

Power Electronic Capacitors



Capacitor selection guide

Block diagram

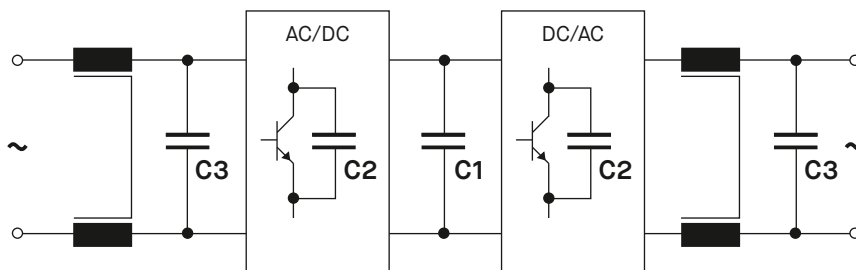


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Iskra manufactures and supplies a wide range of power electronic capacitors which can be used for various functions in electric circuits. They are most commonly used in frequency or voltage inverters, uninterruptible power supplies, motor drives, welding equipment, wind and solar power systems.

A typical switching-mode power supply is shown in the block diagram above.

DC link capacitors at position **C1** are used for DC voltage smoothing. Capacitors at position **C2** are snubber capacitors. When a switch opens, they eliminate voltage spikes caused by circuit inductance. AC filtering capacitors at position **C3** are used in input/output low-pass LC filters.

The AC/DC general purpose capacitors may be used in AC or DC applications.

Terms and definitions

C_N — rated capacitance

Nominal value of capacitance measured at 20 °C.

U_{NDC} — rated DC voltage

Maximum operating peak voltage of either polarity but of a non-reversing type waveform for which the capacitor has been designed.

U_{RMS} — rated RMS voltage

Root mean square of max. permissible value of sinusoidal AC voltage in continuous operation.

U_N — rated AC voltage

Maximum operating peak recurrent voltage of either polarity of a reversing type waveform for which the capacitor has been designed.

U_R — ripple voltage

Peak-to-peak alternating component of the unidirectional voltage.

I_{MAX} — maximum current

Maximum RMS current for continuous operation.

$(dU/dt)_{MAX}$ — maximum rate of voltage rise

Maximum permissible repetitive rate of voltage rise of the operational voltage.

\hat{I} — maximum peak current

Maximum repetitive peak current that can occur during continuous operation.

$$\hat{I} = C \times (du/dt)_{max}$$

\hat{I}_s — maximum surge current

Peak non-repetitive current induced by switching or any other disturbance of the system which is allowed for a limited number of times, for durations shorter than the basic period.

$$\hat{I}_s = C \times (du/dt)_s$$

Tan(δ) — tangent of the loss angle of a capacitor

Ratio between equivalent series resistance and the capacitive reactance of a capacitor at a specified sinusoidal alternating voltage, frequency and temperature.

$$\begin{aligned} \text{Tan}(\delta) &= \text{ESR} \times \omega \times C = \text{tan}(\delta_o) + R_s \times \omega \times C \\ \text{Tan}(\delta_o) &= \text{dielectric loss factor} \end{aligned}$$

R_s — series resistance

Effective ohmic resistance of the conductor of a capacitor under specified operating conditions.

ESR — equivalent series resistance of a capacitor

Effective resistance which, if connected in series with an ideal capacitor of capacitance value equal to that of the capacitor in question, would have a power loss equal to active power dissipated in that capacitor under specified operating conditions.

$$\text{ESR} = \text{tan}(\delta_o) / (\omega \times C) + R_s$$

P_{diss} — dissipated power

Active power dissipated in the capacitor.

$$P_{diss} = I_{max}^2 \times \text{ESR}$$

L_s — self-inductance

The sum of all inductive elements which are contained in a capacitor.

Θ_{amb} — ambient temperature

Temperature measured from the distance of approximately 0.1 m and at two-thirds of the height of the capacitor.

Θ_{min} — lowest operating temperature

Lowest temperature of the dielectric at which the capacitor may be energized.

Θ_{max} — maximum operating temperature

Highest temperature of the case at which the capacitor may be operated.

$\Delta\Theta_{case}$ — container temperature rise

Difference between the temperature of the hottest point of the container and the temperature of the cooling air.

R_{th} — thermal resistance

Thermal resistance indicates how many degrees the temperature of the capacitor rises at the hot spot in relation to the dissipation losses.

Θ_{hs} — hot-spot temperature

Temperature at the hottest spot inside the capacitor.

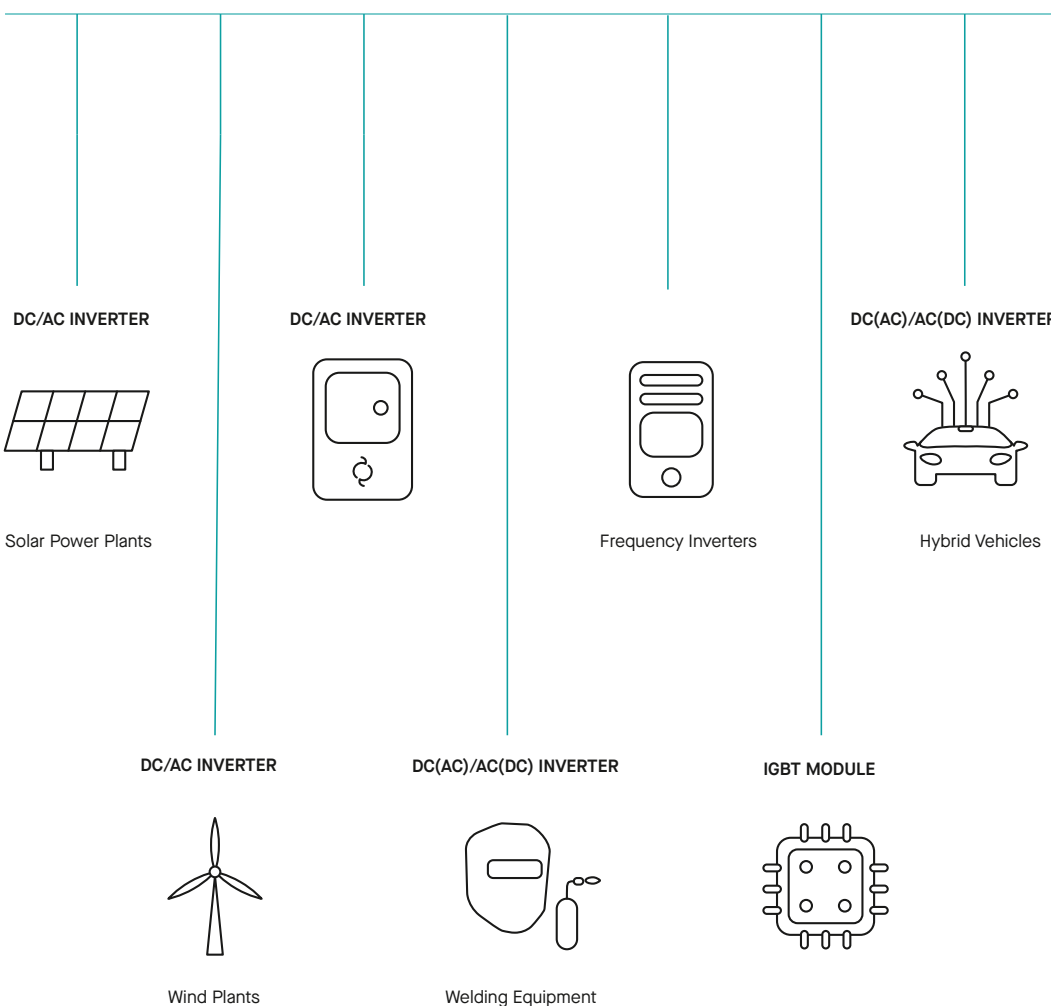
$$\Theta_{hs} = \Theta_{amb} + P_{diss} \times R_{th}$$

P_{max} — maximum power loss

Maximum permissible power dissipation for continuous operation.

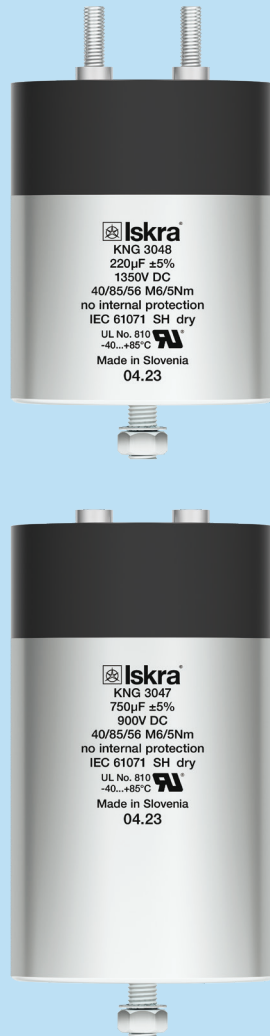
$$P_{max} = (\Theta_{hs} - \Theta_{amb}) / R_{th}$$

Applications



DC LINK CAPACITORS

Type KNG2047 – KNG3047, KNG2048 – KNG3048



Applications

- ▶ Hybrid vehicles wind plants
- ▶ Electric energy generation from sea waves
- ▶ Medical equipment
- ▶ Industrial equipment
- ▶ Car electronics
- ▶ Railways and turbines (generator)
- ▶ Frequency inverters
- ▶ Elevators
- ▶ Welders

Features

- ▶ Used in DC-link circuits, can replace electrolytic capacitor
- ▶ Low ESR, high ripple current handling capabilities
- ▶ Low ESL
- ▶ Self-healing properties
- ▶ Long lifetime

Standards

IEC 61071

UL 810 (construction only)

File No.: E196169



Specifications

Capacitance range	75 µF up to 1740 µF
Capacitance tolerance	± 10 %, on request ± 5 %
Rated voltage U_{NDC}	600 V DC up to 2200 V DC
Dielectric loss factor $\tan(\delta_0)$	$< 2 \times 10^{-4}$ at 1kHz
Test voltage (between terminals)	$1.5 \times U_{NDC}$, 10 s
Test voltage (terminals to case)	3600 V, 50 Hz, 2 s
Temperature coefficient	-2.3 % from -20 °C to +70 °C
Operating temperature	-40 °C to 85 °C
Inductance	< 70 nH
Max. altitude	4000 m
Max. hot spot temperature	85 °C
Climatic category	40/85/56 according to IEC 68/1
Lifetime expectancy	100.000 hours at U_{NDC} , $\theta_{hs} = 70$ °C
Failure rate	100 FIT

General characteristics

Capacitance range

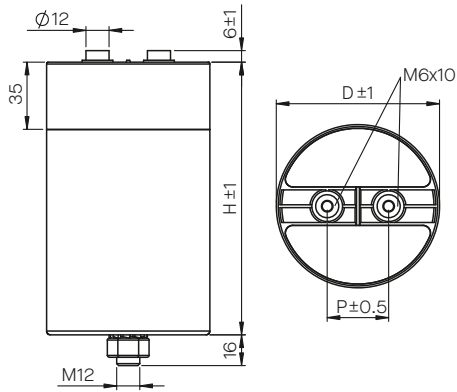
Type	U _{DC} (V DC)	C _N (µF)	I _{max} (A)	İ (kA)	İ _s (kA)	R _s (mΩ)	L _s (nH)	R _{th} (K/W)	D x H (mm)	P (mm)	
KNG204x	600	600	40	3.3	9.9	1.4	40	5.1	85 x 95	32	
KNG204x		650	40	3.6	10.9	1.3	40	5.1	85 x 95	32	
KNG204x		900	35	3.7	11.1	1.9	60	4.5	85 x 125	32	
KNG304x		900	60	7.1	21.2	1.2	60	4.2	85 x 142	32	
KNG304x		1050	60	7.2	21.5	1.3	70	3.9	85 x 155	32	
KNG304x		1280	60	7.1	21.4	1.5	70	2.6	85 x 185	32	
KNG304x		1740	60	7.1	21.4	1.6	80	2.4	85 x 235	32	
KNG204x	700	460	40	2.3	6.9	1.4	40	5.1	85 x 95	32	
KNG204x		620	35	3.1	9.3	1.9	60	4.5	85 x 125	32	
KNG304x		640	60	4.4	13.4	1.5	60	4.2	85 x 142	32	
KNG304x		750	60	4.5	13.5	1.6	70	3.9	85 x 155	32	
KNG304x		920	60	4.6	13.8	1.7	80	2.6	85 x 18	32	
KNG304x		1240	60	4.7	18.8	1.6	80	2.4	85 x 235	32	
KNG304x		1700	80	8.8	26.5	1.3	70	2.1	116 x 185	50	
KNG204x	900	370	35	2.2	6.6	1.8	40	5.5	85 x 95	32	
KNG304x		480	60	4	12	1.2	60	4.9	85 x 142	32	
KNG304x		500	60	4.1	12.3	1.2	40	4.9	85 x 142	32	
KNG304x		560	60	4.2	12.6	1.3	60	4	85 x 155	32	
KNG304x		650	70	3.3	10	1.1	50	4.2	85 x 185	32	
KNG304x		680	60	4.3	12.9	1.3	70	3.2	85 x 185	32	
KNG304x		750	70	4	12	1	55	3.3	85 x 173	32	
KNG304x		950	60	5.7	17.1	1.4	70	2.7	85 x 235	32	
KNG304x		1100	80	8.1	24.3	1.3	60	2.5	116 x 155	50	
KNG304x		2050	60	10.1	30.3	1.5	75	1.5	116 x 285	50	
KNG204x	1100	230	40	2.1	6.3	2.1	40	4.5	85 x 95	32	
KNG304x		320	60	3.3	10	1.2	60	2.8	85 x 142	32	
KNG304x		360	60	3.2	10	1.2	60	2.6	85 x 155	32	
KNG304x		410	65	3.7	11	1.1	45	2.5	85 x 155	32	
KNG304x		420	65	2.5	12.5	1	40	4.9	85 x 136.5	32	
KNG304x		420	65	3.7	11	1.1	45	2.5	85 x 155	32	
KNG304x		450	60	4	12	1.1	70	2.4	85 x 185	32	
KNG304x		500	70	4	12	1.2	60	2.1	85 x 185	50	
KNG304x		610	60	5.3	15.9	1.2	70	2.3	85 x 235	32	
KNG304x		760	80	7.4	22.2	1.1	60	1.8	116 x 155	50	
KNG304x		1100	100	9.9	29.7	1.3	80	1.8	116 x 230	50	
KNG204x		1350	160	40	3.1	9.3	2.1	40	4.1	85 x 95	32
KNG304x			220	60	3.2	9.6	1.4	60	3.7	85 x 142	32
KNG304x	250		60	3.5	10.5	1.3	60	3.5	85 x 155	32	
KNG304x	310		60	3.4	10	1.3	70	3.2	85 x 185	32	
KNG304x	420		60	3.5	10.5	1.4	70	2.7	85 x 235	32	
KNG304x	530		80	7.2	21.6	1.4	60	2	116 x 155	50	
KNG304x	1090		100	11	33	1.7	75	1.5	116 x 290	50	
KNG204x	1500	130	40	1.5	4.5	2.3	40	4.2	85 x 95	32	
KNG304x		180	60	3.5	10.5	1.3	50	3.7	85 x 142	32	
KNG304x		220	60	4	12	1.3	60	3.5	85 x 155	32	
KNG304x		260	60	4.1	12.3	1.4	60	3.2	85 x 185	32	
KNG304x		360	60	3.6	10.8	1.6	70	2.7	85 x 235	32	
KNG304x		460	80	3.1	9.3	1.7	60	2	116 x 155	50	
KNG204x	1800	90	35	1.6	4.8	2.5	60	4.6	85 x 95	32	
KNG304x		140	55	2	6	2.4	70	3.5	85 x 155	32	
KNG304x		240	60	2.9	8.7	1.7	70	2.7	85 x 235	32	
KNG304x		350	80	3	9	2	70	2	116 x 185	50	
KNG204x	2200	75	30	0.5	1.5	5	60	5.8	85 x 125	32	
KNG304x		90	55	0.5	1.5	2.5	60	4.5	85 x 185	32	
KNG304x		150	60	0.5	1.5	2.5	70	3.3	85 x 235	32	
KNG304x		220	80	0.6	1.8	2.3	70	2.7	116 x 185	50	

Notes

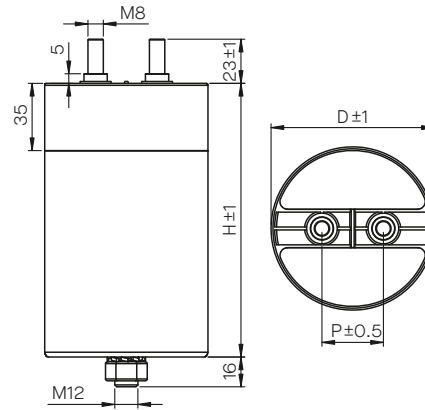
Other values and dimensions available upon request

Dimensions

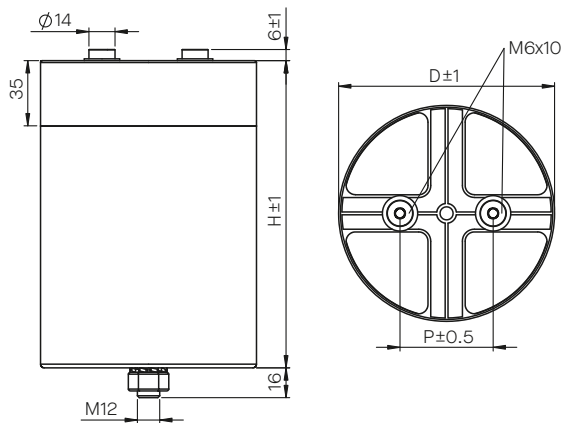
KNG2047, KNG3047 - D85 mm



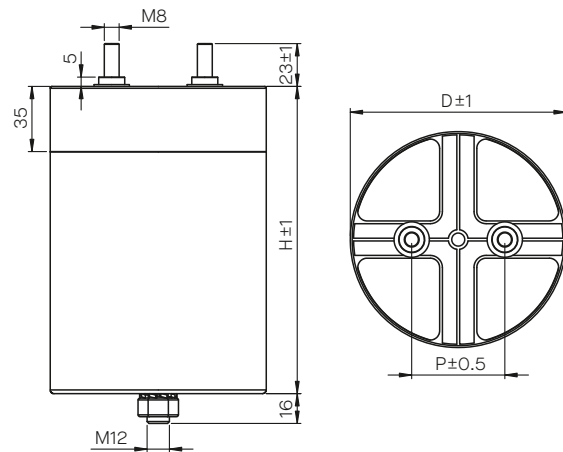
KNG2048, KNG3048 - D85 mm



KNG2047, KNG3047 - D116 mm



KNG2048, KNG3048 - D116 mm



Construction

Dielectric: polypropylene film

Capacitor electrodes: vacuum-deposited metal layers (without overpressure device)

Casing: cylindrical aluminium case with plastic self-extinguishing sealing cover (UL 94 V-0)

Filling: epoxy resin dry (UL94 V-0)

Terminals: M6x10 internal threads (types KNG2047, KNG3047) - max. Torque

5 Nm M8 screw (types KNG2048, KNG3048) - max. Torque 6 Nm

Base stud: M12x16 - max. Torque 12 Nm

HIGH POWER DC LINK CAPACITORS

Type KNG4910, KNG4914

Applications

- ▶ Switching mode power supplies (SMPS)
- ▶ Wind plants
- ▶ Solar power plants
- ▶ Motor drives
- ▶ Induction heaters
- ▶ Frequency inverters
- ▶ Uninterruptible power supplies (UPS)



Features

- ▶ For harsh environment
- ▶ Self-healing properties
- ▶ High ripple current
- ▶ High reliability
- ▶ Very low losses

Standards

IEC 61071

AEC-Q200 (on request)

