EPCOS Product Profile 2014

MotorCap P2 (S2) Aluminum Can

AC Film Capacitors for Motor Run Applications
MotorCap P2 (S2) Aluminum Can
AC Film Capacitors for Motor Run Applications

For film capacitors, the metalized technology is applied. An extremely thin metal film is deposited in a high vacuum onto the low-loss polypropylene film. Then two layers of metalized film are wound to form the electrodes. The impulse resistance is possible due to the so-called self-healing effect. By using polypropylene as the dielectric, the capacitors have a particularly low dissipation factor.

AC film capacitors are usable for general sine-wave applications as filters, inverters, UPS devices etc., but are also particularly suitable for the operation of asynchronous electric motors and electric compressors. As motor run capacitors, they assure smooth and energy-saving operation of electric motors used in applications such as refrigerators, freezers, electric compressors, washers, dryers, air-conditioning appliances, ventilators, pumps, electric doors and drives.

This brochure presents the MotorCap P2 (S2) aluminum can capacitors series B32330/B32332/32333/32335 of EPCOS. The use of MotorCap capacitors increases the energy efficiency of motors and compressors by up to 12 percent. They also significantly improve the torque response of the motor or compressor. This is important for motors and compressors in continuous operation. MotorCap capacitors are addressed particularly to manufacturers of air conditioning systems, washing and drying appliances, compressors for refrigerators and freezers, but also of general electric motors for a variety of applications. MotorCap capacitors comply to high safety standards (UL, VDE, TÜV, CQC).
Important Notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out that **such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.

2. We also point out that in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.

3. **The warnings, cautions and product-specific notes must be observed**.

4. In order to satisfy certain technical requirements, some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous). Useful information on this will be found in our Material Data Sheets on the Internet (www.epcos.com/material). Should you have any more detailed questions, please contact our sales offices.

5. We constantly strive to improve our products. Consequently, the products described in this publication may change from time to time. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order. We also reserve the right to discontinue production and delivery of products. Consequently, we cannot guarantee that all products named in this publication will always be available.

The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

6. Unless otherwise agreed in individual contracts, all orders are subject to the current version of the “General Terms of Delivery for Products and Services in the Electrical Industry” published by the German Electrical and Electronics Industry Association (ZVEI).

7. The trade names EPCOS, BAOKE, Alu-X, CeraDiode, CeraLink, CeraPlas, CSMP, CSSP, CTVS, DeltaCap, DigiSiMic, DSSP, FilterCap, FormFit, MiniBlue, MiniCell, MKD, MKK, MLSC, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, SIP5D, SIP5K, ThermoFuse, WindCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at www.epcos.com/trademarks.
MotorCap P2 (S2) Aluminum Can

Evolution of a proven technology
MotorCaps are AC voltage capacitors which use the advantages of MKP technology and allow the operation of asynchronous induction motors. Permanent R&D efforts assure high quality standards and improvements in costs and size.

Best-in-class performance:
- Can design
- Life time expectancy of 30 000 h / class A
- Temperature resistance at +85 °C
- Highest safety standards
- Required approvals

Benefits of the very robust and compact design:
- More mounting space
- Reduced material costs
- Smaller construction of final application
- Smaller packaging units
- Versions according RoHS

Benefits of MKP technology
- Less thermal stress to motor and compressor
- Very low losses thanks to innovative film technology
- Less energy consumption
- High efficiency
- Lower noise level
- Improved torque
- Improved power factor correction

Improving efficiency with the MotorCap P2 (S2) aluminum can capacitors

Efficiency of asynchronous motors or compressors
MotorCap P2 (S2) Aluminum Can

Improving the torque response
The use of the MotorCap P2 (S2) aluminum can increases the torque response of electric motors.

Product certifications
All MotorCap P2 (S2) aluminum can capacitors are certified by leading authorities and test institutes, e.g. VDE, UL, CQC.

Self-healing technology
An electric breakdown is possible as the result of thermal or electric overload or at the end of service life. This results in a small arc that evaporates the metalization in the region of the breakdown in a matter of microseconds. The gas pressure caused at this spot by the high temperature blows the metal vapour away of the breakdown region. This means that a non-conducting isolation region free of metalization is formed here.

