

Long-life grade capacitors

Applications

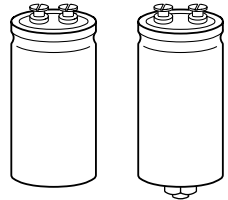
- General industrial electronics
- Professional power supplies

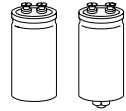
Features

- 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


B41560
B41580



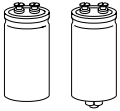
Specifications and characteristics in brief

Rated voltage U_R	25 ... 100 VDC	
Surge voltage U_S	$1,15 \cdot U_R$	
Rated capacitance C_R	1 500 ... 330 000 μF	
Capacitance tolerance	$\pm 20 \% \triangleq \text{M}$	
Leakage current I_L (5 min, 20 °C)	$I_L \leq 0,3 \mu\text{A} \cdot \left(\frac{C_R}{\mu\text{F}} \cdot \frac{U_R}{\text{V}} \right)^{0,7} + 4 \mu\text{A}$	
Self-inductance ESL	Approx. 20 nH Capacitors with low-inductance design: $d \geq 64,3 \text{ mm}$: approx. 13 nH	
Useful life 105 °C; U_R ; $I_{\sim R}$ 85 °C; U_R ; $I_{\sim \text{max}}$ 40 °C; U_R ; $2,2 \cdot I_{\sim R}$	$> 3\,000 \text{ h}$ $> 6\,000 \text{ h}$ $> 250\,000 \text{ h}$	Requirements: $\Delta C/C \leq \pm 45 \% \text{ of initial value}$ $ESR \leq 3 \text{ times initial specified limit}$ $I_L \leq \text{initial specified limit}$ Failure percentage: $\leq 1 \%$ Failure rate: $\leq 40 \text{ fit } (\leq 40 \cdot 10^{-9}/\text{h})$ (for definition "fit", refer to chapter "Quality", page 62)
Voltage endurance test 105 °C; U_R	2 000 h	Post test requirements: $\Delta C/C \leq \pm 15 \% \text{ of initial value}$ $ESR \leq 1,3 \text{ times initial specified limit}$ $I_L \leq \text{initial specified limit}$
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 $3 \times 2 \text{ h}$	
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	$\leq 51,6 \text{ mm}$	64,3 mm	76,9 mm
$I_{\sim \text{max}}$	30 A	40 A	50 A



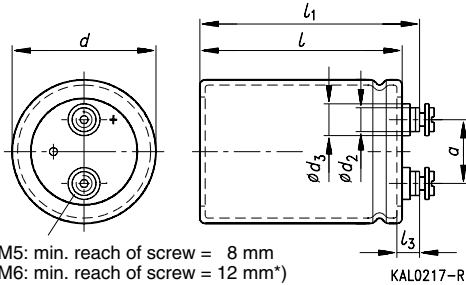
B41560 / B41580

Compact – 105 °C

Dimensional drawings

Type B41560

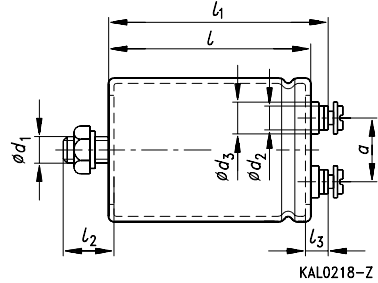
Ring clip/clamp mounting



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

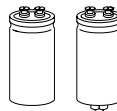
Ter- minal	Dimensions (mm) with insulating sleeve									Approx. wt. (g)
	<i>d</i>	<i>l</i> ± 1	<i>l</i> ₁ ± 1	<i>l</i> ₂ ⁺⁰ ₋₁	<i>l</i> ₃	<i>d</i> ₁	<i>d</i> ₂ max	<i>d</i> ₃ max	<i>a</i> ^{+0,2} _{-0,4}	
M 5	35,7+ 0/- 0,8	55,7	62,2	13	7,0+ 0,2/- 1	M 8	8,2	13,5	12,7	65
M 5	35,7+ 0/- 0,8	80,7	87,2	13	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



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 $\times$ 8 DIN 84-4.8	2 Nm
	M 6	A 6,4 DIN 6797	Cylinder-head screw M 6 $\times$ 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

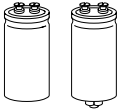
Clamps for capacitors with $d \geq 64,3$ mm

Insulating parts

B44030 (cf. page 169)

B44030 (cf. page 173)

B44020 (cf. page 166)



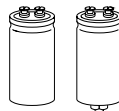
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Compact – 105 °C

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.

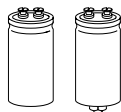

Technical data and ordering codes

U_R	C_R 100 Hz 20 °C μF	Case dimensions $d \times l$ mm	ESR_{max} 100 Hz 20 °C mΩ	Z_{max} 10 kHz 20 °C mΩ	$I_{~max}$ 100 Hz 40 °C A	$I_{~max}$ 100 Hz 85 °C A	$I_{~R}$ 100 Hz 105 °C A	Ordering code ¹⁾
VDC								
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⁾
	330 000	76,9 × 143,2	6,4	5,1	50	50	24	B415*0A5330M000 ²⁾
40	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⁾
	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⁾
63	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⁾
	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.


