harmonic voltage distortions can be attenuated using our products RESI, SOFIA®-HP and MIKA, so that disturbances of higher order voltage distortions do not burden the respective network.

REACTIVE POWER

Electrical loads, such as motors, transformers, welding machines, operate according to the induction principle and require inductive reactive power for the formation of the magnetic fields. This power is not converted into mechanical movement or heat, like the real power, but alternately oscillates between generator and load. The customer who requires this kind of power is charged based per kvar by the utility company. However, there are some relaxations. The most common specification for industrial customers is to maintain their power factor above $\cos \phi \approx 0.9$. The reference to the inductive reactive power is calculated with a working rate of, for example, 1 Cent/kvarh (Price sheet 10 of Westnetz). Thus, in addition to the active energy (real energy), the overconsumption of reactive energy (usage in kvarh) is calculated. These additional costs can be avoided by means of a reactive current compensation system by providing the inductive reactive current over-covering with choked capacitors and automatically regulated in power stages. Condensator Dominit is the compensation specialist and has the necessary tool for every type of reactive power. The harmonic filters SOFIA® and MIA® are used to compensate for distortion-free power. The capacitive systems THYRA and KLARA, the inductive INKA and the extensive CLASSIC range are available for fundamental oscillating reactive power. At last, the medium voltage compensation units of the MIKA group complete the unique product portfolio.

FREQUENCY DISTORTION

In European Network of Transmission System Operators for Electricity (UCTE), as well as in many other strong power distribution networks worldwide, the network frequency is subject to a very narrow tolerance range which is by default never violated. This tolerance range in Germany is in the range of 47.5 Hz to 51.5 Hz, thus guaranteeing a reliable guide for every consumer and every producer. Therefore, only the energy supplier is responsible for ensuring the grid frequency in the public distribution grid. The situation is different in the case of self-sustaining „island networks“, as described, for example, in emergency power operation in hospitals or on ships. If the current-generating generator is too weak for the loads or if the generator feeds unwanted harmonic oscillations into the island network, the network is destabilized in this phenomenon as well. If there is a problem, then contact our team of experts in matters of grid quality. The Condensator Dominit team will be very glad to help you.

LISA

LISA - DELIVERY, COMMISSIONING, SERVICE, ANALYSIS

Our service to our customer is the most important aspect of our business. We believe that the best product quality deserves the best support. For this reason, we offer you, through our LISA program, a tailored package for all your needs:

Analysis of your electrical network

We perform qualified studies of power supply networks (low and high voltage). In doing so, we are investigating the network not only to the

range prescribed by standard (EN 50 160 etc.) up to 2,500 Hz but also beyond 20 kHz. It shows that more and more disturbances in frequency ranges > 2 kHz are available!

Upon completion of the measurement, the customer receives a report from us which contains:

- All measured values with diagram or table
- Summary of results
- Recommendation for required solution

2005

Condensator Dominit

Dr. Christian Dresel overtakes as the chairman of the company

2008

Market Innovation

CLMQ II - Dynamic special design for



on:
nic compensation,
r switching delays of 20 ms

2009

Market innovation:
AVS for voltage stabilization

FLICKER

VOLTAGE DIPS

OVERVOLTAGE

UNBALANCE

*VOLTAGE
CONDITIONING*

HARMONICS

*FILTERING
HARMONICS*

*HARMONICS OF
HIGHER ORDER*

RESONANCES

*DAMPENING OF
RESONANT
HARMONICS*

REACTIVE POWER

*COMPENSATING
OF
REACTIVE
POWER*

INTERNAL REASONS

THYRA

EXTERNAL REASONS

OSKAR®

SOFIA®

MLA®

MIKA

RESI

SOFIA®-HP

MIKA

INDUCTIVE

INKA

CAPACITIVE

THYRA KLARA
CLASSIC

MIKA



OSKOR® -
Online-supply-korrektion with adaptive regulation

OSKOR® sets new standards in electrical power supply technology. Voltage dips in the electrical power supply are the main cause of costly unscheduled production outages. With OSKOR®, the mains voltage is maintained continuous using power electronics and the system is dynamically designed to keep voltage constant at the desired setpoint. Hence, the typical voltage drops rides through with utmost accuracy and precision.

