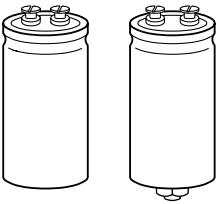
Long-life grade capacitors



KAL0567-B

B43750 B43770

Applications

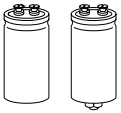
- Traction
- Electric vehicle (Hybrid)
- Power electronics
- Highly professional power supplies

Features

- Max. ripple current capability (up to 100 A)
- High reliability
- Wide temperature range
- All-welded construction ensures reliable electrical contact
- No base insulation for max. cooling
  (insulated solution “2-pad design” upon request)
- Version with low-inductance design available
- Self-extinguishing electrolyte

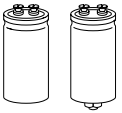
Construction

- Charge-discharge proof, polar
- Aluminum case, partially insulated
- Poles with screw terminal connections
- Mounting with ring clips, clamps or threaded stud



Specifications and characteristics in brief

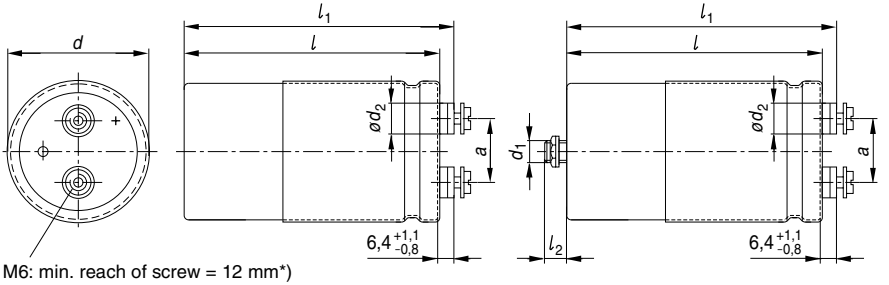
Rated voltage U_R	350 … 450 VDC	
Surge voltage U_S	1,1 · U_R	
Rated capacitance C_R	560 … 5 300 µF	
Capacitance tolerance	± 20 % ≙ M	
Leakage current I_L (5 min, 20 °C)	$I_L \leq 0{,}3\ \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{U_R}{V}\right)^{0{,}7} + 4\ \mu A$	
Self-inductance *ESL*	*d* = 64,3 mm: approx. 14 nH *d* ≥ 76,9 mm: approx. 18 nH Capacitors with low-inductance design: *d* ≥ 64,3 mm: approx. 13 nH	
Useful life		Requirements:
105 °C; U_R; $I_{\sim R}$	> 8 000 h	$\Delta C/C$ ≤ ± 30 % of initial value
85 °C; U_R; $I_{\sim R}$	> 40 000 h	*ESR* ≤ 3 times initial specified limit
40 °C; U_R; 3 · $I_{\sim R}$	> 250 000 h	I_L ≤ initial specified limit
		Failure percentage: ≤ 1 % Failure rate: ≤ 20 fit (≤ 20 · 10^{-9}/h) (for definiton “fit”, refer to chapter *“Quality”*, page 62)
Voltage endurance test		Post test requirements:
125 °C (at U_R)	2 000 h	$\Delta C/C$ ≤ ± 10 % of initial value *ESR* ≤ 1,3 times initial specified limit I_L ≤ initial specified limit
Vibration resistance	To IEC 60068-2-6, test Fc: displacement amplitude 0,75 mm, frequency range 10 to 55 Hz, acceleration max. 10 *g*, duration 3 × 2 h	
IEC climatic category	To IEC 60068-1: 25/105/56 (– 25 °C/+ 105 °C/56 days damp heat test)	
Detail specification	—	
Sectional specification	IEC 60384-4	



Dimensional drawings

Type B43750
Ring clip/clamp mounting

Type B43770
Threaded stud mounting



Positive pole marking: +

Dimensions and weights

Terminal	Dimensions (mm) with partly insulating sleeve[1]							Approx. weight (g)
	d	$l \pm 0{,}8$	$l_1 \pm 0{,}8$	l_2 $^{+0}_{-1}$	d_1	d_2 max	a $^{+0,2}_{-0,4}$	
M 6	64,3 + 0/– 0,8	80,3	86,0	17	M 12	17,7	28,5	350
M 6	64,3 + 0/– 0,8	105,3	111,0	17	M 12	17,7	28,5	450
M 6	76,9 + 0/– 0,7	105,3	111,0	17	M 12	17,7	31,7	550
M 6	76,9 + 0/– 0,7	142,8	148,5	17	M 12	17,7	31,7	850
M 6	91,0 + 0/– 2	67,1	72,4	17	M 12	17,1	31,7	600
M 6	91,0 + 0/– 2	96,6	101,9	17	M 12	17,7	31,7	800
M 6	91,0 + 0/– 2	144,1	149,4	17	M 12	17,7	31,7	1300

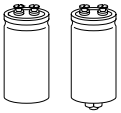
Dimensions are also valid for low-inductance design.

