

EPCOS Product Brief 2016

# PFC Capacitors, Key Components, Systems and AC (mfd)

# PQS



# The Company: EPCOS India Pvt. Ltd.



EPCOS India Private Limited (EIPL) is a Group company of TDK Corporation, Japan. EPCOS emerged in 1999 as a successor to the joint venture Siemens Matsushita Components and the former Siemens passive Components and Electron Tubes Group. The company has been selling electronic components in India since the early 60s. Today, all business activities in India come under the umbrella of EPCOS India Private Limited, having Registered head office at Kalyani Plant in West Bengal and regional offices in Mumbai, Delhi, Bengaluru and Kolkata. In mid-90s EPCOS significantly stepped up its commitment to India by opening new manufacturing facility at Kalyani in West Bengal and Nashik in Maharashtra. EPCOS further reinforced its trust in India by opening up one more manufacturing facility at Bawal in Haryana (2012).

EPCOS in India is involved in design, manufacturing and marketing of a broad range of top quality products such as AC-mfd capacitors, LV Power Factor Correction Capacitors (resin, inert gas and oil filled designs), Key Components required for PF correction system, PF correction systems (APFC Panels), MV Capacitors, MV Capacitor Switch, MV Reactive Power Compensation systems, Power Electronic Capacitors, DC Capacitors, MPP film and high performance ferrite cores. Nashik factory also houses the Global R&D for Film metallisation, AC and PFC Products and Systems while Kalyani is Centre of Excellence for soft ferrites. EPCOS India also services the demands of customers for a wide variety of components from global factories of TDK-EPC.

EPCOS India has a strong sales and marketing team spread over the country. Our strength in market is based on the technical competence and marketing experience of our sales force. It is backed up by a very efficient and dedicated Channel Partner network to cover entire India and some neighboring countries.

About TDK Corporation:  
TDK is one of the leading electronic component manufacturers in the world. TDK Corporation was founded in 1935 in Japan to commercialize the world's first invented ferrite. The spirit of creating entirely new things of value by starting at the fundamental level of the material has defined TDK from the beginning, and it still is the trait that sets the company apart. With a forward-looking vision, TDK endeavors to protect the global environment and make innovation work for the betterment of mankind. The company is constantly striving to contribute to the industry and to society at large



### PhaseCap® Super Heavy Duty



A hi-tech capacitor with stud mounting cylindrical construction having high inrush current capability (Up to 500.IR) and Over current capability (up to 2.0 IR).

**Specification :**

- Conformance to standards IEC 60831- 1 & 2, EN60831-1 & 2

**Range :**

- 5 to 33 KVAR.
- Voltage: 230V to 690V (800/1000V on request)

**Features :**

- Manufactured using stat-of-art wavecut technology for MPP film with heavy edge
- Self healing property
- Low energy consumption
- Temp class: -40°C to 60°C
- Capable of withstanding high inrush current (Up to 500.IR)
- Very High life expectancy up to 2,00,000 operating hours (-40/D)
- Capable for 15000 switching per year to handle dynamic loads
- **Three phase safety device** in the form of pressure sensitive (over pressure) mechanical interrupter
- Compact size and light weight
- Soft biodegradable resin as impregnant.



### PhaseCap® Energy Heavy Duty



A hi-tech capacitor with stud mounting Cylindrical construction with inert gas impregnated winding having very good inrush current capability and over current capability (up to 1.8 IR).

**Specification :**

- Conformance to Standards IEC 60831-1 & 2

**Range :**

- PhaseCap Energy Heavy Duty : Single units from 5 to 33 KVAR PhaseCap up to 56 KVAR
- Voltage : 230V to 690V (800/1000V on request)

**Features :**

- Manufactured using state-of-art wavecut technology for MPP film with heavy edge
- Self healing property
- Low energy consumption
- Capable of withstanding high inrush current up to 400.IR
- **Dry-type**, freedom from oil leakage
- **Three phase safety device** in the form of pressure sensitive (over pressure) mechanical interrupter
- Compact size and light weight
- Temp class: -40/D

**PoleCap Capacitor :**

A modified version of PhaseCap capacitor with connection cable, suitable for long-term outdoor applications and for mounting on the pole.

