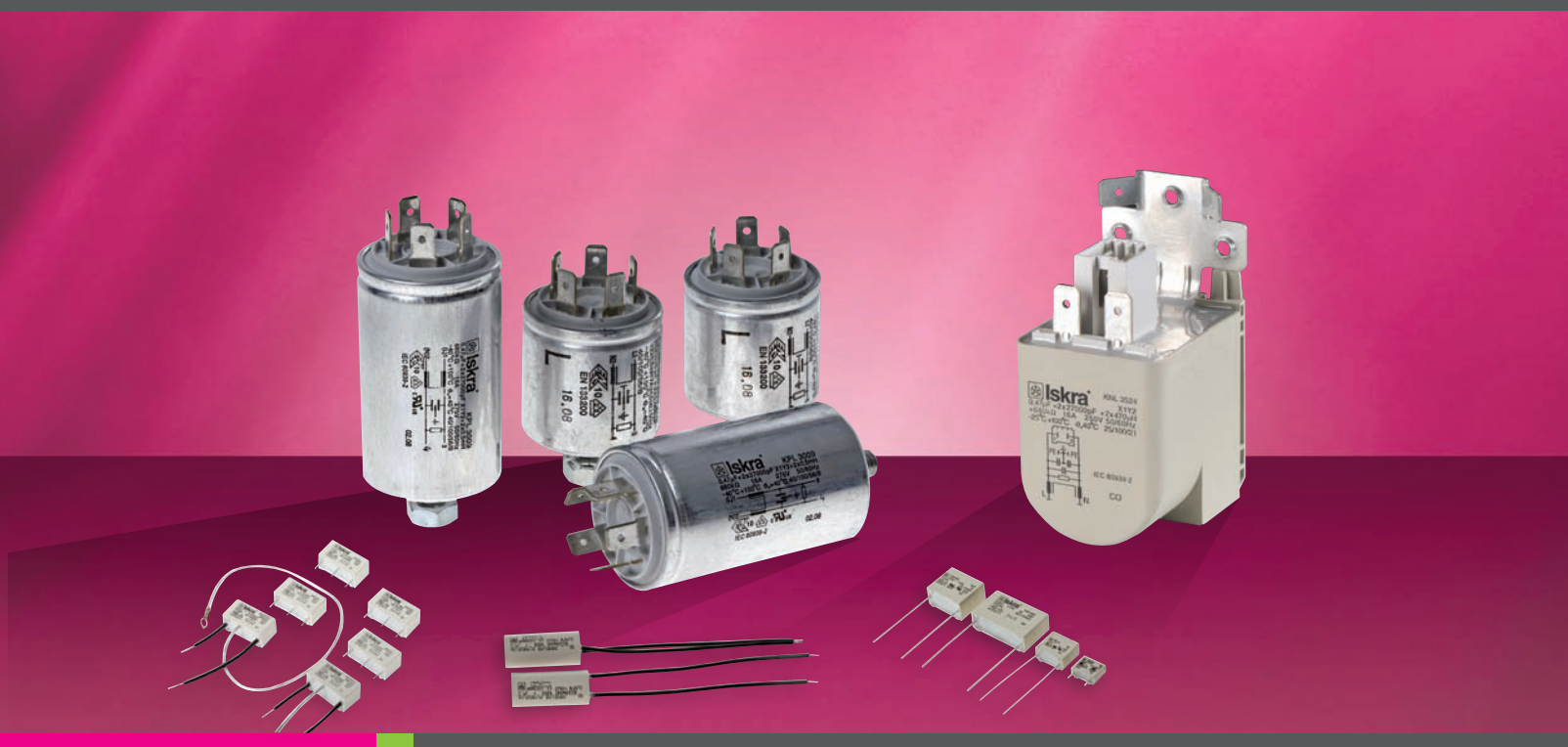


Electrotechnical components

RADIO INTERFERENCE SUPPRESSION COMPONENTS

Iskra®
Iskra Sistemi

Contents

General information on Iskra Capacitors for Radio Interference Suppression Components

General information

1. Origin and spreading of interference

There are two main sources of radio interference:

- devices, which due to their construction produce RF energy. These include generators for use in industry, medicine and science, as well as oscillators, radio and TV receivers etc.
- devices, which produce a wide spectrum of frequencies due to rapid variations in electrical current intensity. These include devices with switching components, thyristors, triacs, commutators and similar.

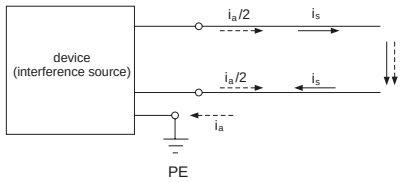
Interference from source to receiver is spread in three ways: along conductors, by coupling and by radiation. To frequencies of 30 MHz approximately, interference is spread mainly along the installed electrical conductors. In this range inductive and capacitative coupling also occurs between the conductors and other metal parts of the devices acting as supports of interference transfer.

Frequencies higher than 30 MHz are spread by radiation since interference source dimensions and terminal conductors are in order of size to the wave length of the radiated interference. The metal parts therefore, act as antennas.

The device connected to the mains supply produces two kinds of interference currents, running along conductors as seen in figure 1.

Symmetrical interference current

Figure 1



runs in different directions in the phase and neutral conductors. Asymmetrical current runs in the same direction in both conductors and ends in the device via the earthing connection. An earthing connection can either be an earthing conductor or capacitance between the device and the surrounding.

Interference on long or medium radio waves is generally greater if the device is earthed. In this case impedance to the surrounding is short circuited and the asymmetrical interference current increases.

Two types of interference appear according to duration time; continuous interference and discontinuous interference. The latter occurs as impulses with less effect than continuous interference. They are treated and suppressed from continuous interference separately. Exact definitions are given in the regulations e.g. CISPR Publ.11, CISPR Publ.14, EN 55011; EN 55014.

2. Maximum permitted interference limits

In order to guarantee good operation of communicational and other equipment, radio interference must be tolerably limited. Interference produced from the source are measured as follows:

- up to frequency 30 MHz, interference voltages are measured which spread along the terminal in the supply network,
- above 30 MHz, strength of radiated field or radiated power on the terminal in the supply network is measured.

Permitted levels of interference are given in the national and international regulations. Recommendations given by CISPR (Comite International Special de Perturbation Radioelectriques) are as follows: CISPR Publ.11, CISPR Publ.14, EN 55011; EN 55014; etc.

Operational methods during measurement are prescribed with individual stipulations and are given in the recommendations of the CISPR Publ. 14.

3. The interference suppression

Two methods:

- reducing interference origin,
- taking steps to prevent interference from spreading from the device of origin.

Spreading of interference is generally suppressed by suppression components connected to the terminal of the power source of the device (network, battery ...) and in certain cases, on the source of interference on the device (brushes of the motor, switches, relays ...) or by shielding the device.