During and after the breakdown the capacitor is fully functional. The reduction in capacitance caused by self-healing is less than 100 pF, i.e. of an order that can only be verified by a precision measuring instrument.
Innovations and Advantages

Overpressure protection with a break-action mechanism:
Electronic components do not have unlimited life expectations. This applies to self-healing capacitors, too. Motor run capacitors of the series B32330/B32332/B32333/B32335 are conventionally constructed as aluminum cans with class P2 (S2) safety protection. They are fitted with a disconnector that responds only to overpressure. Numerous electric breakdowns over time or as result of thermal or electric overload result in the formation of gas, which can cause the pressure to rise inside the capacitor case. This produces a change in length due to the curvature of the lid or stretching of the expansion bead. Expansion beyond a certain degree will separate the internal wires and disconnect the capacitor from the line. This disconnection takes place at a defined position (notch) after a total baffle expansion of 0.3 to 1.6 mm, depending on the size of the capacitor.

MotorCap P2 (S2) aluminum can
Construction
- Dielectric: Polypropylene film
- Electrode: Metalized film
- Epoxy resin, self-extinguishing
- Plastic top material to IEC 60335-1 (fire retardant)

Features
- Self-healing properties
- Low dissipation factor
- P2 (S2) safety class as per IEC/EN 60252-1
- High insulation resistance
- 10 000 A fault current-proof
- Low noise operation
- IEC/EN 60335 compatible on request
- RoHS compatible

Terminals
The MotorCap P2 (S2) aluminum can offers customized terminals.

Electrical terminals
- Fast-on terminal
- Double fast-on terminal
- Cable

Mechanical terminals
- For clamping (with no further fixing)
- Threaded stud at bottom of can (M6, max. torque = 5 Nm)

P2 (S2) definition according IEC/EN 60252-1 and UL 810
To prevent case rupture under fault conditions, the capacitor has been designed to fail in the open-circuit mode only. It is protected against fire and electrical shock hazards. The IEC/EN 60252-1 standard applies to all motor run capacitors designed by EPCOS.

Remark: Definition P2 will be replaced by S2 in 2014. EPCOS MotorCap P2 aluminum capacitors fulfill the S2 requirements.

Environment
All EPCOS MotorCap series are RoHS compatible. The compatibility is regularly checked during production. The EPCOS Group operates an environmental management system that conforms to the requirements of ISO 14001. Currently, our locations in Europe and the Americas, as well as our locations in Asia are certified to this standard.
Operation
The MotorCap P2 (S2) aluminum can capacitor is simply plugged into the auxiliary winding of the motor or compressor and can remain permanently connected there. The capacitor is designed for continuous operation.

Applications
The MotorCap P2 (S2) aluminum can was optimized for use in the following applications, but may be used equally well for general drive motors.
- Refrigerators and freezers
- Electrical compressors
- Washers and dryers
- Dishwashers
- Air conditioners
- Heat pumps

Requirements of IEC 60335-1
Domestic appliances are subject to the IEC 60335-1 standard. If a motor run capacitor is used in a domestic appliance that is subject to this standard, there may be additional requirements on the capacitor.

These refer essentially to the materials used as well as to the creepage and clearance distances.

The approval is granted for the complete capacitor assembly and not for individual raw materials only.

The materials as well as the creepage and clearance distances selected for the EPCOS MotorCap P2 (S2) aluminum make it ideal for use in domestic appliances.
MotorCap P2 (S2) Aluminum Can  
Single Capacitance, B32330/B32332/B32333 Series

## Technical data

<table>
<thead>
<tr>
<th>Type/ series</th>
<th>B32330/ B32332</th>
<th>B32330/ B32332</th>
<th>B32333 Super MotorCap</th>
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<td>Single fast-on</td>
<td>Double fast-on</td>
<td>Wire cable terminals</td>
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<td>Max. permissible current $I_{max}$</td>
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### Safety

- **Safety class**: P2 (S2) to IEC 60252-1
- **Life expectancy to IEC/EN 60252**: 250 V: 10 000 h (class B), 450 V: 30 000 h (class A), 450 V: 30 000 h (class A)
- **Climatic parameter to IEC 60068-1**
  - **Temperature limit** $T_{min} / T_{max}$: -25/ +85 °C
  - **Test duration (damp heat test)** $t_{test}$: 21 days