### PhiCap Capacitor



Stud mounting cylindrical type having very good KVAR to volume ratio.

**Specification :**

- Conformance to Standards IEC 60831-1 & 2 IS 13340

**Range :**

- Single units up to 33 KVAR
- Voltage: 220V to 525V

**Available in two designs :**

- Normal duty for linear loads.
- Heavy duty for non-linear loads (up to 525V)

**Features :**

- Manufactured using state-of-art metalisation process for MPP film with heavy edge
- Self healing property
- Low energy consumption
- Soft biodegradable resin as impregnant
- Safety device in the form of pressure sensitive (over pressure) mechanical interrupter
- Temp class : -10/D.

## AC (mfd) Capacitors

AC-mfd capacitors, which use the advantages of MPP technology is being used in various applications such as Motor Run, Motor Start, Lighting, UPS, Invertors, CVTs, Generators etc. Specification: Complying to - IEC60252 /IS 2993 for Motors IS 1709 for Fans and IS 1569 for Lighting Fixture.

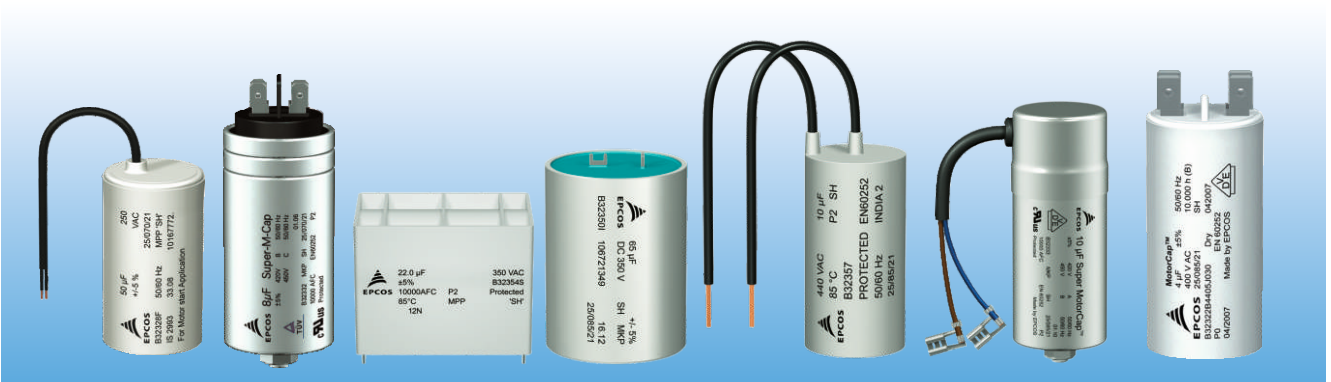
**Range :**

- 250 VAC to 600 VAC, 1 to 150 Mfd

**Features :**

- Multi layer Metallized Polypropylene
- Plastic or Aluminium Can construction
- Safety device construction available
- Fault current proof version up to 10,000A

- Various Terminal and Mounting options
- RoHs compliant
- Dual rating capacitors also available.
- UL, CSA, CE, VDE, TUV, CQC approvals for various ratings (on request).



## SquareCap Capacitor



Rectangular box type, self standing units. Modular construction with sheet metal enclosure.

### Specification :

- Conformance to Standards IS 13340

### Range :

- Single units up to 50 KVAR
- Voltage : 415V to 525V

### Available in three designs :

- ENDC : EPCOS Normal Duty Capacitor for normal inductive loads
- EHDLL : EPCOS Heavy Duty Long Life Capacitor for loads exhibiting some amount of non-linearity, medium size industries
- ESHDC : EPCOS Super Heavy Duty Capacitor for non-linear arduous and fluctuating loads

### Features :

- Manufactured using state-of-art metalisation process for MPP film with heavy edge
- Self healing property
- Low energy consumption
- PU resin as impregnant
- Safety device in the form of pressure sensitive (over pressure) mechanical interrupter
- Simplified modular construction using hermetically sealed single phase basic capacitor cells
- Easy and quick reparability at site
- Temp class: -10/D.