As suppression components use is made of capacitors, chokes, filter sets consisting of capacitors, chokes and resistors.

4. Capacitors and filters for radio interference suppression

Requirements for capacitors and filters for radio interference suppression are given in national and international standards:

IEC60384-14; EN60384-14; UL1414;

UL1283; CSAC22.2 No.1; CSA C22.2 No.8; CSA E384-14;

GB/T14472; EN60939-2.

Definitions Taken From Standards:

Class X capacitors

Class X capacitors are suitable for applications where there is no danger of electrical shock in case of breakdown. Class X capacitors are divided into three subclasses (see table 1) according to the peak voltages of the pulses to which they are exposed during operation in addition to the line voltage. Such impulses can be caused by lightning in overhead lines, switching operations in neighbouring equipment or in the equipment which is shielded by the capacitor.

Class Y capacitors

Class Y capacitors are suitable for applications where the breakdown of the capacitor can lead to a dangerous electric shock. Class Y capacitors are subdivided into the 4 subclasses Y1, Y2, Y3, Y4 shown in table 2:

Note:

The increased electrical and mechanical safety is supposed to rule out short circuits in the capacitor; the current flowing through the capacitor when using alternating voltage and the energy content of the capacitor when using direct voltage, is supposed to be reduced to a safe level by limiting the capacity.

Y capacitors, by fulfilling their technical purpose in electrical equipment, machines and installations, bridge over the plant/industrial insulation whose safety together with additional precautionary measures will avert dangers for humans and animals.

Table 1

Sub-Class	Peak pulse voltage in service	Application	Peak value of the surge voltage to be added before endurance test
X1	> 2,5 kV ≤ 4,0 kV	use with high peak-voltages	for C_R≤1,0 µF : Up=4.0 kV for C_R>1,0 µF : Up=(4/$\sqrt{C_R}$) kV
X2	≤ 2,5 kV	general requirements	for C_R≤1,0 µF : Up=2,5 kV for C_R>1,0 µF : Up=(2,5/$\sqrt{C_R}$) kV
X3	≤ 1,2 kV	general requirements	none

Rated voltage X1, X2 and X3: ≤ 760 V

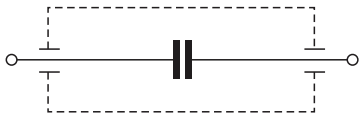
Table 2

Sub-Class	Type of the by-pass insulation	Rated voltage range	Peak impulse voltage before endurance test
Y1	double or reinforced insulation	≤ 500 V	8,0 kV
Y2	basic or supplementary insulation	≥ 150 V ≤ 300 V	5,0 kV
Y3	basic or supplementary insulation	≤ 250 V	none
Y4	basic or supplementary insulation	< 150 V	2,5 kV

Bipolar capacitors

A capacitor with 2 connections for suppression of electromagnetic interference, see fig. 2.

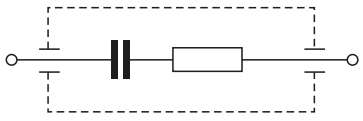
Figure 2: bipolar capacitor



RC Combination

An RC combination in series mounting is a functional unit of class X or Y, resistor and capacitor mounted in series, see fig. 3.

Figure 3: RC-combination



Four-polar capacitors

Four-polar capacitors (feed through capacitors/non-coaxial) have, for at least one coating, two electromagnetically mostly decoupled feeding lines which supply the electrical current.

The active current either flows through the electrodes or is conducted around them.

Bypass capacitors

Bypass capacitors branch off high frequency currents. There are three models in use:

single-, delta- and T-controls. The single capacitor consists of a capacitor in a metal housing to which a connection is fastened according to fig. 5a. The delta construction consists of one X-, and two Y2 or Y3 capacitors which are connected in a triangle as in fig. 5b. The T construction consists of three capacitors C A, C B and C C - connected in T-shape as in fig. 5c.

Figure 4: feed through capacitor for symmetrical usage (non-coaxial)

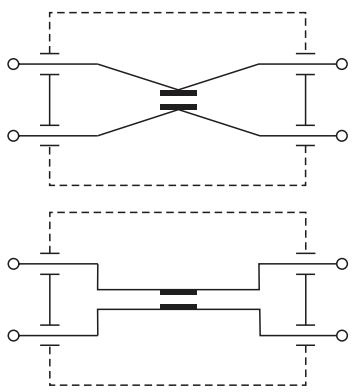


Figure 5a: single by-pass capacitor

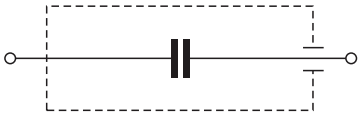


Figure 5b: delta by-pass capacitor

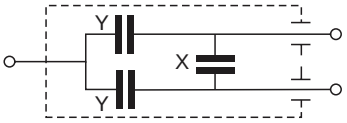
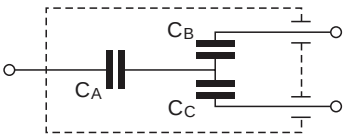


Figure 5c: example for a by-pass capacitor in T-wiring



Rated voltage

The rated voltage is either the RMS-value of the operating voltage at rated frequency or the operating direct current voltage which is allowed between the connections of the capacitor in the total temperature range between the upper and lower category temperatures.

Note:

The rated voltage of radio interference suppression capacitors is generally chosen as equal to or greater than the rated voltage of the network which is used. It has to be taken into account that the voltage of the network may temporarily be as much as 10 % above the rated voltage.

Rated frequency

The rated frequency is the rated supply frequency for which the capacitor is designed, by which it is described and to which other rated values relate.

Surge voltage

A surge voltage is an a-periodic single voltage of a certain profile as described in IEC 60060-1.

Rated current

The rated current of the feed-through conductor is the maximum allowable current which flows during the rated temperature in the feed-through conductor of the capacitor.

Note:

The current of the conductor is generally determined by the rated current of the screened equipment. In special cases the high frequency interfering current also has to be taken into account.

Rated capacitance

The rated capacitance of the capacitor is the capacitance value which characteries its rating for a temperature of 23 °C and after which it is named.

Insulation resistance

The insulation resistance is the ratio of the applied DC voltage to the current flowing after a stipulated time interval.

Time constant

The self-discharging time constant of the capacitor in seconds is the product of the insulation resistance in MΩ and the capacitance in µF.

Dissipation factor

The dissipation factor tan delta is the ratio of the effective output to the wattles power of the capacitor at sinusoidal voltage of a designated frequency.

Insertion loss

The insertion loss is the ratio of the voltages both before and after the insertion of the attenuator measured at the connections.

Note:

If the insertion loss is measured in decibels, the value will be the voltage ratio logarithmised to the basis 10 multiplied by 20.

