



Power Electronic Capacitors

- DC Link Capacitors
- Snubber Capacitors
- AC/DC General Purpose Capacitor



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 figure below. 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.

Block diagram

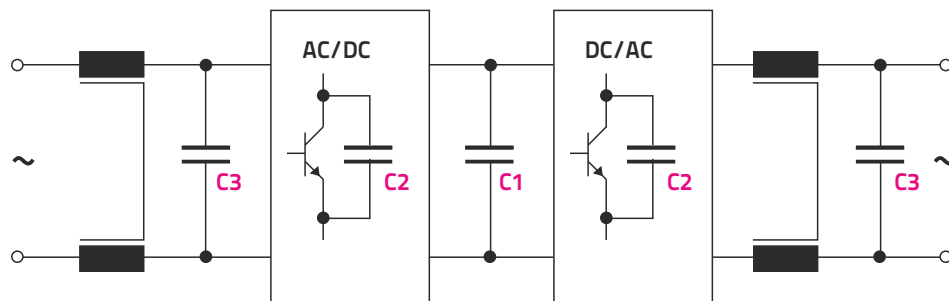


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● **C_N - Rated capacitance**

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_N - Rated AC voltage**

Root mean square value of a.c. voltage for which the capacitor has been designed.

● **U_{rms} - r.m.s. voltage**

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

● **U_{op} - Operating voltage**

Highest voltage at given temperature at which the capacitor may be operated.

● **I_{max} - Maximum current**

Maximum r.m.s. current for continuous operation.

● **(dU/dt)_{max} - Maximum rate of voltage rise**

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

● **I_{hat} - Maximum peak current**

Maximum repetitive peak current that can occur during continuous operation.

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

● **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.

$$\tan(\delta) = ESR \times \omega \times C = \tan(\delta_0) + R_s \times \omega \times C$$

tan(δ₀) = dielectric loss factor

● **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.

$$ESR = \tan(\delta_0) / (\omega \times C) + R_s$$

● **P_{diss} - Dissipated power**

Active power dissipated in the capacitor.

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

● **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.

● **Δθ_{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.

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

● **P_{max} - Maximum power loss**

Maximum permissible power dissipation for continuous operation.

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

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

Reference standards

- IEC 61071
- UL 810 (construction only) File No.: E196169

Specifications

- | | |
|---------------------------------------|--|
| ■ Capacitance range | see table |
| ■ Capacitance tolerance | ± 10%, on request ± 5 % |
| ■ Voltage range | max. 2200V DC |
| ■ Dissipation factor $\tan(\delta_v)$ | $< 2 \times 10^{-4} / 1\text{kHz}$ |
| ■ Series resistance | $< 3 \text{ m}\Omega / 1 \text{ kHz}$ |
| ■ Dielectric | Self-healing MPP, aluminium case, without overpressure device |
| ■ Temperature coefficient | -2.3% from -20 °C to +70 °C |
| ■ Operating temperature | -40 °C to 85 °C (hot spot) |
| ■ Inductance | $< 70 \text{ nH}$ |
| ■ Test voltage | Terminal to terminal = $1.5 U_{\text{NDC}}$, 10s ; Terminal to case 3.6 kV AC, 2s |
| ■ Casing material | Aluminium |
| ■ Cap | UL 94 V-0 |
| ■ Filling | Epoxy resin dry, UL 94 V-0 |
| ■ Terminals | M6x8 internal threads ; M8 screw |
| ■ Torque of terminals | M6: 5 Nm ; M8: 6 Nm |
| ■ Base Stud | M12 x 16, torque 10 Nm |
| ■ Max. altitude | 4000 m |
| ■ Max. hot spot temperature | 85 °C |
| ■ Climatic category | 40/85/21 according to IEC 68/1 |
| ■ Lifetime expectancy | 100 000 hours at U_{NDC} 70 °C |

Features

- Used in DC-link circuits, can replace electrolytic capacitor
- Low ESR, high ripple current handling capabilities
- Low ESL
- Self-healing properties
- Long lifetime
- Aluminium case, filled with epoxy resin



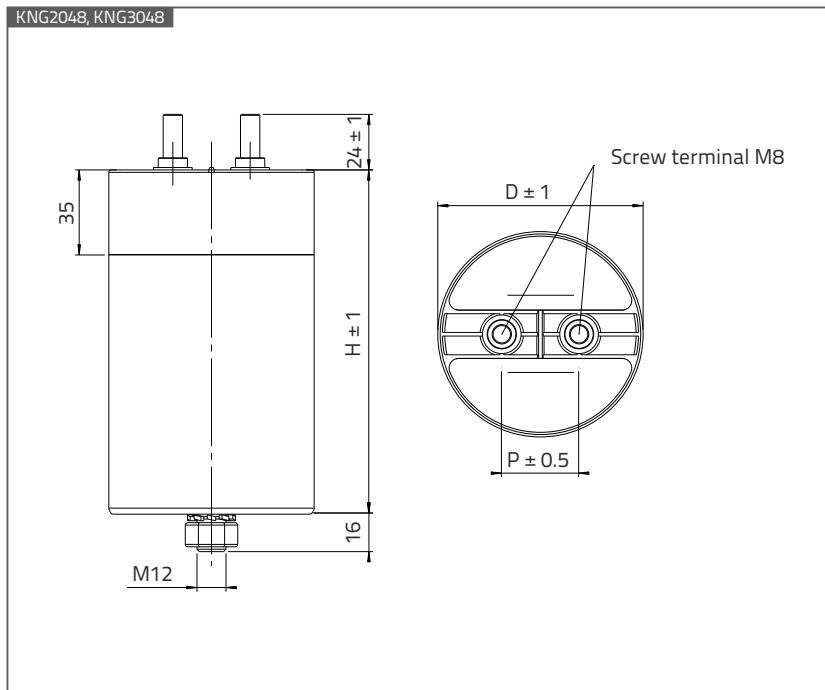
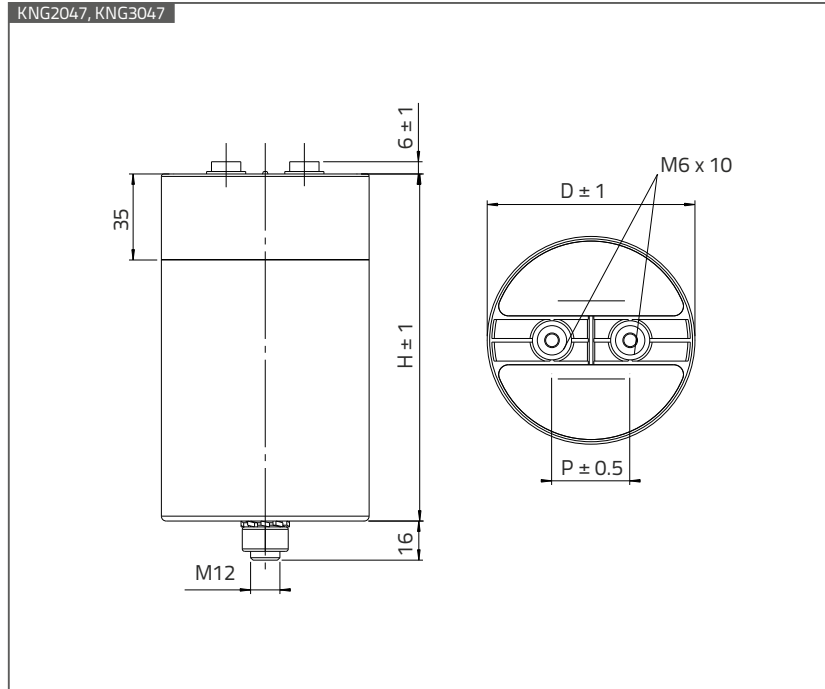
General characteristics

Capacitance range									
U_{NDC} (V DC)	C_N (μ F)	I_{max} (A)	\hat{I} (kA)	\hat{I}_s (kA)	R_s (m Ω)	L_s (nH)	R_{th} (K/W)	D x H (mm)	P (mm)
600	600	30	3.3	9.9	1.4	40	5.1	85x95	32
	650	30	3.6	10.9	1.3	40	5.1	85x95	32
	900	30	3.7	11.1	1.9	60	4.5	85x125	32
	900	60	7.1	21.2	1.2	60	4.2	85x142	32
	1050	60	7.2	21.5	1.3	70	3.9	85x155	32
	1280	60	7.1	21.4	1.5	70	2.6	85x185	32
700	1740	60	7.1	21.4	1.6	80	2.4	85x235	32
	460	35	2.3	6.9	1.4	40	5.1	85x95	32
	620	35	3.1	9.3	1.9	60	4.5	85x125	32
	640	55	4.4	13.4	1.5	60	4.2	85x142	32
	750	55	4.5	13.5	1.6	70	3.9	85x155	32
	920	55	4.6	13.8	1.7	80	2.6	85x185	32
900	1240	60	4.7	18.8	1.6	80	2.4	85x235	32
	1700	65	8.8	26.5	1.3	70	2.1	116x185	50
	370	30	2.2	6.6	1.8	40	5.5	85x95	32
	480	55	4.0	12.0	1.2	60	4.9	85x142	32
	500	55	4.1	12.3	1.2	40	4.9	85x142	32
	560	55	4.2	12.6	1.3	60	4.0	85x155	32
1100	680	55	4.3	12.9	1.3	70	3.2	85x185	32
	950	60	5.7	17.1	1.4	70	2.7	85x235	32
	1100	50	8.1	24.3	1.3	60	2.5	116x155	50
	230	30	2.1	6.3	2.1	40	4.5	85x95	32
	320	55	3.3	10.0	1.2	60	2.8	85x142	32
	360	55	3.2	10.0	1.2	60	2.6	85x155	32
1350	410	65	3.7	11.0	1.1	45	2.5	85x155	32
	420	65	3.7	11.0	1.1	45	2.5	85x155	32
	450	60	4.0	12.0	1.1	70	2.4	85x185	32
	610	60	5.3	15.9	1.2	70	2.3	85x235	32
	760	70	7.4	22.2	1.1	60	1.8	116x155	50
	160	35	3.1	9.3	2.1	40	4.1	85x95	32
1500	220	55	3.2	9.6	1.4	60	3.7	85x142	32
	250	55	3.5	10.5	1.3	60	3.5	85x155	32
	310	55	3.4	10.0	1.3	70	3.2	85x185	32
	420	60	3.5	10.5	1.4	70	2.7	85x235	32
	530	60	7.2	21.6	1.4	60	2.0	116x155	50
1800	130	30	1.5	4.5	2.3	40	4.2	85x95	32
	180	55	3.5	10.5	1.3	50	3.7	85x142	32
	220	55	4.0	12.0	1.3	60	3.5	85x155	32
	260	55	4.1	12.3	1.4	60	3.2	85x185	32
	360	60	3.6	10.8	1.6	70	2.7	85x235	32
2200	460	60	3.1	9.3	1.7	60	2.0	116x155	50
	90	30	1.6	4.8	2.5	60	4.6	85x95	32
	140	55	2.0	6.0	2.4	70	3.5	85x155	32
	240	60	2.9	8.7	1.7	70	2.7	85x235	32
2200	350	50	3.0	9.0	2.0	70	2.0	116x185	50
	75	20	0.5	1.5	5.0	60	5.8	85x125	32
	90	40	0.5	1.5	2.5	60	4.5	85x185	32
	150	40	0.5	1.5	2.5	70	3.3	85x235	32
2200	220	40	0.6	1.8	2.3	70	2.7	116x185	50

DC Link Capacitors

Type KNG2047 - KNG3047, KNG2048 - KNG3048

Dimensions



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



Reference standard

- IEC 61071

Specifications

■ Rated capacitance	0.1 µF up to 550 µF
■ 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	Terminal to terminal = $1.5 \times U_{NDC}$, 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
■ Max. peak-to-peak voltage	$0.2 \times U_{NDC}$
■ Operating temperature range	-40 °C to +85 °C
■ Climatic category	40/85/56 according to IEC 60068-1
■ Life expectancy	$\geq 100\,000$ hours at U_{NDC} , 70 °C
■ Rated temperature	+85 °C
■ Max. operating temperature (case)	105 °C



