TDK

EPCOS Product Brief 2013

AC (mfd) and PFC Capacitors
Key Components and Systems

www.epcos.com

The Company: EPCOS India Pvt. Ltd.

EPCOS India Private Limited (EIPL) is a Member of TDK-EPC 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. And now, EPCOS again reinforced its trust in India by opening up one more manufacturing facility at Bawal in Haryana.

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-EPC Corporation:
TDK-EPC Corporation, a TDK group company, is the manufacturer of TDK's electronic components, modules and systems and is headquartered in Tokyo, Japan. TDK-EPC was founded on October 1st 2009, from the combination of the electronic components business of TDK and the EPCOS Group.The product portfolio includes ceramic, aluminum electrolytic and ferrites, inductors, high-frequency components such as surface acoustic wave (SAW) filter products and modules, piezo and protection components and sensors.

About TDK Corporation:
TDK Corporation is a leading electronics company based in Tokyo, Japan. It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's portfolio includes electronic components, modules and systems marketed under the product brands TDK and EPCOS, power supplies, magnetic application products as well as energy devices, flash memory application devices and others. TDK focuses on demanding markets in the areas of information and communication technology and consumer, automotive and industrial electronics. The company has a network of design and manufacturing locations and sales offices in Asia, Europe and in North and South America. TDK employs about 80,000 people worldwide.

Nashik Plant

Bawal Plant

PhaseCap Super Heavy Duty

A hi-tech capacitor with stud mounting cylindrical construction having high inrush current capability (Up to 400.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 1000V

Features:

- Manufactured using stat-of-art wave cut technology for MPP film with heavy edge.
- Self healing property
- Low energy consumption
- Capable of withstanding high inrush current (Up to 400.IR)
- Very High life expectancy
- Semi-dry biodegradable resin as impregnant
- Shock hazard protected terminals
- Safety device in the form of pressure sensitive (over pressure) mechanical interrupter
- Compact Size and Light weight.
- Temp class: -40°C to 60°C.

PhaseCap Capacitor

A hi-tech capacitor with stud mounting Cylindrical construction with inert gas impregnated winding having very good KVAr to volume ratio.

Specification:

- Conformance to Standards IEC 60831-1 2/96. VDE 560-46 3/95.

Range:

- Phase Cap: Single units from 5 to 56 KVAr.
- Voltage: 230V to 800V.

Features:

- Manufactured using state-of-art wave cut technology for MPP film with heavy edge.
- Self healing property.
- Low energy consumption.
- Capable of withstanding high inrush current.
- Dry-type, freedom from oil leakage.
- 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 out door 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 60831-1and 2/96. IS 13340.

Range:

- Single units up to 30 KVAr.
- Voltage: 220V to 525V.

Available in two designs:

- Normal duty for linear inductive loads.
- Heavy duty for non-linear loads (up to 480V).

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.
- Temp class: -10/D.

AC (mfd) Capacitors

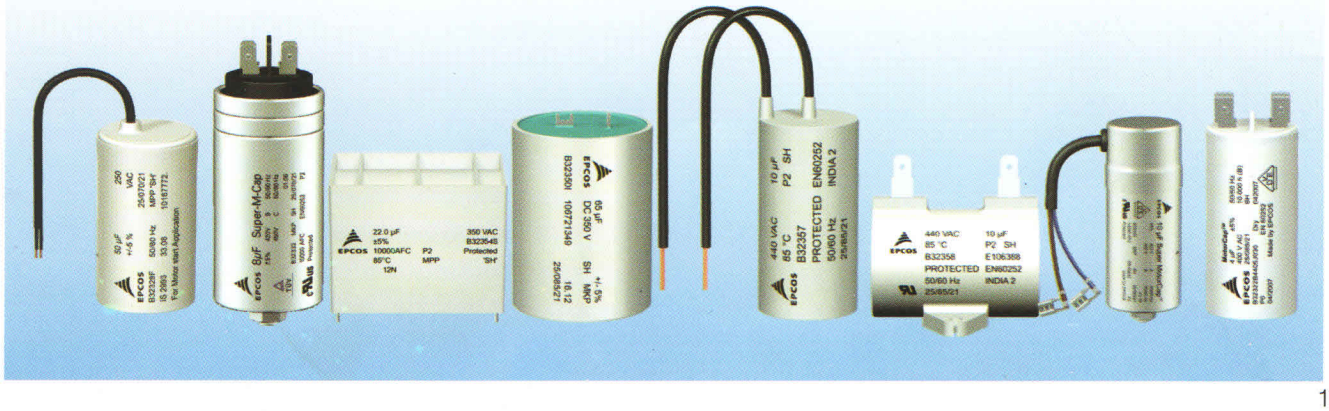
AC-mfd capacitors, which use the advantages of MPP technology is being used in various applications such as Motor Run, Motor Start, Lighting, UPS, Invertors, CVTs, Generators etc.
Specification: Complying to - IEC60252 /IS 2993 for Motors
IS 1709 for Fans and IS 1569 for Lighting Fixture.