Category temperature range

The range of the ambient temperatures where the capacitor may be continuously operated based on its design is defined by the temperature limits of the corresponding category.

Upper category temperature

The upper category temperature is the maximum surface temperature for continuous operation for which the capacitor is designed.

Note:

For feed-through capacitors and RC-combinations the temperature of the outer surface may be influenced by the operating current passing through and causing internal heating. The capacitor connections are regarded as part of the outer surface.

Lower category temperature

The lower category temperature is the lowest temperature of the outer surface during continuous operation for which the capacitor is designed.

Climatic category

The climatic category defines the lower rated temperature/the upper rated temperature/the humidity class.

Passive Flammability

The ability of the capacitor to burn with a flame as a consequence of the application of an external source of heat. The capacitor of filter suppresses RF by representing an inpendance for the higher frequencies which generally drop with frequency increase. By

incorporating the capacitor in-parallel with the interference source, interferences are more or less short circuited. A capacitor incorporated in-parallel with power source terminal, suppresses symmetrical interferences, and between a power conductor terminal and the casing or earth it suppresses asymmetrical interferences. Impedance theoretically drops linearly with frequency. Due to shield inductance of the capacitor the capacitor has its own resonant frequency. Above this frequency the capacitor is no self-suppressing component for interference. The value of frequency is decidedly influenced by the inductance of the capacitor terminals.

Thus with two-terminal capacitors its own resonant frequency is lowered and the suppression range is reduced. For four-terminal capacitors the inductance of conductors has no importance since they are connected in series with the capacitor from the T unit. Four-terminal capacitors can be used for higher frequencies than two-terminal ones. Therefore the main characteristic of the two-terminal capacitor is its own resonant frequency and for the four-terminal capacitor the insertion loss.

Minimum resonant frequency and minimum insertion loss are regulated by certain national standards (VDE 0565-1; 0565-3).

The filters consist of a combination of inductive and capacitive components. They are used especially where greater suppression is required. Their characteristic is insertion loss. They are developed for individual request depending on level of interference, frequency range and required suppression, all of which can be different to that regulated by standards.

5. Important notes

5.1. Special working conditions for metallized capacitors

The capacitors are intended for use as electromagnetic interference suppressions in AC 50Hz/60Hz applications. For all other applications please consults our company before. We do not guarantee or take any responsibility for inappropriate production processing or use for inappropriate applications.

Capacitors must not be used in very humid and warm ambient. In such case the capacitor might absorb humidity and this can change the characteristic of the capacitors.

5.2 Limited product liability

Iskra can not take a responsibility for products with brand mark Iskra which were delivered to customers through the third party for use in improper applications without any knowledge of Iskra for what purpose or application the products will be used.

Therefore we strongly recommend contacting us for any explanation or service regarding to our products and their applications for other use.

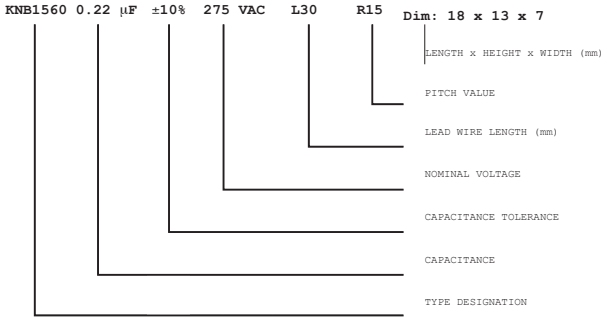
Iskra is either unfamiliar with individual customer application or less familiar with them than the customer themselves. For these reasons, it always ultimately incumbent on the customer to check and decide whether an Iskra product with the properties described in the product specification is suitable for use in a particular customer application.

6. Ordering for interference suppression components

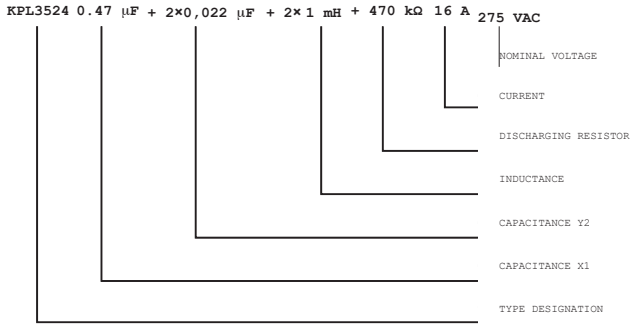
When ordering, the following data should be given:

- type of capacitor or filter
- capacitance
- voltage
- inductance (for filters)
- requirement for discharging resistor
- terminal dimensions
- current (for filters and four terminal capacitors)
- special requirements for connecting components

An example for capacitor:



An example for filter:



7. Production date code marking system according to IEC 60062, clause 5.1 Two-character code (year/month)

The production date code is indicated with two-characters. The 1st character (letter) indicates the year and the 2nd character (number/letter) indicates the month.

Examples:

2006 March = U3

2008 October = W0

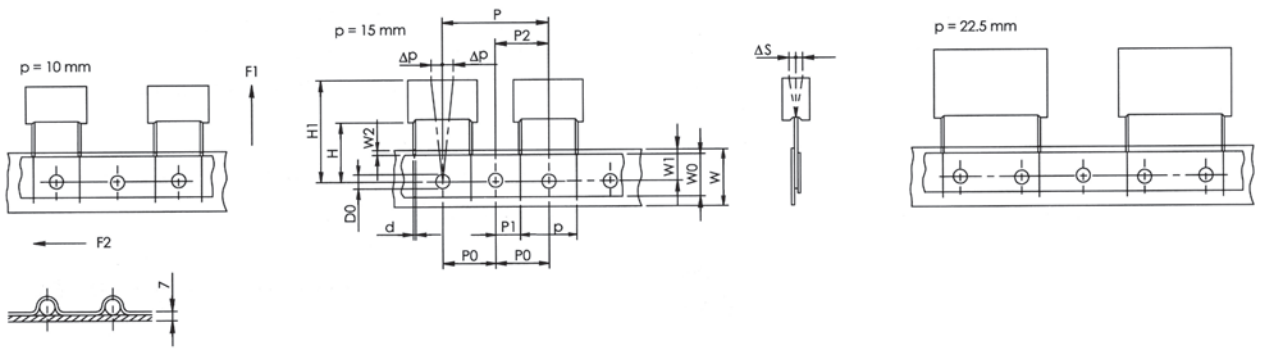
Year	1st character (letter)	Month	2nd character (number/letter)
2000	M	January	1
2001	N	February	2
2002	P	March	3
2003	R	April	4
2004	S	May	5
2005	T	June	6
2006	U	July	7
2007	V	August	8
2008	W	September	9
2009	X	October	O
2010	A	November	N
2011	B	December	D
2012	C		
2013	D		

Taping specification for radial capacitors acc. to IEC 60286-2 (Robotic insertion)