DC Link Capacitors

Type KNG1910, KNG1914



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⁾ (μ F)	Dimensions (mm) ⁽²⁾					$\tan(\delta)$ @1kHz ⁽³⁾ ($\times 10^{-4}$)	ESR@10 kHz ⁽⁴⁾ (m Ω)	I_{max} @10 kHz ⁽⁵⁾ (A)	$(dU/dt)_{max}$ (V/ μ s)	\hat{I} (A)
	L	H	W	P	P1					
1	32.0	17.0	9.0	27.5	-	15	40.0	3.3	27	27
2	32.0	17.0	9.0	27.5	-	15	35.0	3.5	27	54
3	32.0	17.0	9.0	27.5	-	15	27.0	4.0	27	81
4	32.0	19.0	10.0	27.5	-	15	22.0	4.7	27	108
5	32.0	21.0	12.0	27.5	-	15	18.5	5.5	27	135
6	32.0	21.0	12.0	27.5	-	15	16.7	5.8	27	162
7	32.0	22.0	13.0	27.5	-	15	15.2	6.3	27	189
8	32.0	23.5	14.0	27.5	-	15	14.0	6.8	27	216
9	32.0	24.5	15.0	27.5	-	15	12.8	7.4	27	243
10	32.0	26.5	17.0	27.5	-	20	11.7	8.1	27	270
12	32.0	28.0	18.0	27.5	-	20	10.2	9.0	27	324
14	32.0	32.0	18.0	27.5	-	20	9.0	10.0	27	378
15	32.0	32.0	18.0	27.5	-	20	8.5	10.3	27	405
20	32.0	35.5	24.0	27.5	-	20	6.5	13.1	27	540
25	32.0	40.0	25.0	27.5	-	20	5.3	15.4	27	675
28	32.0	40.0	25.0	27.5	-	20	4.8	16.1	27	756
15	42.0	27.0	16.0	37.5	-	25	10.5	9.4	20	300
20	42.0	31.0	18.0	37.5	10.2	25	8.0	11.6	20	400
25	42.0	32.0	19.0	37.5	10.2	25	7.0	12.7	20	500
30	42.0	38.0	21.0	37.5	10.2	25	6.5	14.0	20	600
35	42.0	43.0	28.0	37.5	10.2	25	6.0	14.8	20	700
40	42.0	43.0	28.0	37.5	10.2	25	5.4	15.6	20	800
45	42.0	43.0	28.0	37.5	10.2	25	4.8	16.6	20	900
50	42.0	43.0	28.0	37.5	10.2	25	4.5	17.1	20	1000
55	42.0	45.0	30.0	37.5	10.2/20.3	25	4.2	18.4	20	1100
60	42.0	50.0	36.0	37.5	10.2/20.3	25	4.0	20.2	20	1200
65	42.0	50.0	36.0	37.5	10.2/20.3	25	3.8	20.8	20	1300
70	42.0	50.0	36.0	37.5	10.2/20.3	25	3.5	21.6	20	1400
75	42.0	50.0	36.0	37.5	10.2/20.3	25	3.3	22.3	20	1500
70	57.5	45.0	30.0	52.5	20.3	40	4.7	19.2	13	910
75	57.5	45.0	30.0	52.5	20.3	40	4.4	19.9	13	975
80	57.5	45.0	30.0	52.5	20.3	40	4.2	20.3	13	1040
90	57.5	50.0	35.0	52.5	20.3	40	3.8	22.9	13	1170
100	57.5	50.0	35.0	52.5	20.3	40	3.5	23.9	13	1300
110	57.5	50.0	35.0	52.5	20.3	40	3.2	25.0	13	1430
120	57.5	55.0	40.0	52.5	20.3	40	3.0	26.5	13	1560
130	57.5	55.0	40.0	52.5	20.3	40	2.9	26.9	13	1690
550	59.0	59.0	130.0	52.5	20.3x5	45	1.0	71.0	13	7150

Notes:

⁽¹⁾ Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.

⁽²⁾ Nominal dimensions.

⁽³⁾ Maximum $\tan(\delta)$ values.

⁽⁴⁾ Typical equivalent series resistance at 10 kHz.

⁽⁵⁾ Maximum r.m.s. current at 10 kHz, $\theta_{amb} = 70^\circ\text{C}$ for $\Delta\theta_{case} \leq 20^\circ\text{C}$.

General characteristics

Capacitance range

$U_{NDC} @ 85\text{ }^{\circ}\text{C} = 700\text{ V DC}$, $U_{op} @ 70\text{ }^{\circ}\text{C} = 800\text{ V DC}$, $U_{op} @ 105\text{ }^{\circ}\text{C} = 500\text{ V DC}$

$C_N^{(1)}$ (μF)	Dimensions (mm) ⁽²⁾					$\tan(\delta) @ 1\text{ kHz}^{(3)}$ ($\times 10^{-4}$)	ESR@10 kHz ⁽⁴⁾ (m Ω)	$I_{max} @ 10\text{ kHz}^{(5)}$ (A)	$(dU/dt)_{max}$ (V/ μs)	\hat{I} (A)
	L	H	W	P	P1					
1	32.0	17.0	9.0	27.5	–	10	40.0	3.3	30	30
2	32.0	17.0	9.0	27.5	–	10	35.0	3.5	30	60
3	32.0	19.0	10.0	27.5	–	10	25.0	4.4	30	90
4	32.0	21.0	12.0	27.5	–	10	19.0	5.5	30	120
5	32.0	22.0	13.0	27.5	–	10	15.5	6.2	30	150
6	32.0	24.5	15.0	27.5	–	15	13.0	7.3	30	180
7	32.0	24.5	15.0	27.5	–	15	11.5	7.8	30	210
8	32.0	26.5	17.0	27.5	–	15	10.2	8.7	30	240
9	32.0	28.0	18.0	27.5	–	15	9.3	9.4	30	270
10	32.0	28.0	18.0	27.5	–	15	8.5	9.8	30	300
12	32.0	32.0	18.0	27.5	–	15	7.3	11.1	30	360
14	32.0	35.0	20.0	27.5	–	15	6.5	12.5	30	420
15	32.0	35.5	24.0	27.5	–	15	6.1	13.6	30	450
20	32.0	40.0	25.0	27.5	–	15	4.6	16.5	30	600
10	42.0	27.0	16.0	37.5	–	20	14.0	8.2	22	220
12	42.0	27.0	16.0	37.5	–	20	12.0	8.8	22	264
15	42.0	31.0	18.0	37.5	–	20	9.8	10.5	22	330
18	42.0	38.0	21.0	37.5	10.2	20	8.2	12.4	22	396
20	42.0	38.0	21.0	37.5	10.2	20	7.4	13.1	22	440
22	42.0	38.0	21.0	37.5	10.2	20	6.8	13.6	22	484
25	42.0	43.0	28.0	37.5	10.2	25	6.1	14.7	22	550
30	42.0	43.0	28.0	37.5	10.2	25	5.7	15.2	22	660
35	42.0	43.0	28.0	37.5	10.2	25	5.0	16.2	22	770
40	42.0	45.0	30.0	37.5	10.2/20.3	25	4.5	17.8	22	880
45	42.0	45.0	30.0	37.5	10.2/20.3	25	4.1	18.7	22	990
50	42.0	50.0	36.0	37.5	10.2/20.3	25	3.8	20.8	22	1100
55	42.0	50.0	36.0	37.5	10.2/20.3	25	3.5	21.6	22	1210
50	57.5	45.0	30.0	52.5	20.3	35	6.0	17.0	15	750
55	57.5	45.0	30.0	52.5	20.3	35	5.5	17.8	15	825
60	57.5	45.0	30.0	52.5	20.3	35	5.1	18.5	15	900
65	57.5	50.0	35.0	52.5	20.3	35	4.7	20.6	15	975
70	57.5	50.0	35.0	52.5	20.3	35	4.4	21.3	15	1050
75	57.5	50.0	35.0	52.5	20.3	35	4.2	21.8	15	1125
80	57.5	55.0	40.0	52.5	20.3	35	4.0	22.9	15	1200
85	57.5	55.0	40.0	52.5	20.3	35	3.8	23.5	15	1275
90	57.5	55.0	40.0	52.5	20.3	35	3.6	24.2	15	1350
100	57.5	55.0	40.0	52.5	20.3	35	3.3	25.3	15	1500
400	59.0	59.0	130.0	52.5	20.3x5	40	1.1	67.0	15	6000

Notes:

⁽¹⁾ Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.

⁽²⁾ Nominal dimensions.

⁽³⁾ Maximum $\tan(\delta)$ values.

⁽⁴⁾ Typical equivalent series resistance at 10 kHz.

⁽⁵⁾ Maximum r.m.s. current at 10 kHz, $\theta_{amb} = 70\text{ }^{\circ}\text{C}$ for $\Delta\theta_{case} \leq 20\text{ }^{\circ}\text{C}$.

DC Link Capacitors

Type KNG1910, KNG1914



General characteristics

Capacitance range

$U_{NDC} @ 85\text{ }^{\circ}\text{C} = 800\text{ V DC}$, $U_{op} @ 70\text{ }^{\circ}\text{C} = 650\text{ V DC}$, $U_{op} @ 105\text{ }^{\circ}\text{C} = 550\text{ V DC}$

$C_N^{(1)}$ (μF)	Dimensions (mm) ⁽²⁾					$\tan(\delta) @ 1\text{ kHz}^{(3)}$ ($\times 10^{-4}$)	ESR@10 kHz ⁽⁴⁾ (m Ω)	$I_{max} @ 10\text{ kHz}^{(5)}$ (A)	$(dU/dt)_{max}$ (V/ μs)	\hat{I} (A)
	L	H	W	P	P1					
1	32.0	17.0	9.0	27.5	-	10	40.0	3.3	35	35
2	32.0	19.0	10.0	27.5	-	10	27.0	4.3	35	70
3	32.0	21.0	12.0	27.5	-	10	19.0	5.5	35	105
4	32.0	22.0	13.0	27.5	-	10	15.0	6.3	35	140
5	32.0	24.5	15.0	27.5	-	10	13.0	7.3	35	175
6	32.0	26.5	17.0	27.5	-	10	10.9	8.4	35	210
7	32.0	28.0	18.0	27.5	-	10	9.3	9.4	35	245
8	32.0	32.0	18.0	27.5	-	15	8.1	10.5	35	280
9	32.0	33.0	20.0	27.5	-	15	7.2	11.7	35	315
10	32.0	35.0	20.0	27.5	-	15	6.5	12.5	35	350
12	32.0	35.5	24.0	27.5	-	15	5.4	14.4	35	420
15	32.0	40.0	25.0	27.5	-	15	4.4	16.9	35	525
8	42.0	27.0	16.0	37.5	10.2	20	11.5	9.0	25	200
9	42.0	31.0	18.0	37.5	10.2	20	10.5	10.1	25	225
10	42.0	31.0	18.0	37.5	10.2	20	9.5	10.7	25	250
11	42.0	31.0	18.0	37.5	10.2	20	9.0	11.0	25	275
12	42.0	31.0	18.0	37.5	10.2	20	8.5	11.3	25	300
15	42.0	38.0	21.0	37.5	10.2	20	7.2	13.3	25	375
18	42.0	38.0	21.0	37.5	10.2	20	6.2	14.3	25	450
20	42.0	43.0	28.0	37.5	10.2	20	5.7	15.2	25	500
22	42.0	43.0	28.0	37.5	10.2	20	5.5	15.5	25	550
25	42.0	43.0	28.0	37.5	10.2	20	5.0	16.2	25	625
30	42.0	45.0	30.0	37.5	10.2/20.3	20	4.5	18.8	25	750
35	42.0	50.0	36.0	37.5	10.2/20.3	25	3.9	20.5	25	875
40	42.0	50.0	36.0	37.5	10.2/20.3	25	3.5	21.6	25	1000
40	57.5	45.0	30.0	52.5	20.3	30	6.3	16.6	17	680
45	57.5	45.0	30.0	52.5	20.3	30	5.6	17.3	17	765
50	57.5	50.0	35.0	52.5	20.3	30	5.3	19.4	17	850
55	57.5	50.0	35.0	52.5	20.3	30	4.9	20.2	17	935
60	57.5	50.0	35.0	52.5	20.3	30	4.5	21.1	17	1020
65	57.5	55.0	40.0	52.5	20.3	30	4.2	22.4	17	1105
70	57.5	55.0	40.0	52.5	20.3	30	4.0	22.9	17	1190
75	57.5	55.0	40.0	52.5	20.3	30	3.8	23.5	17	1275
240	59.0	59.0	130.0	52.5	20.3x5	35	1.4	60.0	17	4080
300	59.0	59.0	130.0	52.5	20.3x5	35	1.2	65.0	17	5100

Notes:

⁽¹⁾ Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.

⁽²⁾ Nominal dimensions.