## Thyristor Switch Module



Thyristor switching is used when load variation is rapid as in case of cranes, lifts, spot welding, plastic extrusion etc. As there are no moving parts the switching life is very high as compared to contactors. The power electronic devices used have a rated PIV of 2200, one of the highest in its class, thus enhancing the reliability of the module.

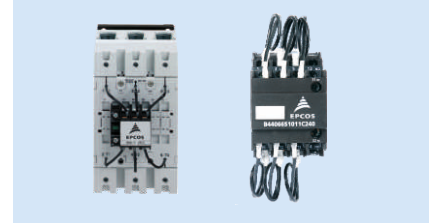
### Range :

- Suitable for 10, 25 and 50 KVAR
- Rated Voltage 400, 415, 440 and 690 V

### Features :

- Suitable for real time power factor correction
- Easy Installation
- Switching time : 5 milli seconds
- Permanent self- controlling of :
  - Voltage Parameter
  - Capacitor Current
  - Temperature of the thyristor switch
- Manual operation possible
- Automatic switch off in case of over current and over temperature
- Display of :
  - Operations
  - Faults
  - Activation.

## Capacitor Duty Contactors



Use of capacitor duty contactor enhance the life of the capacitors also limits the system transients thus improving power quality. Contactors have additional auxiliary contacts with current limiting resistors in series with it.

### Specification :

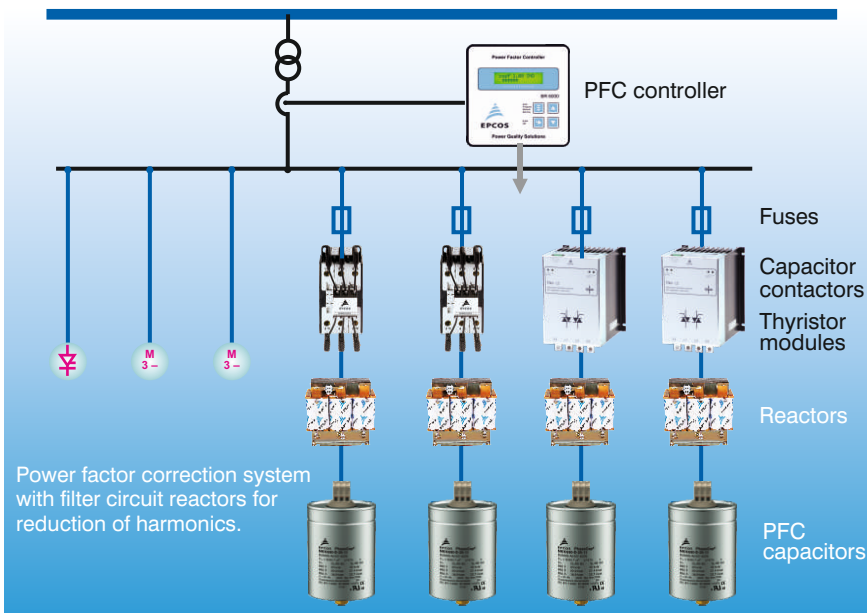
- Technical data according to Standards IEC 947-4-1, IEC 947-5-1, EN 60947-4-1 EN 60947-5-1 and VDE 0660

### Range :

- Rating: 7 KVAR to 100 KVAR
- Optional Voltage Range (380 V to 690 V)
- Operational ambient temperature up to 60° C

### Features :

- Largest range
- Excellent damping of inrush current by the use of leading contacts with wiper function and special resistors
- Longer useful life of main contacts of capacitor Contactor
- Soft switching of contactor and thus longer useful life
- Weld resistant up to a possible peak inrush current of 200 times the rated capacitor current
- Enhance mean life expectancy of PFC systems
- Reduce Ohmic losses
- Tamper proof and protected resistors
- Suitable for use with or without detuned reactors
- Easy access for cable connection
- Type tested at CPRI
- AC-6b Utilisation category.





## BR 4000ET/ER



### BR 4000ET

#### Technical Data :

- Steps - 4 , 6 and 8 relay outputs
- Current Input - 1A or 5 A
- Supply Voltage - 144VAC-288VAC
- Measurement Voltage : 144...288VAC (L-N)
- Operating temperature : 0 to 55 ° C
- Compact 96 x 96 x 75 mm
- Adapter plate for 144 x 144 cut out can be provided

#### Important Display parameters :

- Voltage
- Real time PF
- Current
- Power KW, KVA, KVAR
- Harmonics % ITHD, %VTHD

#### Features :

- Intelligent control
- Single CT sensing for balance loads.
- Large measurement and input voltage
- User friendly operation
- Power factor display up to 3<sup>rd</sup> decimal
- Protection against 6 basic parameters.

