

Capacitors with Screw Terminals

B41560

Compact – 105 °C

B41580

Long-life grade capacitors

Applications

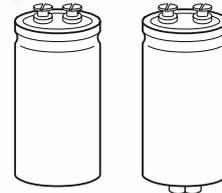
- General industrial electronics
- Professional power supplies

Features

- High reliability, extremely good electrical characteristics
- High *CU* product, i. e. extremely compact
- High ripple current capability
- All-welded construction ensures reliable electrical contact
- Version with low-inductance design available

Construction

- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Poles with screw terminal connections
- Mounting with ring clips, clamps or threaded stud
- The bases of types with threaded stud are not insulated



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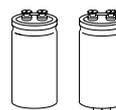
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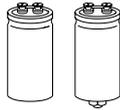
Specifications and characteristics in brief

Rated voltage U_R	25 ... 100 VDC	
Surge voltage U_S	$1,15 \cdot U_R$	
Rated capacitance C_R	1 500 ... 330 000 μ F	
Capacitance tolerance	$\pm 20 \% \triangleq M$	
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	Approx. 20 nH Capacitors with low-inductance design: $d \geq 64,3$ mm: approx. 13 nH	
Useful life 105 °C; U_R ; $I_{\sim R}$ 85 °C; U_R ; $I_{\sim \max}$ 40 °C; U_R ; $2,2 \cdot I_{\sim R}$	> 3 000 h > 6 000 h > 250 000 h	Requirements: $\Delta C/C \leq \pm 45 \%$ of initial value $ESR \leq 3$ times initial specified limit $I_L \leq$ initial specified limit Failure percentage: $\leq 1 \%$ Failure rate: ≤ 40 fit ($\leq 40 \cdot 10^{-9}/h$) (for definiton "fit", refer to chapter "Quality", page 62)
Voltage endurance test 105 °C; U_R	2 000 h	Post test requirements: $\Delta C/C \leq \pm 15 \%$ of initial value $ESR \leq 1,3$ times initial specified limit $I_L \leq$ 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: 40/105/56 (– 40 °C/+ 105 °C/56 days damp heat test)	
Detail specification	Similar to CECC 30301-810	
Sectional specification	IEC 60384-4	

Ripple current capability

Due to the ripple current capability of the contact elements, the following current upper limits must not be exceeded:

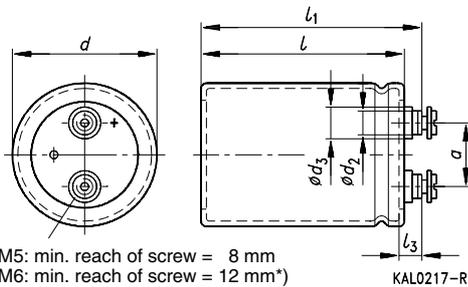
Capacitor diameter	$\leq 51,6$ mm	64,3 mm	76,9 mm
$I_{\sim \max}$	30 A	40 A	50 A



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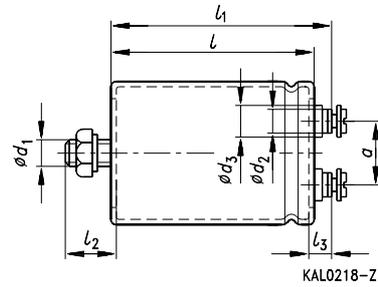
Dimensional drawings

Type B41560
 Ring clip/clamp mounting



M5: min. reach of screw = 8 mm
 M6: min. reach of screw = 12 mm*)
 *) 8 mm for low-inductance design

Type B41580
 Threaded stud mounting



Positive pole marking: +

Screw terminals with UNF threads are available upon request.