SΦFIA® -
Supply optimization by voltage controlled harmonic filter with intelligent adaptation

SΦFIA® sets new standards in voltage-controlled harmonic filtering. With an increasing number of non-linear loads, e.g. frequency converters or switching power supplies, the number of loads with a non-linear U-I characteristic increases in the power system. This reacts on the electrical power supply network as if it were a current source that feeds integer multiples of the fundamental frequency current. These distortions are called harmonics. SΦFIA® has an automatic impedance control with which the filter automatically adjusts the suction applied to the network. Up to now, it was necessary to know all network data of the customer for the design of voltage-controlled filters and to have the filter laid out by a specialist. We have integrated this expertise into the control electronics which results in an optimal filtering results.



Development and market launch:

2015

Voltage-controlled harmonic filter with intelligent adaptation: SΦFIA®

For the first time exhibited at the Hannover Fair 2015, one of the world's biggest trade

November 2015: Dominit Industrial Power Systems, a daughter firm of Condensator D

MLA® - Modular intelligent active filter

The MLA® product family of Condensator Dominit GmbH is the latest generation of a current-controlled active filter achieving maximum performance with minimal losses. The consumers with speed and power control, such as frequency converter-driven motors or energy-saving lamps, are an essential component of our energy consumption. At the same time, these consumers with non-linear U-I characteristics ensure serious network effects due to harmonic currents. The modular intelligent filter MLA® is used to reduce harmonic currents, reactive power supply, flicker reduction and load current balancing.



RESI - Resonance-elimination-system

The RESI product family is used when disturbances occur at higher frequencies than those of the classical upper order harmonics. With pure LC suction circuits, network resonances can not be eliminated but are only shifted in frequency units. Resonance can be completely eliminated by the introduction of attenuation - e.g. of a high-pass resistance. RESI systems are available up to large units for attenuating the effect of commutation dips by high-performance converters.

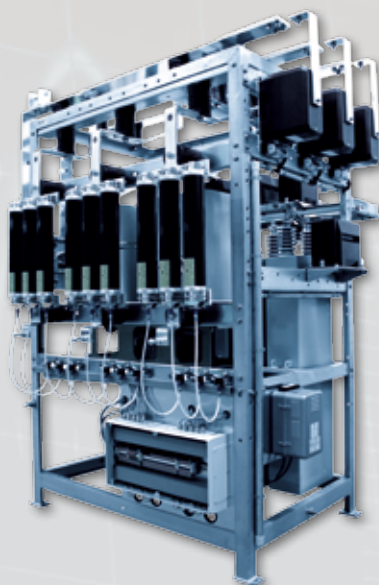


Pilot project SIMON - Simulation of Ohmic networks

Project funding by the European Union and the state of North-Rhine Westfalia

2016

fair
Dominit was established.



MIKA - Medium-voltage-compensation-assemblies

The product family MIKA of Condensator Dominit GmbH stands for premium systems and sophisticated concepts for the compensation and filtering of medium- and high-voltage networks. The portfolio ranges from the simple three-phase AC capacitors to Audio frequency blocking, RC circuitry and encapsulated control systems to turnkey overall concepts.

CLASSIC - classical reactive current compensation

Capacitors, tuned and detuned capacitor control systems, reactive power controllers, filter circuit chokes and more can be customized according to your needs and could be designed individually to match your network needs. Benefit from our extensive experience and competence over more than seven decades.



2017

Planning and construction of new company building at Brilon-Wald

THYRA -
Thyristor switched regulated assemblies

The thyristor-switched system is used especially where short or fast-changing loads are the cause of network disturbance. Fluctuations in voltage, as well as flicker phenomena are consequences which can result from the operation of loads with fast load changes, particularly in grid areas with low mains short-circuit power.



INKA -
Inductive compensation assemblies

The INKA series, an inductive compensation systems, are the expansion of the range of the classical compensation systems in the inductive range, in order to compensate equipment with capacitive characteristics. These include, for example, long cable runs in public distribution networks or in extended customer facilities, such as large photovoltaic parks at night.





KLARA -

Classic reactive power compensation system

During the times of increasing energy efficiency of power system, there are still large numbers of inductive loads connected to the system. Eventually, these elements consume more reactive power which would result in overloading the system and the connected transmission network, causing further power losses. KLARA product range consisting of automatically controlled low-voltage reactive power compensating system, are available in three different categories:

- KLARA-S with wall attached housing for low power requirements
- KLARA-M with compact standalone cabinet for medium voltage requirements
- KLARA-I with RITTAL TS8 control cabinet for applications requiring high performance

EPILOG

Condensator Dominit is the only company in the world that offers a complete portfolio to ensure the quality of voltage.