Specifications

Rated capacitance	0.22 µF up to 100 µF
Capacitance tolerance	±5 %, ±10 %
Rated voltage U_{NDC}	250 V DC, 300 V DC, 450 V DC, 630 V DC, 750 V DC, 875 V DC
Test voltage (between terminals)	$1.5 \times U_{NDC}$, 10 s
Self-inductance	< 1 nH per mm of pitch
Insulation resistance between terminals	$R \times C \geq 30\,000$ s after 1 min at 100 V for $U_{NDC} < 500$ V DC at 500 V for $U_{NDC} \geq 500$ V DC
Operating temperature range	-40 °C to +110 °C
Max. hot spot temperature	+110 °C
Climatic category	40/110/56 according to IEC 60068-1
Life expectancy	$\geq 100,000$ hours at U_{NDC} , $\theta_{hs} = 70$ °C
Failure rate	100 FIT

General characteristics

Capacitance range

U _{NDC} @ 85 °C = 250 V DC, U _{op} @ 70 °C = 300 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ)@1kHz ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	î (A)
	L	H	W	P	P1					
1.5	32	16	7.5	27.5	-	10	27	3.8	32	48
2.2	32	17	9	27.5	-	10	19	4.8	32	70
3	32	19	10	27.5	-	10	14.5	5.8	32	96
3.3	32	20	11	27.5	-	10	13.8	6.2	32	106
4.7	32	22	13	27.5	-	10	10	7.8	32	150
5	32	22	13	27.5	-	10	9.5	8	32	160
5.6	32	23.5	14	27.5	-	10	8.6	8.7	32	179
6	32	24.5	15	27.5	-	10	8.2	9.2	32	192
6.8	32	24.5	15	27.5	-	10	7.4	9.7	32	218
8	32	26.5	17	27.5	-	10	6.5	10.9	32	256
8.2	32	28	18	27.5	-	10	6.3	11.4	32	262
10	32	28	18	27.5	-	10	5.3	12	32	320
12	32	32	18	27.5	-	10	4.5	12	32	384
15	32	35	20	27.5	-/10.2	10	3.7	16.6	32	480
18	32	35.5	24	27.5	-/10.2	10	3.2	18.7	32	576
20	32	40	25	27.5	-/10.2	10	3	20.1	32	640
10	42	27	16	37.5	-	15	9.2	10.1	22	220
12	42	27	16	37.5	-	15	8	10.8	22	264
15	42	31	18	37.5	10.2	15	6.5	12.9	22	330
18	42	38	21	37.5	10.2	15	5.6	15	22	396
20	42	38	21	37.5	10.2	15	5.1	15.8	22	440
22	42	38	21	37.5	10.2	15	4.7	16.4	22	484
25	42	43	28	37.5	10.2	15	4.2	17.7	22	550
30	42	43	28	37.5	10.2	15	3.7	18.9	22	660
35	42	43	28	37.5	10.2	15	3.3	20	22	770
40	42	45	30	37.5	10.2/20.3	15	3	21.8	22	880
50	42	50	36	37.5	10.2/20.3	15	2.6	24	22	1100
55	42	50	36	37.5	10.2/20.3	15	2.5	24	22	1210
55	57.5	45	30	52.5	20.3	20	3	24.1	15	825
60	57.5	45	30	52.5	20.3	20	2.8	24.9	15	900
70	57.5	50	35	52.5	20.3	20	2.5	28.2	15	1050
75	57.5	50	35	52.5	20.3	20	2.4	28.8	15	1125
80	57.5	50	35	52.5	20.3	20	2.3	29.4	15	1200
90	57.5	55	40	52.5	20.3	20	2.1	31.7	15	1350
100	57.5	55	40	52.5	20.3	20	1.9	32	15	1500

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values measured at 1 kHz.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

U _{NDC} @ 85 °C = 300 V DC, U _{op} @ 70 °C = 450 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ) @ 1kHz ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	î (A)
	L	H	W	P	P1					
1	32	16	7.5	27.5	-	10	36	3.3	36	36
2.2	32	19	10	27.5	-	10	16.5	5.5	36	79
3.3	32	21	12	27.5	-	10	12	6.9	36	119
4	32	23.5	14	27.5	-	10	11.5	7.9	36	144
4.7	32	24.5	15	27.5	-	10	9	8.8	36	169
5	32	24.5	15	27.5	-	10	8.7	9	36	180
5.6	32	26.5	17	27.5	-	10	7.9	9.9	36	202
6	32	26.5	17	27.5	-	10	7.5	10.1	36	216
6.8	32	28	18	27.5	-	10	6.8	11	36	245
8	32	32	18	27.5	-	10	6	12	36	288
8.2	32	32	18	27.5	-	10	5.9	12	36	295
10	32	33	20	27.5	-/10.2	10	5	14	36	360
12	32	35.5	24	27.5	-/10.2	10	4.2	16.3	36	432
15	32	40	25	27.5	-/10.2	10	3.4	19.2	36	540
8.2	42	27	16	37.5	-	15	10.4	9.5	25	205
9	42	31	18	37.5	10.2	15	9.3	10.8	25	225
10	42	31	18	37.5	10.2	15	8.5	11.3	25	250
11	42	31	18	37.5	10.2	15	7.7	11.8	25	275
12	42	31	18	37.5	10.2	15	7	12.4	25	300
15	42	38	21	37.5	10.2	15	5.7	14.9	25	375
18	42	38	21	37.5	10.2	15	4.8	16.2	25	450
20	42	43	28	37.5	10.2	15	4.3	17.5	25	500
22	42	43	28	37.5	10.2	15	3.9	18.4	25	550
25	42	43	28	37.5	10.2	15	3.5	19.4	25	625
30	42	45	30	37.5	10.2/20.3	15	2.9	22.2	25	750
35	42	50	36	37.5	10.2/20.3	15	2.6	24	25	875
40	42	50	36	37.5	10.2/20.3	15	2.3	24	25	1000
40	57.5	45	30	52.5	20.3	20	3.1	23.7	17	680
45	57.5	45	30	52.5	20.3	20	2.8	24.9	17	765
50	57.5	50	35	52.5	20.3	20	2.6	27.7	17	850
55	57.5	50	35	52.5	20.3	20	2.4	28.8	17	935
60	57.5	50	35	52.5	20.3	20	2.2	30.1	17	1020
65	57.5	55	40	52.5	20.3	20	2.1	31.7	17	1105
70	57.5	55	40	52.5	20.3	20	2	32	17	1190
75	57.5	55	40	52.5	20.3	20	1.9	32	17	1275

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values measured at 1 kHz.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

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	L	H	W	P	P1					
0.82	32	16	7.5	27.5	-	10	38	3.2	45	37
1	32	17	9	27.5	-	10	32	3.7	45	45
1.5	32	19	10	27.5	-	10	21	4.8	45	68
2	32	21	12	27.5	-	10	16.5	5.9	45	90
3.3	32	24.5	15	27.5	-	10	10.5	8.2	45	149
4	32	26.5	17	27.5	-	10	9	9.2	45	180
4.7	32	28	18	27.5	-	10	7.5	10.5	45	212
5	32	28	18	27.5	-	10	7.3	10.6	45	225
5.6	32	32	18	27.5	-	10	6.4	11.8	45	252
6	32	33	20	27.5	-/10.2	10	6.2	12.6	45	270
6.8	32	33	20	27.5	-/10.2	10	5.6	13.2	45	306
8	32	35.5	24	27.5	-/10.2	10	4.9	15.1	45	360
8.2	32	35.5	24	27.5	-/10.2	10	4.8	15.3	45	369
10	32	40	25	27.5	-/10.2	10	4.1	17.5	45	450
5	42	27	16	37.5	-	15	13	8.5	32	160
5.6	42	27	16	37.5	-	15	11.5	9	32	179
6	42	31	18	37.5	10.2	15	10.8	10	32	192
6.8	42	31	18	37.5	10.2	15	9.5	10.7	32	218
7.5	42	31	18	37.5	10.2	15	8.7	11.1	32	240
8	42	38	21	37.5	10.2	15	8.1	12.5	32	256
8.2	42	38	21	37.5	10.2	15	7.9	12.7	32	262
10	42	38	21	37.5	10.2	15	6.6	13.8	32	320
12	42	38	21	37.5	10.2	15	5.6	15	32	384
14	42	43	28	37.5	10.2	15	4.9	16.4	32	448
15	42	43	28	37.5	10.2	15	4.6	16.9	32	480
18	42	43	28	37.5	10.2	15	3.9	18.4	32	576
20	42	45	30	37.5	10.2/20.3	15	3.5	20.2	32	640
22	42	50	36	37.5	10.2/20.3	15	3.2	22.6	32	704
25	42	50	36	37.5	10.2/20.3	15	2.9	23.8	32	800
25	57.5	45	30	52.5	20.3	20	3.7	21.7	22	550
30	57.5	45	30	52.5	20.3	20	3.2	23.3	22	660
35	57.5	50	35	52.5	20.3	20	2.8	26.7	22	770
40	57.5	50	35	52.5	20.3	20	2.5	28.2	22	880
45	57.5	55	40	52.5	20.3	20	2.3	30.3	22	990
50	57.5	55	40	52.5	20.3	20	2.1	31.7	22	1100

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values measured at 1 kHz.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

U _{NDC} @ 85 °C = 6300 V DC, U _{op} @ 70 °C = 800 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ)@1kHz ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	Ī (A)
	L	H	W	P	P1					
0.56	32	16	7.5	27.5	-	10	48	2.9	54	30
0.68	32	17	9	27.5	-	10	40	3.3	54	37
0.82	32	17	9	27.5	-	10	33	3.6	54	44
1	32	19	10	27.5	-	10	26.8	4.3	54	54
1.2	32	21	12	27.5	-	10	23	5	54	65
2	32	24.5	15	27.5	-	10	14	7.1	54	108
2.2	32	24.5	15	27.5	-	10	13	7.3	54	119
3	32	28	18	27.5	-	10	9.8	9.2	54	162
3.3	32	28	18	27.5	-	10	8.8	9.7	54	178
4	32	32	18	27.5	-	10	7.2	11.2	54	216
4.7	32	33	20	27.5	-/10.2	10	6.6	12.2	54	254
5	32	35	20	27.5	-/10.2	10	6.3	12.7	54	270
5.6	32	35.5	24	27.5	-/10.2	10	5.8	13.9	54	302
6	32	35.5	24	27.5	-/10.2	10	5.5	14.3	54	324
6.8	32	40	25	27.5	-/10.2	10	4.9	16	54	258
7	32	40	25	27.5	-/10.2	10	4.8	16.1	54	266
4	42	27	16	37.5	-	15	12	8.8	38	152
4.7	42	31	18	37.5	10.2	15	10.2	10.3	38	179
5	42	31	18	37.5	10.2	15	9.5	10.7	38	190
5.6	42	32	19	37.5	10.2	15	8.7	11.4	38	213
6	42	32	19	37.5	10.2	15	8.2	11.7	38	228
6.8	42	38	21	37.5	10.2	15	7.3	13.2	38	258
8	42	38	21	37.5	10.2	15	6.5	14	38	304
8.2	42	38	21	37.5	10.2	15	6.3	14.2	38	312
10	42	43	28	37.5	10.2	15	5.2	15.9	38	380
12	42	43	28	37.5	10.2	15	4.3	17.5	38	456
15	42	50	36	37.5	10.2/20.3	15	3.6	21.3	38	570
18	42	50	36	37.5	10.2/20.3	15	3.1	23	38	684
20	42	50	36	37.5	10.2/20.3	15	2.8	24	38	760
18	57.5	45	30	52.5	20.3	20	4.5	19.7	26	468
20	57.5	45	30	52.5	20.3	20	4.1	20.6	26	520
22	57.5	50	35	52.5	20.3	20	3.8	22.9	26	572
25	57.5	50	35	52.5	20.3	20	3.4	24.2	26	650
30	57.5	55	40	52.5	20.3	20	2.9	26.9	26	780
35	57.5	55	40	52.5	20.3	20	2.5	29	26	910

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values measured at 1 kHz.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

U _{NDC} @ 85 °C = 750 V DC, U _{op} @ 70 °C = 900 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ)@1kHz ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	Ī (A)
	L	H	W	P	P1					
0.39	32	16	7.5	27.5	-	10	60	2.6	63	25
0.47	32	17	9	27.5	-	10	50	3	63	30
0.56	32	17	9	27.5	-	10	41.5	3.2	63	35
0.68	32	19	10	27.5	-	10	35	3.7	63	43
0.82	32	20	11	27.5	-	10	30	4.2	63	52
1	32	21	12	27.5	-	10	25.5	4.7	63	63
1.5	32	24.5	15	27.5	-	10	17	6.4	63	95
2	32	26.5	17	27.5	-	10	13	7.7	63	126
2.2	32	26.5	17	27.5	-	10	11.6	8.1	63	139
3	32	33	20	27.5	-/10.2	10	8.8	10.6	63	189
3.3	32	33	20	27.5	-/10.2	10	8.2	10.9	63	208
4	32	35.5	24	27.5	-/10.2	10	6.9	12.7	63	252
4.7	32	40	25	27.5	-/10.2	10	6	14.4	63	296
5	32	40	25	27.5	-/10.2	10	5.6	14.9	63	315
2.2	42	27	16	37.5	-	15	17	7.4	45	140
3	42	27	16	37.5	-	15	13	8.5	45	135
3.3	42	31	18	37.5	10.2	15	12.3	9.4	45	149
4	42	32	19	37.5	10.2	15	10.5	10.4	45	180
4.7	42	38	21	37.5	10.2	15	9	11.9	45	212
5	42	38	21	37.5	10.2	15	8.5	12.2	45	225
5.6	42	38	21	37.5	10.2	15	7.7	12.8	45	252
6	42	38	21	37.5	10.2	15	7.3	13.2	45	270
6.8	42	43	28	37.5	10.2	15	6.6	14.1	45	306
8	42	43	28	37.5	10.2	15	5.8	15.1	45	360
8.2	42	43	28	37.5	10.2	15	5.7	15.2	45	369
9	42	45	30	37.5	10.2	15	5.3	16.4	45	405
10	42	45	30	37.5	10.2/20.3	15	4.8	17.3	45	450
12	42	50	36	37.5	10.2/20.3	15	4.1	20	45	540
14	42	50	36	37.5	10.2/20.3	15	3.7	21	45	630
14	57.5	45	30	52.5	20.3	20	4.8	19	30	420
15	57.5	45	30	52.5	20.3	20	4.6	19.4	30	450
18	57.5	50	35	52.5	20.3	20	3.8	22.9	30	540
20	57.5	50	35	52.5	20.3	20	3.5	23.9	30	600
22	57.5	55	40	52.5	20.3	20	3.2	25.6	30	660
25	57.5	55	40	52.5	20.3	20	3	26.5	30	750

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values measured at 1 kHz.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

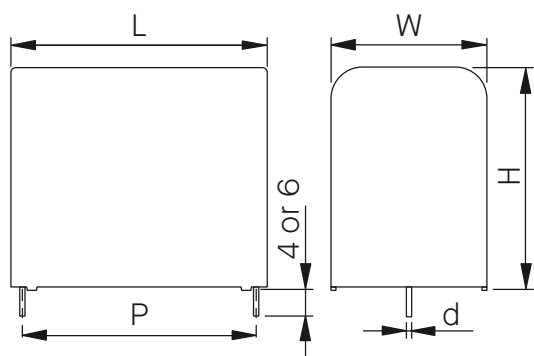
U _{NDC} @ 85 °C = 875 V DC, U _{op} @ 70 °C = 1050 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ)@1kHz ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	Ī (A)
	L	H	W	P	P1					
0.22	32	16	7.5	27.5	-	10	80	2.2	72	16
0.33	32	17	9	27.5	-	10	55	2.8	72	24
0.47	32	19	10	27.5	-	10	42	3.4	72	34
0.56	32	19	10	27.5	-	10	37	3.6	72	40
0.68	32	20	11	27.5	-	10	30	4.2	72	49
0.82	32	21	12	27.5	-	10	25	4.8	72	59
1	32	22	13	27.5	-	10	22	5.2	72	72
1.5	32	26.5	17	27.5	-	10	15	7.2	72	108
2	32	28	18	27.5	-	10	11.5	8.5	72	144
2.2	32	32	18	27.5	-	10	10.5	9.2	72	158
3	32	35.5	24	27.5	-/10.2	10	7.8	12	72	216
3.3	32	35.5	24	27.5	-/10.2	10	7.3	12.4	72	238
4	32	40	25	27.5	-/10.2	10	6.3	14.1	72	288
2	42	27	16	37.5	-	15	16	7.6	51	102
2.2	42	27	16	37.5	-	15	15	7.9	51	112
3	42	31	18	37.5	10.2	15	11.5	9.7	51	153
3.3	42	38	21	37.5	10.2	15	10.5	11	51	168
4	42	38	21	37.5	10.2	15	9	11.9	51	204
4.7	42	38	21	37.5	10.2	15	7.6	12.9	51	240
5	42	43	28	37.5	10.2	15	7	13.7	51	255
5.6	42	43	28	37.5	10.2	15	6.3	14.5	51	286
6	42	43	28	37.5	10.2	15	6.1	14.2	51	306
6.8	42	43	28	37.5	10.2	15	5.8	15.1	51	347
7.5	42	45	30	37.5	10.2/20.3	15	5.4	16.3	51	383
8	42	45	30	37.5	10.2/20.3	15	5.1	16.7	51	408
8.2	42	45	30	37.5	10.2/20.3	15	5	16.9	51	418
9	42	50	36	37.5	10.2/20.3	15	4.6	18.9	51	459
10	42	50	36	37.5	10.2/20.3	15	4.4	19.3	51	510
10	57.5	45	30	52.5	20.3	20	5.2	18.3	35	350
12	57.5	45	30	52.5	20.3	20	4.6	19.4	35	420
14	57.5	50	35	52.5	20.3	20	4	22.3	35	490
15	57.5	50	35	52.5	20.3	20	3.8	22.9	35	525
16	57.5	50	35	52.5	20.3	20	3.7	23.2	35	560
18	57.5	55	40	52.5	20.3	20	3.3	25.3	35	630
20	57.5	55	40	52.5	20.3	20	3	26.5	35	700

Notes:

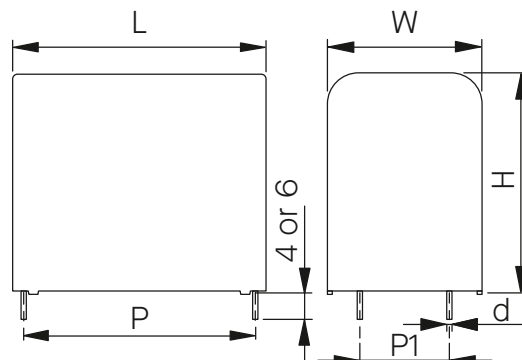
- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values measured at 1 kHz.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

Dimensions

KNG4910 (2 pins)



KNG4914 (4 pins)



Terminal dimensions						Max. box dimensions		
P (mm)	Tolerance (mm)	P1 (mm)	Tolerance (mm)	d (mm)	Tolerance (mm)	L _{max} (mm)	H _{max} (mm)	W _{max} (mm)
27.5	±0.5	-	-	0.8	±0.05	L + 0.5	H + 0.2	W + 0.5
27.5	±0.5	10.2	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.2	W + 0.5
37.5	±0.5	-	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.5	W + 0.5
37.5	±0.5	10.2	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.5	W + 0.5
37.5	±0.5	20.3	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.5	W + 0.5
52.5	±0.5	20.3	±0.5	1.2	±0.05	L + 1.0	H + 1.0	W + 1.0

Construction

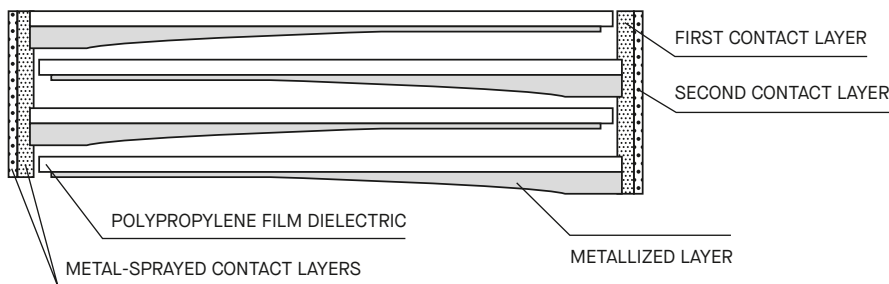
Dielectric: polypropylene film

Capacitor electrodes: vacuum-deposited metal layers

Casing: plastic case with flame-retardant epoxy resin sealing (UL 94 V-0)