Range:

- 250 VAC to 600 VAC,1 to 150 Mfd

Features:

- Multi layer Matallized 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.

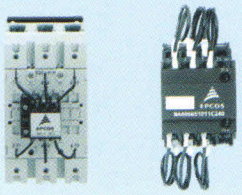
Range:

- 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: It can be used identically as a Contactor.
- Switching time: 5 milli seconds.
- Permanent self- controlling of :
  - -Voltage Parameter
  - -Capacitor Current
  - -Temperature of the thyristor switch.
- Alarm output per module.
- 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:

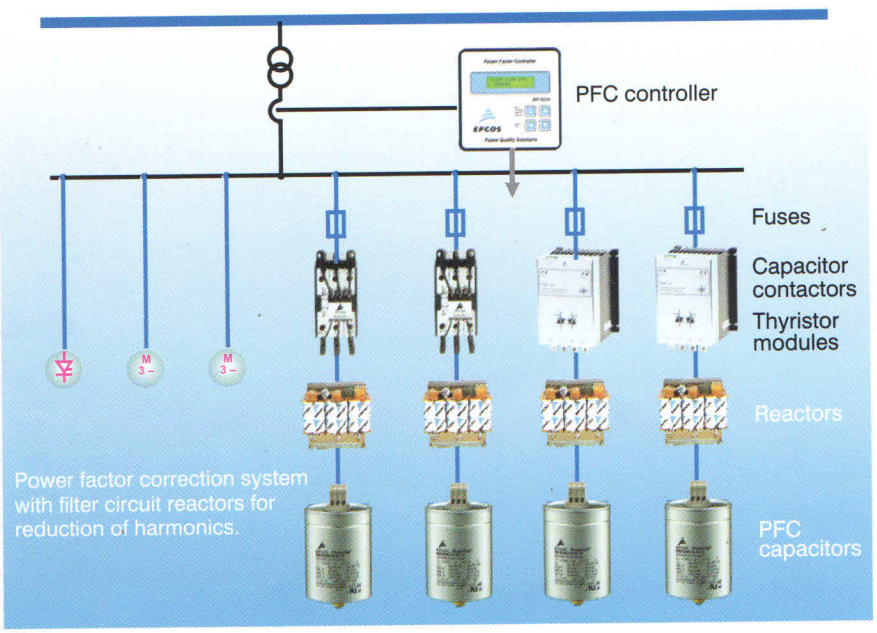
- Technical data according to Standards IEC 947-4-1, IEC 947-5-1, EN 60947-4-1EN 60947-5-1 and VDE 0660

Range:

- Rating: 5 KVAr to 100 KVAr.
- Optional Voltage Range (380 V to 440 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 with out detuned reactors.
- Easy access for cable connection
- Type tested at CPRI.
- AC-6b Utilisation category.



Power factor correction system with filter circuit reactors for reduction of harmonics.

BR 4000

Power Factor Controllers are used for automatic reactive power compensation / power factor improvement through switched capacitor banks. EPCOS offers four different series for this purpose having certain unique features.

Technical Data:

- Steps - 4 and 8 relay outputs
- Current Input - 1A or 5 A
- Supply Voltage - 1Ph 230 VAC (-20% to + 10%)
- Measurement Voltage : 1Ph 2 wire 230 VAC (- 20% to + 10%)
- Operating temperature : 0 to 70 ° C
- Compact 96 x 96 mm front fascia

Important Display parameters:

- Voltage
- Current
- Active Power
- Reactive Power
- Apparent Power
- Power Factor
- Frequency
- VTHD
- ITHD

Features:

- Microcontroller logic for measurements
- User friendly operation
- Control mode : Binary, Unequal and User defined
- Multifunctional LCD display
- Single CT sensing for balanced loads
- Individual harmonic measurement upto 15th order.

BR 7000

A higher end version of PF controller, freely programmable for switching of Single or Three phase capacitors is also available in our product basket.

Features:

- 15 switching outputs
- 3 additional alarm/message relays
- Large, multifunctional and illuminated graphic LCD display (128x64 dots, 8 lines)
- 2 independent isolated RS485 interfaces
- Error storage with time stamp
- Optional MODBUS or ASCII protocol
- Individual harmonic measurement upto 31st order.

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
- Compact 144 x 144 mm front fascia

Important display parameters:

Same as per BR 4000

Features:

In addition to BR 4000

- 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 in16 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 RS232 or RS485
- Sensitivity - upto 0.8% of sensed current
- THD inclusive of 31st harmonics
- 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 4000

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
- RS232 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 19th order.