Descriptions	Symbol	Dimensions (mm)			
		Lead spacing 10 mm	Lead spacing 15 mm	Lead spacing 22.5 mm	Tolerances
Carrier tape width	W	18	18	18	+1 / - 0.5
Hold-down tape width	W_0	12 or 6	12 or 6	12 or 6	± 0.5
Hotel position	W_1	9	9	9	± 0.5
Hold-down tape position	W_2	3	3	3	max
Feed hole diameter	D_0	4	4	4	± 0.2
Pitch of component	P	25.4	25.4	38.1	± 1
Feed hole pitch	P_0*	12.7	12.7	12.7	± 0.2
Feed hole centre to lead	P_1	7.7	5.2	7.8	± 0.7
Feed hole centre to component centre	P_2	12.7	12.7	19.05	± 1.3
Height from feed hole centre to the component body	H	18.5	18.5	18.5	± 0.5
Component alignment	Δp	0	0	0	± 1.3
	ΔS	0	0	0	± 2
Lead spacing	p	10	15	22.5	+0.6 / - 0.1
Lead wire diameter	d	0.6	0.8	0.8	± 0.5
Total tape thickness	t	0.7	0.7	0.7	± 0.2
Extraction force for components	F_1	5	5	5	min. (N)
Break force of the tape	F_2	15	15	15	min. (N)
Component height	H_1	31	34	39	max

* Cumulative pitch error over any 20 pitches: max. ±1 mm

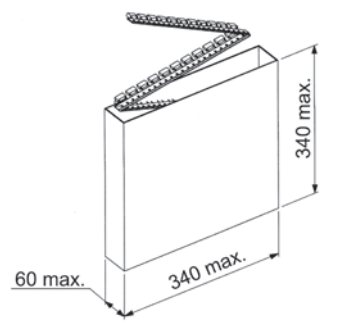
Figure 6



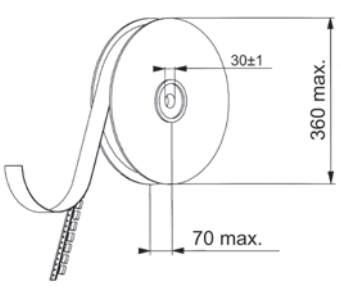
Taped package units

Pitch (mm)	Capacitor thickness b (mm)	Ammo-pack (pcs/box)	Reel-pack (pcs/reel)
10	4; 4.3	900	900
	5	768	700
	6	648	550
15	5	768	600
	5.5	696	600
	6	648	500
	7	552	450
	7.5	504	400
	8.5	444	350
	9	420	350
22.5	6	424	350
	6.5	392	370
	7	368	300
	8.5	304	250
	10	256	200
	10.5	240	200

Figure 7



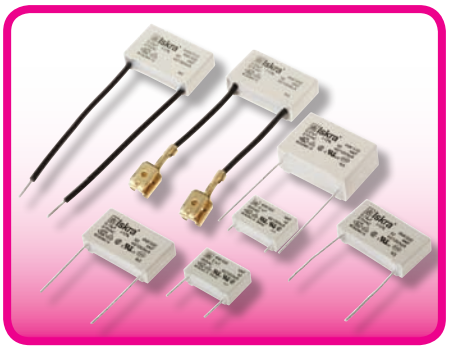
Ammo pack



Reel pack

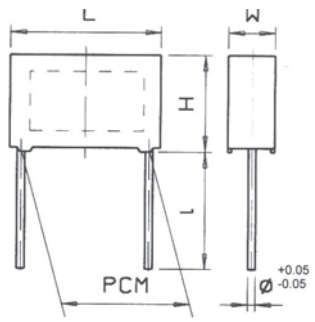
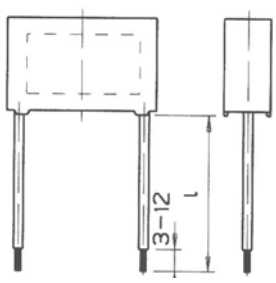
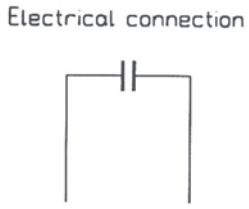
Capacitors

Type KNB1530 Type KNB1532 Type KNB1533	275 V AC 300 V AC	class **X2**



TECHNICAL DATA

Construction:	polypropylene film, metallized
Rated voltage:	275 V A.C., 300 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0,1 µF and ± 10 % for C > 0,1 µF
Climatic category:	40/100/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 °C to + 100 °C
Test voltage:	2635 V D.C., 1 s
Max. pulse rise time du/dt, at 390 V D.C. for 275 V A.C. and 425 V D.C. for 300 V A.C.:	900 V/µs for PCM = 10 mm 400 V/µs for PCM = 15 mm 200 V/µs for PCM = 22.5 mm 160 V/µs for PCM = 27.5 mm 100 V/µs for PCM = 37.5 mm
Insulation resistance at 20 °C, U_m = 100 V D.C., t =1 min:	$R_i \geq 15000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 5000$ s for C > 0.33 µF
Dielectric loss tanδ at f = 1 kHz and 20 °C:	$\leq 5 \times 10^{-4}$
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Self inductance:	approx. 10 nH/cm of capacitor length and terminals
Complies to:	IEC 60384-14, UL 1283, UL1414, EN 60384-14, CSA C22.2 No.1, CSA E384-14, GB/T 14472 - 1998

KNB1530	KNB1532, KNB1533	Electrical connection
		

Available in custom design version. Recommended for serial connection.

ø 0.6 mm for PCM = 10 mm
ø 0.8 mm for PCM > 10 mm

Casing: thermoplastic, (PP or on request PBT HF) sealed with synthetical resin	Thermoplastic material is self-extinguishing according to UL 94, class V-0.

Terminals		
Type	Terminal length	Type of terminals
KNB1530	$3^{\pm 0.5}$, $4^{\pm 0.5}$, 6^{-1}, $9^{\pm 1}$, $15^{\pm 2}$, $20^{\pm 2}$, $25^{\pm 5}$, $30^{\pm 5}$, $50^{\pm 5}$ mm, other on request	Tinned copper wire
KNB1532	20 to 200 mm	Insulated stranded wire 0.5 mm^2
KNB1533	20 to 200 mm	Insulated solid wire ø 0,8 mm End terminals on request