### Construction

- **Reference standards**: IEC 60252-1, EN 60252, UL 810
- **Can**: Aluminum can with overpressure disconnection device
- **Terminal top**: UL 94 V2/V0 compatible; glow wire test to IEC/EN 60695-2-1/1; compatible to IEC/EN 60335-1 as an option
- **Dimensions**
  - Ø 30 ... 40 mm, H: 68 ... 103 mm
  - Ø 30 ... 40 mm, H: 52 ... 103 mm
  - Ø 30 ... 40 mm, H: 74 ... 125 mm

### Approvals

- **UL 810 component**
- **VDE**: UL 810 component
- **CQC on request**
- **TÜV**: VDE UL 810 component

### Mounting options

- Stud M8x1.25
- Star Washer 8 mm
- Nut M8x1.25

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Please read Important notes on page 4 and Cautions and warnings on page 14.
## MotorCap P2 (S2) Aluminum Can

Single Capacitance, B32330/B32332 Series

### Ordering codes and packing units

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<th>$C_{n}$</th>
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### Composition of ordering code

*: Terminals

0 Single fast-on terminals

2 Double fast-on terminals

#: Construction of can and plastic top

5 Aluminum can, Option A: UL 94 V2 top

6 Aluminum can, Option B: UL 94 V2/V0 top/IEC 60335-1

7 Aluminum can with M8 bolt, Option A: UL 94 V2 top

8 Aluminum can with M8 bolt, Option B: UL 94 V2/V0 top/IEC 60335-1

x: Terminal details

0 Fast-on terminals

1 ... 9 Ordering codes will be created based on cable length and receptacles on request
MotorCap P2 (S2) Aluminum Can
Single Capacitance, B32333 Series

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<th>$C_n$ (µF)</th>
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<td>A</td>
</tr>
<tr>
<td></td>
<td>45</td>
<td>40 x 125</td>
<td>B32333B6456J0#x</td>
<td>–</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>45 x 125</td>
<td>B32333B6506J0#x</td>
<td>–</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>45 x 125</td>
<td>B32333B6556J0#x</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>45 x 125</td>
<td>B32333B6606J0#x</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Composition of ordering code

#: Construction of can and plastic top
5 Aluminum can, Option A: UL 94 V2 top
6 Aluminum can, Option B: UL 94 V2/V0 top/IEC 60335-1
7 Aluminum can with M8 bolt, Option A: UL 94 V2 top
8 Aluminum can with M8 bolt, Option B: UL 94 V2/V0 top/IEC 60335-1

x: Terminal details
0 Fast-on terminals
1 … 9 Ordering codes will be created based on cable length and receptacles on request

Display of ordering codes for EPCOS products

The ordering code for one and the same EPCOS product can be represented differently in data sheets, data books, other publications, on the EPCOS website, or in order-related documents such as shipping notes, order confirmations and product labels. The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products. Detailed information can be found on the Internet under www.epcos.com/orderingcodes
MotorCap P2 (S2) Aluminum Can
Dual Capacitance, B32335 Series

Technical data

<table>
<thead>
<tr>
<th>Type/ series</th>
<th>B32335 (250 V)</th>
<th>B32335 (450 V)</th>
</tr>
</thead>
</table>
| Terminals        | Fast-on terminals  
– Single fast-on  
– Double fast-on  
– Quadruple |

Electrical ratings

<table>
<thead>
<tr>
<th>Rated voltage $V_R$</th>
<th>250 V</th>
<th>450 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated capacitance $C_R$</td>
<td>15+2 ... 30+8 μF</td>
<td>10+1 ... 60+10 μF</td>
</tr>
<tr>
<td>Rated frequency $f_R$</td>
<td>50/ 60 Hz</td>
<td></td>
</tr>
<tr>
<td>Capacitance tolerance</td>
<td>±5%</td>
<td></td>
</tr>
<tr>
<td>Max. permissible voltage $V_{max}$</td>
<td>1.1 • $V_R$</td>
<td></td>
</tr>
<tr>
<td>Max. permissible current $I_{max}$</td>
<td>1.3 • $I_R$</td>
<td></td>
</tr>
<tr>
<td>Dissipation factor ($20 \degree C, 120 \text{ Hz}$)</td>
<td>$\tan \delta \leq 1.0 \times 10^{-3}$</td>
<td></td>
</tr>
</tbody>
</table>