### BR 4000ER

#### Technical Data:

- Steps - 4 , 6 and 8 relay outputs
- Current Input - 1A or 5 A
- Supply Voltage - 110 VAC-550 VAC
- Measurement Voltage : 30...550 VAC (L-L/L-N)
- Operating temperature : 0 to 60 ° C
- Compact 96 x 96 x 75 mm
- Adapter plate for 144 x 144 cut out can be provided

#### Important Display parameters :

- Voltage
- Real time PF
- Current
- Power KW, KVA, KVAR
- Temperature
- Harmonics % ITHD, %VTHD, individual up to 31<sup>st</sup>
- Energy KWH, KVAH, KVARH

#### Features :

- Intelligent control
- Large measurement and input voltage range
- User friendly operation
- Individual harmonics up to 31<sup>st</sup> order
- Four quadrant operations RS 485 communication/real time clock (optional)
- 4 steps variant upgradable to 6 and 8 with additional module.
- Configurable alarm output for various parameters
- Recall recorded values for 10 various important parameters.

## BR 5000



#### Technical Data :

- Steps - 8 and 16 relay outputs
- Current Input - 1A or 5 A
- Supply Voltage - 1Ph 415 VAC (-40% to +20% )
- Measurement Voltage : 3Ph 3 wire 415 VAC (-40% to +20% )
- Operating temperature : 0 to 70 ° C
- 144 x 144 mm front fascia
- Supply frequency 50 Hz

#### Important display parameters :

Same as per BR 4000ET

#### Features :

In addition to BR 4000ET

- Three CT sensing for unbalanced loads
- Dual target Power Factor setting - useful for utility and DG mode operation
- Automatic synchronization possible
- Separate 3 CT monitoring of healthiness of Capacitor within Panel
- Data logging
- RS 232 in front and RS 232/485 switchable connection at rear
- Step operation indication on LCD display plus LED which facilitates viewing from a distance
- Unique facility of including 'Fixed Capacitor Bank' for purpose of Transformer compensation. This can be set such that the controller doesn't 'see' this capacitor.
- Unique external temperature sensing by PT100
- Settable alarm facility - undervoltage, overvoltage and so on
- Settable auxiliary outputs - 2 Nos for Alarm, etc.
- Dynamic Power Factor Controller (Transistorised) available in 16 steps without PT100 facility available
- Special 8/16 step Controller for Medium Voltage application available
- EMI/EMC type tested.

### BR 5100

New PF controller with various unique features such as:

- With GSM communication facility
- Programming from remote location
- Two way simplex communication via RS 232 or RS 485
- Sensitivity - up to 0.8% of sensed current
- PF value displayed to third decimal
- Smoke alarm sensing and messaging.

## BR 6000



#### Technical Data :

- Steps - 6 and 12 outputs (in both relay and transistorised versions)
- Current Input - 1A or 5 A
- Supply Voltage - 1Ph - 230 V AC
- Measurement Voltage : 1Ph 30V - 525V AC (L-N) or (L-L)
- Operating temperature: -20 to +60° C
- Compact 144 x 144 mm front fascia

#### Important display parameters :

Same as per BR 4000ET

#### Features :

- Microcontroller logic for measurements
- Self explanatory menu navigation in several languages
- Self optimizing control capability
- Control modes : LIFO, FIFO and Self optimized Intelligent Control.
- Large and multifunctional LCD with backlit display (2 X 16 characters)
- Single CT sensing for balanced loads
- Dual target Power Factor setting (available in 12 stage) - useful for utility and DG mode operation available optional
- Automatic synchronization possible
- Display and storage of maximum values, number of switching operations and operating time
- Recall function of recorded values
- RS 232 Interface optional
- Alarm output optional
- Dynamic Power Factor Controller (Transistorised) available in 6 and 12 steps
- Cascading possible with master slave versions
- Protective earth terminal to reduce noise and unwanted interference signals
- EMI/ EMC type tested
- Individual Harmonic measurement upto 19<sup>th</sup> order.