Dimensions and weights

Ter- minal	Dimensions (mm) with insulating sleeve									Approx. wt. (g)
	d	$l \pm 1$	$l_1 \pm 1$	$l_2^{+0}_{-1}$	l_3	d_1	$d_2 \text{ max}$	$d_3 \text{ max}$	$a^{+0.2}_{-0.4}$	
M 5	35,7+ 0/- 0,8	55,7	62,2	13	7,0+ 0,2/- 1	M 8	8,2	13,5	12,7	65
M 5	35,7+ 0/- 0,8	80,7	87,2	13	7,0+ 0,2/- 1	M 8	8,2	13,5	12,7	105
M 5	35,7+ 0/- 0,8	105,7	112,2	13	7,0+ 0,2/- 1	M 8	8,2	13,5	12,7	135
M 5	51,6+ 0/- 0,8	80,7	87,2	17	7,0+ 0,2/- 1	M 12	8,2	13,5	22,2	220
M 5	51,6+ 0/- 0,8	105,7	112,2	17	7,0+ 0,2/- 1	M 12	8,2	13,5	22,2	280
M 5	64,3+ 0/- 0,8	105,7	112,2	17	7,0+ 0,2/- 1	M 12	8,2	13,5	28,5	440
M 6	76,9+ 0/- 0,7	105,7	111,5	17	6,4+ 1,1/- 0,8	M 12	17,7	17,7	31,7	540
M 6	76,9+ 0/- 0,7	143,2	149,0	17	6,4+ 1,1/- 0,8	M 12	17,7	17,7	31,7	840

Dimensions are also valid for low-inductance design.

Packing

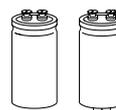
For ecological reasons the packing is pure cardboard.

Capacitor diameter d	Packing units (pieces)
35,7 mm	36
51,6 mm	22
64,3 mm	15
76,9 mm	12



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Special designs

- Low-inductance design

Ordering code:

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 5	A 5,1 DIN 6797	Cylinder-head screw M 5 × 8 DIN 84-4.8	2 Nm
	M 6	A 6,4 DIN 6797	Cylinder-head screw M 6 × 12 DIN 85-4.8	2,5 Nm
For mounting	M 8	J 8,2 DIN 6797	Hex nut BM 8 DIN 439	4 Nm
	M 12	J 12,5 DIN 6797	Hex nut BM 12 DIN 439	10 Nm

The following must be ordered separately:

Ring clips

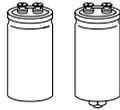
B44030 (cf. page 169)

Clamps for capacitors with $d \geq 64,3$ mm

B44030 (cf. page 173)

Insulating parts

B44020 (cf. page 166)



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Overview of available types

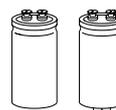
U_R (VDC)	25	40	63	100
C_R (μF)	Case dimensions $d \times l$ (mm)			
1500				35,7 × 55,7
2 200				35,7 × 80,7
3 300				35,7 × 80,7
4 700			35,7 × 55,7	35,7 × 105,7
6 800			35,7 × 80,7	51,6 × 80,7
10 000		35,7 × 55,7	35,7 × 105,7	51,6 × 105,7
15 000	35,7 × 55,7	35,7 × 80,7	51,6 × 80,7	64,3 × 105,7
22 000	35,7 × 80,7	35,7 × 105,7	51,6 × 105,7	76,9 × 105,7
33 000	35,7 × 80,7	51,6 × 80,7	64,3 × 105,7	76,9 × 143,2
47 000	35,7 × 105,7	51,6 × 105,7	64,3 × 105,7	
68 000	51,6 × 80,7	51,6 × 105,7	76,9 × 105,7	
100 000	51,6 × 105,7	64,3 × 105,7	76,9 × 143,2	
150 000	64,3 × 105,7	76,9 × 105,7		
220 000	76,9 × 105,7	76,9 × 143,2		
330 000	76,9 × 143,2			

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



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Technical data and ordering codes