Safety

<table>
<thead>
<tr>
<th>Class of safety</th>
<th>P2 (S2) to IEC/EN 60252-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life expectancy to IEC/EN 60252</td>
<td>250 V: 10 000 h (class B) Up to 450 V: 10 000 h (class B)</td>
</tr>
</tbody>
</table>

Climatic parameter to IEC/EN 60068-1

| Temperature limits $T_{min} / T_{max}$ | -25 °C/ +85 °C |
| Test duration (damp heat test) $t_{test}$ | 21 days |

Construction

| Reference standards | IEC 60252-1, EN 60252, UL 810 |
| Can                | Aluminum can with overpressure disconnection device |
| Terminal top       | UL 94 V2 compatible; glow wire test to IEC/EN 60695-2-1/1; compatible to IEC/EN 60335-1 as an option |
| Dimensions         | Ø 40 ... 63 mm H: 70 ... 124 mm Ø 40 ... 53 mm H: 70 ... 105 mm |

Approvals

| Approvals | UL 810 component TÜV |

Mounting options

The Dual MotorCap is designed as a dual run electrical capacitor. To create a rotating magnetic field, it alters the current to one or more windings of an electric motor. It is used in air conditioners, washing machines and heat pumps.

A dual run capacitor supports two electric motors, such as in large air conditioner or heat pump units, with both a fan motor and a compressor motor. The dual capacitor has 3 terminals labeled “C”, “F”, and “H” for the common, fan, and hermetic compressor connections.

Round dual run capacitors are commonly used for air conditioning and to help starting and running the compressor or condenser fan motor. Dual capacitors are available in a variety of sizes, depending on capacitance, e.g. 40 plus 5 μF, and on voltage.

For series B32335, all characteristics of the MotorCap P2 (S2) aluminum can series are valid as well, and therefore comply in the same way to the highest EPCOS standards.
## MotorCap P2 (S2) Aluminum Can
Dual Capacitance, B32335 Series

