

CLARIANT[®] FRAKO

In collaboration with Frako-Germany

Trusted Name in Power Quality Management Since 1998

It's all about saving your money!



More Power by
Saving Energy

Clariant Power System Ltd introduce as one of the leading manufacturer in Reactive Power Management System and Power Quality Improvement in India over a decade, in technical collaboration with FRAKO Kondensatoren-und Anlagenbau, Germany which pioneer in the field of Reactive Power Management Schemes over 100 years as No. 1 Company in Europe.

Clariant is in to Design, Engineering, Assembly, Testing, Commissioning & after Sales-Support for :

- All types of Capacitor panels (Low Voltage & High Voltage)
- Specially Designed Tuned Filter Panels
- Thyristor Switched Automatic Harmonic Filter Panels
- Contactor Switched Automatic Harmonic Filter Panels
- HT Fixed Harmonic Filter Capacitor Banks (Indoor & Outdoor)
- HT Automatic Harmonic Power Factor Correction Panel.
- Active Harmonic Filters

Our systems have been working satisfactorily and maintaining Power quality parameters being increasingly and strictly enforced and monitored by way of incentives and penalties by various State Electricity Boards. Our systems come with performance guarantees for maintaining agreed PF Values, Harmonic Levels and Energy Savings.

Our systems generate excellent savings and pay back for themselves in very short span of time.

Pay Back periods range from few months to an year or two. Savings are produced as a result of Effective Harmonic Mitigation, Power Factor Improvement and KVA Demand Reduction. Our Systems generate Active Power Savings between 2 to 4%. In some cases Guaranteed Active Power Savings of more than 4% on continuous basis have been achieved such as at Good Year Plants. KVA Demand Reduction, High Power Factor Incentives and High Load Factor Incentives can provide unbelievable savings of 10% and more.

Our state of the art design and manufacturing process to meet specific requirements of individual installations ensure Minimum Self Consumption, generate Excellent Energy Savings and provide Long Trouble Free Life to electrical equipments due to reduced Harmonic Levels.

We provide services for Power Quality Studies, Harmonic Analysis and Thermography studies.

These studies are followed up with offers for providing Power Quality Solutions being designed and manufactured by us.

Environmental protection is also of primary concern to us. We reflect this in our products, our company and the way we deal with our clients as a part of our CSR activities corporate social responsibility.

We believe, "Business is Relationship & we strengthen on management of Relationship." With this looking forward for opportunity for further long term fruitful association.

HIGHLIGHTS

With immense pleasure, we take this opportunity to share with you that, We have set up a MILESTONE in POWER QUALITY MANAGEMENT segment by achieving Current & Voltage Harmonics much lesser than levels specified by TANGENCO / CEA, at the following industries as cited below.

HINDUJA FOUNDRIES, CHENNAI (EAST LAND):

We had successfully reduced A(THD) from 15.40% to 6.50% & V(THD) from 4.80% to 2.50% by installing Specially Designed Tapped Tuned Harmonic Filters.

THIS HAS RESULTED WITH VARIOUS OTHER BENEFITS AS FOLLOWS:

- 1) Power Factor improved up to UNITY from 0.94.
- 2) Individual Current & Voltage Harmonic level has come down to 1%
- 3) KVA reduction is almost 5.05% at full load condition.
- 4) RMS Current reduction at 33 KV is 6.2%
- 5) Saving in Units consumption resulting in direct benefit in Electricity Bill.

ABI Showatech (India Ltd), Chennai (TVS Group)

We had reduced A (THD) from 14.5% to 3.1% & V(THD) from 3.1% to 1% after commissioning of Tuned Contactor Switched AHPFC panel.

A(THD) & V(THD) levels at ABI Main Incomer are well within Limits as per CEA Guidelines.

L&T Kacheepuram

After successful installation of 350 KVAR ,525V Tuned Automatic Harmonic filters on dated 23.11.14 by Clariant Team ATHD levels are reduced to 5.20% from 16.2% at SS 1 Location & 2.88% to from 22.2% at SS 2 Location respectively.

We have bagged a prestigious Purchase Order from M/s Daelim – Petrofac SRIP Joint Venture.

(A joint Venture of Daelim Industrial Co. Ltd and Petrofac International Limited for Sohar Refinery Improvement Project.

The size of the installation is appx 30 MVAR Capacitors at 36 KV with all associated controls, Switchgear and Harmonic Filters at one location.

We have received prestigious purchase orders from Larsen & Turbo Ltd. Hydrocarbon Abu Dhabi for New Abu Dhabi International Air Port Aviation Fuel Depot Project.

We also received Major Purchase order from Watania Steel & NAJD Steel, Riyadh Saudi Arabia.

We got major break through in tyre segment & executed overseas project in Thailand & Indonesia for Good Year Tyres and achieved the best promise result as per contract.

Certifications & Approvals

CLARIANT
ISO 9001 -2008
By ACM Ltd.

CLARIANT
ISO-14001-2004
By Geotek Global
Cert. Pvt. Ltd.