⁽³⁾ Maximum $\tan(\delta)$ values.

⁽⁴⁾ Typical equivalent series resistance at 10 kHz.

⁽⁵⁾ Maximum r.m.s. current at 10 kHz, $\theta_{amb} = 70\text{ }^{\circ}\text{C}$ for $\Delta\theta_{case} \leq 20\text{ }^{\circ}\text{C}$.

General characteristics

Capacitance range

$U_{NDC} @ 85\text{ }^{\circ}\text{C} = 900\text{ V DC}$, $U_{op} @ 70\text{ }^{\circ}\text{C} = 1100\text{ V DC}$, $U_{op} @ 105\text{ }^{\circ}\text{C} = 650\text{ V DC}$

$C_N^{(1)}$ (μF)	Dimensions (mm) ⁽²⁾					$\tan(\delta) @ 1\text{kHz}^{(3)}$ ($\times 10^{-4}$)	ESR@10 kHz ⁽⁴⁾ (m Ω)	$I_{max} @ 10\text{ kHz}^{(5)}$ (A)	$(dU/dt)_{max}$ (V/ μs)	\hat{I} (A)
	L	H	W	P	P1					
1	32.0	17.0	9.0	27.5	–	10	40.0	3.3	40	40
2	32.0	21.0	12.0	27.5	–	10	22.0	5.1	40	80
3	32.0	24.5	15.0	27.5	–	10	17.5	6.3	40	120
4	32.0	26.5	17.0	27.5	–	10	14.0	7.4	40	160
5	32.0	32.0	18.0	27.5	–	10	12.5	8.5	40	200
6	32.0	33.0	20.0	27.5	–	10	10.5	9.7	40	240
7	32.0	35.5	24.0	27.5	–	10	9.0	11.2	40	280
8	32.0	35.5	24.0	27.5	–	10	7.8	12.0	40	320
9	32.0	40.0	25.0	27.5	–	10	7.0	13.4	40	360
10	32.0	40.0	25.0	27.5	–	10	6.3	14.1	40	400
5	42.0	27.0	16.0	37.5	10.2	15	16.5	7.5	29	145
6	42.0	27.0	16.0	37.5	10.2	15	14.0	8.2	29	174
7	42.0	31.0	18.0	37.5	10.2	15	12.5	9.3	29	203
8	42.0	38.0	21.0	37.5	10.2	15	11.0	10.7	29	232
9	42.0	38.0	21.0	37.5	10.2	15	10.0	11.3	29	261
10	42.0	38.0	21.0	37.5	10.2	15	9.0	11.9	29	290
12	42.0	43.0	28.0	37.5	10.2	15	7.5	13.2	29	348
14	42.0	43.0	28.0	37.5	10.2	15	6.6	14.1	29	406
15	42.0	43.0	28.0	37.5	10.2	15	6.2	14.6	29	435
18	42.0	43.0	28.0	37.5	10.2/20.3	20	5.3	15.8	29	522
20	42.0	45.0	30.0	37.5	10.2/20.3	20	4.8	17.3	29	580
22	42.0	50.0	36.0	37.5	10.2/20.3	20	4.4	19.3	29	638
25	42.0	50.0	36.0	37.5	10.2/20.3	20	4.0	20.2	29	725
30	42.0	50.0	36.0	37.5	10.2/20.3	20	3.5	21.6	29	870
25	57.5	45.0	30.0	52.5	20.3	25	7.0	15.8	20	500
26	57.5	45.0	30.0	52.5	20.3	25	6.8	16.0	20	520
30	57.5	50.0	35.0	52.5	20.3	25	6.0	18.2	20	600
35	57.5	50.0	35.0	52.5	20.3	25	5.5	19.0	20	700
40	57.5	50.0	35.0	52.5	20.3	25	5.0	20.0	20	800
45	57.5	50.0	35.0	52.5	20.3	25	4.8	20.4	20	900
50	57.5	55.0	40.0	52.5	20.3	25	4.5	21.6	20	1000
55	57.5	55.0	40.0	52.5	20.3	25	4.2	22.4	20	1100
60	57.5	55.0	40.0	52.5	20.3	25	3.9	23.2	20	1200
150	59.0	59.0	130.0	52.5	20.3x5	30	2.3	47.0	20	3000
200	59.0	59.0	130.0	52.5	20.3x5	30	1.8	53.0	20	4000

Notes:

⁽¹⁾ Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.

⁽²⁾ Nominal dimensions.

⁽³⁾ Maximum $\tan(\delta)$ values.

⁽⁴⁾ Typical equivalent series resistance at 10 kHz.

⁽⁵⁾ Maximum r.m.s. current at 10 kHz, $\theta_{amb} = 70\text{ }^{\circ}\text{C}$ for $\Delta\theta_{case} \leq 20\text{ }^{\circ}\text{C}$.

DC Link Capacitors

Type KNG1910, KNG1914



General characteristics

Capacitance range

$U_{NDC} @ 85\text{ }^{\circ}\text{C} = 1100\text{ V DC}$, $U_{op} @ 70\text{ }^{\circ}\text{C} = 1350\text{ V DC}$, $U_{op} @ 105\text{ }^{\circ}\text{C} = 800\text{ V DC}$

$C_N^{(1)}$ (μF)	Dimensions (mm) ⁽²⁾					$\tan(\delta) @ 1\text{ kHz}^{(3)}$ ($\times 10^{-4}$)	ESR@10 kHz ⁽⁴⁾ (m Ω)	$I_{max} @ 10\text{ kHz}^{(5)}$ (A)	$(dU/dt)_{max}$ (V/ μs)	\hat{I} (A)
	L	H	W	P	P1					
1	32.0	19.0	10.0	27.5	–	10	35.0	3.7	50	50
1.2	32.0	21.0	12.0	27.5	–	10	29.0	4.4	50	60
2	32.0	24.5	15.0	27.5	–	10	18.0	6.2	50	100
2.2	32.0	24.5	15.0	27.5	–	10	17.5	6.3	50	110
3	32.0	28.0	18.0	27.5	–	10	13.5	7.8	50	150
3.3	32.0	32.0	18.0	27.5	–	10	12.8	8.4	50	165
4	32.0	32.0	18.0	27.5	–	10	12.0	8.7	50	200
4.7	32.0	33.0	20.0	27.5	–	10	10.5	9.7	50	235
5	32.0	33.0	20.0	27.5	–	10	10.0	9.9	50	250
6	32.0	35.0	24.0	27.5	–	10	8.5	11.5	50	300
7	32.0	40.0	25.0	27.5	–	10	7.5	12.9	50	350
8	32.0	40.0	25.0	27.5	–	10	6.8	13.6	50	400
4	42.0	27.0	16.0	37.5	10.2	15	15.0	7.9	35	140
4.7	42.0	31.0	18.0	37.5	10.2	15	13.0	9.1	35	165
5	42.0	31.0	18.0	37.5	10.2	15	12.5	9.3	35	175
6	42.0	32.0	19.0	37.5	10.2	15	10.4	10.4	35	210
6.8	42.0	32.0	19.0	37.5	10.2	15	9.2	11.1	35	238
7	42.0	38.0	21.0	37.5	10.2	15	9.0	11.9	35	245
8	42.0	38.0	21.0	37.5	10.2	15	8.5	12.2	35	280
9	42.0	38.0	21.0	37.5	10.2	15	8.0	12.6	35	315
10	42.0	43.0	28.0	37.5	10.2	15	7.5	13.2	35	350
12	42.0	43.0	28.0	37.5	10.2	15	6.3	14.5	35	420
14	42.0	45.0	30.0	37.5	10.2/20.3	15	5.5	16.1	35	490
15	42.0	45.0	30.0	37.5	10.2/20.3	15	5.2	26.6	35	525
20	42.0	50.0	36.0	37.5	10.2/20.3	15	4.0	20.2	35	700
18	57.5	45.0	30.0	52.5	20.3	20	8.2	14.6	25	450
20	57.5	45.0	30.0	52.5	20.3	20	7.5	15.2	25	500
22	57.5	50.0	35.0	52.5	20.3	20	7.0	16.9	25	550
25	57.5	50.0	35.0	52.5	20.3	20	6.2	17.9	25	625
26	57.5	50.0	35.0	52.5	20.3	20	6.0	18.2	25	650
30	57.5	55.0	40.0	52.5	20.3	20	5.3	19.9	25	750
35	57.5	55.0	40.0	52.5	20.3	25	4.6	21.4	25	875
40	57.5	55.0	40.0	52.5	20.3	25	4.1	22.7	25	1000
110	59.0	59.0	130.0	52.5	20.3x5	30	3.1	40.0	25	2750
120	59.0	59.0	130.0	52.5	20.3x5	30	2.9	42.0	25	3000

Notes:

⁽¹⁾ Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.

⁽²⁾ Nominal dimensions.

⁽³⁾ Maximum $\tan(\delta)$ values.

⁽⁴⁾ Typical equivalent series resistance at 10 kHz.

⁽⁵⁾ Maximum r.m.s. current at 10 kHz, $\theta_{amb} = 70\text{ }^{\circ}\text{C}$ for $\Delta\theta_{case} \leq 20\text{ }^{\circ}\text{C}$.

General characteristics

Capacitance range

$U_{NDC} @ 85\text{ °C} = 1300\text{ V DC}$, $U_{op} @ 70\text{ °C} = 1550\text{ V DC}$, $U_{op} @ 105\text{ °C} = 900\text{ V DC}$

$C_N^{(1)}$ (μF)	Dimensions (mm) ⁽²⁾					$\tan(\delta) @ 1\text{kHz}^{(3)}$ ($\times 10^{-4}$)	ESR@10 kHz ⁽⁴⁾ (m Ω)	$I_{max} @ 10\text{ kHz}^{(5)}$ (A)	$(dU/dt)_{max}$ (V/ μs)	\hat{I} (A)
	L	H	W	P	P1					
0.1	32.0	16.0	7.5	27.5	–	10	150.0	1.6	65	7
0.15	32.0	16.0	7.5	27.5	–	10	120.0	1.8	65	10
0.22	32.0	16.0	7.5	27.5	–	10	110.0	1.9	65	14
0.33	32.0	17.0	9.0	27.5	–	10	75.0	2.4	65	21
0.47	32.0	17.0	9.0	27.5	–	10	55.0	2.8	65	31
0.56	32.0	17.0	9.0	27.5	–	10	45.0	3.1	65	36
0.68	32.0	19.0	10.0	27.5	–	10	40.0	3.5	65	44
0.82	32.0	21.0	12.0	27.5	–	10	38.0	3.9	65	53
1	32.0	21.0	12.0	27.5	–	10	30.0	4.3	65	65
1.5	32.0	24.5	15.0	27.5	–	10	20.0	5.9	65	98
2	32.0	26.5	17.0	27.5	–	10	16.0	6.9	65	130
2.2	32.0	26.5	17.0	27.5	–	10	15.0	7.2	65	143
3	32.0	33.0	20.0	27.5	–	10	12.0	9.0	65	195
3.3	32.0	35.0	20.0	27.5	–	10	11.0	9.6	65	215
4	32.0	35.5	24.0	27.5	–	10	10.0	10.6	65	260
5	32.0	40.0	25.0	27.5	–	10	8.0	12.5	65	325
2	42.0	27.0	16.0	37.5	10.2	15	22.0	6.5	45	90
3	42.0	31.0	18.0	37.5	10.2	15	15.0	8.5	45	135
4	42.0	38.0	21.0	37.5	10.2	15	11.5	10.5	45	180
5	42.0	38.0	21.0	37.5	10.2	15	9.5	11.5	45	225
6	42.0	43.0	28.0	37.5	10.2	15	8.5	12.2	45	270
7	42.0	43.0	28.0	37.5	10.2	15	7.3	13.4	45	315
8	42.0	43.0	28.0	37.5	10.2	15	6.8	13.9	45	360
9	42.0	43.0	28.0	37.5	10.2	15	6.0	14.8	45	405
10	42.0	45.0	30.0	37.5	10.2/20.3	15	5.5	16.1	45	450
12	42.0	50.0	36.0	37.5	10.2/20.3	15	4.8	18.5	45	540
14	42.0	50.0	36.0	37.5	10.2/20.3	15	4.2	19.8	45	630
14	57.5	45.0	30.0	52.5	20.3	20	9.0	13.9	30	420
15	57.5	45.0	30.0	52.5	20.3	20	8.5	14.3	30	450
18	57.5	50.0	35.0	52.5	20.3	20	7.2	16.6	30	540
20	57.5	55.0	40.0	52.5	20.3	20	6.6	17.9	30	600
22	57.5	55.0	40.0	52.5	20.3	20	6.2	18.4	30	660
25	57.5	55.0	40.0	52.5	20.3	20	5.5	19.6	30	750
75	59.0	59.0	130.0	52.5	20.3x5	30	4.0	35.0	30	2250
100	59.0	59.0	130.0	52.5	20.3x5	30	3.2	40.0	30	3000

Notes:

⁽¹⁾ Capacitance value measured at 1 kHz. Intermediate capacitance values available on request.