### Ordering codes and packing units

<table>
<thead>
<tr>
<th>$V_C$ V AC</th>
<th>$C_R$ µF</th>
<th>Max. dimensions $D \times H$</th>
<th>Ordering code</th>
<th>Approvals</th>
<th>Packing units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TÜV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UL</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B32335</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>upon request</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 450       | 10+ 1   | 40 x 70                     | B32335I6116J0#0 | –         | 36            |
| 10+ 1.5   | 40 x 70 | B32335I6116J5#0             | –             | 36         |               |
| 10+ 2     | 40 x 70 | B32335I6126J0#0             | –             | 36         |               |
| 12+ 1.5   | 40 x 70 | B32335I6136J0#0             | –             | 36         |               |
| 12+ 2     | 40 x 70 | B32335I6146J0#0             | –             | 36         |               |
| 12+ 5     | 40 x 70 | B32335I6176J0#0             | –             | 36         |               |
| 13+ 1.5   | 40 x 70 | B32335I6146J5#0             | –             | 36         |               |
| 13+ 1.8   | 40 x 70 | B32335I6146J8#0             | –             | 36         |               |
| 13+ 2     | 40 x 70 | B3235I6156J0#0              | –             | 36         |               |
| 13+ 5     | 40 x 70 | B32335I6186J0#0             | –             | 36         |               |
| 15+ 1.5   | 40 x 70 | B32335I6166J0#0             | –             | 36         |               |
| 15+ 2     | 40 x 70 | B32335I6176J0#1             | B             | 36         |               |
| 15+ 2.5   | 40 x 70 | B32335I6176J5#0             | B             | 36         |               |
| 15+ 3     | 40 x 70 | B32335I6186J0#1             | B             | 36         |               |
| 15+ 4     | 40 x 70 | B32335I6196J0#0             | B             | 36         |               |
| 15+ 5     | 40 x 70 | B32335I6206J0#0             | B             | 36         |               |
| 17+ 1.8   | 40 x 80 | B32335I6186J8#0             | B             | 36         |               |
| 20+ 1.5   | 40 x 80 | B32335I6216J5#0             | B             | 36         |               |
| 20+ 2     | 40 x 80 | B32335I6226J0#0             | B             | 36         |               |
| 20+ 4     | 40 x 80 | B32335I6246J0#0             | B             | 36         |               |
| 20+ 5     | 40 x 80 | B32335I6256J0#0             | B             | 36         |               |
| 25+ 1.5   | 40 x 80 | B32335I6266J5#0             | B             | 36         |               |
| 25+ 2     | 40 x 80 | B32335I6276J0#0             | B             | 36         |               |
| 25+ 2.5   | 40 x 80 | B32335I6276J5#0             | B             | 36         |               |
| 25+ 3     | 40 x 80 | B32335I6286J0#0             | B             | 36         |               |
| 25+ 4     | 40 x 80 | B32335I6296J0#0             | B             | 36         |               |
| 25+ 5     | 40 x 80 | B32335I6306J0#0             | B             | 36         |               |
| 25+ 7.5   | 40 x 94 | B32335I6326J5#0             | B             | 36         |               |
| 25+ 8     | 40 x 94 | B32335I6336J0#0             | B             | 36         |               |
| 25+ 10    | 40 x 94 | B32335I6356J0#0             | B             | 36         |               |
| 30+ 1.5   | 40 x 103| B32335I6316J5#0             | B             | 36         |               |
| 30+ 1.8   | 40 x 103| B32335I6316J8#0             | B             | 36         |               |
| 30+ 2     | 40 x 103| B32335I6326J0#1             | B             | 36         |               |
| 35+ 1.5   | 40 x 103| B32335I6366J5#0             | B             | 36         |               |
| 35+ 2     | 40 x 103| B32335I6376J0#1             | B             | 36         |               |
| 35+ 3     | 40 x 103| B32335I6386J0#0             | B             | 36         |               |
| 35+ 5     | 40 x 103| B32335I6406J0#0             | B             | 36         |               |
| 35+ 6     | 40 x 103| B32335I6416J0#0             | B             | 36         |               |
| 35+ 8     | 40 x 103| B32335I6436J0#0             | B             | 36         |               |
| 35+ 10    | 40 x 103| B32335I6456J0#0             | B             | 36         |               |
| 40+ 5     | 40 x 103| B32335I6456J5#0             | B             | 36         |               |
| 45+ 4     | 45 x 103| B32335I6496J0#0             | B             | 25         |               |
| 45+ 5     | 45 x 103| B32335I6506J0#0             | B             | 25         |               |
| 46+ 6     | 45 x 103| B32335I6526J0#0             | B             | 25         |               |
| 45+10     | 45 x 103| B32335I6556J0#0             | B             | 25         |               |
| 50+ 4     | 45 x 103| B32335I6546J0#0             | B             | 25         |               |
| 50+ 5     | 45 x 103| B32335I6556J1#1             | B             | 25         |               |
| 55+ 5     | 53 x 105| B32335I6606J0#0             | B             | 25         |               |
| 60+10     | 53 x 105| B32335I6706J0#0             | B             | 25         |               |

### Composition of ordering code

#: Construction of can and plastic top

- 5 Aluminum can, without mounting, V2 top
- 6 Aluminum can, without mounting, V0 top/IEC 60335-1
- 7 Aluminum can with M8 bolt, UL 94 V2 top
- 8 Aluminum can with M8 bolt, UL 94 V2/V0 top/IEC 60335-1
Cautions and Warnings

- The MotorCap P2 (S2) aluminum can should be operated in line with its typical approved usage.
- Handle the capacitor units carefully, as they may be charged even after disconnection.
- Observe the appropriate engineering practice.
- The capacitor terminals, connected busbars and cables as well as any other devices connected to them must be regarded as live. The device is electrically charged.

Storage and operating conditions

Do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acids, alkalis, salts or similar substances are present. In a dusty environment, regular maintenance and cleaning, especially of the terminals, is required to avoid formation of a conductive path between phases and/or phases and ground.

Ambient temperature

The capacitor must not be exposed to direct heat or fire. The permissible range of minimum and maximum temperatures is specified on the capacitor i.e.

- 25/70/21 = minimum permissible temperature: –25 °C, max. permissible temperature: +70 °C.