Standard values KNB1530, KNB1532, KNB1533, 275 V AC, class X2

Capacitance	Dimensions					For capacitors with insulated leads on request				
C (µF)	L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)	IEC 60384-14 275 V AC	UL 1283 300 V AC	UL 1414 250 V AC	C22.2 No.1 250 V AC	GB/T14472 275 V AC	E384-14-95 275 V AC
0.01*	13	9.5	4.3	10	▪	▪	▪	▪	▪	▪
0.015*	13	10.5	5	10	▪	▪	▪	▪	▪	▪
0.022*	13	11.5	6	10	▪	▪	▪	▪	▪	▪
0.01	18	11	5.5	15	▪	▪	▪	▪	▪	▪
0.015	18	11	5.5	15	▪	▪	▪	▪	▪	▪
0.022	18	11	5.5	15	▪	▪	▪	▪	▪	▪
0.033	18	11	5.5	15	▪	▪	▪	▪	▪	▪
0.047	18	11	5.5	15	▪	▪	▪	▪	▪	▪
0.068	18	12	6	15	▪	▪	▪	▪	▪	▪
0.1*	18	12	6	15	▪	▪	▪	▪	▪	▪
0.1	18	13	7	15	▪	▪	▪	▪	▪	▪
0.12	18	13.5	7.5	15	▪					▪
0.15*	18	14.5	9	15	▪	▪	▪			▪
0.22*	18	19	10	15	▪	▪	▪			▪
0.33*	18	20	12.5	15	▪	▪	▪	▪	▪	▪
0.15	27	15	6.5	22.5	▪	▪	▪	▪	▪	▪
0.22	27	16.5	7	22.5	▪	▪	▪	▪	▪	▪
0.27	27	18.5	8.5	22.5	▪	▪	▪	▪	▪	▪
0.33	27	18.5	8.5	22.5	▪	▪	▪	▪	▪	▪
0.47	27	20	10.5	22.5	▪	▪	▪	▪	▪	▪
0.47*	26	22	9.5	22.5	▪	▪	▪	▪	▪	▪
0.47	32	20	11	27.5	▪	▪	▪	▪	▪	▪
0.56	31.5	19	10	27.5	▪	▪				▪
0.68	32	20	11	27.5	▪	▪	▪	▪	▪	▪
1	32	24.5	15	27.5	▪	▪	▪	▪	▪	▪
1*	31.5	22	13	27.5	▪	▪	▪	▪	▪	▪
1.5	32	28	18	27.5	▪	▪			▪	▪
2.2	32	33	20	27.5	▪	▪			▪	▪
1.5	41.5	23	14	37.5	▪	▪			▪	▪
2.2	41.5	26	18	37.5	▪	▪			▪	▪
2.2	41.5	31	18	37.5	▪	▪			▪	▪

* mini size
marking with 

Approvals in use = ▪
Approvals in pending = o

Note: KNB1532 and KNB1533 with PCM = 10 mm are not available with VDE-ENEC.

Standard values KNB1530, KNB1532, KNB1533, 300 V AC, class X2

Capacitance	Dimensions					For capacitors with insulated leads on request			
C (µF)	L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)	IEC 60384-14 300 V AC	UL 1283 300 V AC	UL 1414 250 V AC	C22.2 No.1 250 V AC	E384-14-95 300 V AC
0.01	13	9	4	10	▪	▪	▪	▪	▪
0.015	13	9	4	10	▪	▪	▪	▪	▪
0.022	13	10.5	5	10	▪	▪	▪	▪	▪
0.033	13	11.5	6	10	▪	▪	▪	▪	▪
0.047	13	13.5	6	10	▪	▪	▪	▪	▪
0.01	18	11	5	15	▪	▪	▪	▪	▪
0.015	18	11	5	15	▪	▪	▪	▪	▪
0.022	18	11	5	15	▪	▪	▪	▪	▪
0.033	18	11	5	15	▪	▪	▪	▪	▪
0.047	18	11	5	15	▪	▪	▪	▪	▪
0.068	18	11	5.5	15	▪	▪	▪	▪	▪
0.1	18	12	6	15	▪	▪	▪	▪	▪
0.12	18	13	7	15	▪	▪	▪		▪
0.15	18	13.5	7.5	15	▪	▪	▪	▪	▪
0.22	18	16.5	8.5	15	▪	▪	▪	▪	▪
0.27	18	18.5	11	15	▪	▪	o	▪	▪
0.33	18	18.5	11	15	▪	▪	▪	▪	▪
0.1	26.5	14	6	22.5	▪	▪	o	▪	▪
0.15	26.5	14	6	22.5	▪	▪	▪	▪	▪
0.22	27	15	6.5	22.5	▪	▪	▪	▪	▪
0.33	26.5	16.5	8.5	22.5	▪	▪	▪	▪	▪
0.47	26.5	18.5	10	22.5	▪	▪	▪	▪	▪
0.56	27	20	10.5	22.5	▪	▪	▪		▪
0.33	31.5	16	7.5	27.5	▪	▪	o	▪	▪
0.47	32	17	9	27.5	▪	▪	▪	▪	▪
0.68	32	18.5	11	27.5	▪	▪	▪	▪	▪
1	31.5	22	13	27.5	▪	▪	▪	▪	▪
1.5	31.5	26.5	17	27.5	▪	▪			▪
2.2	31.5	32	18	27.5	▪	▪			▪
2.7	31.5	32	18	27.5	▪	▪			
3.3	31.5	32	18	27.5	▪	▪			
3.3	31.5	33	20	27.5	▪	▪			▪
3.9	31.5	33	20	27.5	▪	▪			
4.7	32	39	24	27.5	▪	▪			
5.6	32	39	24	27.5	▪	▪			
1.5	41.5	22	14	37.5	▪	▪			▪
2.2	41.5	27	16	37.5	▪	▪			▪
2.2	41.5	26	18	37.5	▪	▪			▪
3.3	41.5	26	18	37.5	▪	▪			
3.9	41.5	31	18	37.5	▪	▪			
4.7	41.5	32	19	37.5	▪	▪			
3.6	41.5	38	21	37.5	▪	▪			
6.8	41.5	38	21	37.5	▪	▪			
8.2	41.5	43	28	37.5	▪	▪			
10	41.5	43	28	37.5	▪	▪			
10	42	45	30	37.5	▪	▪			

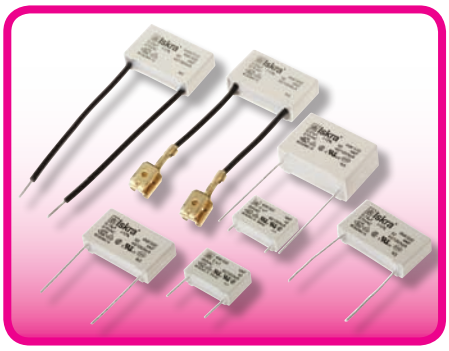
* mini size
marking with

Approvals in use = ▪
Approvals in pending = o

Note: KNB1532 and KNB1533 with PCM = 10 mm are not available with VDE-ENEC.