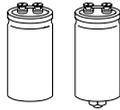
U_R VDC	C_R 100 Hz 20 °C μF	Case dimensions $d \times l$ mm	ESR_{max} 100 Hz 20 °C m Ω	Z_{max} 10 kHz 20 °C m Ω	$I_{\text{~max}}$ 100 Hz 40 °C A	$I_{\text{~max}}$ 100 Hz 85 °C A	$I_{\text{~R}}$ 100 Hz 105 °C A	Ordering code ¹⁾
25	15 000	35,7 × 55,7	42	31	18	11	5,3	B415*0A5159M000
	22 000	35,7 × 80,7	29	22	25	15	7,4	B415*0A5229M000
	33 000	35,7 × 80,7	20	17	30	18	8,8	B415*0A5339M000
	47 000	35,7 × 105,7	16	13	30	23	11	B415*0A5479M000
	68 000	51,6 × 80,7	12	9,3	30	26	13	B415*0A5689M000
	100 000	51,6 × 105,7	9,4	7,6	30	30	15	B415*0A5100M000
	150 000	64,3 × 105,7	8,0	6,4	40	38	18	B415*0A5150M000 ²⁾
	220 000	76,9 × 105,7	7,0	5,6	50	40	20	B415*0A5220M000 ²⁾
40	330 000	76,9 × 143,2	6,4	5,1	50	50	24	B415*0A5330M000 ²⁾
	10 000	35,7 × 55,7	42	37	18	11	5,3	B415*0A7109M000
	15 000	35,7 × 80,7	29	26	25	15	7,4	B415*0A7159M000
	22 000	35,7 × 105,7	22	20	30	20	9,5	B415*0A7229M000
	33 000	51,6 × 80,7	15	13	30	23	11	B415*0A7339M000
	47 000	51,6 × 105,7	12	10	30	29	14	B415*0A7479M000
	68 000	51,6 × 105,7	10	8,4	30	30	15	B415*0A7689M000
	100 000	64,3 × 105,7	8,2	7,0	40	38	18	B415*0A7100M000 ²⁾
63	150 000	76,9 × 105,7	7,2	6,0	50	41	20	B415*0A7150M000 ²⁾
	220 000	76,9 × 143,2	6,4	5,4	50	49	24	B415*0A7220M000 ²⁾
	4 700	35,7 × 55,7	60	64	15	9,2	4,4	B415*0A8478M000
	6 800	35,7 × 80,7	44	46	20	12	6,0	B415*0A8688M000
	10 000	35,7 × 105,7	30	33	28	17	8,1	B415*0A8109M000
	15 000	51,6 × 80,7	22	21	30	19	9,1	B415*0A8159M000
	22 000	51,6 × 105,7	16	16	30	25	12	B415*0A8229M000
	33 000	64,3 × 105,7	12	12	40	31	15	B415*0A8339M000 ²⁾
63	47 000	64,3 × 105,7	10	9,4	40	35	17	B415*0A8479M000 ²⁾
	68 000	76,9 × 105,7	8,0	7,8	50	39	19	B415*0A8689M000 ²⁾
	100 000	76,9 × 143,2	6,6	6,6	50	48	23	B415*0A8100M000 ²⁾

■ Preferred types

1) * "6" = for capacitors with ring clip/clamp mounting

"8" = for capacitors with threaded stud

2) For low-inductance design, see page 85.



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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 m Ω	Z_{max} 10 kHz 20 °C m Ω	$I_{\sim\text{max}}$ 100 Hz 40 °C A	$I_{\sim\text{max}}$ 100 Hz 85 °C A	$I_{\sim R}$ 100 Hz 105 °C A	Ordering code ¹⁾
100	1 500	35,7 × 55,7	104	90	11	7,0	3,4	B415*0A9158M000
	2 200	35,7 × 80,7	70	77	16	9,9	4,7	B415*0A9228M000
	3 300	35,7 × 80,7	48	53	19	12	5,7	B415*0A9338M000
	4 700	35,7 × 105,7	35	39	26	16	7,5	B415*0A9478M000
	6 800	51,6 × 80,7	24	25	30	18	8,7	B415*0A9688M000
	10 000	51,6 × 105,7	17	18	30	24	11	B415*0A9109M000
	15 000	64,3 × 105,7	13	14	40	30	15	B415*0A9159M000 ²⁾
	22 000	76,9 × 105,7	10	11	50	35	17	B415*0A9229M000 ²⁾
	33 000	76,9 × 143,2	8,0	8,4	50	44	21	B415*0A9339M000 ²⁾

■ Preferred types

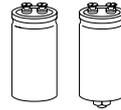
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"8" = for capacitors with threaded stud