### Three Phase Filter Reactor



This is also known as anti-resonance three phase filter reactor. Detuned reactors are used with shunt capacitor banks to prevent harmonic resonance and also harmonic overloading of capacitor banks. These reactors are characterized by high linearity, low loss and compact size.

#### Range :

- Effective Filter out put 5 KVAR to 100 KVAR
- Filtering factor: - (5.67%, 7% and 14% corresponding to tuning frequencies of 210 Hz, 189 Hz and 134 Hz, for fundamental frequency of 50 Hz)
- Rated Voltage: (230 V to 690 V)
- Available in three designs
  1. Aluminum Strip Wound
  2. Aluminum Foil Wound
  3. Copper Conductor wound

#### Features :

- **Highest linearity**, low risk of reactor tilting
- Low losses and noise level
- High over loading capability
- Low weight in case of aluminum windings
- **Safety device - temperature micro switch**
- **Type tested at CPRI.**

#### Enclosed Capacitor Rack module

With the growth in power electronic devices the percentage of harmonics in the grid is increased. This has also grown the popularity of detuned harmonic filter within APFC panel. To utilize the existing APFC panels and to replace the plain capacitor with appropriate combination of Reactor - capacitor, EPCOS offers the specially designed Enclosed capacitor Rack module.

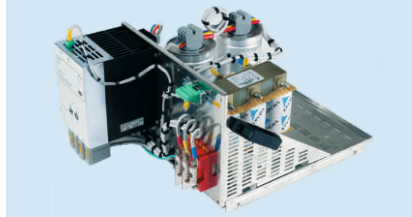
#### Technical Data :

- Standard Rating - 12.5, 25 , 50 KVAR
- Voltage - 415V / 440V
- Capacitors - Phase Cap / Phi Cap
- Reactor - Aluminum / Copper wound

#### Features and Benefits :

- Appropriate selection of Capacitor and detuned harmonic filter reactor rating
- Easy installation and maintenance
- Standardized rating of components
- Can be used with existing panels and switchgear
- Natural Ventilation
- **Best retrofitting option.**

### Capacitor Rack Module



EPCOS offers State of the Art solutions - Rack Modules, (design registered) which are preassembled, using quality components from EPCOS. These are ready to use in APFC panel construction. This facilitates ease of fabrication and drastically reduces manufacturing lead time.

#### Technical Data :

- Standard Rating -12.5, 25 , 50 KVAR
- Voltage - 415V / 440V
- Capacitors - Phase Cap / Phi Cap
- Reactor - Aluminum / Copper wound
- Switching - Contactor / Thyristor
- Switchgear - Fuse / MCB / MCCB /SD
- Trolley dimensions (in mm) 410 (W) x 450 (D) x 310 (H)

#### Features :

- Compact with Optimal spacing between switchgear, Capacitor and reactor
- Appropriate selection of Capacitor and reactor rating
- Isolation Between switchgear and Capacitor -Reactor compartment
- Easy installation and accessibility with Draw-out type design
- Comfortable maintenance without any complexity
- Modularity in design offers, wide range of possible combinations
- Minimum inventory and logistic cost, makes this more suitable for bulk procurement
- Standardized rating of components
- Reliability in operation
- Low MTTR
- Type tested at ERDA..

### LV APFC Panels



EPCOS offers wide range of automatic switched capacitor panels for Power Factor correction in various configurations for a wide range of applications. The Panels are both Contactor switched and Thyristor switched type.