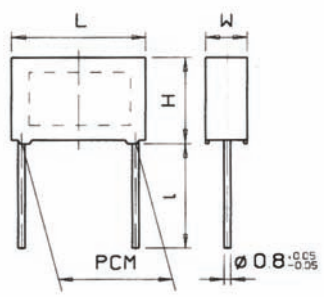
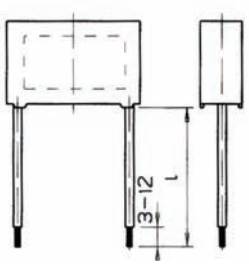
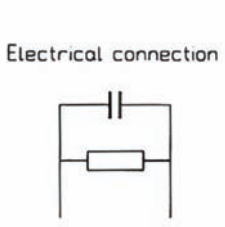
Capacitors with discharge resistor

Type KNB1530 Type KNB1532 Type KNB1533	275 V AC 300 V AC	class **X2**



TECHNICAL DATA

Construction: - capacitor: - resistor:	polypropylene film, metallized metaloxide film
Rated voltage:	275 V A.C., 300 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0.1 µF, ± 10 % for C > 0.1 µF
Resistance tolerance:	± 5 %
Resistance power:	0.6 W
Climatic category:	40/100/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 °C to + 100 °C
Test voltage:	2635 V D.C., 2 s
Max. pulse rise time du/dt, at 425 V D.C.:	400 V/µs for PCM = 15 mm 200 V/µs for PCM = 22.5 mm 160 V/µs for PCM = 27.5 mm 100 V/µs for PCM = 37.5 mm
Insulation resistance at 20 °C, U_m = 100V D.C., t = 1 min:	R_i ≥ 15000 MΩ for C ≤ 0.33 µF Ri × C_n ≥ 5000 s for C > 0.33 µF
Dielectric loss tanδ at f = 1 kHz and 20 °C:	≤ 5 × 10^{-4}
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Self inductance:	approx. 10 nH/cm of capacitor length and terminals
Complies to:	IEC 60384-14, EN 60384-14, CSA E384-14

KNB1530	KNB1532, KNB1533	Electrical connection
		

Available in custom design version. Recommended for serial connection.

Casing: thermoplastic. (PP or on request PBT HF) sealed with synthetical resin	Thermoplastic material and synthetical resin are self-extinguishing according to UL 94. class V-0.	
Terminals		
Type	Terminal length	Type of terminals
KNB1530	$3^{\pm 0.5}$, $4^{\pm 0.5}$. 6^{-1}, $9^{+1}.15^{\pm 2}$, $20^{\pm 2}$, $25^{\pm 5}$, $30^{\pm 5}$, $50^{\pm 5}$ mm. other on request	Tinned copper wire
KNB1532	20 to 200 mm	Insulated stranded wire 0.5 mm^2
KNB1533	20 to 200 mm	Insulated solid wire ø 0.8 mm End terminals on request

Standard values KNB1530, KNB1532, KNB1533, 275 V AC, class X2, with discharge resistor

Capacitance C (µF)	Resistance R (kΩ)	Dimensions				IEC 60384-14	E384-14-95
		L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)		
0.047		18	13	7	15	▪	▪
0.068		18	13	7	15	▪	▪
0.1		18	14.5	9	15	▪	▪
0.15	470	27	16.5	7	22.5	▪	▪
0.22	to	26.5	16.5	8.5	22.5	▪	▪
0.22	2700	27	18.5	8.5	22.5	▪	▪
0.33		26.5	18.5	10	22.5	▪	▪
0.47		26.5	20.5	11	22.5	▪	▪
0.47		32	20	11	27.5	▪	▪

Resistance values according to IEC 60063 range E12.

Approvals in use = ▪
Approvals in pending = o

Standard values KNB1530, KNB1532, KNB1533, 300 V AC, class X2, with discharge resistor

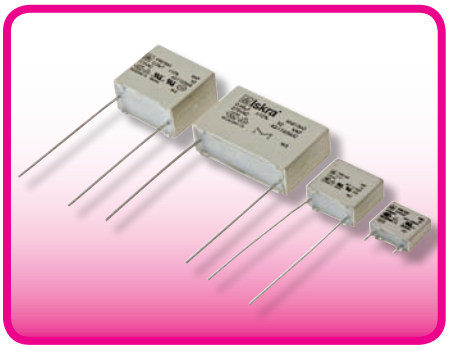
Capacitance C (µF)	Resistance R (kΩ)	Dimensions				IEC 60384-14	E384-14-95
		L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)		
0.047		18	12	6	15	▪	▪
0.068		18	13	7	15	▪	▪
0.1		18	13.5	7.5	15	▪	▪
0.15		18	16.5	8.5	15	▪	▪
0.22	470	18	18.5	9	15	▪	▪
0.33	to	18	20	12.5	15	▪	▪
0.15	2700	27	15	6.5	22.5	▪	▪
0.22		27	16.5	7	22.5	▪	▪
0.33		27	18.5	8.5	22.5	▪	▪
0.47		27	20	10.5	22.5	▪	▪
0.47		31.5	19	10	27.5	▪	▪

Resistance values according to IEC 60063 range E12.

Approvals in use = ▪
Approvals in pending = o

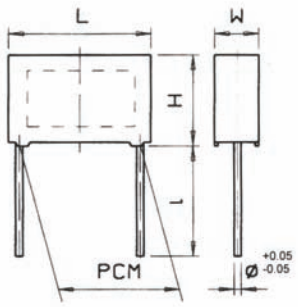
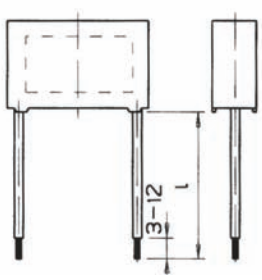
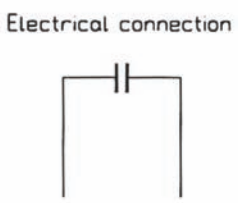
Capacitors

Type KNB1560 Type KNB1562 Type KNB1563	275 V AC	class **X2**



TECHNICAL DATA

Construction:	polypropylene film, metallized
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0.1 µF, ± 10 % for C > 0.1 µF
Climatic category:	40/110/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 °C to + 110 °C
Test voltage:	2200 V D.C., 1 s for C ≤ 1µF 1900 V D.C., 1 s for C > 1µF
Max. pulse rise time du/dt, at 390 V D.C. according to IEC 60384-14:	500 V/µs for PCM C > 1µF 400 V/µs for PCM = 15 mm C ≤ 0,022 µF 250 V/µs for PCM = 15 mm C > 0,022 µF 150 V/µs for PCM = 22.5 mm 100 V/µs for PCM = 27.5 mm 550 V/µs for PCM = 7.5 mm miniature version 350 V/µs for PCM = 10 mm miniature version
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	R_i ≥ 15000 MΩ for C ≤ 0.33 µF Ri × C_n ≥ 5000 s for C > 0.33 µF
Dielectric loss tanδ at f = 1 kHz and 20 °C:	≤ 1 × 10^{-3}
Soldering:	IEC publ, 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Self inductance:	approx. 10 nH/cm of capacitor length and terminals
Complies to:	IEC 60384-14, EN 60384-14 UL 1283, UL 1414, CSA C22.2 No.1, GB/T14472-1998

KNB1560	KNB1562, KNB1563	Electrical connection
		

Available in custom design version. Recommended for serial connection.