Terminals: parallel tinned copper wire (2 or 4 pins)

Internal construction



HIGH DENSITY DC LINK CAPACITORS

Type KNG1910, KNG1914

Applications

- ▶ Hybrid vehicles
- ▶ Wind plants
- ▶ Solar power plants
- ▶ Electric energy generation from sea waves
- ▶ Medical equipment
- ▶ Industrial equipment
- ▶ Car electronics
- ▶ Railways and turbines (generator)
- ▶ Frequency inverters
- ▶ DC filtering applications



Features

- ▶ High capacitance
- ▶ Self-healing properties
- ▶ High reliability
- ▶ Low losses
- ▶ Low dissipation factor of dielectric

Standards

IEC 61071

AEC-Q200 (on request)

Specifications

Rated capacitance	0.1 mF up to 480 mF
Capacitance tolerance	±5%, ±10%
Rated voltage	450 V DC, 700 V DC, 800 V DC, 900 V DC, 1100 V DC, 1300 V DC
Test voltage (between terminals)	1.5×U _{NDC} , 10 s
Self-inductance	< 1nH per mm of pitch
Insulation resistance between terminals	R×C ≥ 30 000 s after 1 min at 100 V for U _{NDC} < 500 V DC at 500 V for U _{NDC} ≥ 500 V DC
Max. peak-to-peak voltage	0.2×U _{NDC}
Operating temperature range	-40 °C to +85 °C
Max. hot spot temperature	105 °C
Climatic category	40/85/56 according to IEC 60068-1
Life expectancy	≥ 100 000 hours at U _{NDC} , θ _{hs} = 70 °C
Failure rate	100 FIT

General characteristics

Capacitance range

U _{NDC} @ 85 °C = 450 V DC, U _{op} @ 70 °C = 500 V DC, U _{op} @ 105 °C = 300 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ)@1kHz ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	Ī (A)
	L	H	W	P	P1					
1	32	17	9	27.5	-	15	40	3.3	27	27
2	32	17	9	27.5	-	15	35	3.5	27	54
3	32	17	9	27.5	-	15	27	4	27	81
4	32	19	10	27.5	-	15	22	4.7	27	108
5	32	21	12	27.5	-	15	18.5	5.5	27	135
6	32	21	12	27.5	-	15	16.7	5.8	27	162
7	32	22	13	27.5	-	15	15.2	6.3	27	189
8	32	23.5	14	27.5	-	15	14	6.8	27	216
9	32	24.5	15	27.5	-	15	12.8	7.4	27	243
10	32	26.5	17	27.5	-	20	11.7	8.1	27	270
12	32	28	18	27.5	-	20	10.2	9	27	324
14	32	32	18	27.5	-	20	9	10	27	378
15	32	32	18	27.5	-	20	8.5	10.3	27	405
20	32	35.5	24	27.5	-/10.2	20	6.5	13.1	27	540
25	32	40	25	27.5	-/10.2	20	5.3	15.4	27	675
28	32	40	25	27.5	-/10.2	20	4.8	16.1	27	756
15	42	27	16	37.5	-	25	10.5	9.4	20	300
20	42	31	18	37.5	10.2	25	8	11.6	20	400
25	42	32	19	37.5	10.2	25	7	12.7	20	500
30	42	38	21	37.5	10.2	25	6.5	14	20	600
35	42	43	28	37.5	10.2	25	6	14.8	20	700
40	42	43	28	37.5	10.2	25	5.4	15.6	20	800
45	42	43	28	37.5	10.2	25	4.8	16.6	20	900
50	42	43	28	37.5	10.2	25	4.5	17.1	20	1000
55	42	45	30	37.5	10.2/20.3	25	4.2	18.4	20	1100
60	42	50	36	37.5	10.2/20.3	25	4	20.2	20	1200
65	42	50	36	37.5	10.2/20.3	25	3.8	20.8	20	1300
70	42	50	36	37.5	10.2/20.3	25	3.5	21.6	20	1400
75	42	50	36	37.5	10.2/20.3	25	3.3	22	20	1500
70	57.5	45	30	52.5	20.3	40	4.7	19.2	13	910
75	57.5	45	30	52.5	20.3	40	4.4	19.9	13	975
80	57.5	45	30	52.5	20.3	40	4.2	20.3	13	1040
90	57.5	50	35	52.5	20.3	40	3.8	22.9	13	1170
100	57.5	50	35	52.5	20.3	40	3.5	23.9	13	1300
110	57.5	50	35	52.5	20.3	40	3.2	25	13	1430
120	57.5	55	40	52.5	20.3	40	3	26.5	13	1560
130	57.5	55	40	52.5	20.3	40	2.9	26.9	13	1690
480	59	59	130	52.5	20.3x5	45	1	71	13	6240

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

U _{NDC} @ 85 °C = 700 V DC, U _{op} @ 70 °C = 800 V DC, U _{op} @ 105 °C = 500 V DC											
C _N (1) (μF)	Dimensions (mm) (2)					tan(δ)@1kHz (3) (x10 ⁻⁴)	ESR@10 kHz (4) (mΩ)	I _{max} @10 kHz (5) (A)	(dU/dt) _{max} (V/μs)	Ī (A)	
	L	H	W	P	P1						
1	32	17	9	27.5	-	10	40	3.3	30	30	
2	32	17	9	27.5	-	10	35	3.5	30	60	
3	32	19	10	27.5	-	10	25	4.4	30	90	
4	32	21	12	27.5	-	10	19	5.5	30	120	
5	32	22	13	27.5	-	10	15.5	6.2	30	150	
6	32	24.5	15	27.5	-	15	13	7.3	30	180	
7	32	24.5	15	27.5	-	15	11.5	7.8	30	210	
8	32	26.5	17	27.5	-	15	10.2	8.7	30	240	
9	32	28	18	27.5	-	15	9.3	9.4	30	270	
10	32	28	18	27.5	-	15	8.5	9.8	30	300	
12	32	32	18	27.5	-	15	7.3	11.1	30	360	
14	32	35	20	27.5	-/10.2	15	6.5	12.5	30	420	
15	32	35	20	27.5	-/10.2	15	6.1	12.9	30	450	
18	32	35.5	24	27.5	-/10.2	15	5.1	14.8	30	540	
20	32	40	25	27.5	-/10.2	15	4.6	16.5	30	600	
10	42	27	16	37.5	-	20	14	8.2	22	220	
12	42	27	16	37.5	-	20	12	8.8	22	264	
15	42	31	18	37.5	10.2	20	9.8	10.5	22	330	
18	42	38	21	37.5	10.2	20	8.2	12.4	22	396	
20	42	38	21	37.5	10.2	20	7.4	13.1	22	440	
22	42	38	21	37.5	10.2	20	6.8	13.6	22	484	
25	42	43	28	37.5	10.2	25	6.1	14.7	22	550	
30	42	43	28	37.5	10.2	25	5.7	15.2	22	660	
35	42	43	28	37.5	10.2	25	5	16.2	22	770	
40	42	45	30	37.5	10.2/20.3	25	4.5	17.8	22	880	
45	42	45	30	37.5	10.2/20.3	25	4.1	18.7	22	990	
50	42	50	36	37.5	10.2/20.3	25	3.8	20.8	22	1100	
55	42	50	36	37.5	10.2/20.3	25	3.5	21.6	22	1210	
50	57.5	45	30	52.5	20.3	35	6	17	15	750	
55	57.5	45	30	52.5	20.3	35	5.5	17.8	15	825	
60	57.5	45	30	52.5	20.3	35	5.1	18.5	15	900	
65	57.5	50	35	52.5	20.3	35	4.7	20.6	15	975	
70	57.5	50	35	52.5	20.3	35	4.4	21.3	15	1050	
75	57.5	50	35	52.5	20.3	35	4.2	21.8	15	1125	
80	57.5	55	40	52.5	20.3	35	4	22.9	15	1200	
85	57.5	55	40	52.5	20.3	35	3.8	23.5	15	1275	
90	57.5	55	40	52.5	20.3	35	3.6	24.2	15	1350	
100	57.5	55	40	52.5	20.3	35	3.3	25.3	15	1500	
360	59	59	130	52.5	20.3x5	40	1.1	67	15	5400	

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

U _{NDC} @ 85 °C = 800 V DC, U _{op} @ 70 °C = 950 V DC, U _{op} @ 105 °C = 550 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ) _{@1kHz} ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	Ī (A)
	L	H	W	P	P1					
1	32	17	9	27.5	-	10	40	3.3	35	35
2	32	19	10	27.5	-	10	27	4.3	35	70
3	32	21	12	27.5	-	10	19	5.5	35	105
4	32	22	13	27.5	-	10	15	6.3	35	140
5	32	24.5	15	27.5	-	10	13	7.3	35	175
6	32	26.5	17	27.5	-	10	10.9	8.4	35	210
7	32	28	18	27.5	-	10	9.3	9.4	35	245
8	32	32	18	27.5	-	15	8.1	10.5	35	280
9	32	33	20	27.5	-/10.2	15	7.2	11.7	35	315
10	32	35	20	27.5	-/10.2	15	6.5	12.5	35	350
12	32	35.5	24	27.5	-/10.2	15	5.4	14.4	35	420
15	32	40	25	27.5	-/10.2	15	4.4	16.9	35	525
8	42	27	16	37.5	-	20	11.5	9	25	200
9	42	31	18	37.5	10.2	20	10.5	10.1	25	225
10	42	31	18	37.5	10.2	20	9.5	10.7	25	250
11	42	31	18	37.5	10.2	20	9	11	25	275
12	42	31	18	37.5	10.2	20	8.5	11.3	25	300
15	42	38	21	37.5	10.2	20	7.2	13.3	25	375
18	42	38	21	37.5	10.2	20	6.2	14.3	25	450
20	42	43	28	37.5	10.2	20	5.7	15.2	25	500
22	42	43	28	37.5	10.2	20	5.5	15.5	25	550
25	42	43	28	37.5	10.2	20	5	16.2	25	625
30	42	45	30	37.5	10.2/20.3	20	4.5	18.8	25	750
35	42	50	36	37.5	10.2/20.3	25	3.9	20.5	25	875
40	42	50	36	37.5	10.2/20.3	25	3.5	21.6	25	1000
40	57.5	45	30	52.5	20.3	30	6.3	16.6	17	680
45	57.5	45	30	52.5	20.3	30	5.6	17.3	17	765
50	57.5	50	35	52.5	20.3	30	5.3	19.4	17	850
55	57.5	50	35	52.5	20.3	30	4.9	20.2	17	935
60	57.5	50	35	52.5	20.3	30	4.5	21.1	17	1020
65	57.5	55	40	52.5	20.3	30	4.2	22.4	17	1105
70	57.5	55	40	52.5	20.3	30	4	22.9	17	1190
75	57.5	55	40	52.5	20.3	30	3.8	23.5	17	1275
220	59	59	130	52.5	20.3x5	35	1.4	60	17	3740
270	59	59	130	52.5	20.3x5	35	1.2	65	17	4590

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

U _{NDC} @ 85 °C = 900 V DC, U _{op} @ 70 °C = 1100 V DC, U _{op} @ 105 °C = 650 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ)@1kHz ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	Ī (A)
	L	H	W	P	P1					
1	32	17	9	27.5	-	10	40	3.3	40	40
2	32	21	12	27.5	-	10	22	5.1	40	80
3	32	24.5	15	27.5	-	10	17.5	6.3	40	120
4	32	26.5	17	27.5	-	10	14	7.4	40	160
5	32	32	18	27.5	-	10	12.5	8.5	40	200
6	32	33	20	27.5	-/10.2	10	10.5	9.7	40	240
7	32	35.5	24	27.5	-/10.2	10	9	11.2	40	280
8	32	35.5	24	27.5	-/10.2	10	7.8	12	40	320
9	32	40	25	27.5	-/10.2	10	7	13.4	40	360
10	32	40	25	27.5	-/10.2	10	6.3	14.1	40	400
5	42	27	16	37.5	-	15	16.5	7.5	29	145
6	42	27	16	37.5	-	15	14	8.2	29	174
7	42	31	18	37.5	10.2	15	12.5	9.3	29	203
8	42	38	21	37.5	10.2	15	11	10.7	29	232
9	42	38	21	37.5	10.2	15	10	11.3	29	261
10	42	38	21	37.5	10.2	15	9	11.9	29	290
12	42	43	28	37.5	10.2	15	7.5	13.2	29	348
14	42	43	28	37.5	10.2	15	6.6	14.1	29	406
15	42	43	28	37.5	10.2	15	6.2	14.6	29	435
18	42	43	28	37.5	10.2/20.3	20	5.3	15.8	29	522
20	42	45	30	37.5	10.2/20.3	20	4.8	17.3	29	580
22	42	50	36	37.5	10.2/20.3	20	4.4	19.3	29	638
25	42	50	36	37.5	10.2/20.3	20	4	20.2	29	725
30	42	50	36	37.5	10.2/20.3	20	3.5	21.6	29	870
25	57.5	45	30	52.5	20.3	25	7	15.8	20	500
26	57.5	45	30	52.5	20.3	25	6.8	16	20	520
30	57.5	50	35	52.5	20.3	25	6	18.2	20	600
35	57.5	50	35	52.5	20.3	25	5.5	19	20	700
40	57.5	50	35	52.5	20.3	25	5	20	20	800
45	57.5	50	35	52.5	20.3	25	4.8	20.4	20	900
50	57.5	55	40	52.5	20.3	25	4.5	21.6	20	1000
55	57.5	55	40	52.5	20.3	25	4.2	22.4	20	1100
60	57.5	55	40	52.5	20.3	25	3.9	23.2	20	1200
150	59	59	130	52.5	20.3x5	30	2.3	47	20	3000
200	59	59	130	52.5	20.3x5	30	1.8	53	20	4000

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

U _{NDC} @ 85 °C = 1100 V DC, U _{op} @ 70 °C = 1350 V DC, U _{op} @ 105 °C = 800 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ) _{@1kHz} ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	Ī (A)
	L	H	W	P	P1					
H	32	19	10	27.5	-	10	35	3.7	50	50
1.2	32	21	12	27.5	-	10	29	4.4	50	60
2	32	24.5	15	27.5	-	10	18	6.2	50	100
2.2	32	24.5	15	27.5	-	10	17.5	6.3	50	110
3	32	28	18	27.5	-	10	13.5	7.8	50	150
3.3	32	32	18	27.5	-	10	12.8	8.4	50	165
4	32	32	18	27.5	-	10	12	8.7	50	200
4.7	32	33	20	27.5	-/10.2	10	10.5	9.7	50	235
5	32	33	20	27.5	-/10.2	10	10	9.9	50	250
6	32	35.5	24	27.5	-/10.2	10	8.5	11.5	50	300
7	32	40	25	27.5	-/10.2	10	7.5	12.9	50	350
8	32	40	25	27.5	-/10.2	10	6.8	13.6	50	400
4	42	27	16	37.5	-	15	15	7.9	35	140
4.7	42	31	18	37.5	10.2	15	13	9.1	35	165
5	42	31	18	37.5	10.2	15	12.5	9.3	35	175
6	42	32	19	37.5	10.2	15	10.4	10.4	35	210
6.8	42	32	19	37.5	10.2	15	9.2	11.1	35	238
7	42	38	21	37.5	10.2	15	9	11.9	35	245
8	42	38	21	37.5	10.2	15	8.5	12.2	35	280
9	42	38	21	37.5	10.2	15	8	12.6	35	315
10	42	43	28	37.5	10.2	15	7.5	13.2	35	350
12	42	43	28	37.5	10.2	15	7	13.7	35	420
14	42	45	30	37.5	10.2/20.3	15	6.8	14.5	35	490
15	42	45	30	37.5	10.2/20.3	15	6.1	15.3	35	525
20	42	50	36	37.5	10.2/20.3	15	5.1	17.9	35	700
18	57.5	45	30	52.5	20.3	20	8.2	14.6	25	450
20	57.5	45	30	52.5	20.3	20	7.5	15.2	25	500
22	57.5	50	35	52.5	20.3	20	7	16.9	25	550
25	57.5	50	35	52.5	20.3	20	6.2	17.9	25	625
26	57.5	50	35	52.5	20.3	20	6	18.2	25	650
30	57.5	55	40	52.5	20.3	20	5.3	19.9	25	750
35	57.5	55	40	52.5	20.3	25	4.6	21.4	25	875
40	57.5	55	40	52.5	20.3	25	4.1	22.7	25	1000
110	59	59	130	52.5	20.3x5	30	3.1	40	25	2750
120	59	59	130	52.5	20.3x5	30	2.9	42	25	3000

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values measured at 1 kHz.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

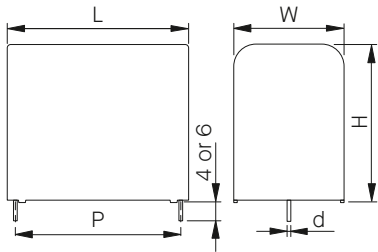
U _{NDC} @ 85 °C = 1300 V DC, U _{op} @ 70 °C = 1550 V DC, U _{op} @ 105 °C = 900 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ)@1kHz ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	Ī (A)
	L	H	W	P	P1					
0.1	32	16	7.5	27.5	-	10	150	1.6	65	7
0.15	32	16	7.5	27.5	-	10	120	1.8	65	10
0.22	32	16	7.5	27.5	-	10	110	1.9	65	14
0.33	32	17	9	27.5	-	10	75	2.4	65	21
0.47	32	17	9	27.5	-	10	55	2.8	65	31
0.56	32	17	9	27.5	-	10	45	3.1	65	36
0.68	32	19	10	27.5	-	10	40	3.5	65	44
0.82	32	21	12	27.5	-	10	38	3.9	65	53
1	32	21	12	27.5	-	10	30	4.3	65	65
1.5	32	24.5	15	27.5	-	10	20	5.9	65	98
2	32	26.5	17	27.5	-	10	16	6.9	65	130
2.2	32	26.5	17	27.5	-	10	15	7.2	65	143
3	32	33	20	27.5	-/10.2	10	12	9	65	195
3.3	32	35	20	27.5	-/10.2	10	11	9.6	65	215
4	32	35.5	24	27.5	-/10.2	10	10	10.6	65	260
5	32	40	25	27.5	-/10.2	10	8	12.5	65	325
2	42	27	16	37.5	-	15	22	6.5	45	90
3	42	31	18	37.5	10.2	15	15	8.5	45	135
4	42	32	19	37.5	10.2	15	11.5	9.9	45	180
5	42	38	21	37.5	10.2	15	9.5	11.5	45	225
6	42	43	28	37.5	10.2	15	8.5	12.2	45	270
7	42	43	28	37.5	10.2	15	8.1	12.7	45	315
8	42	43	28	37.5	10.2	15	7.8	13	45	360
9	42	43	28	37.5	10.2	15	7.5	13.2	45	405
10	42	45	30	37.5	10.2/20.3	15	7	14.3	45	450
12	42	50	36	37.5	10.2/20.3	15	6.4	16	45	540
14	42	50	36	37.5	10.2/20.3	15	5.8	16.8	45	630
14	57.5	45	30	52.5	20.3	20	9	13.9	30	420
15	57.5	45	30	52.5	20.3	20	8.5	14.3	30	450
18	57.5	50	35	52.5	20.3	20	7.2	16.6	30	540
20	57.5	55	40	52.5	20.3	20	6.6	17.9	30	600
22	57.5	55	40	52.5	20.3	20	6.2	18.4	30	660
25	57.5	55	40	52.5	20.3	20	5.5	19.6	30	750
70	59	59	130	52.5	20.3x5	30	4	35	30	2100
90	59	59	130	52.5	20.3x5	30	3.2	40	30	2700