#### Specification of APFC Panel :

- Rated Voltage : 380/400/415/440/ 690 V
- Rated Frequency: 50 / 60 Hz
- Rated Output : 20 -1500 KVAR
- Configuration : Delta / Star floating / Star grounding
- Number of steps : 1-16
- Step Distribution : Equal / Binary / Unequal
- Series Reactor : 0.2%, 5.67%, 7%, 14%
- Reactor winding : Copper/ Al. strip / Al. foil
- Switching device : Thyristor/ Capacitor duty contactor
- Panel Type: Standard / Modular / Compartmentalized
- Branch Protection : HRC fuse/ semiconductor fuse / SFU / MCCB
- Capacitors : Resin filled / Gas filled / APP
- Protections : OV / UV / SC / EF / OT / smoke / fire
- Controller : BR 4000 / BR 5000 / BR 6000
- Measuring CT : 1 or 3
- Data logging: Through controller internal memory (select models)
- Communication interface: Optional (RS 232, RS 485, Profibus)
- Power analyzer : Optional

#### Features :

- Wide choice of capacitors
- High quality reactors with highest linearity
- Appropriate switching devices
- State of art controllers
- Thyristor modules for real time power factor correction
- Proven performance of APFC in welding/ unbalanced load.

#### Special Designs :

APFC panels of special design for critical applications can also be offered, such as -

- Individual phase correction as required in residential or commercial establishments
- **Welding type of loads.**



## Active Harmonic Filter



### Specification :

- 12 IGBT's with 3 level Topology
- 32 bit Digital Signal Processor
- Selective Drive control algorithm
- Wall mounted and floor mounted construction
- Modular systems from 60Amp to 600Amps
- Independent operations of modules
- Compensation up to 50<sup>th</sup> Harmonic
- **Ultra-fast response time 21µs**
- 3 phase- 3 wire and 4 wire configuration
- Voltage range 200V to 400V  $\pm$  10% (4 wire) and 200V to 480V  $\pm$  10% (3 Wire)
- Best suited for fast changing harmonic distortions
- Reactive power compensation against Capacitive and Inductive load
- Balancing of loads in all phases.

### Applications :

- Industries having Variable Frequency Drives, Inverters, UPS, Furnaces etc.
- Industries such as Paper, Steel Rolling, Textile, Garment, Software Parks, Automotive, Battery manufacturing, Continuous Process Plants and Pharmaceuticals.
- Data centers, IT parks Hotels, Hospitals,
- Shopping malls and Office buildings
- Solar generation farms and Wind turbines

### Special features :

- **Grid resonance protection**
- Lowest active power loss (>3%)
- High harmonic attenuation factor >98%
- True 4 wire system with full capacity 4th wire
- Neutral load compensation of 3\* In
- Compliant with International standards IEC 61000-3-6

### Customer Benefit :

- Simple and easy installation
- User friendly menu operations
- **Lower life cycle cost.**

## LV and MV APP Capacitors



**Low Voltage APP** power capacitors are non self-healing type capacitors designed and manufactured by using latest technology and high quality material. These capacitors employ a technique where in the dielectric comprises of both sides rough, hazy polypropylene film impregnated with a non PCB liquid. The fluid is biodegradable in environment. Electrodes are made of high purity, thin aluminum foils.

### Specification :

- Conformance to Standard IS 13585

### Range :

- Up to 50 KVAR, in single unit
- Higher ratings in form of banks
- Available in Ratings of 415, 440, 480 and 525V. Voltages up to 1000V on request

### Features :

- Extended foil design
- Low energy consumption
- Leakproof CRCA sheet steel Container
- Provided with internal element fuse
- Extremely robust construction, suitable for use in arduous applications including applications related to Tuned and Detuned Harmonic Filters
- Suitable for indoor application
- Temp class : -5/D.

**Medium Voltage** power capacitors are designed and manufactured by using latest technology high quality material. These capacitors employ a technique where in the dielectric comprises several layers of polypropylene film impregnated with an non PCB liquid. The fluid is biodegradable in environment. Electrodes are made from thin aluminum foils.

### Specification :

- Conformance to standard IEC 60871 IS 13925

### Range :

- Up to 1000 KVAR. in single unit in 23 KV range
- Higher ratings in form of banks

### Features :

- Extended foil design
- Bushings with desired BIL
- Low energy consumption
- M. S / S. S Containers
- Available with internal / external fuses
- Suitable for indoor and outdoor application
- Banking : Star / Delta / Double Star / H

## MV Surge Capacitors



Surge Capacitor / RC transient suppressor comprise of specially designed capacitor in series with a non-inductive resistor. These capacitors are designed and manufactured by using latest technology high quality material. These capacitors employ a technique where in the dielectric comprises several layers of polypropylene film impregnated with an non PCB liquid.