Casing: thermoplastic, (PP or on request PBT HF) sealed with synthetical resin	Thermoplastic material and synthetical resin are self-extinguishing according to UL 94, class V-0.

Terminals		
Type	Terminal length	Type of terminals
KNB1560	$3^{\pm0.5}$, $4^{\pm0.5}$, 6^{-1}, 9^{+1},$15^{\pm2}$, $20^{\pm2}$, 25^{+5}, 30^{+5}, 50^{+5} mm, other on request	Tinned copper wire
KNB1562	20 to 200 mm	Insulated stranded wire 0,5 mm^2
KNB1563	20 to 200 mm	Insulated solid wire ø 0,8 mm

Standard values KNB1560, KNB1562, KNB1563, 275 V AC, class X2

Capacitance	Dimensions						For capacitors with insulated leads on request		
C (µF)	L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)	ø (mm)	IEC 60384-14 275 V AC	UL 1283 275 V AC	UL 1414 250 V AC	GB/T14472 275 V AC
0.01	13	9	4	10	0.6	▪	▪	▪	▪
0.015	13	9	4	10	0.6	▪	▪	▪	▪
0.022	13	9	4	10	0.6	▪	▪	▪	▪
0.033	13	9	4	10	0.6	▪	▪		▪
0.033	13	10.5	5	10	0.6	▪	▪	▪	▪
0.047	13	10.5	5	10	0.6	▪	▪		▪
0.047	13	11.5	6	10	0.6	▪	▪	▪	▪
0.068	13	11	5.5	10	0.6	▪	▪	▪	▪
0.1	13	12	6	10	0.6	▪	▪	▪	▪
0.01	18	11	5	15	0.8	▪	▪	▪	▪
0.015	18	11	5	15	0.8	▪	▪	▪	▪
0.022	18	11	5	15	0.8	▪	▪	▪	▪
0.033	18	11	5	15	0.8	▪	▪	▪	▪
0.047	18	11	5	15	0.8	▪	▪	▪	▪
0.068	18	11	5	15	0.8	▪	▪	▪	▪
0.1	18	11	5.5	15	0.8	▪	▪	▪	▪
0.12	18	12	6	15	0.8	▪	▪	▪	▪
0.15	18	13	7	15	0.8	▪	▪	▪	▪
0.22	18	14.5	8.2	15	0.8	▪	▪	▪	▪
0.27	18	14.5	9	15	0.8	▪	▪	▪	▪
0.33	18	16	9.5	15	0.8	▪	▪	▪	▪
0.33	18	19.5	7.5	15	0.8	▪	▪	▪	▪
0.47	18	18.5	11	15	0.8	▪	▪	▪	▪
0.56	18	20	12.5	15	0.8	▪	▪		▪
0.15	26.5	14	6	22.5	0.8	▪	▪	▪	▪
0.22	26.5	14	6	22.5	0.8	▪	▪	▪	▪
0.27	26.5	15	6	22.5	0.8	▪	▪	▪	▪
0.33	26.5	16	7	22.5	0.8	▪	▪	▪	▪
0.47	26.5	17	8.5	22.5	0.8	▪	▪	▪	▪
0.56	26.5	18.5	9	22.5	0.8	▪	▪	▪	▪
0.68	26.5	18.5	10	22.5	0.8	▪	▪	▪	▪
1	26.5	21.5	12.5	22.5	0.8	▪	▪	▪	▪
0.47	31.5	16	7.5	27.5	0.8	▪	▪	▪	▪
0.56	32	17	9	27.5	0.8	▪	▪	▪	▪
0.68	32	17	9	27.5	0.8	▪	▪	▪	▪
1	32	20	11	27.5	0.8	▪	▪	▪	▪
1.5	31.5	23.5	14	27.5	0.8	▪	▪		▪
2.2	31.5	26.5	17	27.5	0.8	▪	▪		▪