Notes:

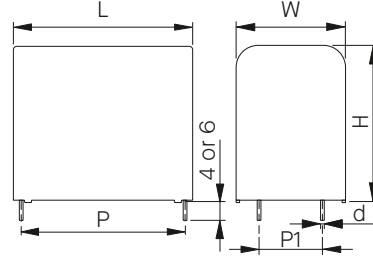
- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values measured at 1 kHz.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

Dimensions

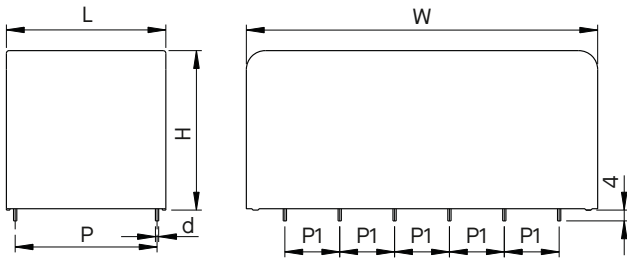
KNG1910 (2 pins)



KNG1914 (4 pins)



KNG1914 (12 pins)



Terminal dimensions						Max. box dimensions		
P (mm)	Tolerance (mm)	P1 (mm)	Tolerance (mm)	d (mm)	Tolerance (mm)	L _{max} (mm)	H _{max} (mm)	W _{max} (mm)
27.5	±0.5	-	-	0.8	±0.05	L + 0.5	H + 0.2	W + 0.5
27.5	±0.5	10.2	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.2	W + 0.5
37.5	±0.5	-	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.5	W + 0.5
37.5	±0.5	10.2	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.5	W + 0.5
37.5	±0.5	20.3	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.5	W + 0.5
52.5	±0.5	20.3	±0.5	1.2	±0.05	L + 1.0	H + 1.0	W + 1.0

Construction

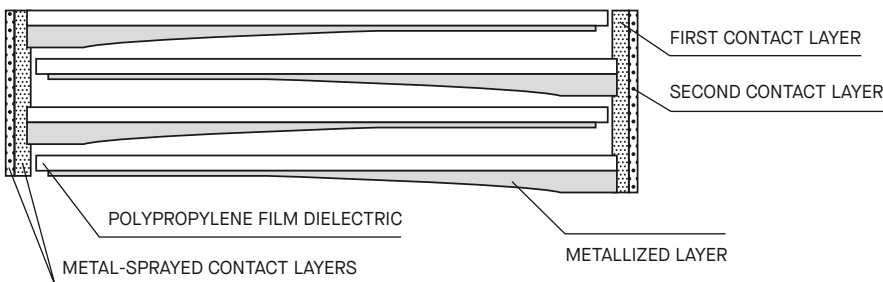
Dielectric: polypropylene film

Capacitor electrodes: vacuum-deposited metal layers

Casing: plastic case with flame-retardant epoxy resin sealing (UL 94 V-0)

Terminals: parallel tinned copper wire (2, 4 or 12 pins)

Internal construction



Cautions and warnings

Mechanical overloads



ATTENTION: The capacitor is designed for mounting on a PC board. Do not move the capacitor, after it has been soldered to the PC board. The capacitor should not be mounted on places where vibrations or accelerations occur. Do not exceed the tested ability to withstand vibration. Avoid any compressive, tensile or flexural stress.

Note: Movement of the capacitor within the case can cause low insulation resistance, shorts, failure on terminals and the capacitor case.

Overload



ATTENTION: Do not overload the capacitor. Avoid overloading the capacitor and consider the flammability of materials.

Impulses



ATTENTION: If electric energy impulses are higher, dielectric will break down. Avoid external electric energy impulse. The peak voltage (U_p , AC) should not be higher than the rated DC voltage (U_{NDC}).

Environmental conditions



ATTENTION: Do not exceed operating temperature. Do not expose the capacitor to humidity longer than it is recommended. Do not expose the capacitor to increased temperature more than it is recommended. The dissipation factor may go up and down with increased temperature. Avoid external fire or electricity.

DC LINK CAPACITORS

Type DC link EV

– customized products



Applications

- ▶ Energy conversion
- ▶ AC motor drives
- ▶ Hybrid/electric vehicles
- ▶ Inverter modules

Features

- ▶ Metallized self-healing polypropylen
- ▶ Low ESR (high ripple current)
- ▶ Low ESL
- ▶ Long lifetime

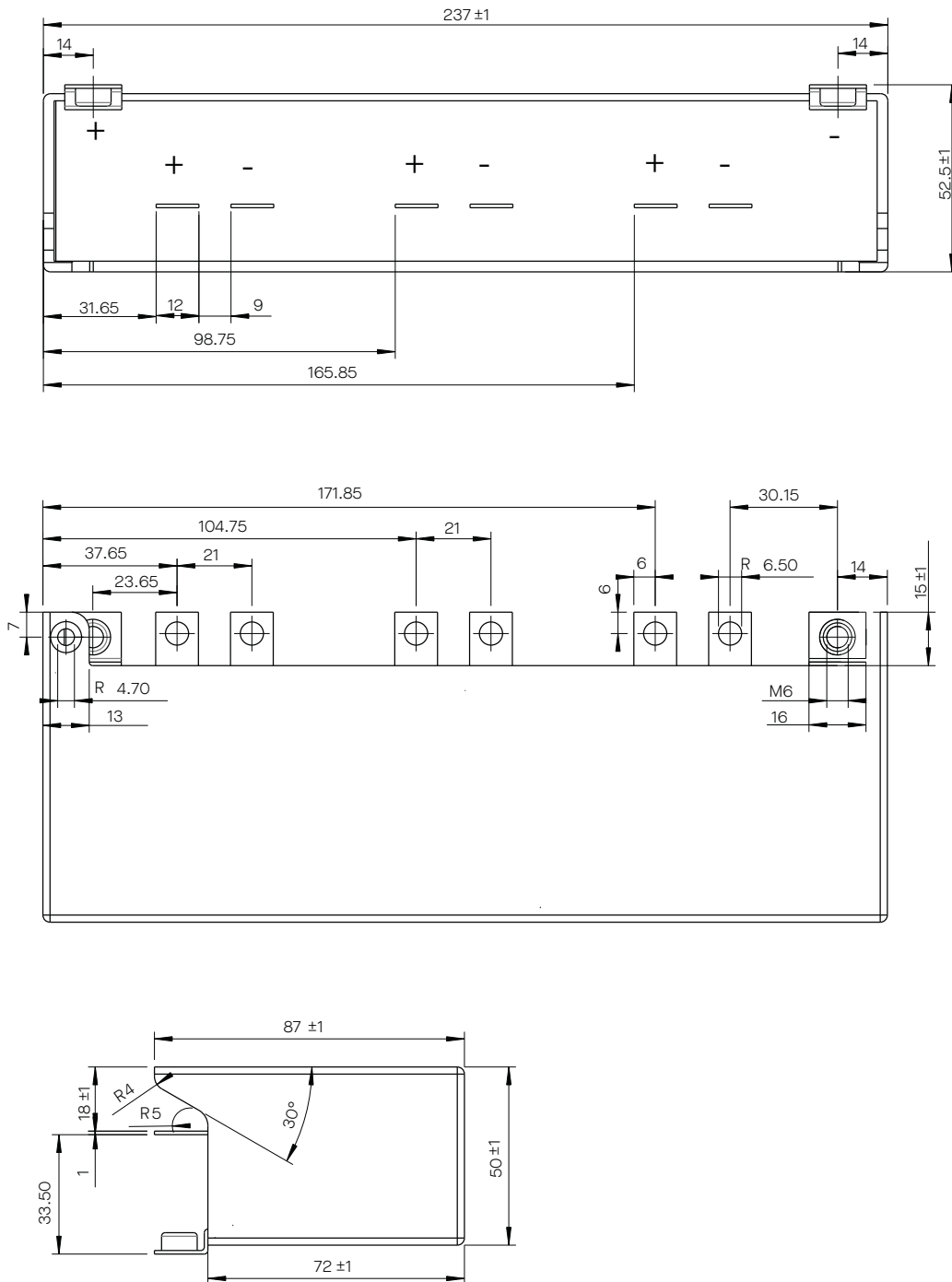
Standards

IEC 61071

Specifications

Electrical characteristics	
Rated capacitance	500 µF, ± 10 %
Rated DC voltage	450 V DC
Peak voltage	675 V AC
Nom. RMS current	85 A _{rms}
Max. RMS current	120 A _{rms}
Max. peak current	2500 A
Equivalent series resistance @ 1 kHz	< 1 mΩ
Equivalent series inductance	15 nH
Max. pulse rise time	4 V/µs
Thermal characteristics	
Min. Operating temperature	-40 °C
Max. Operating temperature	+110 °C
Storage temperature	-40 °C to +85 °C
Test methods & performances	
Voltage test (between terminals)	675 V, 10 s
Voltage test (terminals to case)	2500 V, 50 Hz, 2 s
Life expectancy	
Life expectancy @ U _{NDC}	15 000 hours (hotspot max. T = 90 °C)
Reliability	300 FIT
Construction	
Dielectric	Metallized polypropylene
Winding	Non-inductive
Filling	Polyurethane resin
Case constructions	PBT (metallic for prototype)
Terminals	Flat copper
Dimensions	
Width	72 mm
Height	50 mm
Length	237 mm
App. weight	< 1.5 kg

Dimensions



Notes:

For more information about the construction, please contact Iskra.
Iskra technical department is ready to support customers in developing capacitors on their requests and specifications.

DC LINK CAPACITORS

KNA96D6 480 μ F 10% 600VDC



Applications

- ▶ Energy conversion
- ▶ AC motor drives
- ▶ Hybrid/electric vehicles
- ▶ Inverter modules

Features

- ▶ Metallized self-healing polypropylen
- ▶ Low ESR (high ripple current)
- ▶ Low ESL
- ▶ Long lifetime

Standards

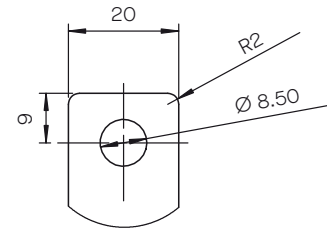
IEC 61071

Specifications

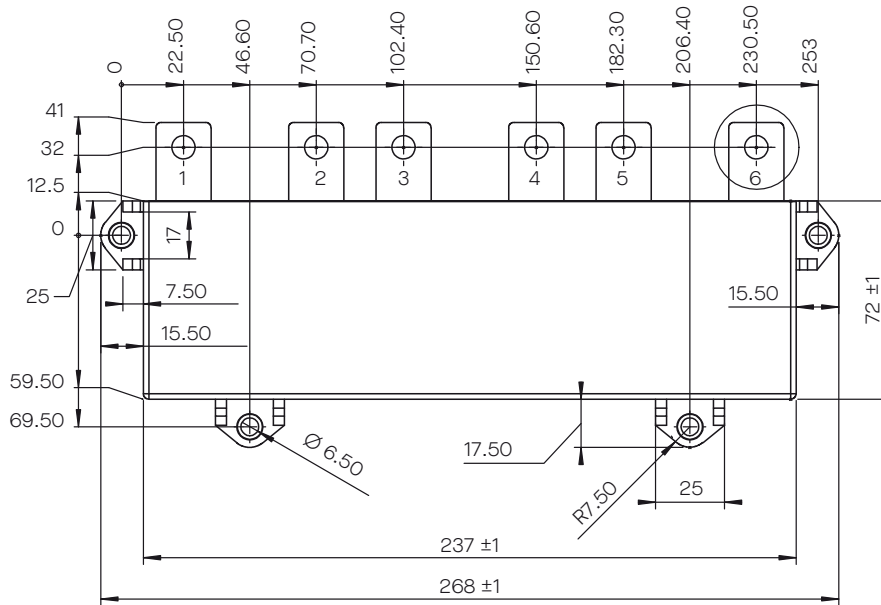
Electrical characteristics	
Rated capacitance (C_N)	480 μ F
Capacitance tolerance	± 10 % (code K)
Rated voltage (U_{NDC})	600 VDC at 85 °C
Non-recurrent surge voltage (U_s)	780 VDC
Test voltage between terminals	$1.5 \cdot U_{NDC}$, 10 s
Equivalent series resistance (ESR)	1.2 m Ω at 10 kHz
Max. RMS current (I_{max})	160 A, $T_{amb} = 70$ °C
Max. pulse loading (dU/dt)	5 V/ μ s
Max. peak current (I)	2400 A
Max. peak-to-peak voltage (U_{p-p})	$0.2 \cdot U_{NDC}$
Insulation resistance (R_i)	$R_i \cdot C_N \leq 10\,000$ s at 500 V, 60 s
Self inductance (L_s)	< 20 nH
Climatic category	40/085/56 acc. to IEC 60068-1
Operating temperature (T_{min} to T_{max})	-40 °C to 105 °C
Max. hot spot temperature ($T_{hs, max}$)	105 °C
Life expectancy	
Lifetime expectancy	> 100 000 h at U_{NDC} , $T_{hs} = 70$ °C
Failure rate	< 300 FIT acc. to IEC 61709
Materials	
Dielectric	Self-healing metallized polypropylene
Case	Flame-retardant plastic case (UL 94 V-0)
Case cover	Flame-retardant resin (UL 94 V-0)
Terminals	Tinned copper lugs for screw fixing M8
Dimensions	
Width	72 mm ± 1
Height	50 mm ± 1
Length	237 mm ± 1

Dimensions

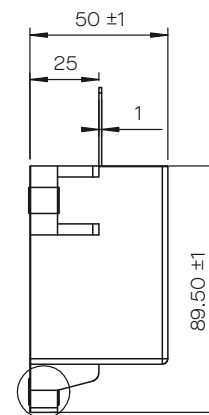
6x terminals



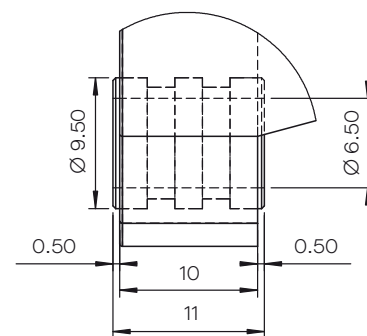
Detail 1 (2:2.5)



Detail 2 (2:1)



4x fixing holes



Notes:

For more information about the construction, please contact Iskra.
Iskra technical department is ready to support customers in developing capacitors on their requests and specifications.

DC LINK CAPACITORS

KNA96D6 1000 μ F 10% 800VDC



Applications

- ▶ Energy conversion
- ▶ AC motor drives
- ▶ Hybrid/electric vehicles
- ▶ Inverter modules

Features

- ▶ Metallized self-healing polypropylen
- ▶ Low ESR (high ripple current)
- ▶ Low ESL
- ▶ Long lifetime

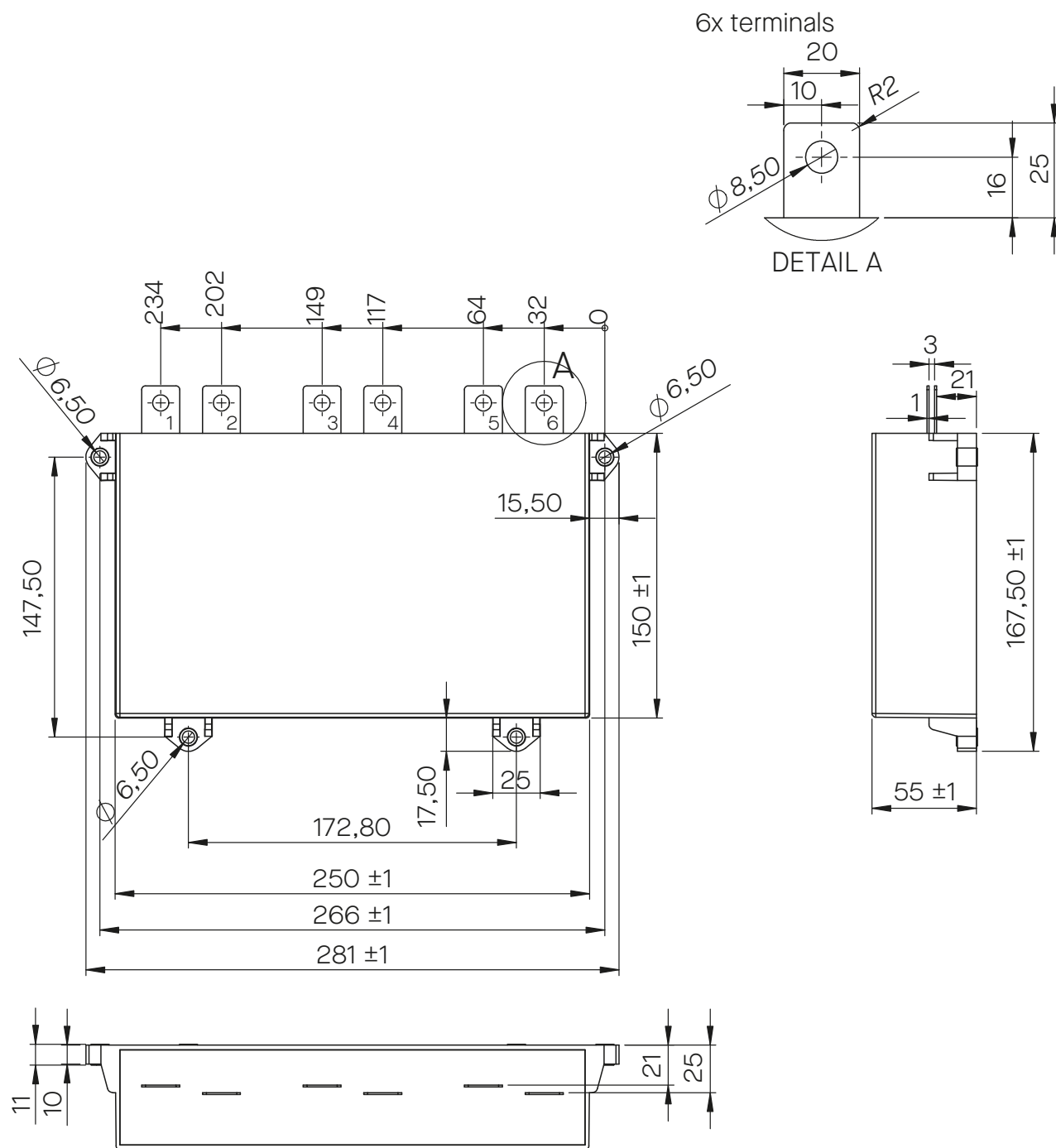
Standards

IEC 61071

Specifications

Electrical characteristics	
Rated capacitance (C_N)	1000 μ F
Capacitance tolerance	± 10 % (code K)
Rated voltage (U_{NDC})	800 VDC at 85 °C
Non-recurrent surge voltage (U_s)	1040 VDC
Test voltage between terminals	$1.5 \cdot U_{NDC}$, 10 s
Equivalent series resistance (ESR)	< 1.2 m Ω at 10 kHz
Max. RMS current (I_{max})	160 A, $T_{amb} = 70$ °C
Max. pulse loading (dU/dt)	5 V/ μ s
Max. peak current (I)	4500 A
Max. peak-to-peak voltage (U_{p-p})	$0.2 \cdot U_{NDC}$
Insulation resistance (R_i)	$R_i \cdot C_N \leq 10\ 000$ s at 500 V, 60 s
Self inductance (L_s)	< 20 nH
Climatic category	40/085/56 acc. to IEC 60068-1
Operating temperature (T_{min} to T_{max})	-40 °C to 105 °C
Max. hot spot temperature ($T_{hs, max}$)	105 °C
Life expectancy	
Lifetime expectancy	> 100 000 h at U_{NDC} , $T_{hs} = 70$ °C
Failure rate	< 300 FIT acc. to IEC 61709
Materials	
Dielectric	Self-healing metallized polypropylene
Case	Flame-retardant plastic case (UL 94 V-0)
Case cover	Flame-retardant resin (UL 94 V-0)
Terminals	Tinned copper lugs for screw fixing M8
Dimensions	
Width	55 mm ± 1
Height	150 mm ± 1
Length	250 mm ± 1

Dimensions



Notes:

For more information about the construction, please contact Iskra.