### Specifications :

IS 11548 :1986

### Range :

- 0.05mfd to 10mfd
- Available from 440V to 40 KV range
- Number of phases: 1 / 3
- Number of Bushing : 1 / 2 / 3

### Features :

- Extended foil design
- Bushings with desired BIL
- Low energy consumption
- CRCA / SS Containers
- Suitable for Indoor and outdoor application
- Temp Class : -0° C to +55° C.

## MV Energy Storage Capacitors



Energy storage capacitors are designed and manufactured by using latest technology high quality material. These capacitors are characterized by low inductance design and high pulse current handling capabilities. The dielectric comprises several layers of polypropylene film impregnated with non PCB liquid. The fluid is biodegradable in environment. Electrodes are made from thin aluminum foils.

### Specifications :

IS 13666 :1993

### Range :

- up to 7.5KJ
- 5KV DC to 100KV DC
- Number of phases : 1
- Number of Bushing : 1

### Features :

- Extended foil design
- Low ESL, ESR
- CRCA / SS Containers
- Suitable for Indoor and outdoor application
- Temp Class : -0° C to +55° C.

## MV Vacuum Contactors



EPCOS offers state of art Vacuum Contactors for various applications. Vacuum contactors have an edge over gas / air /oil type switches because of highest dielectric strength of vacuum. Vacuum contactors use state of art vacuum interrupters selected to perform the required duty. Vacuum contactors are used for lower current breaking e.g. motor current, capacitive current and other low inductive currents.

### Specification :

- Rated Voltage: 6.6 KV / 11 KV.
- Highest system Voltage: 7.2 KV / 12 KV
- Rated frequency : 50 / 60 Hz
- BIL : 20 KV AC / 60 KV peak and 28 KV AC / 75 KV peak
- Number of phases: 3 / 2 / 1
- Rated Current : 200 A / 400 A
- Rated motor switching current : 400 A
- Rated single bank capacitor switching current : 100/200 A
- Rated short time current: 10KA per second.
- Peak making current : 10 KA / 25 KA peak.
- Electrical endurance : 10000 operations
- Mechanical endurance: 25000 operations
- Mechanism : Solenoid / Mechanical latch
- Indication : Switch ON / OFF

### Features :

- Encapsulated Vacuum Interrupter with a high dielectric strength and reliability
- Choice of Solenoid and Mechanical mechanism
- Mechanism tested for 30000 operations
- Capable of operation from 70% to 120% of rated voltage of operating coil
- Highly efficient in capacitor switching and DC switching applications.
- No arc produced exposed to, atmosphere hence no fire hazards.
- Maintenance free electrical contacts. Compact with low foot prints saves panel space
- High electrical and mechanical life.

## MV Capacitor Switch



EPCOS offers state of art Vacuum Capacitor Switches for various applications. Vacuum capacitor switches have an edge over gas / air /oil type switches because of highest dielectric strength of vacuum.

The core of capacitor switch is a specially designed vacuum contactor suitable for capacitor switching. The switch comprises of vacuum contactor and other associated equipments such as measuring CT, PT, auxiliary transformer etc.

### Specification :

- Rating Voltage : 11 KV
- Highest System Voltage : 12 KV
- Rated frequency: 50 / 60 Hz
- Number of phases : 3
- BIL : 28 KV AC / 75 KV peak.
- Rated Current : 200 A / 400 A
- Rated Single bank capacitor switching current : 100 A
- Rated short time current : 10 KA 1 second
- Peak making current : 10 KA / 25 KA peak
- Electrical endurance : 10000 operations
- Mechanical endurance : 25000 operations
- Mechanism : Solenoid
- Controller type : Single step / Multi step
- Installation : Outdoor / Indoor.
- Mounting : Pole mounted / Structure mounted
- Power Interface : 6 bushing / 7 bushing
- Indication : Switch ON / OFF

### Features :

- Most Compact in its series
- Light Weight, can be mounted on single pole / double pole structure.
- Eco friendly and high power switching capacity
- Offers various power interface, control and protection options to meet various customized application needs.