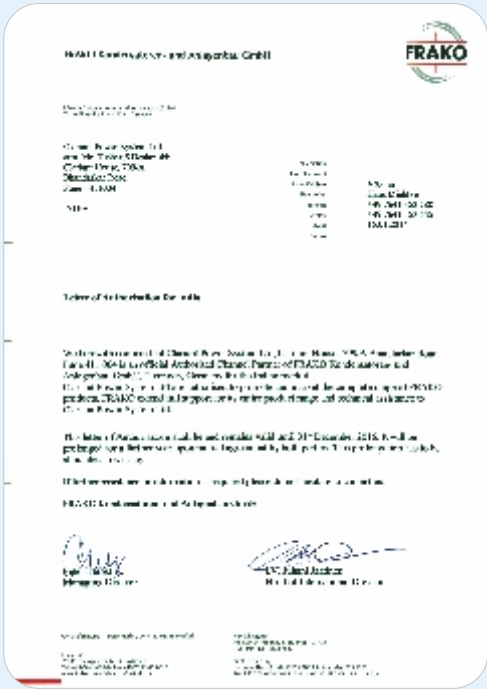
FRAKO
ISO 9001-2000
ISO 14001-2004
BY DQS GmbH

NSIC - Crisil
(SE2B)

CE Certification
by QS Zurich
Certification
Pvt. Ltd.

ERDA
Certification

Awards & Achievements



Complete Reactive Power Solutions

Tuned Harmonic Filter (Contactor Logic / Thyristor Logic)

Technical Data

System Voltage : 400.....660 V / 950V Filter tuned to : 5th, 7th, 11th & 13th
 Rated KVAR : 60.....2500 KVAR / 6000 KVAR Type : Auto / fixed

Harmonic filters consist of capacitors connected in series with Reactor. The capacitors produces reactive power at the filter's fundamental frequency & reduce the THDV, (I) of the system. A typical Harmonic filter consists of three series resonant circuits tuned to the most common harmonics (5th,7th,11th & 13h order harmonics). Harmonic filters are custom designed for each application using standard components. This ensures that the best possible power factor correction and filtering characteristics are achieved with a reasonable investment. This will helps in reducing the THD in the system as per Relevant Standards like IEEE-519 / 1992 & guidelines of CEA & other utilities.



Tuned Harmonic Scheme

Fast Acting Thyristor Switched Automatic Harmonic Filter Panel

Technical Data

System Voltage : 440.....525 V/850 V Filter tuned to : 5th, 7th, 11th, 13th
 Rated KVAR : 50.....2500 KVAR Type : Auto

Capacitor Switching at precise 0 current cross over threshold, means : 'NO' inrush current at switching "ON Instant", No generation of voltage or current spikes. surges and harmonics. Instant correction of load power factor. The response time could be as small as 20 mili seconds. Better control over MD KVar compensation help in achieving substantial saving in Electricity Bills by reducing KVAh and rKVAh consumption.



Fast Acting RTPFC Panel

Contactor Switched Automatic Harmonic Filter Panel

Technical Data

System Voltage : 440.....525 V
 Rated KVAR : 50.....6000 KVAR Type : Auto

Automatically controlled power factor regulation, low installation cost. Harmonic filters are in detuned mode (133Hz,189Hz) and effectively reduce at 5th, 7th harmonics inturn I²R and eddy current losses in the systems. We can achieve any target power factor with this scheme. Results in potential savings in electrical bill with the convincing payback period < 12 months.



Automatic Harmonic Filter Panel



APFC Relay | RTPFC Relay

Power Factor Control Relay (APFC Relays / RTPFC Relays)

Technical Data

Type EMR1100S / RM9606 / RM2106 / RM 2112

- Fully automatic microprocessor based and simple commissioning
- Patented control characteristic - no overcompensation during low load
- Measurement and monitoring of harmonics
- Over current trip function - protection for capacitors
- Four-quadrant regulation
- Continuous monitoring for defective capacitor stages through self adjustment of control program.
- Zero voltage and zero current tripping with alarm signal.
- manual/automatic operation with ability to switch each individual capacitor stage ON or OFF.



LT Capacitor Duty Contactor

LT Capacitor Duty Contactors

Technical Data

System Voltage : 400.....660 V

Rated KVAR : 10 to 200 KVAR

Long service life and a high number of switching operations.

Safe switching of capacitor stages with or without reactors, Bounce-free switching contacts, Wear-free contact material. During the switching of power capacitors a peak inrush current of 200 times of the rated current can occur. In order to limit the inrush current and to protect switching devices and capacitors, capacitor switching contactors type K3-...K with leading transition contacts are used. To limit the inrush current to <70 x I_N, damping resistors are used.

Capacitor switching contactors are protected against welding for a prospective peak inrush current of 200 x I_e.

Long life contactors tested by FRAKO for 1,00,000 switching operations Patented design with significant damping on inrush current.



LT Capacitor

LT Capacitor

Technical Data

Rating : 0.8 - 37.2 KVAR Heavy Duty Capacitor

Voltage : 230 V - 800 V (other voltage on request.)