Iskra technical department is ready to support customers in developing capacitors on their requests and specifications.

DC LINK CAPACITORS

KNG2247 750 μ F 1100VDC



Applications

- ▶ Energy conversion
- ▶ AC motor drives
- ▶ Hybrid/electric vehicles
- ▶ Inverter modules

Features

- ▶ Metallized self-healing polypropylen
- ▶ Low ESR (high ripple current)
- ▶ Low ESL
- ▶ Long lifetime

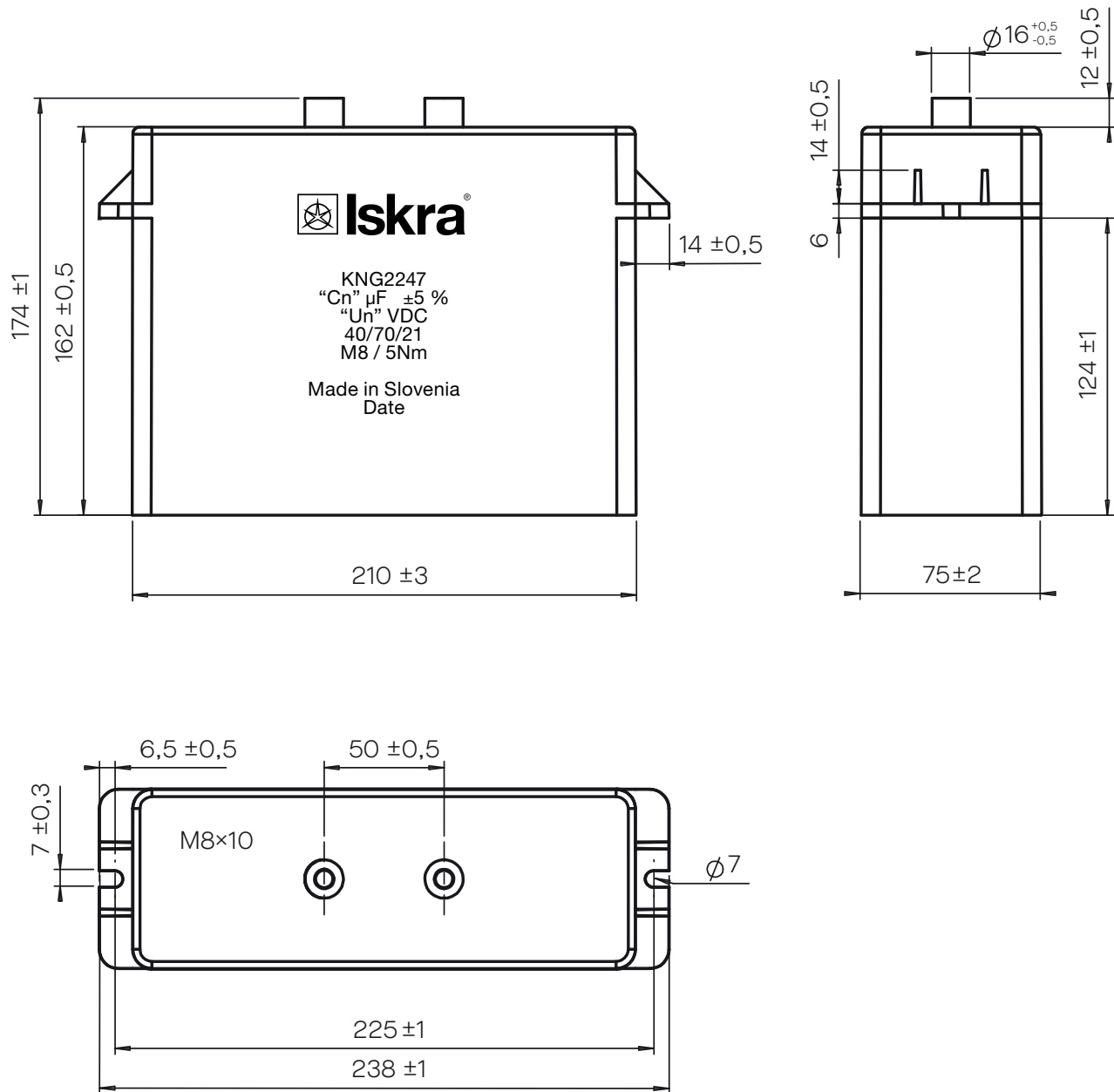
Standards

IEC 61071

Specifications

Electrical characteristics	
Rated capacitance (C_n)	750 μ F
Capacitance tolerance	$\pm 5 \%$
Rated DC voltage	1100 V
Max. current (I_{max})	145 A
Max. du/dt	14 V/us
Max. peak current (\hat{I})	31.5 kA
Max. surge current (I_s)	10.5 kA
Tangent of the loss angle ($\tan(d_o)$)	2×10^{-4}
Equivalent series inductance (ESL)	45 nH
Equivalent series resistance (ESR)	0.4 mOhm @ 1 kHz
Operating temperature (T_{min} to T_{max})	-40 °C to 70 °C
Storage temperature ($T_{storage}$)	-40 °C to 85 °C
Max. hot spot temperature (T_{hs})	70 °C
Thermal resistance (R_{th})	1.8 °C/W
Altitude	Up to 4000 m
Test methods and performances	
Terminal to terminal (U_{BB})	1650 V, 10 s
Terminal to case (U_{BC})	N/A
Mechanical parameters	
Length (L)	210 mm
Width (W)	75 mm
Height (H)	162 mm
Protection	IP00
Weight	3.7 kg
Clearance distance	34 mm
Creepage distance	34 mm
Safety device	No internal protection device
Terminals	Male M8×14 (Maximal torque 12 Nm)
Material parameters	
Dielectric	Self healing
Filling	Dry resin, UL 94, V0
Case	Plastic, UL 94, V0

Dimensions



Notes:

For more information about the construction, please contact Iskra.
Iskra technical department is ready to support customers in developing capacitors on their requests and specifications.

SNUBBER CAPACITORS

Type KNO19Ax, KNO19Bx, KNO1919, KNO1914



Applications

Snubber capacitors are used in applications with high pulse loadings and high frequencies. The purpose of snubber capacitors is to eliminate voltage spikes which are caused by semiconductors or other devices.

- ▶ IGBT (insulated gate bipolar transistor) module
- ▶ AC and DC converter and inverter (electric drives)
- ▶ Uninterruptible power system (UPS)
- ▶ Power supply

Features

- ▶ High voltage
- ▶ High pulse load capability
- ▶ Self-healing properties
- ▶ High reliability
- ▶ Low self-inductance
- ▶ Low dissipation factor of dielectric
- ▶ Terminal options for direct mount or board
- ▶ High insulation resistance

Standards

IEC 61071

AEC-Q200 (on request)

Specifications

Rated capacitance	0.047 μ F up to 8 μ F
Capacitance tolerance	$\pm 5\%$, $\pm 10\%$
Rated voltage	630 V DC, 850 V DC, 1200 V DC, 1600 V DC, 2000 V DC, 2500 V DC, 3000 V DC
Operating temperature range	-40 °C to +85 °C
Max hot spot temperature	105 °C
Climatic category	40/85/56 according to IEC 60068-1
Dissipation factors at 1 kHz	$\text{tg}\delta \leq 5 \times 10^{-4}$
Test voltage terminal to terminal	$1.5 \times U_{\text{NDC}}$, 10 s
Peak non-repetitive max. current	$I \times 1.5$
Life expectancy	$\geq 100\,000$ hours at U_{NDC} , $\theta_{\text{hs}} = 70\text{ °C}$
Failure rate	100 FIT

General characteristics

Type KNO19Ax, KNO19Bx, KNO1919, KNO1914

C_N (μF)	U_{NDC} (V DC)	U_{rms} (V AC)	$(dU/dt)_{max}$ (V/μs)	Dimensions (mm) L×H×W
0.33	630	400	600	32 × 20 × 11
0.39	630	400	600	32 × 24.5 × 15
0.47	630	400	600	32 × 24.5 × 15
0.56	630	400	600	41.5 × 23 × 14
0.68	630	400	600	41.5 × 23 × 14
1	630	400	500	41.5 × 27 × 16
1.2	630	400	500	41.5 × 31 × 18
1.5	630	400	500	41.5 × 31 × 18
2	630	400	500	41.5 × 38 × 21
2.2	630	400	500	41.5 × 38 × 21
2.5	630	400	400	41.5 × 43 × 28
2.7	630	400	400	41.5 × 43 × 28
3	630	400	400	41.5 × 43 × 28
3.3	630	400	400	41.5 × 43 × 28
3.5	630	400	400	41.5 × 43 × 28
4	630	400	300	42 × 45 × 30
4.7	630	400	300	57.5 × 45 × 30
5	630	400	300	57.5 × 45 × 30
5.6	630	400	300	57.5 × 45 × 30
6	630	400	300	57.5 × 45 × 30
6.3	630	400	300	57.5 × 50 × 35
7	630	400	100	57.5 × 50 × 35
8	630	400	100	57.5 × 50 × 35
0.22	850	400	600	32 × 20 × 11
0.27	850	400	600	32 × 24.5 × 15
0.33	850	400	600	32 × 24.5 × 15
0.39	850	400	600	41.5 × 23 × 14
0.47	850	400	600	41.5 × 23 × 14
0.56	850	400	600	41.5 × 27 × 16
0.68	850	400	600	41.5 × 27 × 16
0.82	630	400	600	41.5 × 31 × 18
1	850	400	600	41.5 × 31 × 18
1.2	850	400	500	41.5 × 38 × 21
1.5	850	400	500	41.5 × 38 × 21
1.8	850	400	500	41.5 × 43 × 28
2	850	400	500	41.5 × 43 × 28
2.2	850	400	500	42 × 45 × 30
2.5	850	400	500	42 × 45 × 30
2.7	850	400	400	42 × 45 × 30
3	850	400	400	57.5 × 45 × 30
3.3	850	400	400	57.5 × 45 × 30
4	850	400	400	57.5 × 45 × 30
4.7	850	400	400	57.5 × 50 × 35
5.6	850	400	300	57.5 × 50 × 35

C_N (μF)	U_{NDC} (V DC)	U_{rms} (V AC)	$(dU/dt)_{max}$ (V/μs)	Dimensions (mm) L×H×W
0.22	1000	600	1000	32 × 24.5 × 15
0.27	1000	600	1000	32 × 24.5 × 15
0.33	1000	600	900	32 × 24.5 × 15
0.39	1000	600	900	41.5 × 23 × 14
0.47	1000	600	900	41.5 × 23 × 14
0.56	1000	600	900	41.5 × 27 × 16
0.68	1000	600	900	41.5 × 27 × 16
0.82	1000	600	500	41.5 × 32 × 19
1	1000	600	500	41.5 × 38 × 21
1.2	1000	600	400	41.5 × 38 × 21
1.5	1000	600	400	41.5 × 43 × 28
1.8	1000	600	400	42 × 45 × 30
2	1000	600	400	42 × 45 × 30
2.2	1000	600	400	42 × 45 × 30
2.5	1000	600	400	57.5 × 45 × 30
2.7	1000	600	400	43 × 48 × 33
2.7	1000	600	400	57.5 × 45 × 30
3	1000	600	400	57.5 × 45 × 30
3.3	1000	600	400	57.5 × 50 × 35
4	1000	600	300	57.5 × 50 × 35
0.15	1200	630	800	32 × 20 × 11
0.22	1200	630	800	41.5 × 23 × 14
0.27	1200	630	800	41.5 × 23 × 14
0.33	1200	630	700	41.5 × 27 × 16
0.39	1200	630	700	41.5 × 27 × 16
0.47	1200	630	700	41.5 × 31 × 18
0.56	1200	630	700	41.5 × 32 × 19
0.68	1200	630	700	41.5 × 38 × 21
0.82	1200	630	700	41.5 × 38 × 21
1	1200	630	500	41.5 × 43 × 28
1.2	1200	630	500	41.5 × 43 × 28
1.5	1200	630	500	42 × 45 × 30
1.8	1200	630	500	43 × 48 × 33
2	1200	630	500	57.5 × 45 × 30
2.2	1200	630	500	57.5 × 45 × 30
2.5	1200	630	500	57.5 × 50 × 35
2.7	1200	630	500	57.5 × 50 × 35
3	1200	630	500	57.5 × 50 × 35
3.3	1200	630	500	57.5 × 50 × 35

General characteristics

Type KNO19Ax, KNO19Bx, KNO1919, KNO1914

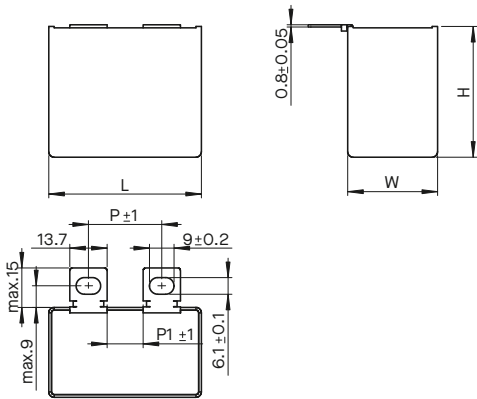
C _N (μF)	U _{NDC} (V DC)	U _{rms} (V AC)	(dU/dt) _{max} (V/μs)	Dimensions (mm) L×H×W
0.1	1600	650	900	32 × 20 × 11
0.12	1600	650	900	32 × 24.5 × 15
0.15	1600	650	900	41.5 × 23 × 14
0.22	1600	650	900	41.5 × 23 × 14
0.27	1600	650	700	41.5 × 27 × 16
0.33	1600	650	700	41.5 × 27 × 16
0.39	1600	650	700	41.5 × 31 × 18
0.47	1600	650	700	41.5 × 32 × 19
0.56	1600	650	700	41.5 × 38 × 21
0.68	1600	650	700	41.5 × 38 × 21
0.75	1600	650	700	41.5 × 43 × 28
0.82	1600	650	700	41.5 × 43 × 28
1	1600	650	700	41.5 × 43 × 28
1.2	1600	650	700	57.5 × 45 × 30
1.5	1600	650	700	57.5 × 45 × 30
2	1600	650	500	57.5 × 50 × 35
2.2	1600	650	500	57.5 × 50 × 35
2.5	1600	650	400	57.5 × 50 × 35
3	1600	650	400	57.5 × 55 × 40
0.1	2000	700	1000	32 × 24.5 × 15
0.1	2000	700	1000	41.5 × 23 × 14
0.12	2000	700	1000	41.5 × 23 × 14
0.15	2000	700	1000	41.5 × 23 × 14
0.22	2000	700	900	41.5 × 27 × 16
0.27	2000	700	900	41.5 × 31 × 18
0.33	2000	700	900	41.5 × 32 × 19
0.39	2000	700	900	41.5 × 38 × 21
0.47	2000	700	900	41.5 × 38 × 21
0.56	2000	700	900	41.5 × 43 × 28
0.68	2000	700	900	41.5 × 43 × 28
0.82	2000	700	600	42 × 45 × 30
1	2000	700	700	42 × 45 × 35
1	2000	700	600	57.5 × 45 × 30
1.2	2000	700	600	57.5 × 45 × 30
1.5	2000	700	600	57.5 × 50 × 35

C _N (μF)	U _{NDC} (V DC)	U _{rms} (V AC)	(dU/dt) _{max} (V/μs)	Dimensions (mm) L×H×W
0,1	2500	725	1100	41.5 × 27 × 16
0,15	2500	725	1100	41.5 × 31 × 18
0,22	2500	725	1100	41.5 × 38 × 21
0,33	2500	725	1100	41.5 × 43 × 28
0,47	2500	725	1100	42 × 45 × 30
0,56	2500	725	1000	57.5 × 45 × 30
0,68	2500	725	1000	57.5 × 45 × 30
0,82	2500	725	1000	57.5 × 45 × 30
1	2500	725	900	57.5 × 50 × 35
1,2	2500	725	900	57.5 × 55 × 40
0,047	3000	750	1600	41.5 × 23 × 14
0,068	3000	750	1600	41.5 × 27 × 16
0,1	3000	750	1600	41.5 × 27 × 16
0,15	3000	750	1600	41.5 × 32 × 19
0,22	3000	750	1600	41.5 × 38 × 21
0,33	3000	750	1400	42 × 45 × 30
0,47	3000	750	1400	57.5 × 45 × 30
0,68	3000	750	1200	57.5 × 50 × 35
0,82	3000	750	900	57.5 × 50 × 35
1	3000	750	900	57.5 × 55 × 40

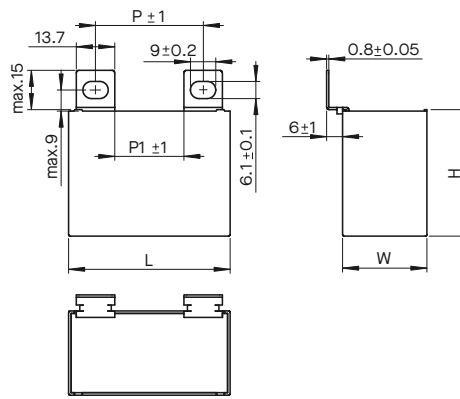
Possible lug version depending on box size

Dimensions (L×H×W)	Type KNO19xx (Digit 6-7)												
	Wire		Lugs for vertical mounting					Lugs for vertical mounting					
	10	14	A0	A1	A2	A3	A4	B0	B1	B2	B3	B4	B5
32 × 20 × 11	.												
32 × 24.5 × 15	.												
41.5 × 23 × 14
41.5 × 27 × 16
41.5 × 31 × 18
41.5 × 32 × 19
41.5 × 38 × 21
41.5 × 43 × 28
42 × 45 × 30
42 × 45 × 35
43 × 48 × 33
57.5 × 45 × 30
57.5 × 50 × 35
57.5 × 55 × 40

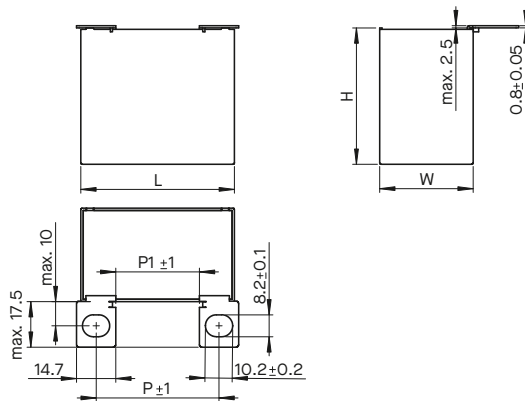
KNO19A0, A1, A4



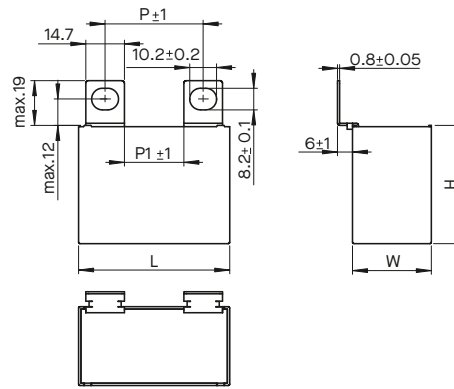
KNO19B0, B1, B3, B5



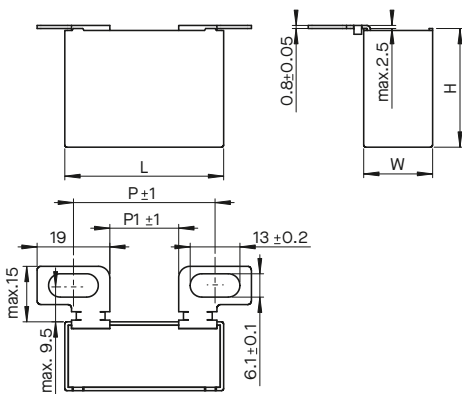
KNO19A2



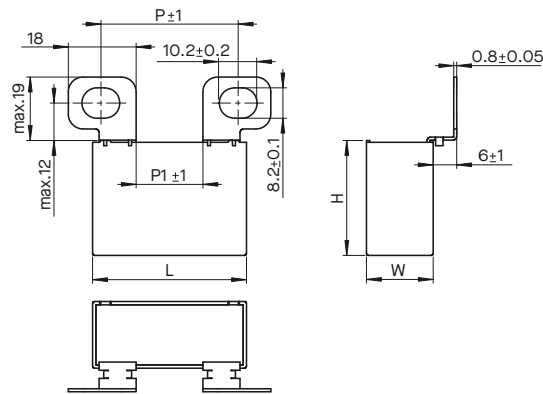
KNO19B2



KNO19A3



KNO19B4



Lug dimensions

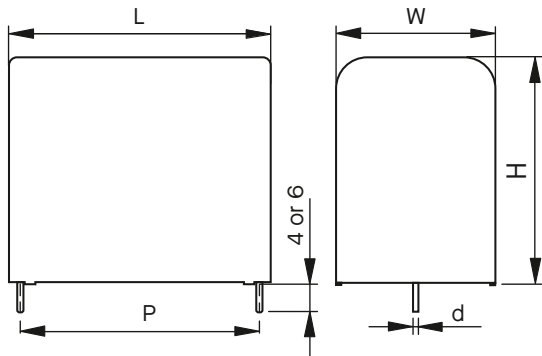
Version	L (mm)	P (mm)	P1 (mm)	Screw
A0	41.5	24	10	M6
A0	42	24	10	M6
A0	43	24	10	M6
A0	57.5	37	23	M6
A1	57.5	25	11	M6
A2	57.5	46	31	M8
A3	41.5	37	18	M6
A4	41.5	22	8	M6