Packing

For ecological reasons the packing is pure cardboard.

Capacitor diameter d	Packing units (pieces)
64,3 mm	15
76,9 mm	12
91,0 mm	8

1) Fully insulated versions available upon request.



Special designs

- Low-inductance design

Ordering codes:

Design	Identification in 3rd block of ordering code	Remark
Low inductance (13 nH)	M003	For capacitors with diameter $d \geq 64{,}3$ mm

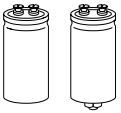
Accessories

The following items are included in the delivery package, but are not fastened to the capacitors:

	Thread	Toothed washers	Screws/Nuts	Maximum torque
For terminals	M 6	A 6,4 DIN 6797	Cylinder-head screw M 6 × 12 DIN 85-4.8	2,5 Nm
For mounting	M 12	J 12,5 DIN 6797	Hex nut BM 12 DIN 439	10 Nm

The following must be ordered separately:

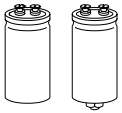
Ring clips	B 44 030 (cf. page 169)
Clamps	B 44 030 (cf. page 173)
Insulating parts	B 44 020 (cf. page 166)



Overview of available types

U_R (VDC)	350	400	450
C_R (µF)	Case dimensions $d \times l$ (mm)		
560			64,3 × 80,3
680			91,0 × 67,1
850		64,3 × 80,3	64,3 × 105,3
1 200	64,3 × 80,3	91,0 × 67,1	76,9 × 105,3
1 300		64,3 × 105,3	91,0 × 96,6
1 500	91,0 × 67,1		
1 800	64,3 × 105,3		
1 900		76,9 × 105,3	76,9 × 142,8
2 400			91,0 × 144,1
2 700	76,9 × 105,3		
2 900		76,9 × 142,8	
3 900	76,9 × 142,8	91,0 × 144,1	
5 300	91,0 × 144,1		

The capacitance and voltage ratings listed above are available in different cases upon request.
Other voltage and capacitance ratings are also available upon request.