Frequency : 50/60 HZ

Over current : 2.7 times rated

Inrush : 450 times rated

Mean Life expectancy : 200000 hrs.

Switching : 100000 L/yr

Power Loss : 0.2 W/KVAR

Temp Class : -40°C to +55°C

Self-healing type at over voltage, Reliable in operations because of Segmented film technology, plus overpressure dis-connector disconnects the capacitors from the mains at the end of there life time or at dangerous overload, environmental friendly, dry type CO₂ emission reduction, Safes energy costs.



HT Capacitor

HT Capacitor

Technical Data

Power Rating : 50 KVAR... 700 KVAR per capacitor casing

Voltage Rating : 3 KV... 25KV, 50 Hz / 60 Hz Power Loss : <0.2 W/KVAR

Type : Indoor / Outdoor

Discharge to less than 75V in < 10 min

HT Capacitors are manufactured with ALL FILM TECHNOLOGY. The dielectric material consists of high quality polypropylene film sandwiched between aluminum foil electrodes. A large number of capacitor elements are assembled to form a capacitor unit, also known as a winding pack. The elements can be provided with internal/ external fuses. Each capacitor unit is permanently connected to a discharge resistor. The winding packs are housed in a sheet steel casing, which is filled with a high quality, environmentally sound impregnating oil. Residual moisture and oxygen are removed from the winding pack in a drying and impregnation process taking place under vacuum at an increased temperature and lasting several days.

The Capacitor comply with the requirements of IEC 60871-1, IEC 60871-2 & IEC 60871-4



Harmonic Filter (HT)

Harmonic Filter (HT)

Technical Data

Type : Dry Type / Oil Natural Cooled (ONAN)

Ref. Standard : IS 5553-Part 3 - 1990, Frequency 50 Hz, Insulation Class A, Rated continuous current 130% of the rated current, P = 6%. Air Core Aluminum / Copper Wound. Epoxy impregnated.

Short Time Current for 2 Sec. = 16.66 Times the rated current.

Application : Line End / Neutral end of capacitors. For harmonic suppression and inrush current limiting. For tuned application also.



HT AHPFC Scheme

HT Automatic Harmonic Power Factor Correction Panel

Technical Data

System Voltage : 3.3 KV.....6.6 KV, 11KV

Filter tuned to : 5th, 7th, 11th, 13th

Rated KVAR : 450.....5000 KVAR

Type : Auto / fixed

Clariant is pioneer in proving complete (tuned + detuned) HT AHPFC scheme with advance technology and latest state of art in technical collaboration with FRAKO Germany. This effectively reduces the losses at HTbus avoid over compensation, improve system stability by injecting reactive power in line with Network load requirement in auto mode with EMR 1100S AHPFC relay



HT Harmonic Filter Capacitor Bank

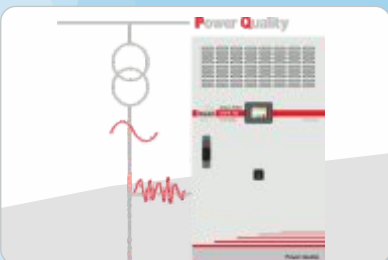
HT Harmonic Filter Capacitor Bank & Associated Equipments

Technical Data

Systems Voltage : 3.3 KV....66KV, 3.3 KV....66KV

Rated KVAR : 50 KVAR....10 MVar with series Reactor

High voltage power capacitor units include a wide range of one and three-phase all film power and surge protection capacitors. Featuring the most modern technology, they are produced to meet the requirements of different climatic and operating conditions. They can be open or enclosed, high or low power, fixed power, integrated or for use with individual motors.



Energy Management Power Quality Analysis Harmonic Study

Energy Management Power Quality Analysis Harmonic Study

1. Mains Monitoring & Mains Analysis
 2. Maximum Demand Controller
 3. Display Meter.
 4. Harmonic Analysis
 5. Sags & Swells
 6. Transient inrush current.
 7. Unbalance - V, I, W
 8. Power & Energy
- # PANEL MOUNTED DISPLAY METER. (PF, CURRENT, VOLTAGE, KWH, etc.)



3rd Generation Active Filter

OSFM

Technical Data

System Voltage : 400.....660 V

Filter tuned to : 8th to 50 order

OSFM 50 v to 2000 amps

Type : Auto

Nowadays well-engineered functionalities as well as complex handling possibilities characterize many electronic devices. This also applies to Active Filters for active suppression of harmonic currents.

With its Active Filter OSFM, FRAKO counts on the Human Machine Interface technology. The HMI user interface of the FRAKO Active Filter OSFM offers a fast and easy access to essential features of the system.

The 3.5" touch-screen display as well as the graphic user interface with menu navigation allow an easy, fast and efficient operation of the system.

Reference List of Customers

Steel & Metal



Rolling / Structural / Wire Rod Mill



Ferro Alloys Industries



Automobile Industries



Tyre Industries



Power



Textile Industries



Cement / Paper / Telecom Industries



Infrastructure & Pharmaceuticals / Banks



OEM



Oil, Petroleum Refineries & Petrochemical



Foundries



Overseas clients



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