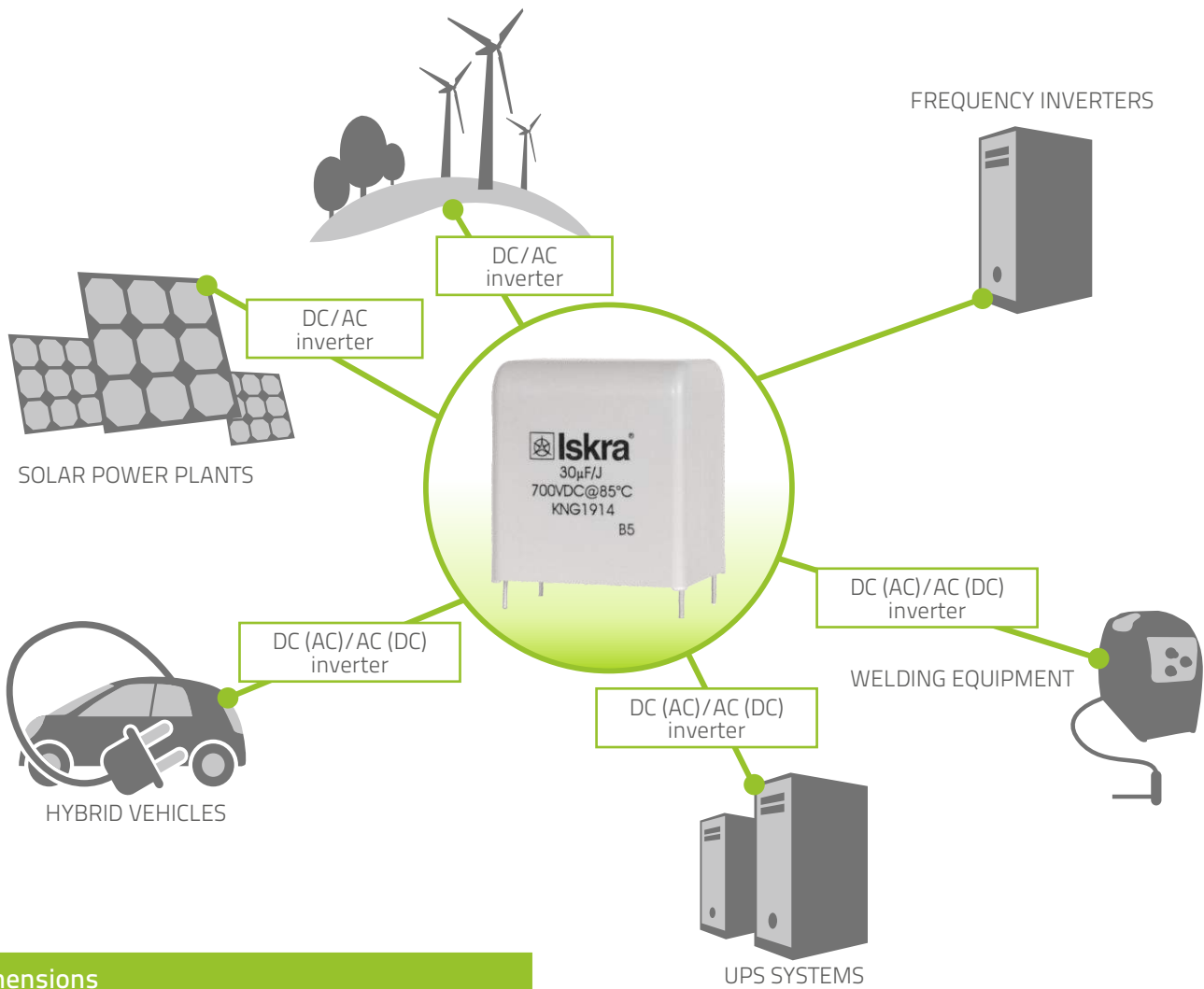
⁽²⁾ Nominal dimensions.

⁽³⁾ Maximum $\tan(\delta)$ values.

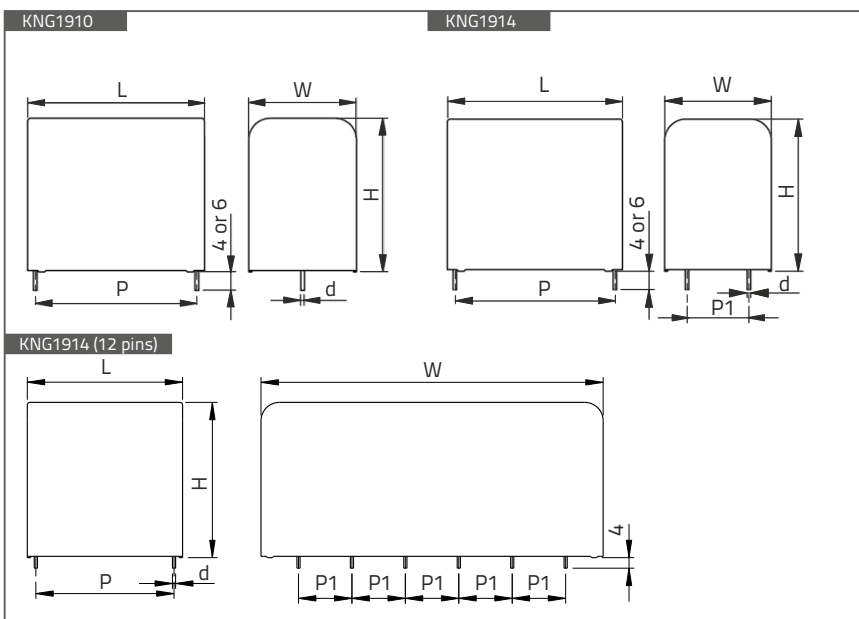
⁽⁴⁾ Typical equivalent series resistance at 10 kHz.

⁽⁵⁾ Maximum r.m.s. current at 10 kHz, $\theta_{amb} = 70\text{ °C}$ for $\Delta\theta_{case} \leq 20\text{ °C}$.

DC Link Capacitors Applications



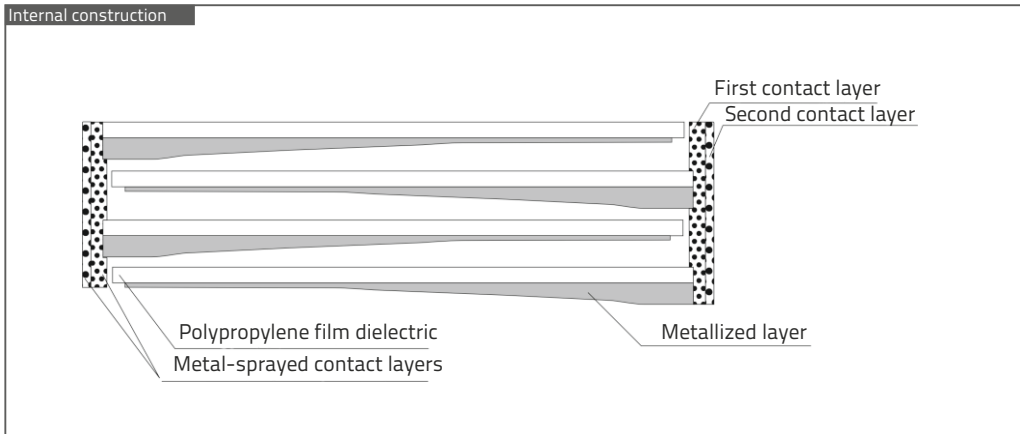
Dimensions



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	
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
- Casing: Plastic case with flame-retardant epoxy resin sealing (UL 94 V-0)
- Terminal: Parallel tinned copper, 2, 4 or 12 pins



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

Specifications

Electrical characteristics

■ Rated capacitance	500 μ F, \pm 10 %
■ Rated DC voltage	450 V DC
■ Peak voltage	675 V AC
■ Nom. RMS current (@ T_{amb} = max. 80 °C)	85 A _{rms}
■ Max. RMS current (@ T_{amb} = max. 70 °C)	120 A _{rms}
■ Max. peak current	2500 A
■ Equivalent series resistance @ 1 kHz	< 1 m Ω
■ Equivalent series inductance	15 nH
■ Max. pulse rise time	4 V/ μ s

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 @ 25 °C	675 V/10 s
■ Voltage test terminals to case @ 50 Hz	2500 V/1 min

Life expectancy

■ Life expectancy @ U_{NDC}	15 000 hours (hotspot max. temperature 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

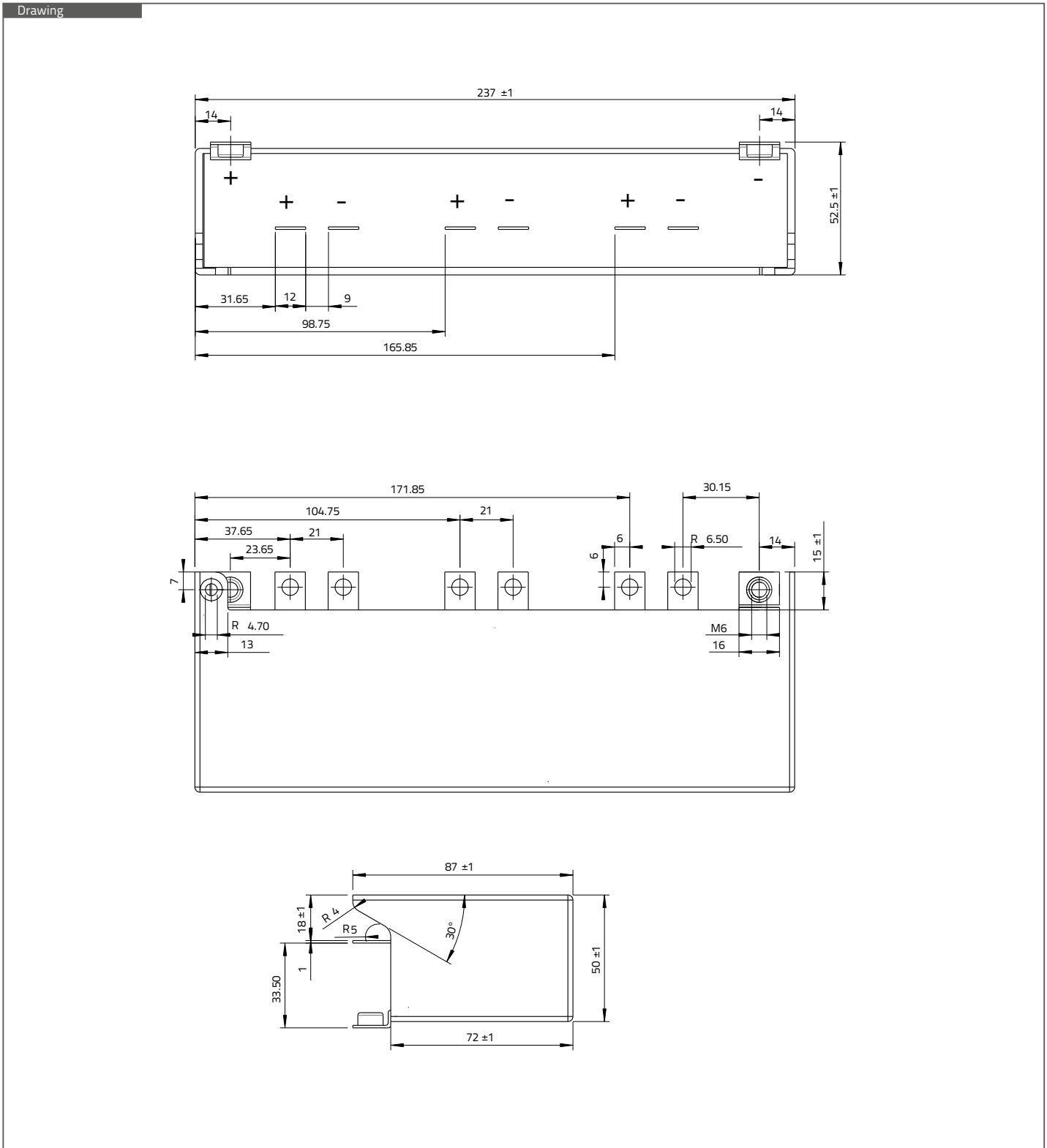
■ Width	72 mm
■ Height	50 mm
■ Length	237 mm
■ App. weight	< 1.5 kg