Version	L (mm)	P (mm)	P1 (mm)	Screw
B0	41.5	24	10	M6
B0	42	24	10	M6
B0	43	24	10	M6
B0	57.5	37	23	M6
B1	57.5	25	11	M6
B2	57.5	37	23	M8
B3	57.5	22	8	M6
B4	41.5	37	18	M8
B5	41.5	22	8	M6

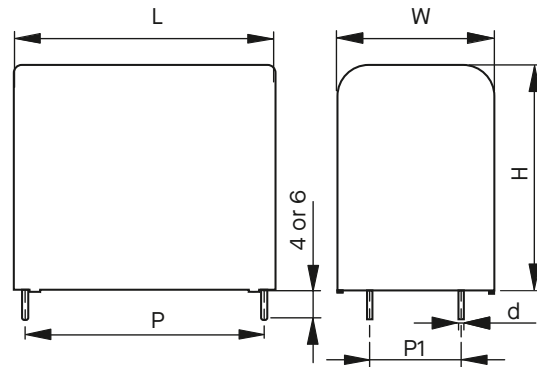


Dimensions

KNO1910 (2 pins)



KNO1914 (4 pins)



Version	L (mm)	P (mm)	Tolerance (mm)	P1 (mm)	Tolerance (mm)	d (mm)	Tolerance (mm)
10	32	27.5	±0.4	/	/	0.8	±0.05
	41.5	37.5	±0.4	/	±0.5	1 or 1.2	±0.05
	42	37.5	±0.4	/	±0.5	1 or 1.2	±0.05
	57.5	50.5	±0.4	/	±0.5	1.2	±0.05
14	41.5	37.5	±0.4	10.2 or 20.3	±0.5	1 or 1.2	±0.05
	42	37.5	±0.4	10.2 or 20.3	±0.5	1 or 1.2	±0.05
	57.5	50.5	±0.4	20.3	±0.5	1.2	±0.05

Construction

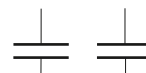
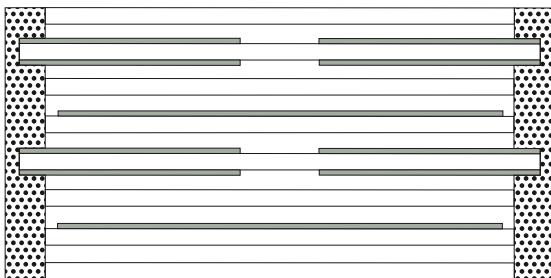
Dielectric: polypropylene film

Capacitor electrodes: vacuum-deposited metal layers

Casing: plastic case with flame-retardant epoxy resin sealing (UL 94 V-0)

Terminals: tinned lugs from brass or parallel tinned copper wire (2 or 4 pins)

Internal construction



DOUBLE SIDED METALLIZED PLASTIC FILM WITH INTERNAL SERIES CONNECTION AND METALLIZED PLASTIC FILM

Cautions and warnings

Mechanical overloads



ATTENTION: The capacitor is designed for mounting on a PC board. Do not move the capacitor, after it has been soldered to the PC board. The capacitor should not be mounted on places where vibrations or accelerations occur. Do not exceed the tested ability to withstand vibration. Avoid any compressive, tensile or flexural stress. When fixing the lugs the screw torque is to be limited to max. 10 Nm.

Overload



ATTENTION: Do not overload the capacitor. Avoid overloading the capacitor and consider the flammability of materials.

Impulses



ATTENTION: If electric energy impulses are higher, dielectric will break down. Avoid external electric energy impulse. The peak voltage (U_p , AC) should not be higher than the rated DC voltage (U_{NDC}).

Environmental conditions



ATTENTION: Do not exceed operating temperature. Do not expose the capacitor to humidity longer than it is recommended. Do not expose the capacitor to increased temperature more than it is recommended. The dissipation factor may go up and down with increased temperature. Avoid external fire or electricity.

AC/DC GENERAL PURPOSE CAPACITORS

Type KNI5048



Applications

Metallized polypropylene ac and dc capacitors are used for power electronic applications with high current and harmonics distortion with long life expectancy.

- ▶ Inverter
- ▶ Filtering
- ▶ Switching

Features

- ▶ AC/DC voltage
- ▶ Self-healing properties
- ▶ High reliability
- ▶ Cylindrical aluminium case with plastic self-extinguishing sealing cover
- ▶ Overpressure disconnecter
- ▶ Tinned brass screw

Standards

IEC 61071

UL-CSA approved (file No. E163120)




Specifications


Rated capacitance	10 μ F up to 600 μ F
Capacitance tolerance	$\pm 5\%$, $\pm 10\%$
Rated voltage (U_{rms})	250 V AC, 330 V AC, 480 V AC, 690 V AC
Operating temperature range	-40 °C to +85 °C
Climatic category	40/070/56 according to IEC 60068-1
Dissipation factors	$\text{tg}\delta \leq 10 \times 10^{-4}$ at 100 Hz
Test voltage (between terminals)	$1.5 \times U_n$, 10 s
Test voltage (terminals to case)	3 kV, 50 Hz, 2 s
Life expectancy	$\geq 100\,000$ hours at U_{rms} , $\theta_{hs} = 70\text{ °C}$
Failure rate	300 FIT

General characteristics

Capacitance range

U _{rms} = 250 V AC, U _N = 350 V AC, U _{NDC} = 400 V DC												
C _N (μF)	I _{max} (A)	\hat{i} (kA)	dU/dt (V/μs)	R _s (mΩ)	R _{th} (K/W)	D x H (mm)	H1 (mm)	M (mm)	P (mm)	M1 (mm)	L (mm)	 US U _{rms} = 250 V AC
30	22	0.75	25	5.1	11.0	50 × 77	27	6	22	12	12	
40	22	1	25	5.1	11.0	50 × 77	27	6	22	12	12	
50	22	1.25	25	4.9	9.7	50 × 90	27	6	22	12	12	
60	25	1.5	25	4.7	8.7	60 × 77	27	6	22	12	12	•
70	25	1.75	25	4.7	8.7	60 × 77	27	6	22	12	12	•
80	25	2	25	4.2	7.8	60 × 90	27	6	22	12	12	•
100	25	2.5	25	3.6	7.1	60 × 102	27	6	22	12	12	•
130	25	1.95	15	3.9	6.0	60 × 127	27	6	22	12	12	•
150	25	2.25	15	3.9	6.0	60 × 127	27	6	22	12	12	•
150	35	2.25	15	3.6	5.2	75 × 108	33	10	35	12	16	•
175	25	2.62	15	4.0	5.2	60 × 152	27	6	22	12	12	•
200	25	3	15	4.0	5.2	60 × 152	27	6	22	12	12	•
200	35	3	15	3.5	4.4	75 × 133	33	10	35	12	16	•
250	40	3	12	3.8	3.9	75 × 158	33	10	35	12	16	•
300	50	3.6	12	3.8	3.9	75 × 158	33	10	35	12	16	•
400	50	4.8	12	3.0	2.8	85 × 194	33	10	35	12	16	•
500	50	5	10	2.7	2.3	85 × 244	33	10	35	12	16	•
600	50	6	10	2.4	2.3	85 × 244	33	10	35	12	16	•

Capacitance range

U _{rms} = 330 V AC, U _N = 465 V AC, U _{NDC} = 600 V DC												
C _N (μF)	I _{max} (A)	\hat{i} (kA)	dU/dt (V/μs)	R _s (mΩ)	R _{th} (K/W)	D x H (mm)	H1 (mm)	M (mm)	P (mm)	M1 (mm)	L (mm)	 US U _{rms} = 340 V AC
25	22	0.75	30	5.3	11.0	50 × 77	27	6	22	12	12	
30	22	0.9	30	5.3	11.0	50 × 77	27	6	22	12	12	
40	22	1.2	30	5.1	9.7	50 × 90	27	6	22	12	12	
50	22	1.25	25	5.0	8.7	55 × 90	27	6	22	12	12	
60	25	1.5	25	4.8	7.1	60 × 102	27	6	22	12	12	•
70	25	1.4	20	4.8	7.1	60 × 102	27	6	22	12	12	•
75	25	1.5	20	4.6	7.1	60 × 102	27	6	22	12	12	•
80	25	1.6	20	4.6	7.1	60 × 102	27	6	22	12	12	•
100	25	2	20	4.1	6.0	60 × 127	27	6	22	12	12	•
100	30	1.5	15	3.8	5.2	75 × 108	33	10	35	12	16	•
150	30	2.25	15	3.5	4.4	75 × 133	33	10	35	12	16	•
200	40	3	15	2.9	4.0	75 × 153	33	10	35	12	16	•
250	45	3.75	15	3.0	2.8	85 × 194	33	10	35	12	16	•
300	50	4.5	15	3.0	2.8	85 × 194	33	10	35	12	16	•
400	50	4.8	12	2.6	2.3	85 × 244	33	10	35	12	16	•


• Approvals in use

Notes:


Other values and dimensions available on request.

General characteristics

Capacitance range

U _{rms} = 480 V AC, U _N = 675 V AC, U _{NDC} = 850 V DC												
C _N (μF)	I _{max} (A)	İ (kA)	dU/dt (V/μs)	R _s (mΩ)	R _{th} (K/W)	D x H (mm)	H1 (mm)	M (mm)	P (mm)	M1 (mm)	L (mm)	 U _{rms} = 500 V AC
10	22	0.4	40	5.5	11.0	50 x 77	27	6	22	12	12	
15	22	0.6	40	5.5	9.7	55 x 77	27	6	22	12	12	
20	25	0.8	40	5.3	8.7	60 x 77	27	6	22	12	12	•
25	25	1	40	5.2	7.8	60 x 90	27	6	22	12	12	•
30	25	1.2	40	4.8	7.1	60 x 102	27	6	22	12	12	•
35	25	1.4	40	4.8	7.1	60 x 102	27	6	22	12	12	•
40	25	1.6	40	4.1	6.0	60 x 127	27	6	22	12	12	•
50	25	2	40	4.0	6.0	60 x 127	27	6	22	12	12	•
60	30	2.1	35	3.8	4.4	75 x 133	33	10	35	12	16	•
70	30	2.1	30	3.8	4.4	75 x 133	33	10	35	12	16	•
80	35	2	25	4.9	3.9	75 x 158	33	10	35	12	16	•
90	35	2.25	25	4.7	3.9	75 x 158	33	10	35	12	16	•
100	30	2	20	5.1	3.3	75 x 193	33	10	35	12	16	•
100	35	2.5	25	2.6	3.1	85 x 169	33	10	35	12	16	•
133	35	2.66	20	3.5	2.8	85 x 194	33	10	35	12	16	•
150	50	3	20	3.4	2.8	85 x 194	33	10	35	12	16	•
200	50	4	20	3.0	2.3	85 x 244	33	10	35	12	16	•
250	50	3.75	15	2.6	2.0	85 x 294	33	10	35	12	16	•

Capacitance range

U _{rms} = 480 V AC, U _N = 675 V AC, U _{NDC} = 850 V DC												
C _N (μF)	I _{max} (A)	İ (kA)	dU/dt (V/μs)	R _s (mΩ)	R _{th} (K/W)	D x H (mm)	H1 (mm)	M (mm)	P (mm)	M1 (mm)	L (mm)	 U _{rms} = 690 V AC
10	25	0.4	40	4.8	8.7	60 x 77	27	6	22	12	12	
15	22	0.45	30	4.5	7.1	60 x 102	27	6	22	12	12	
22	25	0.66	30	4	6.0	60 x 127	27	6	22	12	12	
33	35	0.82	25	4.2	4.2	85 x 114	33	10	35	12	16	
47	50	1.17	25	2.9	3.6	85 x 139	33	10	35	12	16	
68	65	1.7	25	3.2	3.2	85 x 164	33	10	35	12	16	

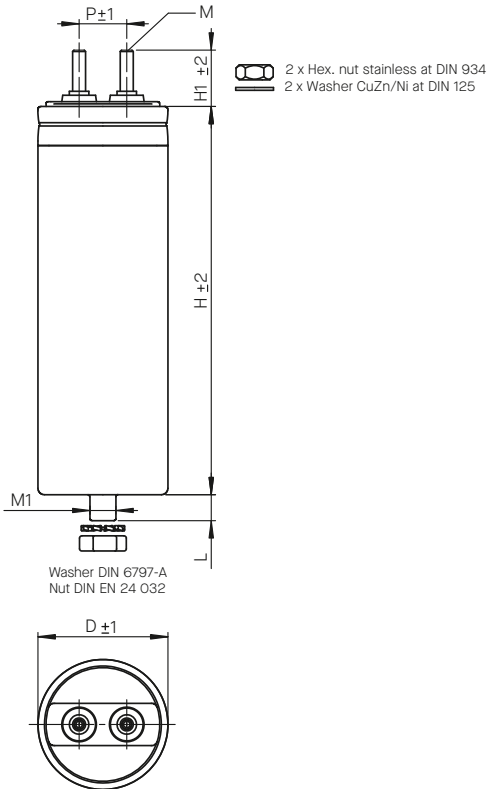
- Approvals in use

Notes:

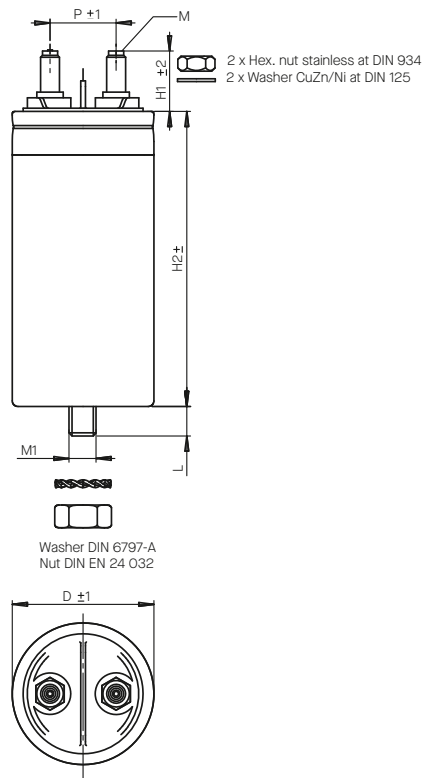
Other values and dimensions available on request.

Dimensions

KNI5048 D50 to D60 mm



KNI5048 D75 to D85 mm



Construction

Dielectric: polypropylene film

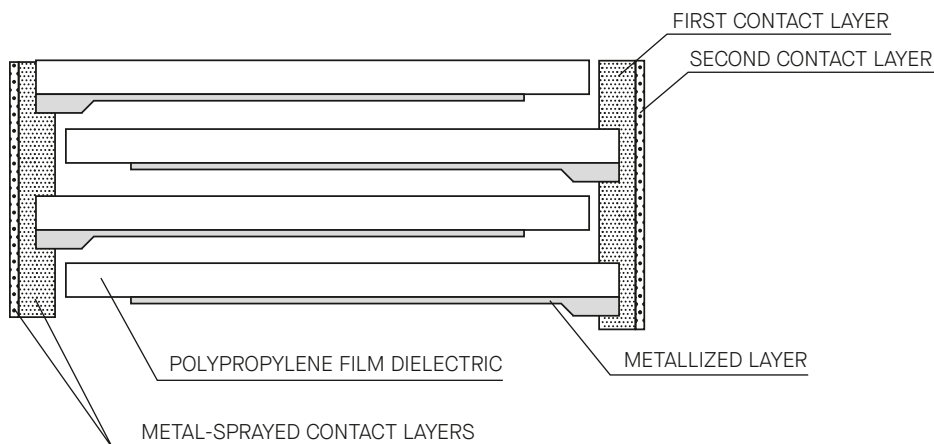
Capacitor electrodes: vacuum-deposited metal layers (overpressure disconnecter)

Casing: cylindrical aluminium case with plastic self-extinguishing sealing cover (UL94 V-0)

Filling: biodegradable vegetable oil (non PCB)

Terminals: tinned brass screw

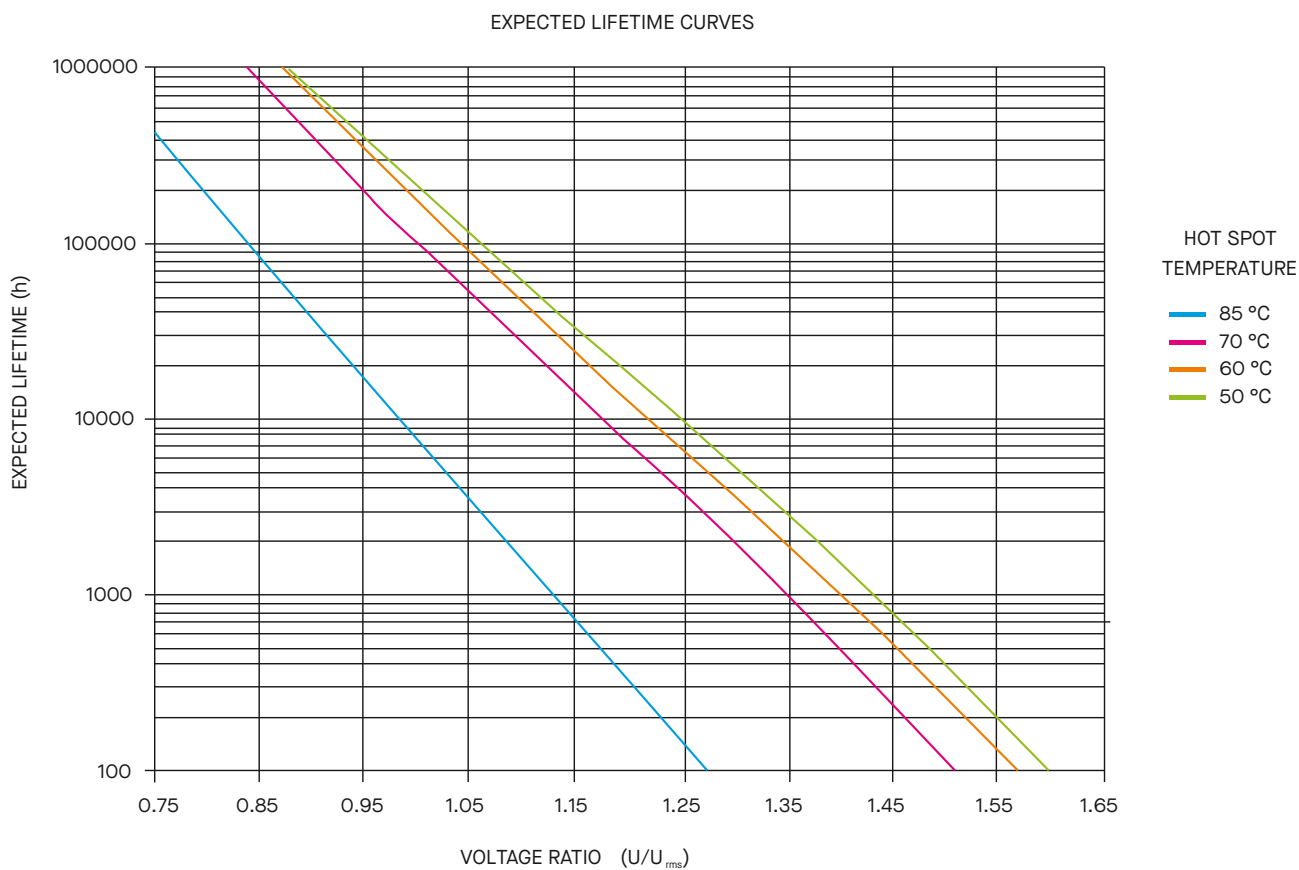
Internal construction



Lifetime expectancy



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Safe operation of the capacitors can be expected only if all electrical and thermal specifications as stated on the label, in the data sheets or catalogues and the following instructions are strictly observed. The manufacturer does not accept responsibility for any damage that could arise due to non-observance.