B41560 / B41580
Compact – 105 °C
Technical data and ordering codes

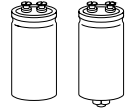
U_R	C_R	Case dimensions	ESR_{max}	Z_{max}	$I_{~max}$	$I_{~max}$	$I_{~R}$	Ordering code ¹⁾
	100 Hz	dimensions	100 Hz	10 kHz	100 Hz	100 Hz	100 Hz	
	20 °C	$d \times l$	20 °C	20 °C	40 °C	85 °C	105 °C	
VDC	μF	mm	mΩ	mΩ	A	A	A	
100	1 500	35,7 × 55,7	104	90	11	7,0	3,4	B415*0A9158M000
	2 200	35,7 × 80,7	70	77	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

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

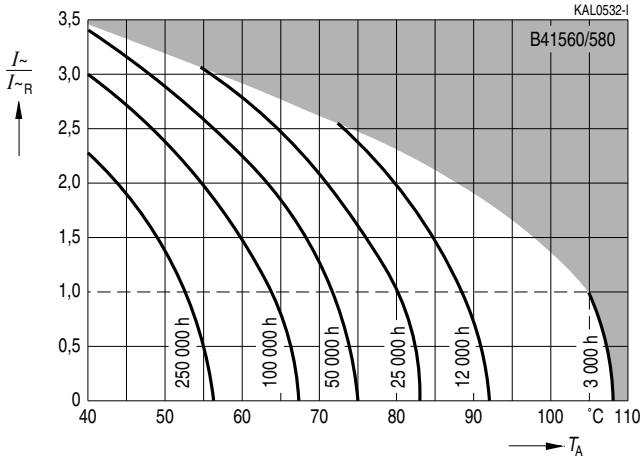
"8" = for capacitors with threaded stud

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

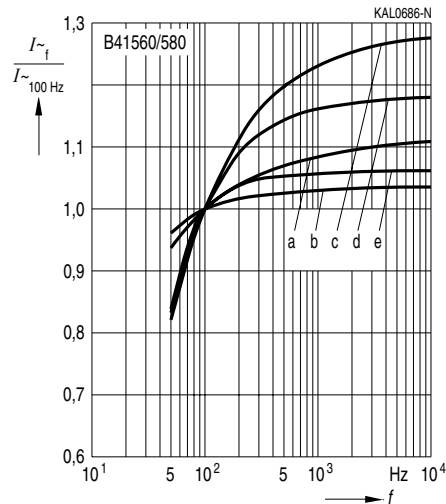


Useful life

depending on ambient temperature T_A under ripple current operating conditions¹⁾

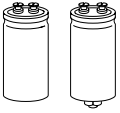


Frequency factor of permissible ripple current $I_{\sim}$ versus frequency f



d (mm)	35,7	51,6	64,3	76,9
$\leq 63 \text{ VDC}$	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.

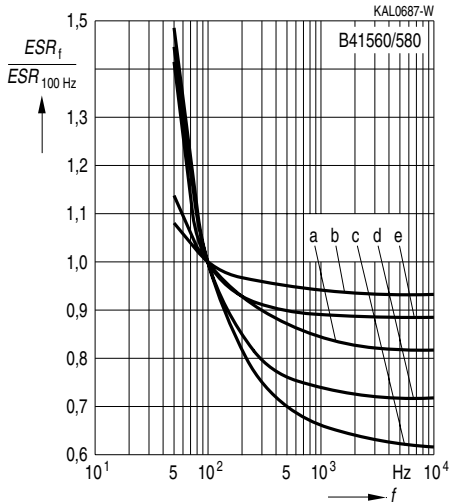


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Compact – 105 °C

Frequency characteristics of ESR

Typical behavior

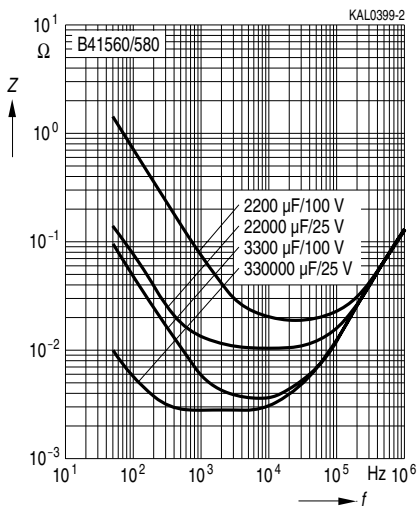


d (mm)	35,7	51,6	64,3	76,9
≤ 63 VDC	a	a	a	b
100 VDC	c	d	d	e

Impedance Z

versus frequency f

Typical behavior at 20 °C



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