### Pole Mounted RPC System



The Pole Mounted Reactive Power Compensation (RPC) Systems are built around critical key components such as capacitors, capacitor switches and damping reactors etc designed and manufactured by EPCOS. These Reactive Power Compensation Systems are specially designed for single step automatic reactive power compensation system ideal for 11 KV feeders. These are self powered, highly reliable and suitable for unmanned lines requiring low service. The inrush current and fault current handling capacity of the switch is optimized considering the application. The switch is provided with a customized single step control box with a special controller having monitoring, control and protection features. Both capacitor switch and control box are designed for IP55 ingress protection and are suitable for outdoor installation.

#### Specification :

- Size / Rating : 100 to 1200 KVAR
- Rated Voltage : 12 KV
- Number of Steps : Single
- Control mode: Auto
- Control Parameter : Load current / load power factor
- Damping reactor : 0.2% and 6% (optional)
- Configuration : Delta / Star
- Installation : Outdoor

#### Features :

- Self Powered highly reliable, suitable for unmanned lines requiring low services
- Suitable for direct outdoor installation as designed with IP55 ingress protection
- The complete unit is self contained and does not need any auxiliary supply.

### Pad Mounted RPC System



EPCOS offers indoor as well as outdoor Pad mounted / metal clad Reactive Power Compensation System for various applications. These are metal clad switched or fixed capacitor banks of various configurations customized for specific applications. Switched capacitor banks have specially designed and manufactured Vacuum contactors for switching of capacitor banks. The panels are designed for indoor as well outdoor installations with various degrees of ingress protection. Depending upon the application and configuration various values of damping reactors are provided to enhance the performance.

#### Specification :

- Size / Rating : 100 to 18000 KVAR
- Rated Voltage : 3.3 / 6.6 / 11 KV
- Number of Steps : 1 - 8
- Control mode : Auto / Manual
- Control Parameter : Load current / load power factor
- Damping reactor : 0.2% and 6% (optional)
- Configuration : Delta / Star / Double star
- Installation : Indoor / outdoor

#### Features :

- Required less space for installation
- Suitable for indoor / outdoor installation
- Optimum compensation of reactive KVA in case of switched capacitor banks
- Choice of cable entry locations.

### Station Type RPC System



EPCOS offers turnkey solutions for station type Reactive Power Compensation Systems. These are open execution shunt capacitor banks of various ratings and configurations. The banks are fixed or switched. Switched bank use either special capacitor switches or Vacuum circuit breakers for switching. The capacitor switches are designed for multi-step switching and have capability of switching parallel connected capacitor banks with appropriate current limiting reactors. The banks are complete with PT, CT, NCT / RVT, Isolators, Lightning arrestors, Series Reactors and Circuit breaker with customized Control and Relay panel.

#### Specification :

- Size / Rating : 200 to 20000 KVAR
- Rated Voltage : 6.6 / 11 / 22 / 33 KV
- Number of Steps : 1- 8
- Control mode : Auto / Manual
- Control Parameter : Load Power Factor
- Damping reactor : 0.2% and 6% (optional)
- Configuration : Delta / Star / Double star
- Installation : Outdoor

#### Features :

- Optimum compensation of reactive KVA in case of switched capacitor banks
- Controllers with Data logging, remote control and communication facility
- A single control panel with multi step controller to control multiple switches.



Nashik Plant



Bawal Plant

**Authorized Dealer**

For more details on products and applications please contact our nearest sales office or write to us at [sales.in@epcos.com](mailto:sales.in@epcos.com)



**EPCOS India Pvt. Ltd.**

A TDK Group Company  
**Sales Head Office:**  
 14/2, Rajesh Chambers, Brunton Road, Bengaluru 560001.  
 Tel: +91-80-4039 0640. Fax : +91-80-4039 0603.  
 Email: sales.in@epcos.com.

**Regional Sales Offices:**  
 Kolkata Tel: +91-33-2419 8815.  
 Mumbai Tel: +91-22-2575 0800.  
 Noida Tel: +91-120-450 5801  
 Bengaluru Tel: +91-80-4039 0640.

Fax: +91-33-2419 8815.  
 Fax: +91-22-2575 0810.  
 Fax: +91-120-4505 818.  
 Fax: +91-80-4039 0603.

"Product development is a continuous process. Consequently the data indicated in this leaflet is subject to change without prior notice. For the latest information, contact your local partners."