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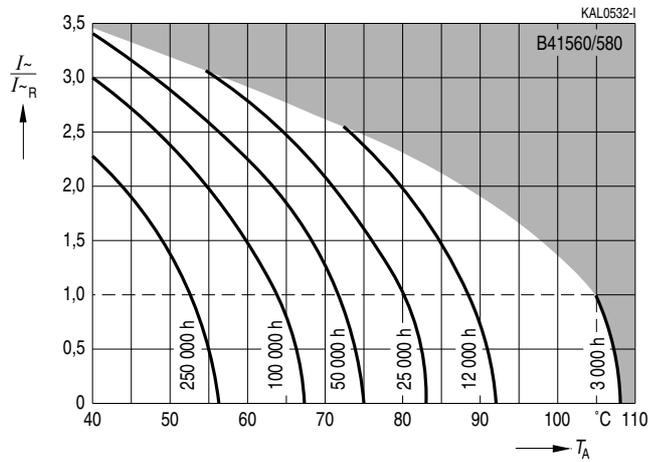
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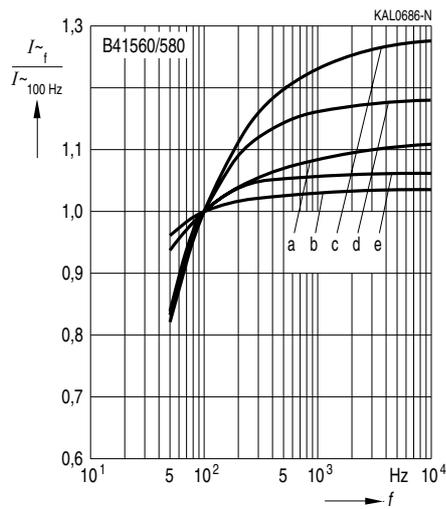


Useful life

depending on ambient temperature T_A under ripple current operating conditions¹⁾

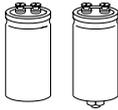


Frequency factor of permissible ripple current I_{\sim} versus frequency f



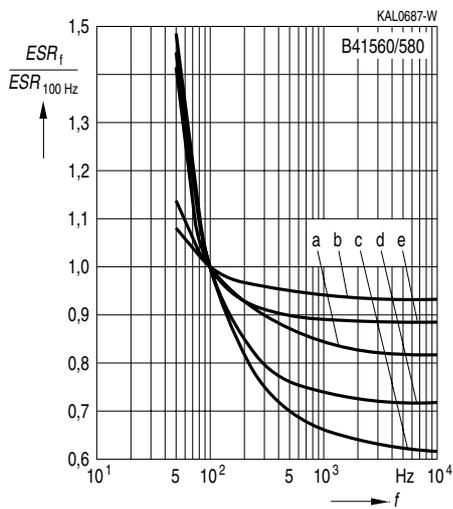
d (mm)	35,7	51,6	64,3	76,9
≤ 63 VDC	a	a	a	b
100 VDC	c	d	d	e

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



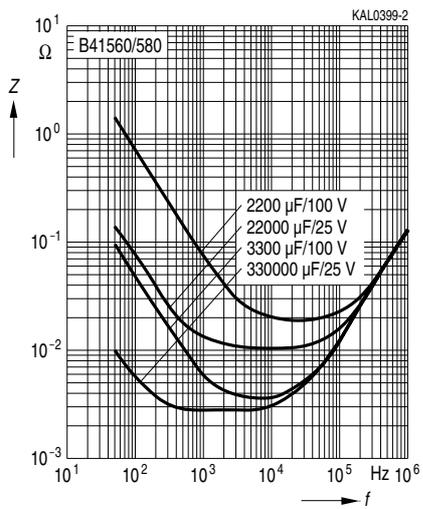
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Frequency characteristics of ESR
 Typical behavior



<i>d</i> (mm)	35,7	51,6	64,3	76,9
≤ 63 VDC	a	a	a	b
100 VDC	c	d	d	e

Impedance Z
 versus frequency *f*
 Typical behavior at 20 °C



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