Reference standard

- IEC 61071



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, KNO1910, 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

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, 1000 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
■ Climatic category	40/85/56 according to IEC 60068
■ Maximum application temperature	+85 °C
■ 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	$\hat{I} \times 1.5$
■ Life expectancy	≥ 100000 hours at U_{NDC}

Reference standard

- IEC61071



DC Voltages and rated capacitance

Double-sided metallized plastic film with internal series connection

$U_{NDC}(V)$	$C_N(\mu F)$
630	0.33 - 8
850	0.22 - 5.6
1000	0.22 - 4
1200	0.15 - 3.3
1600	0.1 - 3
2000	0.1 - 1.5
2500	0.1 - 1.2
3000	0.047 - 1

General characteristics

Type KNO19Ax, KNO19Bx, KNO1910, KNO1914

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

$C_N(\mu F)$	$U_{NDC}(V DC)$	$U_{rms}(V AC)$	$(dU/dt)_{max}(V/\mu s)$	Dimensions (mm) LxHxW
0.22	850	500	600	32 x 20 x 11
0.27	850	500	600	32 x 24.5 x 15
0.33	850	500	600	32 x 24.5 x 15
0.39	850	500	600	41.5 x 23 x 14
0.47	850	500	600	41.5 x 23 x 14
0.56	850	500	600	41.5 x 27 x 16
0.68	850	500	600	41.5 x 27 x 16
0.82	850	500	600	41.5 x 31 x 18
1	850	500	600	41.5 x 31 x 18
1.2	850	500	500	41.5 x 38 x 21
1.5	850	500	500	41.5 x 38 x 21
1.8	850	500	500	41.5 x 43 x 28
2	850	500	500	41.5 x 43 x 28
2.2	850	500	500	42 x 45 x 30
2.5	850	500	500	42 x 45 x 30
2.7	850	500	400	42 x 45 x 30
3	850	500	400	57.5 x 45 x 30
3.3	850	500	400	57.5 x 45 x 30
4	850	500	400	57.5 x 45 x 30
4.7	850	500	400	57.5 x 50 x 35
5.6	850	500	300	57.5 x 50 x 35

Snubber Capacitors

DC Voltages and Rated Capacitance



General characteristics

Type KNO19Ax, KNO19Bx, KNO1910, KNO1914

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

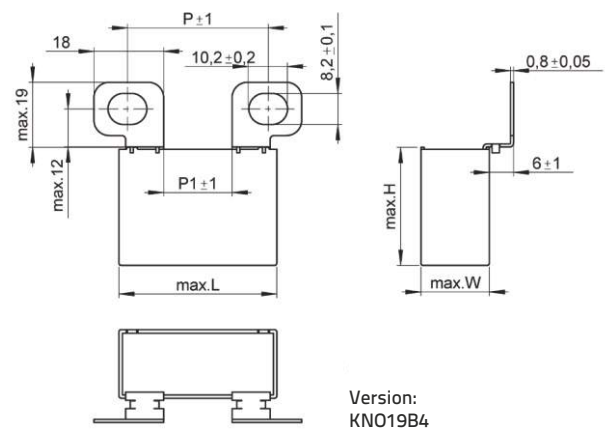
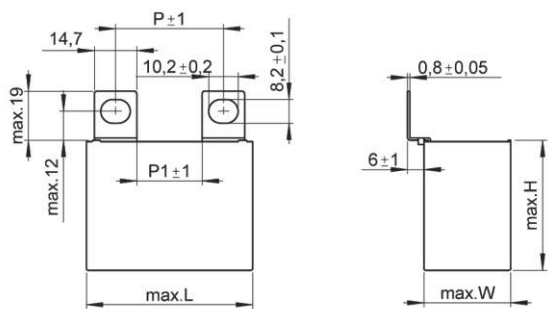
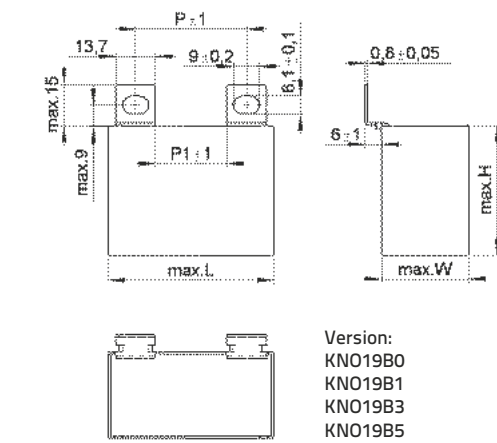
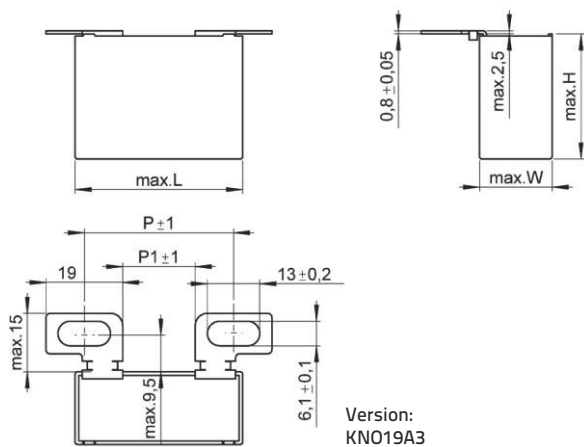
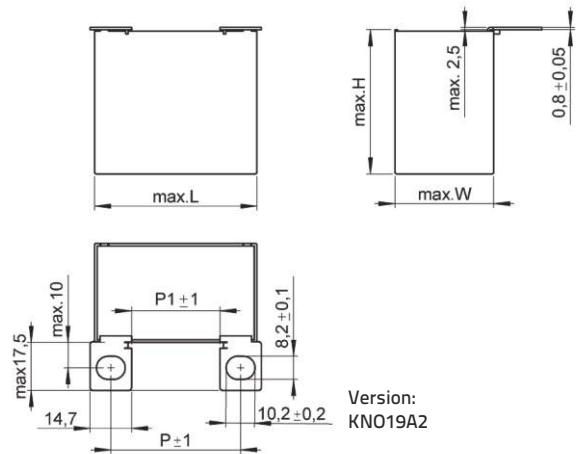
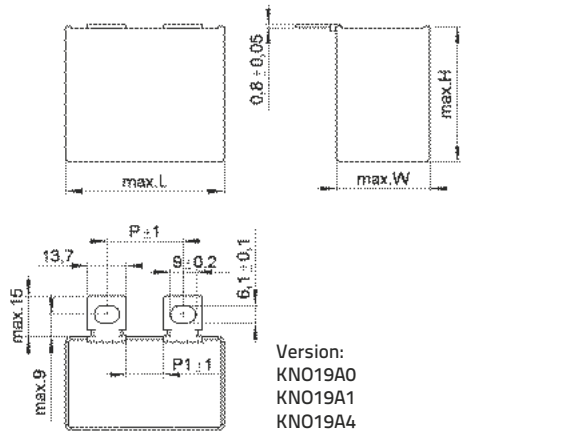
C_N (μF)	U_{NDC} (V DC)	U_{rms} (V AC)	$(dU/dt)_{\text{max}}$ (V/ μs)	Dimensions (mm) LxHxW
0.15	1200	630	800	32 x 20 x 11
0.22	1200	630	800	41.5 x 23 x 14
0.27	1200	630	800	41.5 x 23 x 14
0.33	1200	630	700	41.5 x 27 x 16
0.39	1200	630	700	41.5 x 27 x 16
0.47	1200	630	700	41.5 x 31 x 18
0.56	1200	630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

C_N (μF)	U_{NDC} (V DC)	U_{rms} (V AC)	$(dU/dt)_{\text{max}}$ (V/ μs)	Dimensions (mm) LxHxW
0.1	1600	650	900	32 x 20 x 11
0.12	1600	650	900	32 x 24.5 x 15
0.15	1600	650	900	41.5 x 23 x 14
0.22	1600	650	900	41.5 x 23 x 14
0.27	1600	650	700	41.5 x 27 x 16
0.33	1600	650	700	41.5 x 27 x 16
0.39	1600	650	700	41.5 x 31 x 18
0.47	1600	650	700	41.5 x 32 x 19
0.56	1600	650	700	41.5 x 38 x 21
0.68	1600	650	700	41.5 x 38 x 21
0.75	1600	650	700	41.5 x 43 x 28
0.82	1600	650	700	41.5 x 43 x 28
1	1600	650	700	41.5 x 43 x 28
1.2	1600	650	700	57.5 x 45 x 30
1.5	1600	650	700	57.5 x 45 x 30
2	1600	650	500	57.5 x 45 x 30
2.2	1600	650	500	57.5 x 50 x 35
2.5	1600	650	400	57.5 x 50 x 35
3	1600	650	400	57.5 x 55 x 40

C_N (μF)	U_{NDC} (V DC)	U_{rms} (V AC)	$(dU/dt)_{\text{max}}$ (V/ μs)	Dimensions (mm) LxHxW
0.1	2000	700	1000	32 x 24.5 x 15
0.1	2000	700	1000	41.5 x 23 x 14
0.12	2000	700	1000	41.5 x 23 x 14
0.15	2000	700	1000	41.5 x 23 x 14
0.22	2000	700	900	41.5 x 27 x 16
0.27	2000	700	900	41.5 x 31 x 18
0.33	2000	700	900	41.5 x 32 x 19
0.39	2000	700	900	41.5 x 38 x 21
0.47	2000	700	900	41.5 x 38 x 21
0.56	2000	700	900	41.5 x 43 x 28
0.68	2000	700	900	41.5 x 43 x 28
0.82	2000	700	600	42 x 45 x 30
1	2000	700	700	42 x 45 x 35
1	2000	700	600	57.5 x 45 x 30
1.2	2000	700	600	57.5 x 45 x 30
1.5	2000	700	600	57.5 x 50 x 35

C_N (μF)	U_{NDC} (V DC)	U_{rms} (V AC)	$(dU/dt)_{\text{max}}$ (V/ μs)	Dimensions (mm) LxHxW
0.1	2500	725	1100	41.5 x 27 x 16
0.15	2500	725	1100	41.5 x 31 x 18
0.22	2500	725	1100	41.5 x 38 x 21
0.33	2500	725	1100	41.5 x 43 x 28
0.47	2500	725	1100	42 x 45 x 30
0.56	2500	725	1000	57.5 x 45 x 30
0.68	2500	725	1000	57.5 x 45 x 30
0.82	2500	725	1000	57.5 x 45 x 30
1	2500	725	900	57.5 x 50 x 35
1.2	2500	725	900	57.5 x 55 x 40

C_N (μF)	U_{NDC} (V DC)	U_{rms} (V AC)	$(dU/dt)_{\text{max}}$ (V/ μs)	Dimensions (mm) LxHxW
0.047	3000	750	1600	41.5 x 23 x 14
0.068	3000	750	1600	41.5 x 27 x 16
0.1	3000	750	1600	41.5 x 27 x 16
0.15	3000	750	1600	41.5 x 32 x 19
0.22	3000	750	1600	41.5 x 38 x 21
0.33	3000	750	1400	42 x 45 x 30
0.47	3000	750	1400	57.5 x 45 x 30
0.68	3000	750	1200	57.5 x 50 x 35
0.82	3000	750	900	57.5 x 50 x 35
1	3000	750	900	57.5 x 55 x 40



Lug dimensions

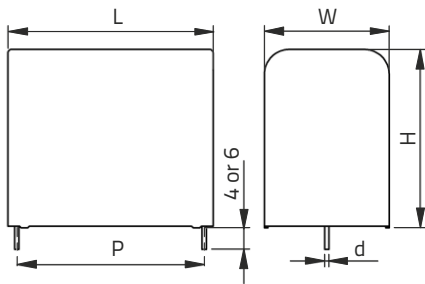
Version	L (mm)	P (mm)	P1 (mm)	Screw
A0	41.5	24	10	M6
A0	42	24	10	M6
A0	57.5	37	23	M6
A1	57.5	25	11	M6
A2	57.5	46	31	M8
A3	41.5	37	18	M6
A4	41.5	22	8	M6