Connection

Use the appropriate tab connectors to connect the cables of the capacitors.

Do not solder leads to the terminals.

Do not bend or turn or move in any other way the connecting terminals and the tab connectors.

Do not use heavy or sharp objects and tools on the bordering or the connecting terminals.

Connection at threaded studs should be made between two nuts. During the connection the lower nut should be backed up to avoid any transmission of the torque.

Permitted torque for screw connections:

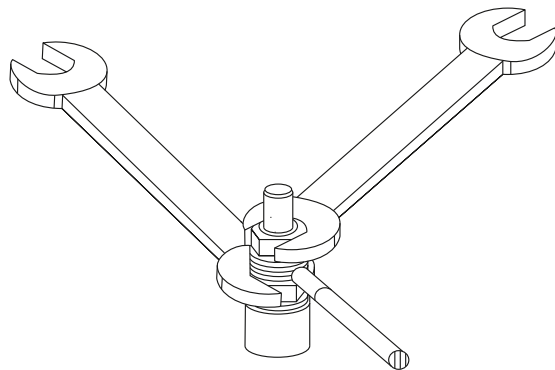
M4 - 2 Nm

M5 - 3 Nm

M6 - 5 Nm

M10 - 10 Nm

WARNING: SAFE CONNECTION



TO PREVENT BREAKING AT TIGHTENING
ALWAYS USE TWO WRENCHES

Mounting

Can be mounted in any position.

The capacitor has to be installed in such a way as to avoid any mechanical damage and dents in the aluminium.

Capacitors with overpressure safety device should be connected with sufficiently flexible leads in order to enable proper functioning of the mechanism. Above the terminals leave enough space for expansion of the capacitor case.

Leave a minimum distance of 15 mm of free space above each capacitor.

Connect these capacitors by using only flexible cables or elastic copper bands.

Earthing

Capacitors with a metal case must be earthed at the mounting stud

Permitted torque for studs:

M8 - 5 Nm

M12 - 12 Nm

Cautions and warnings



ATTENTION: In case of dents of more than 1 mm in depth or any other mechanical damage, capacitors must not be used at all. This also applies to cases of leakage. To ensure the full functionality of the overpressure disconnecter, elastic elements must not be hindered and a minimum space of 15 mm has to be kept above each capacitor. Check tightness of the connections/terminals periodically. The energy is stored in capacitors may be lethal. To prevent any chance of shock, discharge and short circuit the capacitor before handling. Failure to follow cautions may result, in the worst case, in premature failures, bursting and fire. Iskra d.o.o. is not responsible for any damage caused to people or things and resulting from an improper installation or a mis-application of capacitors.

Safety



ATTENTION: electrical or mechanical misapplication of capacitors may be hazardous. Personal injury or property damage may result from bursting of the capacitor or from the expulsion of oil or melted material due to mechanical disruption of the capacitor. Ensure good, effective grounding for capacitor enclosures. Observe appropriate safety precautions during operation (self-recharging phenomena and high energy contained in the capacitor). Handle capacitors carefully, even after the disconnection they may still be charged. The terminals of capacitors, connected bus bars and cables as well as other devices may also be energized. Follow good engineering practice.

Thermal load



ATTENTION: after installation of the capacitor it is necessary to verify that maximum hot spot temperature does not exceed during extreme service conditions.

Mechanical protection



ATTENTION: the capacitor has to be installed in such a way as to avoid any mechanical damage and dents in the aluminium.

Storage and operating conditions



ATTENTION: do not use or store capacitors in corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. In dusty environments, it is required to perform regular maintenance and proper cleaning, especially of the terminals, to avoid conductive path between phases and/or phases and ground. The maximum storage temperature is 85 °C.

Overpressure disconnecter



ATTENTION: to ensure full functionality of an overpressure disconnecter, the following must be observed: the elastic elements must be hindered, I.E.: Connecting lines must be flexible leads (cables); there must be enough space for expansion above the connections; folding crimps must not be retained by clamps; stress parameters of the capacitor must follow IEC 61071 specification.

AC FILTERING CAPACITORS (1-, 3-PHASE DELTA CONNECTION) Type KNI4051, KNI4053



Applications

- ▶ Switching mode power supplies (SMPS)
- ▶ Solar power plants
- ▶ Wind plants
- ▶ Frequency inverters
- ▶ Uninterruptible power supplies (UPS)

Features

- ▶ For harsh environment
- ▶ Self-healing properties
- ▶ Aluminium case; filled with vegetable oil, non-PCB
- ▶ Overpressure disconnecter suitable for PFC and LCL filter
- ▶ High ripple current
- ▶ High reliability
- ▶ Very low losses

Standards

IEC 61071

Optional IEC 60831, UL810

Specifications

Rated capacitance	3×8 μF up to 3×200 μF
Capacitance tolerance	±5 %, ±10 %
Rated voltage (U _{rms})	450 V
Rated frequency	50/60 Hz
Dissipation factor (tan δ _c)	2 × 10 ⁻⁴
Insulation strength C x Ri	> 5 000 s
Operating temperature range	-40 °C to +85 °C
Max. hot spot temperature	+85 °C
Storage temperature	-40 °C to +85 °C
Humidity class	C
Protection	IP20
Contacts	2×35 mm ² , M6 (5 Nm), I _{max} = 80 A 2×25 mm ² , M5 (3 Nm), I _{max} = 60 A 2×16 mm ² , M4 (2 Nm), I _{max} = 36 A
Discharge resistor	No
Test voltage (between terminals)	1.5 x Un, 50 Hz, 10 s
Test voltage (terminals to case)	4000 V, 50 Hz, 2 s
Sealing test	75 °C, 6 h
Mounting position	Upwards
Internal protection	Overpressure disconnecter (all phases)
Altitude	Up to 4000 m
Expected lifetime	≥ 100 000 hours at U _{rms} , θ _{hs} = 70 °C
Failure rate	100 FIT

General characteristics

KNI4051

Capacitance range

$U_{rms} = 530 \text{ V AC}, U_N = 750 \text{ V AC}$										
C_N (μF)	R_s (m Ω)	L_s (nH)	I_{max} (A)	\hat{I} (kA)	I_s (kA)	R_{th} (K/W)	H (mm)	D (mm)	Weight (kg)	Packing units (pcs)
20	1,5	45	30	0,3	0,9	5,2	110	75	0,55	9
30	1,6	70	30	0,3	0,9	4,4	135	75	0,65	9
50	1,5	45	60	2,4	7,3	3,3	165	85	0,9	4
100	2,4	70	60	3,1	9,2	2,5	210	90	2	4
150	2,4	70	60	4,6	13,8	2	210	116	2,5	2
200	2,4	70	60	6,1	18,4	2	210	116	2,5	2
300	2,4	70	60	9,2	27,6	1,6	210	136	3,5	1
400	3	110	60	8,9	26,8	1,4	260	136	4	1

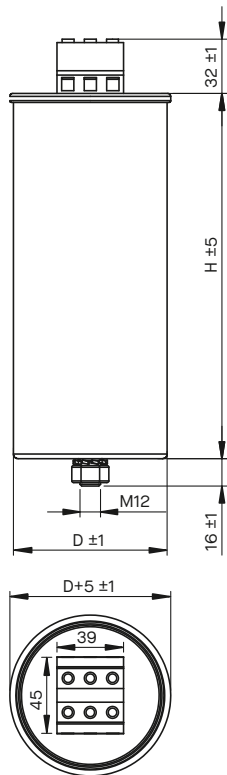
KNI4053

Capacitance range

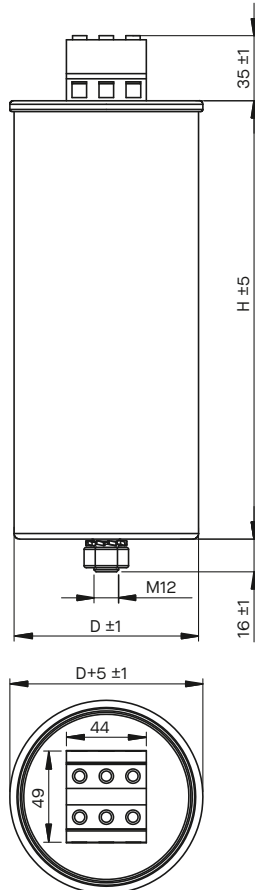
$U_{rms} = 450 \text{ V AC}, U_N = 640 \text{ V AC}$										
C_N (μF)	R_s (m Ω)	L_s (nH)	I_{max} (A)	\hat{I} (kA)	I_s (kA)	R_{th} (K/W)	H (mm)	D (mm)	Weight (kg)	Packing units (pcs)
3×25	3×1.4	110	3×35	0.63	1.89	4.8	165	75	0.8	9
3×38	3×1.2	110	3×60	0.9	2.7	4.2	165	90	1.0	4
3×40	3×0.7	110	3×60	2.7	8.2	4.2	165	90	1.0	4
3×46	3×1.2	110	3×60	1.3	3.9	4.2	165	90	1.0	4
3×58	3×1	110	3×60	1.3	3.9	3.6	210	90	1.3	4
3×77	3×0.9	120	3×60	2	6	3.2	245	90	1.5	4
3×100	3×0.9	120	3×60	2.2	6.6	2.6	210	116	2.2	2
3×135	3×0.8	130	3×60	2.3	6.9	2.2	245	116	2.6	2
3×150	3×0.7	130	3×60	3	9	1.9	245	136	4.1	1
3×200	3×0.6	130	3×60	3.5	10.5	1.9	245	136	4.1	1
$U_{rms} = 530 \text{ V AC}, U_N = 750 \text{ V AC}$										
3×16	3×1.6	110	3×35	0.8	2.4	4.8	165	75	0.8	9
3×30	3×1.5	120	3×60	1.2	3.6	3.6	210	90	1.3	4
3×35	3×1.4	120	3×60	1.4	4.2	3.6	210	90	1.3	4
3×48	3×1.2	120	3×60	1.5	4.5	3.2	245	90	1.5	4
3×50	3×0.6	130	3×60	1.6	4.8	2.6	210	116	2.2	2
3×83	3×0.8	130	3×60	2	6	2.2	245	116	2.6	2
3×100	3×0.8	130	3×60	2.2	6.6	1.9	245	136	4.1	1
$U_{rms} = 600 \text{ V AC}, U_N = 850 \text{ V AC}$										
3×19	3×1.0	110	3×60	1.6	2.4	4.8	165	90	1.0	4
3×30	3×0.7	120	3×60	2.1	3.6	6.3	210	90	1.3	4
3×50	3×0.7	120	3×60	2.5	4.2	2.6	210	116	2.2	2
3×86	3×0.6	130	3×60	4.2	4.5	1.9	245	136	4.1	1
$U_{rms} = 760 \text{ V AC}, U_N = 1080 \text{ V AC}$										
3×11	3×1.2	120	3×50	1.3	3.9	4.2	165	90	1.0	4
3×33.4	3×0.8	120	3×60	2.1	6.3	2.6	210	116	2.2	2
3×55.7	3×0.6	130	3×60	4	12	1.9	245	136	4.1	1
$U_{rms} = 850 \text{ V AC}, U_N = 1200 \text{ V AC}$										
3×8	3×1.4	110	3×50	1	3	4.8	165	75	0.8	9
3×12	3×1.2	110	3×60	1.5	4.5	4.2	165	90	1.0	4
3×25	3×0.5	130	3×60	3	9	2.6	210	116	2.2	2
3×50	3×0.6	130	3×60	4.8	14.4	1.9	245	136	4.1	1
3×55.7	3×0.6	130	3×60	4	12	1.9	245	136	4.1	1

Dimensions

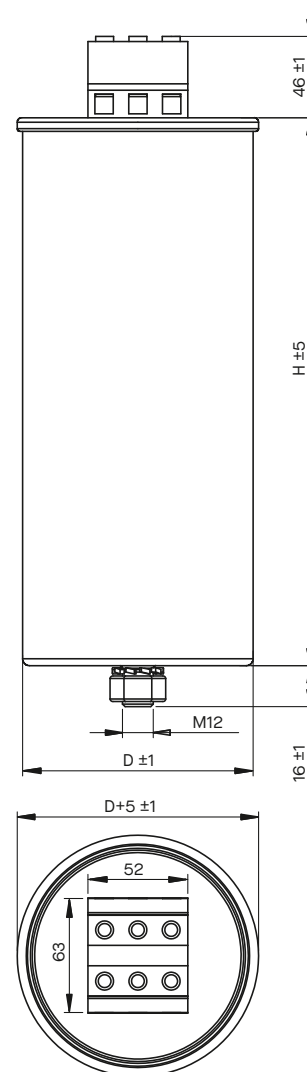
KNI405x D75 mm



KNI405x D90 to D116 mm



KNI405x D136 mm



Construction

- **Dielectric:** polypropylene film
- **Capacitor electrodes:** vacuum-deposited metal layers (overpressure disconnecter)
- **Casing:** cylindrical aluminium case and cover
- **Filling:** biodegradable vegetable oil (non PCB)
- **Terminals:** contact block (M4, M5, M6)
- **Base stud:** M12×16 - max: torque 12 Nm

Safe operation of the capacitors can be expected only if all electrical and thermal specifications as stated on the label, in the data sheets or catalogues and the following instructions are strictly observed. The manufacturer does not accept responsibility for any damage that could arise due to non-observance.

Connection

Use the appropriate tab connectors to connect the cables of the capacitors.

Do not solder leads to the terminals.

Do not bend or turn or move in any other way the connecting terminals and the tab connectors.

Do not use heavy or sharp objects and tools on the bordering or the connecting terminals.

Connection at threaded studs should be made between two nuts. During the connection the lower nut should be backed up to avoid any transmission of the torque.

Permitted torque for screw connections:

M4 - 2 Nm

M5 - 3 Nm

M6 - 5 Nm

M10 - 10 Nm

Mounting

Can be mounted in any position.

The capacitor has to be installed in such a way as to avoid any mechanical damage and dents in the aluminium.

Capacitors with overpressure safety device should be connected with sufficiently flexible leads in order to enable proper functioning of the mechanism. Above the terminals leave enough space for expansion of the capacitor case.

Leave a minimum distance of 15 mm of free space above each capacitor.

Connect these capacitors by using only flexible cables or elastic copper bands.

Earthing

Capacitors with a metal case must be earthed at the mounting stud

Permitted torque for studs:

M8 - 5 Nm

M12 - 12 Nm

Cautions and warnings



ATTENTION: In case of dents of more than 1 mm in depth or any other mechanical damage, capacitors must not be used at all. This also applies to cases of leakage. To ensure the full functionality of the overpressure disconnecter, elastic elements must not be hindered and a minimum space of 15 mm has to be kept above each capacitor. Check tightness of the connections/terminals periodically. The energy is stored in capacitors may be lethal. To prevent any chance of shock, discharge and short circuit the capacitor before handling. Failure to follow cautions may result, in the worst case, in premature failures, bursting and fire. Iskra d.o.o. is not responsible for any damage caused to people or things and resulting from an improper installation or a misapplication of capacitors.

Safety



ATTENTION: electrical or mechanical misapplication of capacitors may be hazardous. Personal injury or property damage may result from bursting of the capacitor or from the expulsion of oil or melted material due to mechanical disruption of the capacitor. Ensure good, effective grounding for capacitor enclosures. Observe appropriate safety precautions during operation (self-recharging phenomena and high energy contained in the capacitor). Handle capacitors carefully, even after the disconnection they may still be charged. The terminals of capacitors, connected bus bars and cables as well as other devices may also be energized. Follow good engineering practice.

Thermal load



ATTENTION: after installation of the capacitor it is necessary to verify that maximum hot spot temperature does not exceed during extreme service conditions.

Mechanical protection



ATTENTION: the capacitor has to be installed in such a way as to avoid any mechanical damage and dents in the aluminium.

Storage and operating conditions



ATTENTION: do not use or store capacitors in corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. In dusty environments, it is required to perform regular maintenance and proper cleaning, especially of the terminals, to avoid conductive path between phases and/or phases and ground. The maximum storage temperature is 85 °C.

Overpressure disconnecter



ATTENTION: to ensure full functionality of an overpressure disconnecter, the following must be observed: the elastic elements must be hindered, I.E.: Connecting lines must be flexible leads (cables); there must be enough space for expansion above the connections; folding crimps must not be retained by clamps; stress parameters of the capacitor must follow IEC 61071 specification.