Temperature is one of the main stress factors for polypropylene type capacitors. It has a major influence on their useful operating life. It should be noted that this useful life is considerably shorter in the case of higher temperature requirements. If the maximum permissible temperature is exceeded, the safety device may become inoperative.

⚠️ Do not expose the capacitor to a direct heat source! Direct exposure or proximity to heat sources can create hot spots on the capacitor much hotter than the ambient temperature and can cause sudden internal failures.

Operating voltage $V_{op}$

The capacitors have been designed for continuous operation at the rated voltage stated on the label. This voltage may be exceeded only within the limits permitted by the applicable standards at room temperature:

<table>
<thead>
<tr>
<th>$V_{op}$</th>
<th>Operating duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.1 \cdot V_n$</td>
<td>24 h/day</td>
</tr>
<tr>
<td>$1.2 \cdot V_n$</td>
<td>5 min/day</td>
</tr>
<tr>
<td>$1.3 \cdot V_n$</td>
<td>1 min/day</td>
</tr>
</tbody>
</table>

Installation

Mounting orientation

Motor-run capacitors may be mounted in any orientation. However, the capacitor is preferentially mounted with its terminals facing upwards.

⚠️ In case of dents deeper than 0.5 mm, do not install the capacitor.

Fixation

Motor-run capacitors must be installed in a cool and well-ventilated place away from objects radiating heat. The maximum torque of capacitors with an M8 bolt is 5 Nm. This bolt is used for grounding the aluminum case. If the capacitor is fixed with a clamp, make sure this does not block or disable its safety device.

Correct clamping procedure

Incorrect clamping procedure

Note: For proper operation of the overpressure disconnector see page 15.
Cautions and Warnings

Connectors
In case of fast-on terminals, the female connectors must be appropriate for the terminal. A good contact must be ensured.

Do not solder cables directly onto the fast-on terminals. The terminal may overheat, the capacitor may leak and any safety device will not operate properly.

⚠️ If the female connector becomes loose, the terminal may overheat, the capacitor may leak and any safety device will not operate properly.

The hermetic seal of the capacitor is extremely important for a long operating life and correct functioning of the break-action mechanism of the overpressure disconnector. Do not damage the rubber seal and the soldering at the tab connectors. The safety feature of the capacitor may not function properly if the capacitor is short-circuited across the terminals. Sufficient precautions must be taken when connecting the capacitor.

Harmonics
Harmonics are sinusoidal voltages and currents whose frequencies are multiples of a 50 Hz or 60 Hz power supply frequency. They result from the operation of electrical loads with non-linear voltage-current characteristics. These loads are largely associated with modern electronic devices such as converters, electrical drives, welding machines and uninterruptible power supplies (UPS).

Harmonics may cause a higher than rated current to flow through the capacitors, which may overheat and become damaged. This may cause operational failures, bursting and fire.

The maximum permissible current (incl. fundamental and harmonic currents) specified in the technical data of the relevant series must not be exceeded under any circumstances.

Overpressure disconnector
Electrical components do not have an unlimited operating life; this also applies to self-healing capacitors. All capacitors of the B32330, B32332, B32333 and B32335 series are consequently fitted with a disconnector that responds to overpressure. If numerous electrical breakdowns occur at the end of the capacitor’s operating life or as a result of thermal or electrical overload, the formation of gas increases the pressure inside the capacitor case.

This causes the expansion bead to expand. If it does so beyond a certain point, the internal wires will separate (tear-off fuses) and disconnect the capacitor from the line opening at a predefined position (notch) at an expansion of 0.3 to 1.6 mm, depending on the capacitor size. This safety mechanism is irreversible. Once the safety device has operated, the capacitor will remain switched off. Because the notch of the mechanical safety mechanism is the weakest section in the connection, P2 (S2) aluminum capacitors should be handled properly during transportation to avoid damaging the break-action mechanism.

In normal condition

Safety device activated

Maintenance
There are no serviceable or repairable parts inside the capacitor, so please refrain from opening it.

For more details, please refer to the actual “Applications warning, Installation and Maintenance Instructions” at www.epcos.com/ac_capacitors
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Edition 2014 · Ordering No. EPC:26045-7600 · Printed in Germany · PP 03142.