Version	L (mm)	P (mm)	P1 (mm)	Screw
B0	41.5	24	10	M6
B0	42	24	10	M6
B0	43	25	11	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

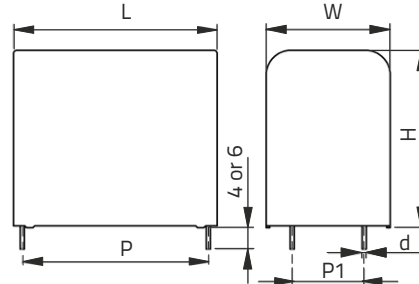
Snubber Capacitors

Dimensions, Construction and Mounting

KNO1910



KNO1914

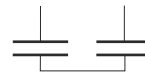
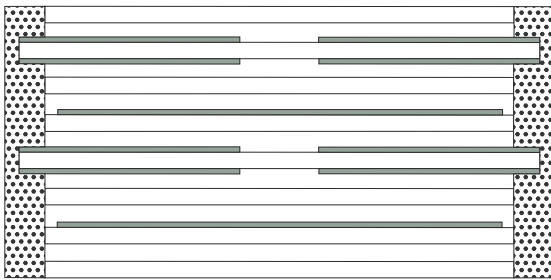


2 pins, 4 pins

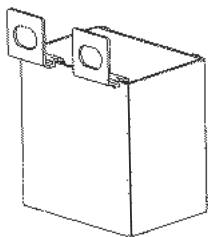
Version	L (mm)	P (mm)	P1 (mm)	d (mm)
10	32	27.5	/	0.8
	41.5	37.5	/	1 or 1.2
	42	37.5	/	1 or 1.2
	57.5	50.5	/	1.2
14	32	32	10.2	0.8
	41.5	41.5	10.2 or 20.3	1 or 1.2
	42	42	10.2 or 20.3	1 or 1.2
	57.5	57.5	20.3	1.2

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, copper or parallel tinned copper wire with 2 or 4 executions

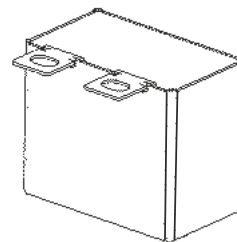


Double sided metallized plastic film with internal series connection and metallized plastic film

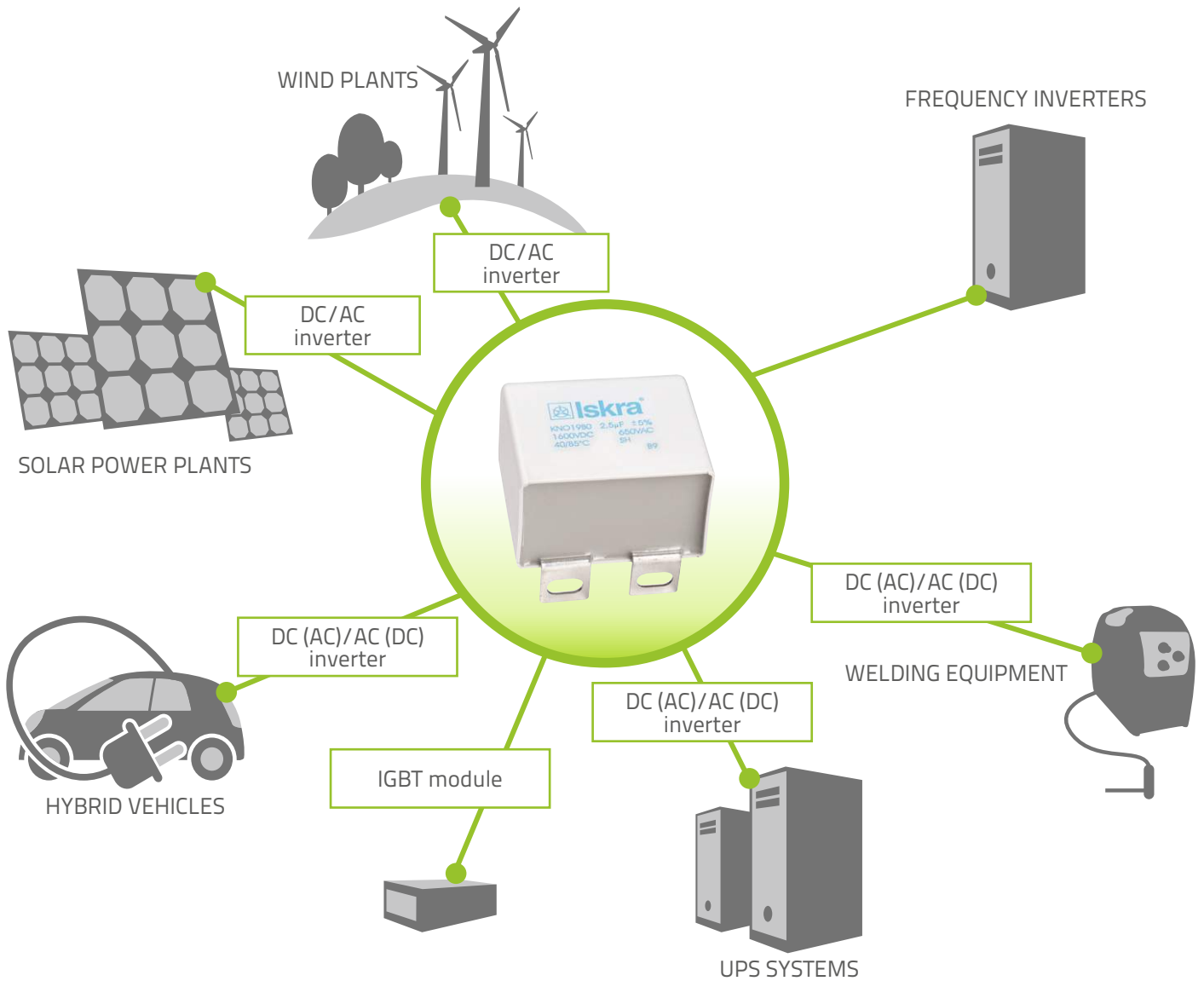


MOUNTED HORIZONTALLY

fixing lugs
for
M6 or M8 screws



MOUNTED VERTICALLY



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.

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

Reference standard

- IEC 61071

Specifications

■ Rated capacitance	10 µF - 600 µF
■ Capacitance tolerance	± 5 %, ± 10 %
■ Rated voltage (U_{rms})	250 V AC, 330 V AC, 480 V AC
■ Operating temperature range	-40 °C to +85 °C
■ Climatic category	40/070/56 according to IEC 60068
■ Dissipation factors at 1 kHz	$tg\delta \leq 10 \times 10^{-4}$ at 100 Hz
■ Test voltage terminal to terminal	$1.5 \times U_{rms}$, 10 s
■ Test voltage (terminal to case)	3 kV, 50 Hz, 2 s
■ Life expectancy	100 000 hours @ $T_{hs} \leq 70$ °C
■ Failure quota	$< 300 \times 10^{-9}$ components hour

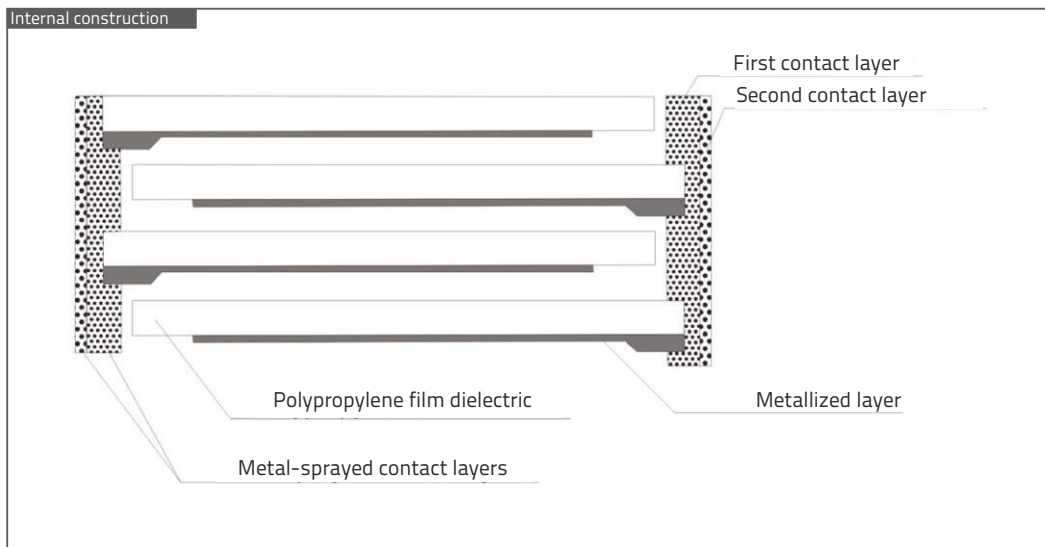
Construction

- Dielectric: polypropylene film
- Capacitor electrodes: Vacuum-deposited : metal layers
- Casing: cylindrical aluminium case with plastic self-extinguishing sealing cover
- Tinned brass screw

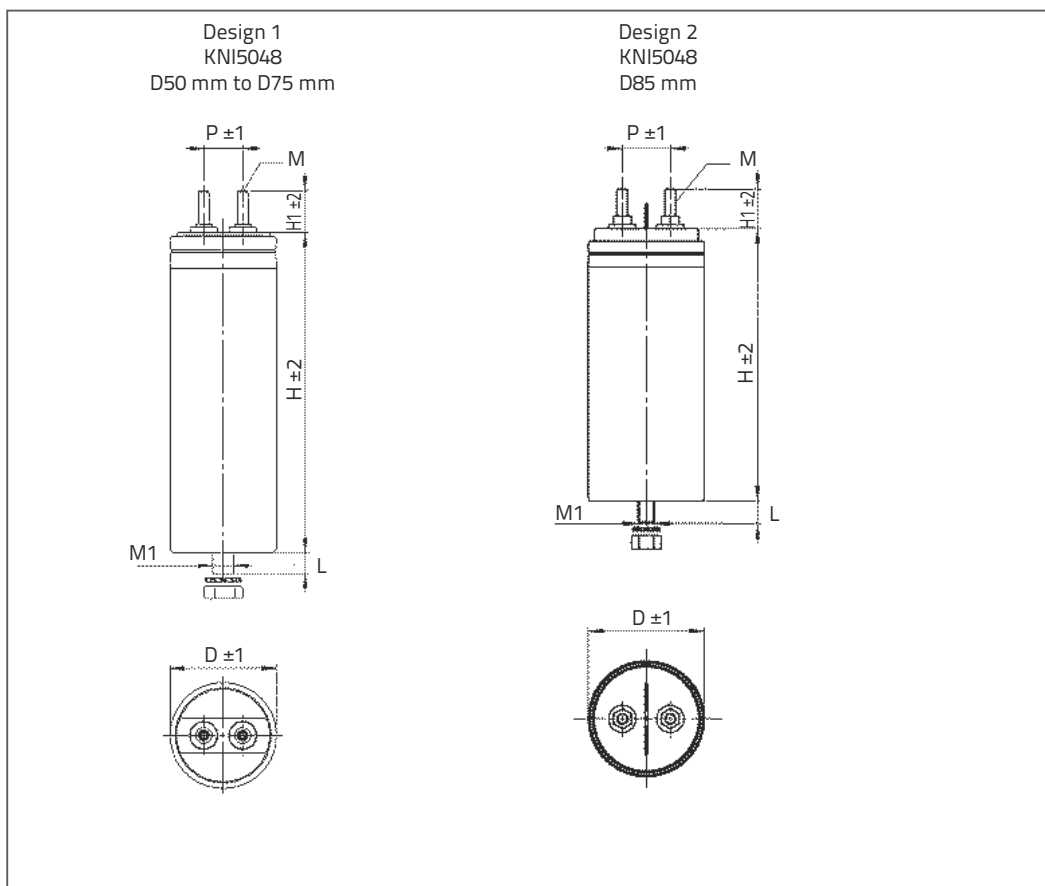


AC/DC General Purpose Capacitors

Type KNI5048



Terminations



General characteristics

Capacitance range

$U_{rms} = 250 \text{ V AC} / U_{NDC} = 400 \text{ V DC}$

C_N (μF)	I_{max} (A)	\hat{I} (kA)	dU/dt (V/ μs)	D x H (mm)	H1 (mm)	M (mm)	P (mm)	M1 (mm)	L (mm)
30	22	0.75	25	50 x 80	24	6	22	12	12
40	22	1	25	50 x 80	24	6	22	12	12
50	22	1.25	25	50 x 93	24	6	22	12	12
60	25	1.5	25	60 x 80	24	6	22	12	12
70	25	1.75	25	60 x 80	24	6	22	12	12
80	25	2	25	60 x 93	24	6	22	12	12
100	25	2.5	25	60 x 105	24	6	22	12	12
130	25	1.95	15	60 x 130	24	6	22	12	12
150	25	2.25	15	60 x 130	24	6	22	12	12
150	35	2.25	15	75 x 110	28	10	34	12	16
175	25	2.62	15	60 x 155	24	6	22	12	12
200	25	3	15	60 x 155	24	6	22	12	12
200	35	3	15	75 x 135	28	10	34	12	16
250	40	3	12	75 x 160	28	10	34	12	16
300	50	3.6	12	75 x 160	28	10	34	12	16
400	50	4.8	12	85 x 200	34	10	35	12	16
500	50	5	10	85 x 250	34	10	35	12	16
600	50	6	10	85 x 250	34	10	35	12	16