AC FILTERING CAPACITORS

Type KNB1910, KNB1914



Applications

- ▶ Input/output AC filters for power converters
- ▶ Switching mode power supplies (SPMS)
- ▶ Solar power plants
- ▶ Wind plants
- ▶ Motor drives
- ▶ Induction heaters
- ▶ Frequency inverters
- ▶ Uninterruptible power supplies (UPS)

Features

- ▶ Self-healing properties
- ▶ High ripple current
- ▶ High reliability
- ▶ Low losses
- ▶ Small dimensions
- ▶ Designed for PCB mounting

Standards

IEC 61071

AEC-Q200 (on request)

Specifications

Rated capacitance	0.1 µF up to 80 µF
Capacitance tolerance	± 5 %, ± 10 %
Rated RMS voltage U_{rms}	250 V AC, 300 V AC, 350 V AC, 400 V AC, 440 V AC
Test voltage (between terminals)	1.5 x UNDC, 10 s
Self-inductance	< 1 nH per mm of pitch
Insulation resistance between terminals	$R_{xC} \geq 30\ 000 \geq$ after 1 min at 500 V
Operating temperature range	-40 °C to 85 °C
Max. hot spot temperature	105 °C
Climatic category	40/85/56 according to IEC 60068/1
Lifetime expectancy	$\geq 60\ 000$ hours at U_{rms} , $\theta_{hs} = 70$ °C
Failure rate	100 FIT

General characteristics

Capacitance range

U _{rms} @ 85 °C = 250 V AC, U _N @ 85 °C = 350 V AC, U _{NDC} @ 85 °C = 600 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ) _{@1 kHz} ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	Ī (A)
	L	H	W	P	P1					
1	32.0	19.0	10.0	27.5	-	10	30.0	4.0	32	32
2	32.0	19.0	10.0	27.5	-	10	24.3	4.5	32	64
3	32.0	21.0	12.0	27.5	-	10	17.1	5.8	32	96
4	32.0	22.0	13.0	27.5	-	10	13.5	6.7	32	128
5	32.0	24.5	15.0	27.5	-	10	11.0	8.0	32	160
6	32.0	26.5	17.0	27.5	-	10	9.5	9.0	32	192
7	32.0	28.0	18.0	27.5	-	10	8.2	10.0	32	224
8	32.0	32.0	18.0	27.5	-	10	7.3	11.1	32	256
9	32.0	33.0	20.0	27.5	-/10.2	10	6.5	12.3	32	288
10	32.0	35.0	20.0	27.5	-/10.2	10	5.9	13.2	32	320
12	32.0	35.5	24.0	27.5	-/10.2	10	4.9	15.2	32	384
15	32.0	40.0	25.0	27.5	-/10.2	10	4.0	17.8	32	480
8	42.0	27.0	16.0	37.5	-	10	15.0	7.9	23	184
9	42.0	27.0	16.0	37.5	-	10	13.5	8.3	23	207
10	42.0	31.0	18.0	37.5	10.2	10	12.3	9.4	23	230
11	42.0	31.0	18.0	37.5	10.2	10	11.4	9.7	23	253
12	42.0	31.0	18.0	37.5	10.2	10	10.8	10.0	23	276
15	42.0	38.0	21.0	37.5	10.2	10	8.7	12.1	23	345
20	42.0	43.0	28.0	37.5	10.2	10	6.6	14.1	23	460
22	42.0	43.0	28.0	37.5	10.2	10	6.0	14.8	23	506
25	42.0	43.0	28.0	37.5	10.2	10	5.5	15.5	23	575
30	42.0	45.0	30.0	37.5	10.2/20.3	15	5.0	16.9	23	690
35	42.0	50.0	36.0	37.5	10.2/20.3	15	4.5	19.1	23	805
40	42.0	50.0	36.0	37.5	10.2/20.3	15	4.0	20.2	23	920
40	57.5	45.0	30.0	52.5	20.3	25	4.7	19.2	15	600
45	57.5	45.0	30.0	52.5	20.3	25	4.2	20.3	15	675
50	57.5	50.0	35.0	52.5	20.3	25	3.8	22.9	15	750
55	57.5	50.0	35.0	52.5	20.3	25	3.5	23.9	15	825
60	57.5	50.0	35.0	52.5	20.3	30	3.2	25.0	15	900
65	57.5	50.0	35.0	52.5	20.3	30	3.0	25.8	15	975
70	57.5	50.0	35.0	52.5	20.3	30	2.9	26.2	15	1050
75	57.5	55.0	40.0	52.5	20.3	30	2.8	27.4	15	1125
80	57.5	55.0	40.0	52.5	20.3	30	2.7	27.9	15	1200

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

U _{rms} @ 85 °C = 300 V AC, U _N @ 85 °C = 420 V AC, U _{NDC} @ 85 °C = 750 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ) _{@1 kHz} ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	İ (A)
	L	H	W	P	P1					
1	32.0	19.0	10.0	27.5	-	10	30.0	4.0	40	40
2	32.0	21.0	12.0	27.5	-	10	19.8	5.3	40	80
3	32.0	24.5	15.0	27.5	-	10	14.0	7.1	40	120
3.3	32.0	24.5	15.0	27.5	-	10	13.0	7.3	40	132
4	32.0	26.5	17.0	27.5	-	10	11.0	8.4	40	160
5	32.0	32.0	18.0	27.5	-	10	9.5	9.7	40	200
6	32.0	33.0	20.0	27.5	-/10.2	10	8.3	10.9	40	240
7	32.0	35.5	24.0	27.5	-/10.2	10	7.3	12.4	40	280
8	32.0	35.5	24.0	27.5	-/10.2	10	6.6	13.0	40	320
9	32.0	40.0	25.0	27.5	-/10.2	10	6.0	14.4	40	360
10	32.0	40.0	25.0	27.5	-/10.2	10	5.5	15.1	40	400
5	42.0	27.0	16.0	37.5	-	10	17.0	7.4	28	140
5.6	42.0	27.0	16.0	37.5	-	10	15.4	7.8	28	157
6	42.0	31.0	18.0	37.5	10.2	10	14.5	8.6	28	168
7	42.0	31.0	18.0	37.5	10.2	10	13.2	9.0	28	196
7.5	42.0	38.0	21.0	37.5	10.2	10	12.5	10.1	28	210
8	42.0	38.0	21.0	37.5	10.2	10	12.0	10.3	28	224
9	42.0	38.0	21.0	37.5	10.2	10	11.0	10.7	28	252
10	42.0	38.0	21.0	37.5	10.2	10	10.0	11.3	28	280
12	42.0	43.0	28.0	37.5	10.2	10	8.5	12.4	28	336
15	42.0	43.0	28.0	37.5	10.2	10	6.8	13.9	28	420
18	42.0	43.0	28.0	37.5	10.2	10	6.5	14.2	28	448
20	42.0	45.0	30.0	37.5	10.2/20.3	15	5.3	16.4	28	560
25	42.0	50.0	36.0	37.5	10.2/20.3	15	4.3	19.5	28	700
25	57.5	45.0	30.0	52.5	20.3	15	6.8	16.0	19	475
30	57.5	50.0	35.0	52.5	20.3	15	5.8	18.5	19	570
35	57.5	50.0	35.0	52.5	20.3	20	5.0	20.0	19	665
40	57.5	50.0	35.0	52.5	20.3	20	4.4	19.9	19	760
45	57.5	55.0	40.0	52.5	20.3	20	4.0	22.9	19	855
50	57.5	55.0	40.0	52.5	20.3	20	3.6	24.2	19	950
55	57.5	55.0	40.0	52.5	20.3	20	3.3	25.3	19	1045

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
 (2) Nominal dimensions.
 (3) Maximum tan(δ) values.
 (4) Typical equivalent series resistance at 10 kHz.
 (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

U _{rms} @ 85 °C = 350 V AC, U _N @ 85 °C = 490 V AC, U _{NDC} @ 85 °C = 900 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ) _{@1 kHz} ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	İ (A)
	L	H	W	P	P1					
1	32.0	19.0	10.0	27.5	-	10	30.0	4.0	50	50
1.2	32.0	21.0	12.0	27.5	-	10	25.0	4.8	50	60
2	32.0	24.5	15.0	27.5	-	10	17.0	6.4	50	100
2.2	32.0	24.5	15.0	27.5	-	10	16.0	6.6	50	110
3	32.0	28.0	18.0	27.5	-	10	12.5	8.1	50	150
3.3	32.0	32.0	18.0	27.5	-	10	11.5	8.8	50	165
4	32.0	32.0	18.0	27.5	-	10	9.8	9.6	50	200
5	32.0	35.0	20.0	27.5	-/10.2	10	8.5	10.9	50	250
6	32.0	35.5	24.0	27.5	-/10.2	10	7.5	12.2	50	300
7	32.0	40.0	25.0	27.5	-/10.2	10	6.8	13.6	50	350
7.5	32.0	40.0	25.0	27.5	-/10.2	10	6.5	13.9	50	375
4	42.0	27.0	16.0	37.5	-	10	19.0	7.0	35	140
5	42.0	31.0	18.0	37.5	10.2	10	16.0	8.2	35	175
6	42.0	38.0	21.0	37.5	10.2	10	13.5	9.7	35	210
7	42.0	38.0	21.0	37.5	10.2	10	11.8	10.4	35	245
8	42.0	38.0	21.0	37.5	10.2	10	10.5	11.0	35	280
9	42.0	43.0	28.0	37.5	10.2	10	9.5	11.8	35	315
10	42.0	43.0	28.0	37.5	10.2	10	8.8	12.2	35	350
12	42.0	43.0	28.0	37.5	10.2	10	7.3	13.4	35	420
14	42.0	45.0	30.0	37.5	10.2/20.3	15	6.5	14.8	35	490
15	42.0	45.0	30.0	37.5	10.2/20.3	15	6.0	15.4	35	525
18	42.0	50.0	36.0	37.5	10.2/20.3	15	5.0	18.1	35	630
20	42.0	50.0	36.0	37.5	10.2/20.3	15	4.5	19.1	35	700
18	57.5	45.0	30.0	37.5	20.3	15	8.7	14.1	23	414
20	57.5	45.0	30.0	52.5	20.3	15	7.9	14.8	23	460
22	57.5	50.0	35.0	52.5	20.3	20	7.2	16.6	23	506
24	57.5	50.0	35.0	52.5	20.3	20	6.7	17.3	23	552
25	57.5	50.0	35.0	52.5	20.3	20	6.5	17.5	23	575
26	57.5	50.0	35.0	52.5	20.3	20	6.3	17.8	23	598
30	57.5	55.0	40.0	52.5	20.3	20	5.5	19.6	23	690
35	57.5	55.0	40.0	52.5	20.3	20	4.8	20.9	23	805

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

U _{rms} @ 85 °C = 400 V AC, U _N @ 85 °C = 560 V AC, U _{NDC} @ 85 °C = 1000 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ) _{@1 kHz} ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	İ (A)
	L	H	W	P	P1					
0.47	32.0	16.0	7.5	27.5	-	10	45.0	2.9	57	27
0.56	32.0	17.0	9.0	27.5	-	10	40.0	3.3	57	32
0.68	32.0	19.0	10.0	27.5	-	10	38.0	3.6	57	39
0.82	32.0	21.0	12.0	27.5	-	10	33.0	4.1	57	47
1	32.0	21.0	12.0	27.5	-	10	28.0	4.5	57	57
1.5	32.0	24.5	15.0	27.5	-	10	20.0	5.9	57	86
2	32.0	26.5	17.0	27.5	-	10	16.0	6.9	57	114
2.2	32.0	26.5	17.0	27.5	-	10	15.0	7.2	57	125
3	32.0	33.0	20.0	27.5	-/10.2	10	11.5	9.2	57	171
3.5	32.0	35.0	20.0	27.5	-/10.2	10	10.5	9.8	57	200
5	32.0	40.0	25.0	27.5	-/10.2	10	7.5	12.9	57	285
2.7	42.0	27.0	16.0	37.5	-	10	20.0	6.8	40	108
3	42.0	31.0	18.0	37.5	10.2	10	19.0	7.5	40	120
3.5	42.0	31.0	18.0	37.5	10.2	10	17.0	8.0	40	140
4	42.0	38.0	21.0	37.5	10.2	10	15.0	9.2	40	160
5	42.0	38.0	21.0	37.5	10.2	10	12.0	10.3	40	200
6	42.0	43.0	28.0	37.5	10.2	10	10.3	11.3	40	140
7	42.0	43.0	28.0	37.5	10.2	10	9.0	12.1	40	180
7.5	42.0	43.0	28.0	37.5	10.2	10	8.6	12.4	40	300
8	42.0	43.0	28.0	37.5	10.2	10	8.3	12.6	40	320
9	42.0	45.0	30.0	37.5	10.2/20.3	10	7.6	13.7	40	360
10	42.0	45.0	30.0	37.5	10.2/20.3	15	7.0	14.3	40	400
12	42.0	50.0	36.0	37.5	10.2/20.3	15	6.0	16.5	40	480
13	42.0	50.0	36.0	37.5	10.2/20.3	15	5.6	17.1	40	520
13	57.5	45.0	30.0	52.5	20.3	15	8.2	14.6	27	351
14	57.5	45.0	30.0	52.5	20.3	15	7.7	15.0	27	378
15	57.5	45.0	30.0	52.5	20.3	20	7.3	15.4	27	405
16	57.5	50.0	35.0	52.5	20.3	20	7.0	16.9	27	432
18	57.5	50.0	35.0	52.5	20.3	20	6.3	17.8	27	486
20	57.5	50.0	35.0	52.5	20.3	20	5.7	18.7	27	540
22	57.5	55.0	40.0	52.5	20.3	20	5.2	20.1	27	594
25	57.5	55.0	40.0	52.5	20.3	20	4.6	21.4	27	675
26	57.5	55.0	40.0	52.5	20.3	20	4.4	21.9	27	702

Notes:

- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
- (2) Nominal dimensions.
- (3) Maximum tan(δ) values.
- (4) Typical equivalent series resistance at 10 kHz.
- (5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

General characteristics

Capacitance range

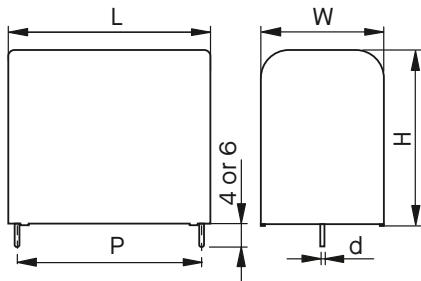
U _{rms} @ 85 °C = 440 V AC, U _N @ 85 °C = 620 V AC, U _{NDC} @ 85 °C = 1100 V DC										
C _N ⁽¹⁾ (μF)	Dimensions (mm) ⁽²⁾					tan(δ)@1 kHz ⁽³⁾ (x10 ⁻⁴)	ESR@10 kHz ⁽⁴⁾ (mΩ)	I _{max} @10 kHz ⁽⁵⁾ (A)	(dU/dt) _{max} (V/μs)	İ (A)
	L	H	W	P	P1					
0.1	32.0	16.0	7.5	27.5	-	10	100.0	2.0	150	15
0.15	32.0	16.0	7.5	27.5	-	10	70.0	2.4	150	23
0.22	32.0	17.0	9.0	27.5	-	10	55.0	2.8	150	33
0.33	32.0	17.0	9.0	27.5	-	10	45.0	3.1	150	50
0.47	32.0	19.0	10.0	27.5	-	10	35.0	3.7	150	71
0.56	32.0	21.0	12.0	27.5	-	10	33.0	4.1	150	84
0.68	32.0	22.0	13.0	27.5	-	10	30.0	4.5	150	102
0.82	32.0	24.5	15.0	27.5	-	10	25.0	5.1	150	123
1	32.0	24.5	15.0	27.5	-	10	22.0	5.6	150	150
1.5	32.0	28.0	18.0	27.5	-	10	16.0	7.2	150	225
2	32.0	33.0	20.0	27.5	-/10.2	10	13.0	8.7	150	300
2.2	32.0	35.0	20.0	37.5	-/10.2	10	12.0	9.2	150	330
3	32.0	40.0	25.0	37.5	-/10.2	10	10.0	11.2	150	450
1.5	42.0	27.0	16.0	37.5	10.2	15	21.0	6.7	100	150
2	42.0	31.0	18.0	37.5	10.2	15	17.0	8.0	100	200
2.2	42.0	31.0	18.0	37.5	10.2	15	16.0	8.2	100	220
3	42.0	38.0	21.0	37.5	10.2	15	12.0	10.3	100	300
3.3	42.0	38.0	21.0	37.5	10.2	15	11.0	10.7	100	330
4	42.0	38.0	21.0	37.5	10.2	15	10.5	11.0	100	400
4.7	42.0	43.0	28.0	37.5	10.2	15	9.5	11.8	100	470
5	42.0	43.0	28.0	37.5	10.2	15	9.0	12.1	100	500
5.6	42.0	43.0	28.0	37.5	10.2	15	8.2	12.7	100	560
6	42.0	45.0	30.0	37.5	10.2/20.3	15	7.8	13.5	100	600
6.8	42.0	45.0	30.0	37.5	10.2/20.3	15	7.0	14.3	100	680
7	42.0	50.0	36.0	37.5	10.2/20.3	15	6.9	15.4	100	700
8	42.0	50.0	36.0	52.5	10.2/20.3	15	6.2	16.3	100	800
8	57.5	45.0	30.0	52.5	20.3	20	6.5	16.4	65	520
9	57.5	45.0	30.0	52.5	20.3	20	6.2	16.7	65	585
10	57.5	45.0	30.0	52.5	20.3	20	5.8	17.3	65	650
12	57.5	50.0	35.0	52.5	20.3	20	5.0	20.0	65	780
15	57.5	55.0	40.0	52.5	20.3	20	4.1	22.7	65	975
16	57.5	55.0	40.0	52.5	20.3	20	4.0	22.9	65	1040
18	57.5	55.0	40.0	52.5	20.3	20	3.9	23.2	65	1170

Notes:

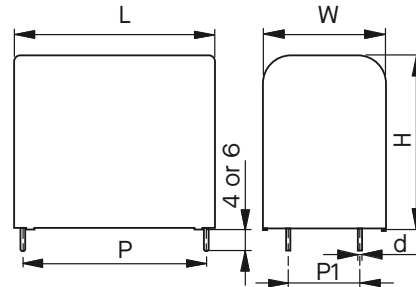
- (1) Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.
(2) Nominal dimensions.
(3) Maximum tan(δ) values.
(4) Typical equivalent series resistance at 10 kHz.
(5) Maximum R.M.S. current at 10 kHz, θ_{amb} = 70 °C for Δθ_{case} ≤ 20 °C

Dimensions

KNB1910 (2 pins)



KNB1914 (4 pins)



Terminal dimensions						Max. box dimensions		
P (mm)	Tolerance (mm)	P1 (mm)	Tolerance (mm)	d (mm)	Tolerance (mm)	L _{max} (mm)	H _{max} (mm)	W _{max} (mm)
27.5	±0.5	-	-	0.8	±0.05	L + 0.5	H + 0.2	W + 0.5
27.5	±0.5	10.2	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.2	W + 0.5
37.5	±0.5	-	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.5	W + 0.5
37.5	±0.5	10.2	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.5	W + 0.5
37.5	±0.5	20.3	±0.5	1 or 1.2	±0.05	L + 0.5	H + 0.5	W + 0.5
52.5	±0.5	20.3	±0.5	1.2	±0.05	L + 1.0	H + 1.0	W + 1.0

Construction

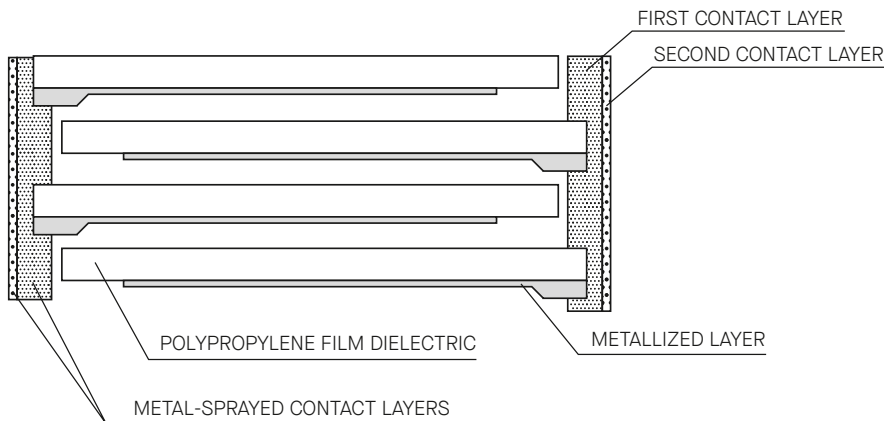
Dielectric: polypropylene film

Capacitor electrodes: vacuum-deposited metal layers

Casing: plastic case with flame-retardant epoxy resin sealing (UL 94 V-0)

Terminals: parallel tinned copper wire (2, 4 or 12 pins)

Internal construction



Cautions and warnings

Mechanical overloads



ATTENTION: The capacitor is designed for mounting on a PC board. Do not move the capacitor, after it has been soldered to the PC board. The capacitor should not be mounted on places where vibrations or accelerations occur. Do not exceed the tested ability to withstand vibration. Avoid any compressive, tensile or flexural stress.

Overload



ATTENTION: Do not overload the capacitor. Avoid overloading the capacitor and consider the flammability of materials.

Impulses



ATTENTION: If electric energy impulses are higher, dielectric will break down. Avoid external electric energy impulse. The peak voltage (U_p , AC) should not be higher than the rated DC voltage (U_{NDC}).

Environmental conditions



ATTENTION: Do not exceed operating temperature. Do not expose the capacitor to humidity longer than it is recommended. Do not expose the capacitor to increased temperature more than it is recommended. The dissipation factor may go up and down with increased temperature. Avoid external fire or electricity.

Disclaimer

While every care has been taken to ensure that the information contained in this document is correct, no responsibility can be accepted for any inaccuracy. We reserve the right to alter or modify the information contained herein at any time in the light of technical or other developments.

Technical specifications are valid under normal operating conditions only. We do not accept any responsibility for any misuse of the product and cannot be held liable for indirect or consequential damages. Technical data and design can be subject to change and should be confirmed prior to ordering.