*The vinegar tower in Brilon-Wald.
The new landmark for best voltage quality –
made in Germany.*

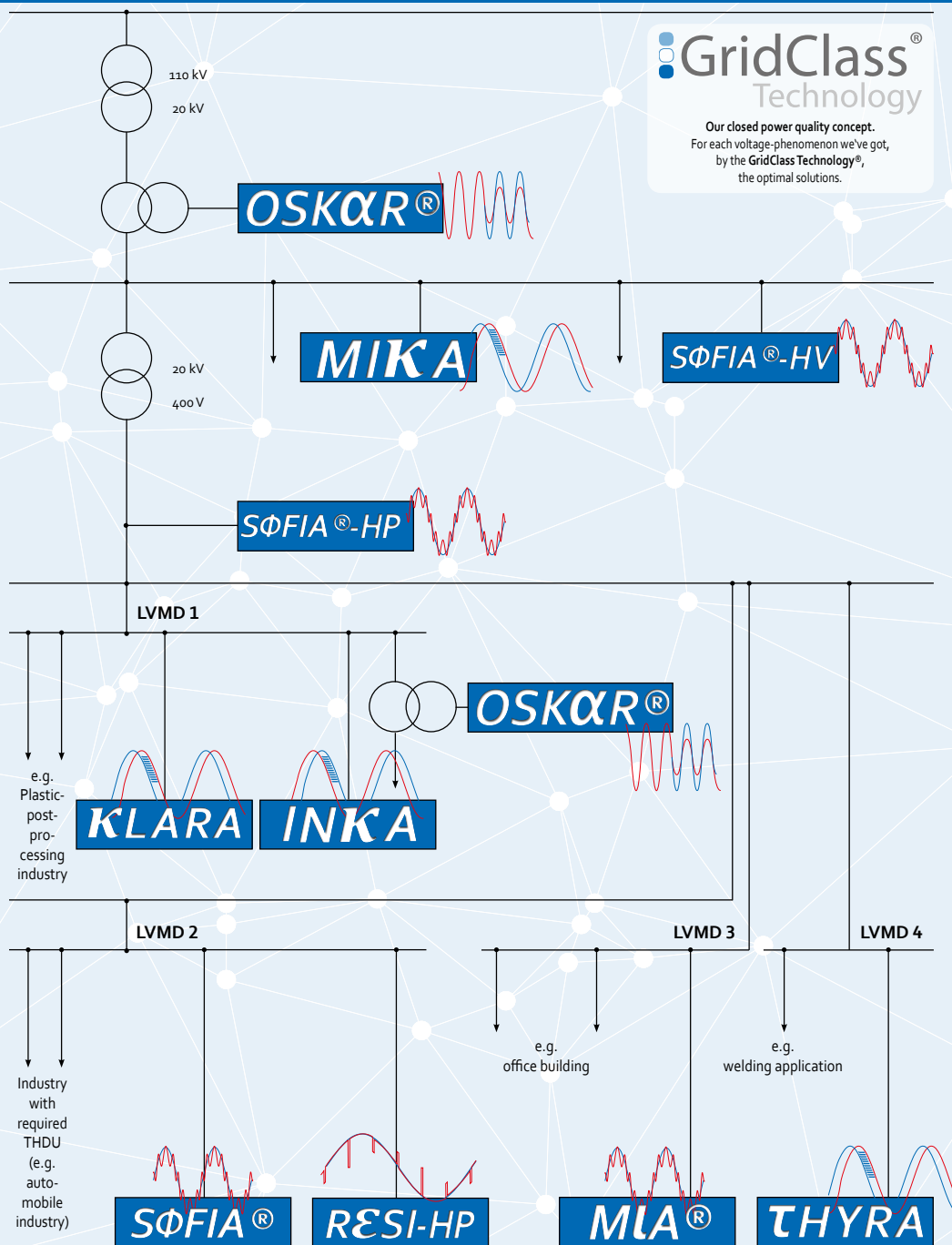


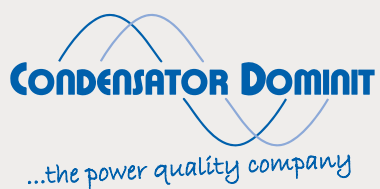
PORTFOLIO-PERFORMANCE SINGLE LINE DIAGRAM

CONDENSATOR DOMINANT

GridClass[®]
Technology

Our closed power quality concept.
For each voltage-phenomenon we've got,
by the GridClass Technology[®],
the optimal solutions.





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Subject to changes. Errors and omissions excepted.