$U_{rms} = 330 \text{ V AC} / U_{NDC} = 600 \text{ V DC}$

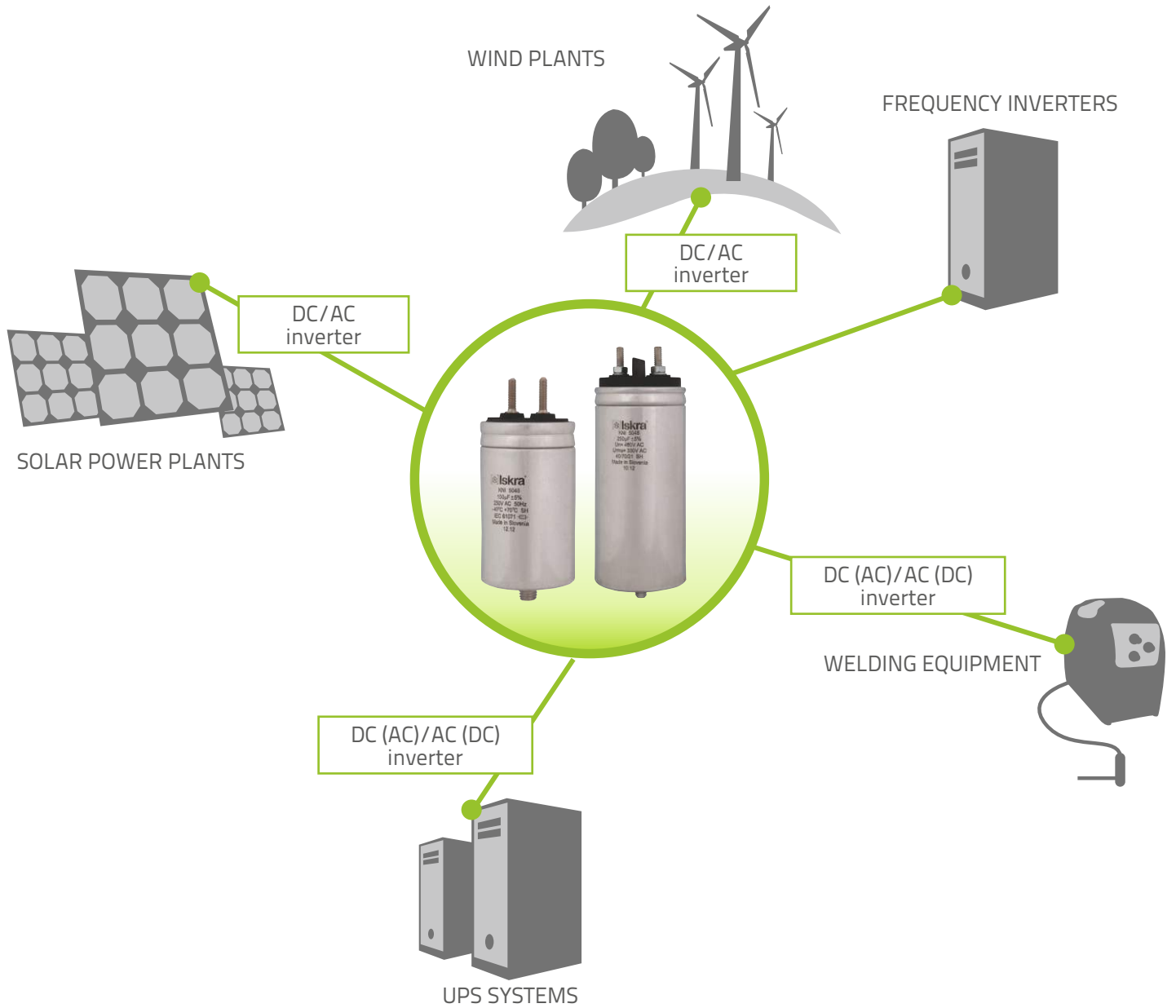
C_N (μF)	I_{max} (A)	\hat{I} (kA)	dU/dt (V/ μs)	D x H (mm)	H1 (mm)	M (mm)	P (mm)	M1 (mm)	L (mm)
25	22	0.75	30	50 x 80	24	6	22	12	12
30	22	0.9	30	50 x 80	24	6	22	12	12
40	22	1.2	30	50 x 93	24	6	22	12	12
50	22	1.25	25	55 x 93	24	6	22	12	12
60	25	1.5	25	60 x 105	24	6	22	12	12
70	25	1.4	20	60 x 105	24	6	22	12	12
75	25	1.5	20	60 x 105	24	6	22	12	12
80	25	1.6	20	60 x 105	24	6	22	12	12
100	25	2	20	60 x 130	24	6	22	12	12
100	30	1.5	15	75 x 110	28	10	34	12	16
150	30	2.25	15	75 x 135	28	10	34	12	16
200	40	3	15	75 x 155	28	10	34	12	16
250	45	3.75	15	85 x 200	34	10	35	12	16
300	50	4.5	15	85 x 200	34	10	35	12	16
400	50	4.8	12	85 x 250	34	10	35	12	16

$U_{rms} = 480 \text{ V AC} / U_{NDC} = 850 \text{ V DC}$

C_N (μF)	I_{max} (A)	\hat{I} (kA)	dU/dt (V/ μs)	D x H (mm)	H1 (mm)	M (mm)	P (mm)	M1 (mm)	L (mm)
10	22	0.4	40	50 x 80	24	6	22	12	12
15	22	0.6	40	55 x 80	24	6	22	12	12
20	25	0.8	40	60 x 80	24	6	22	12	12
25	25	1	40	60 x 93	24	6	22	12	12
30	25	1.2	40	60 x 105	24	6	22	12	12
35	25	1.4	40	60 x 105	24	6	22	12	12
40	25	1.6	40	60 x 130	24	6	22	12	12
50	25	2	40	60 x 130	24	6	22	12	12
60	30	2.1	35	75 x 135	28	10	34	12	16
70	30	2.1	30	75 x 135	28	10	34	12	16
80	35	2	25	75 x 160	28	10	34	12	16
90	35	2.25	25	75 x 160	28	10	34	12	16
100	30	2	20	75 x 195	28	10	34	12	16
100	35	2.5	25	85 x 175	34	10	35	12	16
130	35	2.66	20	85 x 200	34	10	35	12	16
150	50	3	20	85 x 200	34	10	35	12	16
200	50	4	20	85 x 250	34	10	35	12	16
250	50	3.75	15	85 x 300	34	10	35	12	16

Notes: Other values and dimensions available on request.

AC/DC General Purpose Capacitors Applications



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.

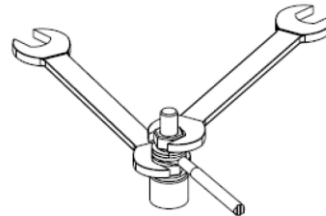
Permitted torque for screw connections:

M6 - 5 Nm

M8 - 6 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

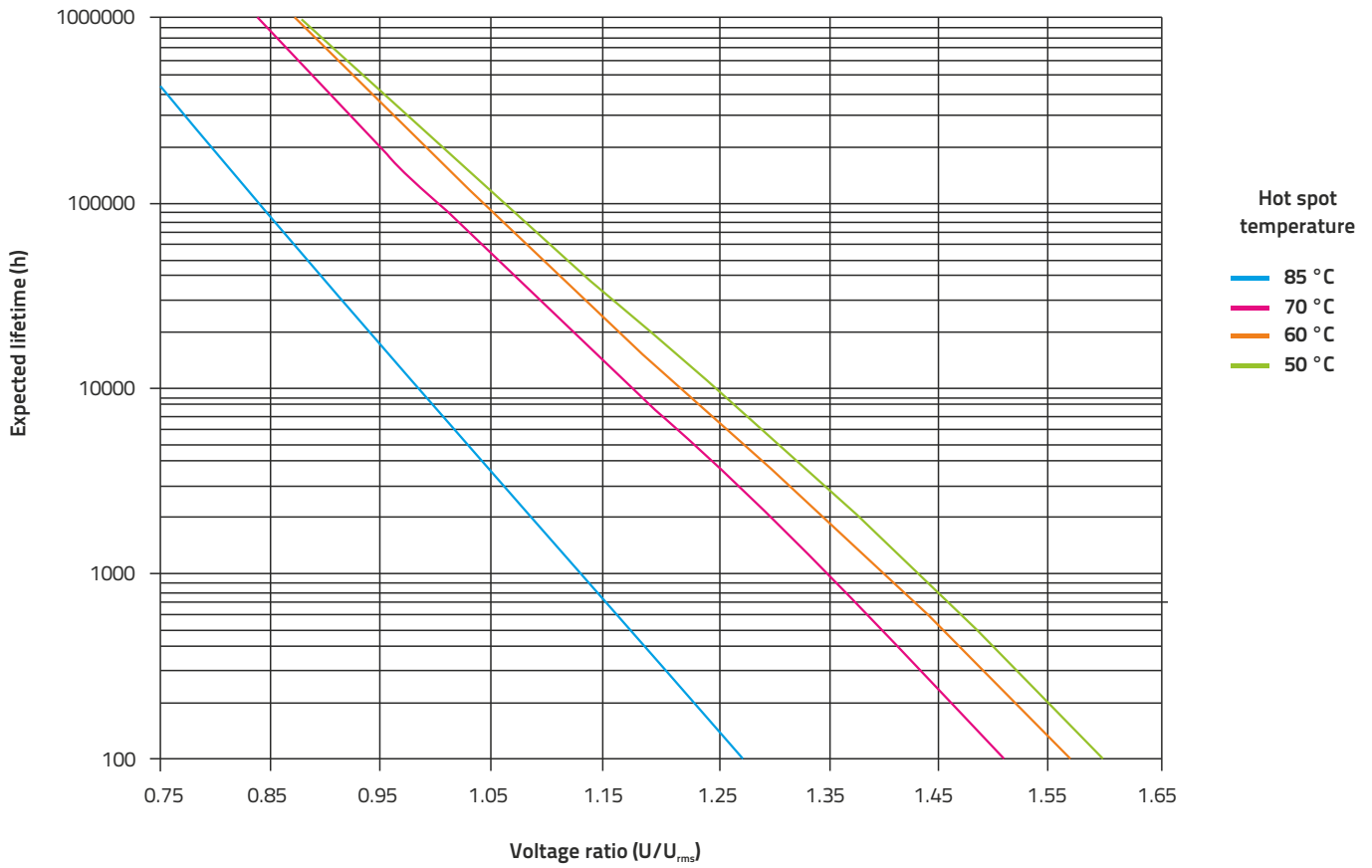
M12 - 12 Nm

AC/DC General Purpose Capacitors

Lifetime Expectancy



Expected lifetime curves



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 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.d. 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, because 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 (SMPS)
- Solar power plants
- Wind plants
- Motor drives
- Induction heaters
- Frequency inverters
- Uninterruptible power supplies (UPS)



Reference standard

- IEC 61071

Features

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

Specifications

- | | |
|-------------------------------------|--|
| ■ Rated capacitance | 0.1 μ F to 80 μ F |
| ■ Capacitance tolerance | $\pm 5\%$, $\pm 10\%$ |
| ■ Rated voltage U_N | 250 V AC, 300 V AC, 350 V AC, 400 V AC, 440 V AC |
| ■ Operating temperature range | -40 °C to 85 °C |
| ■ Climatic category | 40/85/56 acc. to IEC 60068-1 |
| ■ Life expectancy | $\geq 60\,000$ hours at U_N |
| ■ Rated temperature | 85 °C |
| ■ Max. operating temperature (case) | 105 °C |



General characteristics

Capacitance range

$U_N @ 85^\circ\text{C} = 250\text{ V AC}$, $U_{\text{NDC}} @ 85^\circ\text{C} = 600\text{ V DC}$

$C_N^{(1)}$ (μF)	Dimensions (mm) ⁽²⁾					$\tan(\delta)@1\text{kHz}^{(3)}$ ($\times 10^{-4}$)	ESR@10 kHz ⁽⁴⁾ (m Ω)	$I_{\text{max}}@10\text{ kHz}^{(5)}$ (A)	$(dU/dt)_{\text{max}}$ (V/ μs)	\hat{I} (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	6.5	12.3	32	288
10	32.0	35.0	20.0	27.5	–	10	5.9	13.2	32	320
12	32.0	35.5	24.0	27.5	–	10	4.9	15.2	32	384
15	32.0	40.0	25.0	27.5	–	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	31.0	18.0	37.5	–	10	13.5	8.9	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 $\tan(\delta)$ values.