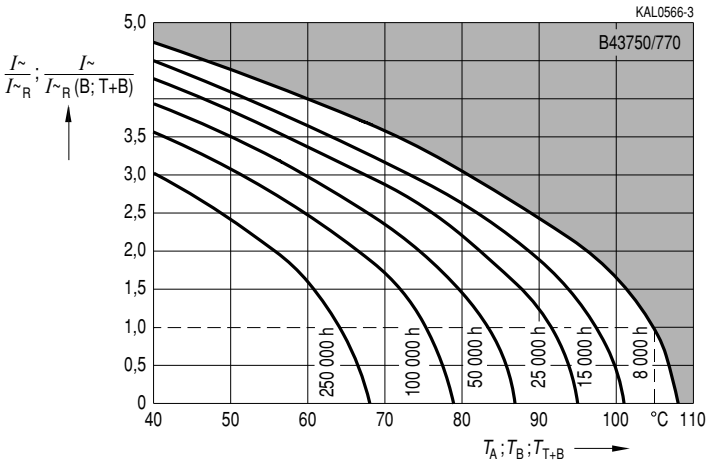
Technical data and ordering codes

U_R VDC	C_R 100 Hz 20 °C µF	Case dimensions $d \times l$ mm	ESR_{max} 100 Hz 20°C mW	Z_{max} 10 kHz 20°C mW	$I_{\sim max}$ 10 kHz 40°C A[1)]	$I_{\sim R}$ 10 kHz 105°C A[1)]	$I_{\sim R}$(B) 10 kHz 105°C A[2)]	$I_{\sim R}$(T+B) 10 kHz 105°C A[3)]	Ordering code[4)5)]
350	1 200	64,3 × 80,3	67	32	45	9,5	21,8	25,6	B437*0A4128M000
	1 500	91,0 × 67,1	54	26	49	10	28,0	31,1	B437*0A4158M000
	1 800	64,3 × 105,3	45	21	56	12	22,4	28,3	B437*0A4188M000
	2 700	76,9 × 105,3	30	13	75	16	33,0	40,9	B437*0A4278M000
	3 900	76,9 × 142,8	21	9	80	20	33,8	45,7	B437*0A4398M000
	5 300	91,0 × 144,1	16	8	80	26	46,5	59,4	B437*0A4538M000
400	850	64,3 × 80,3	140	110	45	9,5	21,8	25,6	B437*0A9857M000
	1 200	91,0 × 67,1	94	80	49	10,4	28,0	31,1	B437*0A9128M000
	1 300	64,3 × 105,3	87	74	56	12	22,4	28,3	B437*0A9138M000
	1 900	76,9 × 105,3	60	51	75	16	33,0	40,9	B437*0A9198M000
	2 900	76,9 × 142,8	39	34	80	20	33,8	45,7	B437*0A9298M000
	3 900	91,0 × 144,1	29	24	80	26	46,5	59,4	B437*0A9398M000
450	560	64,3 × 80,3	220	180	36	7,7	17,6	20,7	B437*0A5567M000
	680	91,0 × 67,1	180	150	45	9,4	25,3	28,1	B437*0A5687M000
	850	64,3 × 105,3	150	120	44	9,1	17,4	21,9	B437*0A5857M000
	1 200	76,9 × 105,3	100	80	54	11,4	24,0	29,7	B437*0A5128M000
	1 300	91,0 × 96,6	92	73	68	14,3	31,4	37,1	B437*0A5138M000
	1 900	76,9 × 142,8	63	50	74	15,5	26,3	35,6	B437*0A5198M000
	2 400	91,0 × 144,1	50	40	80	20,2	36,3	46,4	B437*0A5248M000

1) Ripple current capability with natural cooling
2) (B) = ripple current capability with base cooling
3) (T+B) = ripple current capability with terminal and base cooling
4) * "5" = for capacitors with ring clip/clamp mounting
"7" = for capacitors with threaded stud
5) For low-inductance design, see page 161.

Useful life

depending on temperature T_A, T_B, T_{T+B} under ripple current operating conditions[1)]



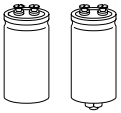
Depending on the application, interpret the graph as follows:

1. Natural cooling
   Use rated current $I\sim_R$ and ambient temperature T_A.
2. Cooling of base
   Use rated current $I\sim_R$ (B) and temperature of capacitor base T_B.
3. Cooling of terminals and base
   Use rated current $I\sim_R$ (T+B) and temperature of capacitor base T_{T+B}.
   Ensure that the temperature of the cooled terminals is lower than that of the case base.

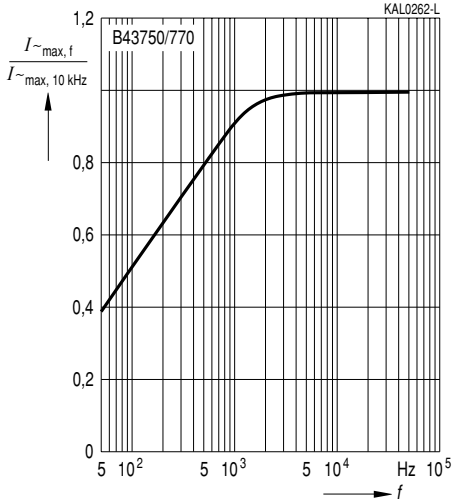
Due to the current load capability of the contact elements, the following current limits must not be exceeded, even if the frequency and temperature factors have been taken into account:

Capacitor diameter	Capacitor base cooling	Terminal and capacitor base cooling
64,3 mm	62 A	75 A
76,9 mm	80 A	100 A
91,0 mm	80 A	100 A

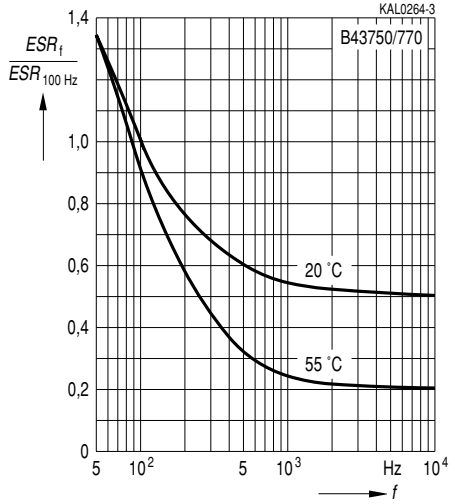
1) Refer to page 40 for an explanation on how to interpret the useful life graphs.



Frequency factor of permissible ripple current *I*~
versus frequency *f*



Frequency characteristics of *ESR*
Typical behavior



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