⁽⁴⁾ Typical equivalent series resistance at 10 kHz.

⁽⁵⁾ Maximum r.m.s. current at 10 kHz, $\theta_{\text{amb}} = 70^\circ\text{C}$ for $\Delta\theta_{\text{case}} \leq 20^\circ\text{C}$.

AC Filtering Capacitors

Type KNB1910, KNB1914



General characteristics

Capacitance range

$U_N @ 85^\circ\text{C} = 300\text{ V AC}, U_{\text{NDC}} @ 85^\circ\text{C} = 750\text{ V DC}$

$C_N^{(1)}$ (μF)	Dimensions (mm) ⁽²⁾					$\tan(\delta) @ 1\text{kHz}^{(3)}$ ($\times 10^{-4}$)	ESR@10 kHz ⁽⁴⁾ (m Ω)	$I_{\text{max}} @ 10\text{ kHz}^{(5)}$ (A)	$(dU/dt)_{\text{max}}$ (V/ μs)	\hat{I} (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	8.3	10.9	40	240
7	32.0	33.5	24.0	27.5	–	10	7.3	12.4	40	280
8	32.0	40.0	25.0	27.5	–	10	6.6	13.8	40	320
9	32.0	40.0	25.0	27.5	–	10	6.0	14.4	40	360
10	32.0	40.0	25.0	27.5	–	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	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
16	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 $\tan(\delta)$ values.

⁽⁴⁾ Typical equivalent series resistance at 10 kHz.

⁽⁵⁾ Maximum r.m.s. current at 10 kHz, $\theta_{\text{amb}} = 70^\circ\text{C}$ for $\Delta\theta_{\text{case}} \leq 20^\circ\text{C}$.

General characteristics

Capacitance range										
U _N @ 85 °C = 350 V AC, U _{NDC} @ 85 °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					
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	40.0	25.0	27.5	-	10	8.5	12.1	50	250
6	32.0	40.0	25.0	27.5	-	10	7.5	12.9	50	300
7	32.0	40.0	25.0	27.5	-	10	6.8	13.6	50	350
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	16.0	8.2	35	175
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	52.5	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.

AC Filtering Capacitors

Type KNB1910, KNB1914



General characteristics

Capacitance range

$U_N @ 85\text{ °C} = 400\text{ V AC}$, $U_{NDC} @ 85\text{ °C} = 1000\text{ V DC}$

$C_N^{(1)}$ (μF)	Dimensions (mm) ⁽²⁾					$\tan(\delta) @ 1\text{kHz}^{(3)}$ ($\times 10^{-4}$)	ESR@10 kHz ⁽⁴⁾ (m Ω)	$I_{\text{max}} @ 10\text{ kHz}^{(5)}$ (A)	$(dU/dt)_{\text{max}}$ (V/ μs)	\hat{I} (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	11.5	9.2	57	171
3.5	32.0	35.0	20.0	27.5	–	10	10.5	9.8	57	200
5	32.0	40.0	25.0	27.5	–	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	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	240
7	42.0	43.0	28.0	37.5	10.2	10	9.0	12.1	40	280
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 $\tan(\delta)$ values.

⁽⁴⁾ Typical equivalent series resistance at 10 kHz.

⁽⁵⁾ Maximum r.m.s. current at 10 kHz, $\theta_{\text{amb}} = 70\text{ °C}$ for $\Delta\theta_{\text{case}} \leq 20\text{ °C}$.

General characteristics

Capacitance range

$U_N @ 85^\circ\text{C} = 440\text{ V AC}$, $U_{NDC} @ 85^\circ\text{C} = 1100\text{ V DC}$

$C_N^{(1)}$ (μF)	Dimensions (mm) ⁽²⁾					$\tan(\delta)@1\text{kHz}^{(3)}$ ($\times 10^{-4}$)	ESR@10 kHz ⁽⁴⁾ (m Ω)	$I_{\text{max}}@10\text{ kHz}^{(5)}$ (A)	$(dU/dt)_{\text{max}}$ (V/ μs)	\hat{I} (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	13.0	8.7	150	300
2.2	32.0	35.0	20.0	27.5	–	10	12.0	9.2	150	330
3	32.0	40.0	25.0	27.5	–	10	10.0	11.2	150	450
1.5	42.0	27.0	16.0	37.5	–	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	37.5	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.

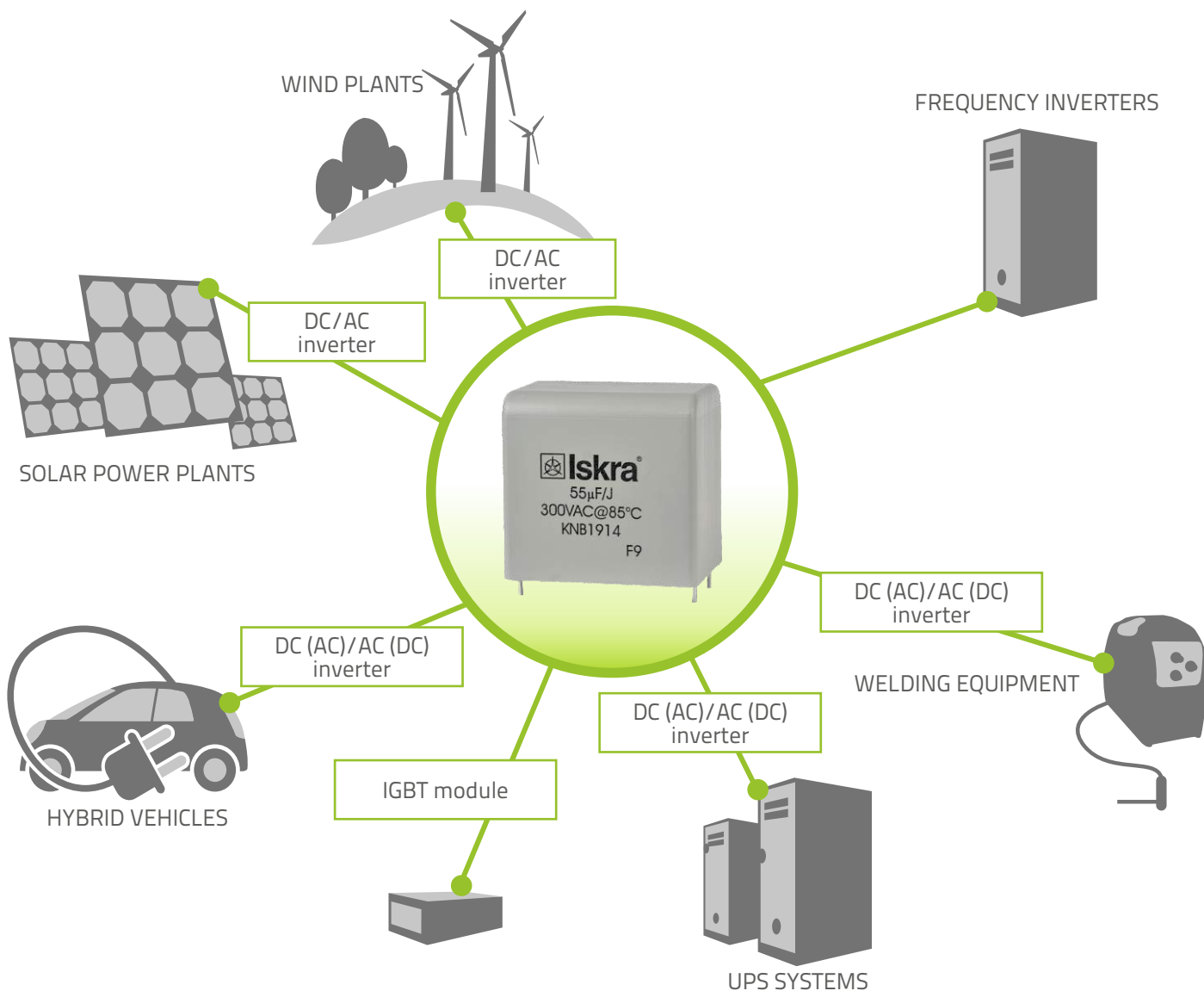
⁽²⁾ Nominal dimensions.

⁽³⁾ Maximum $\tan(\delta)$ values.

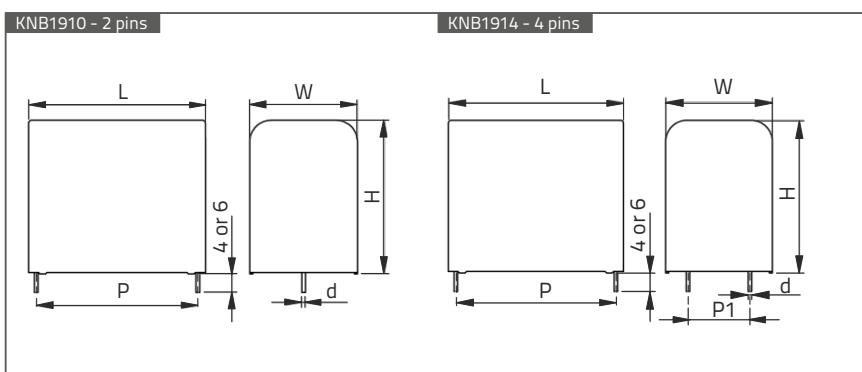
⁽⁴⁾ Typical equivalent series resistance at 10 kHz.

⁽⁵⁾ Maximum r.m.s. current at 10 kHz, $\theta_{\text{amb}} = 70^\circ\text{C}$ for $\Delta\theta_{\text{case}} \leq 20^\circ\text{C}$.

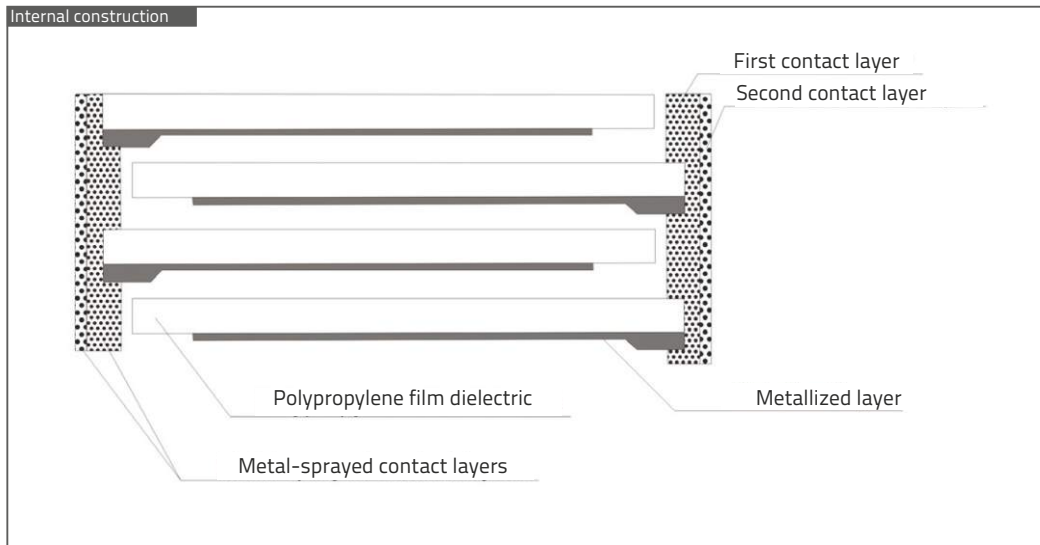
AC Filtering Capacitors Applications



Dimensions



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
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



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.



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