Approvals in use = ▪
Approvals in pending = o

Standard values KNB1560, KNB1562, KNB1563, 275 V AC, class X2, miniature version

Capacitance		Dimensions						For capacitors with insulated leads on request		
C (µF)	Tolerance ± (%)	L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)	ø (mm)	IEC 60384-14 275 V AC	UL 1283 275 V AC	UL 1414 250 V AC	GB/T14472 275 V AC
0.01	20	10.5	9	4	7.5	0.6	▪	▪	▪	▪
0.015	20	10.5	9	4	7.5	0.6	▪	▪	▪	▪
0.022	20	10.5	9	4	7.5	0.6	▪	▪	▪	▪
0.033	20	10.5	10	5	7.5	0.6	▪	▪	▪	▪
0.047	20	10.5	11	5.5	7.5	0.6	▪	▪	▪	▪
0.068	10,20	13	11	5.5	10	0.6	▪	▪	▪	▪
0.1	20	13	11	5	10	0.6	▪	o	o	o
0.1	10, 20	13	11	5.5	10	0.6	▪	o	o	o
0.1	10, 20	18	11	5	15	0.8	▪	▪	▪	▪
0.12	20	18	11	5	15	0.8	▪	▪	▪	▪
0.12	10, 20	18	11	5.5	15	0.8	▪	▪	▪	▪
0.15	20	18	11	5.5	15	0.8	▪	▪	▪	▪
0.15	10, 20	18	12	6	15	0.8	▪	▪	▪	▪
0.18	10, 20	18	12	6	15	0.8	▪	▪	▪	▪
0.22	**20**	**18**	**12.5**	**6.5**	15	0.8	▪	▪	▪	▪
0.22	10, 20	18	13	7	15	0.8	▪	▪	▪	▪
0.27	20	18	13	7	15	0.8	▪	▪	▪	▪
0.27	10, 20	18	13.5	7.5	15	0.8	▪	▪	▪	▪
0.33	**10, 20**	**18**	**16**	**7.5**	15	0.8	▪	▪	▪	▪
0.33	10, 20	18	14.5	8.2	15	0.8	▪	▪	▪	▪
0.39	**20**	**18**	**19.5**	**7.5**	15	0.8	▪	▪	▪	▪
0.39	10, 20	18	16.5	8.5	15	0.8	▪	▪	▪	▪
0.47	20	18	16	9.5	15	0.8	▪	▪	▪	▪
0.47	10, 20	18	18.5	9	15	0.8	▪	▪	▪	▪
0.56	20	18	18.5	9	15	0.8	▪	▪	▪	▪
0.56	10, 20	18	19	10	15	0.8	▪	▪	▪	▪
0.56	10, 20	18	18.5	11	15	0.8	▪	▪	▪	▪
0.68	20	18	18.5	11	15	0.8	▪	▪	▪	▪
0.68	**10, 20**	**18**	**22**	**10**	15	0.8	▪	▪	▪	▪
0.68	10, 20	18	20	11	15	0.8	▪	▪	▪	▪
0.68	10, 20	18	20	12.5	15	0.8	▪	▪	▪	▪
0.82	10, 20	18	20	12.5	15	0.8	▪	o	o	o
1	**10, 20**	**18**	**25**	**12.5**	15	0.8	▪	o	o	o
1	**10, 20**	**18**	**17**	**19.5**	15	0.8	▪	o	o	o
0.47	10, 20	26.5	16	7	22.5	0.8	▪	o	o	o
0.56	**10, 20**	**26.5**	**16.5**	**7.5**	22.5	0.8	▪	o	o	o
0.68	10, 20	26.5	17	8.5	22.5	0.8	▪	o	o	o
0.82	10, 20	26.5	18.5	9	22.5	0.8	▪	o	o	o
1	**10, 20**	**26.5**	**19.5**	**10**	22.5	0.8	▪	o	o	o
1	10, 20	27	20	10.5	22.5	0.8	▪	o	o	o
1.2	10, 20	26.5	20.5	11	22.5	0.8	▪	o		o
1.5	10, 20	26.5	21.5	12.5	22.5	0.8	▪	o		o
1.8	**10, 20**	**27**	**23**	**14**	22.5	0.8	▪	o		o
2.2	**10, 20**	**26.5**	**26.5**	**14.5**	22.5	0.8	▪	o		o
2.2	**10, 20**	**27**	**25**	**16**	22.5	0.8	▪	o		o
1	10, 20	31.5	19	10	27.5	0.8	▪	o	o	o
1.5	10, 20	31.5	21	12	27.5	0.8	▪	o		o
2.2	10, 20	31.5	23.5	14	27.5	0.8	▪	o		o
2.7	**10, 20**	**32**	**28.5**	**15**	27.5	0.8	▪	o		o
3.3	10, 20	31.5	26.5	17	27.5	0.8	▪	o		o
3.9	10, 20	31.5	32	18	27.5	0.8	▪	o		o
4.7	10, 20	31.5	33	20	27.5	0.8	▪	o		o
5.6	**10, 20**	**31.5**	**35.5**	**24**	27.5	0.8	▪	o		o
6.8	**10, 20**	**32**	**39**	**24**	27.5	0.8	▪	o		o

marking with ⋀ except PCM 7.5 mm

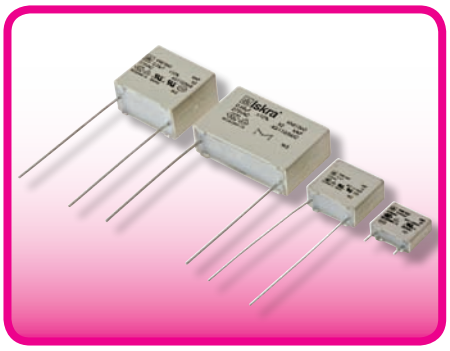
Note: Bold-face printed alternative body dimensions upon request.

Approvals in use = ▪

Approvals in pending = o

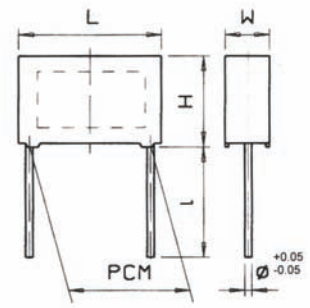
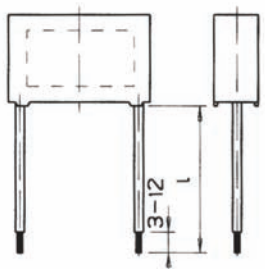
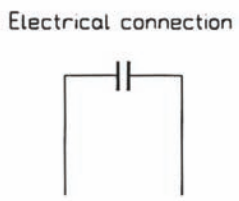
Capacitors

Type KNB1560 Type KNB1562 Type KNB1563	275 V AC + 125 °C	class **X2**



TECHNICAL DATA

Construction:	polypropylene film, metallized
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %, ± 10 %
Climatic category:	40/125/56 according to IEC publ. 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 °C to + 125 °C
Test voltage:	2200 V D.C. for 1s
Max. pulse rise time du/dt, at 390 V D.C.:	550 V/ms for PCM = 7.5mm 350 V/ms for PCM = 10mm 200 V/ms for PCM = 15mm pulse test conditions according to IEC 60384-14
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 15000$ MΩ for $C_x \leq 0.33$ µF $Ri \times C_x \geq 5000$ s for $C_x > 0.33$ µF
Dielectric loss tanδ at f = 1 kHz and 20 °C:	$\leq 1 \times 10^{-3}$
Soldering:	IEC publ. 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Self inductance:	approx. 10 nH/cm of capacitor length and terminals
Complies to:	IEC publ. 60384-14, EN 132 400, UL 1283, UL 1414, CSA C22.2 No.1, GB/T 14472-1998

KNB1560	KNB1562, KNB1563	Electrical connection
		

Available in custom design version. Recommended for serial connection.

Casing: thermoplastic. (PP or on request PBT HF) sealed with synthetical resin	Thermoplastic material and synthetical resin are self-extinguishing according to UL 94. class V-0.

Terminals		
Type	Terminal length	Type of terminals
KNB1560	$4^{\pm0.5}$, 6^{-1}, 25^{+5} mm. other on request	Tinned copper wire
KNB1562	20 to 200 mm	Insulated stranded wire 0.5 mm^2
KNB1563	20 to 200 mm	Insulated solid wire 0.8 mm End terminals on request

Standard values KNB1560, KNB1562, KNB1563, 275 V AC, class X2, + 125 ˚C, miniature version

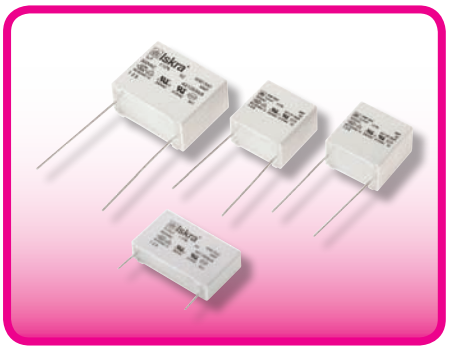
		Dimensions					For capacitors with insulated leads on request,			
C (µF)	Tolerance ± (%)	$L_{max.}$ (mm)	$H_{max.}$ (mm)	$W_{max.}$ (mm)	PCM (mm)	ø (mm)	IEC 60384-14 275VAC	UL1283 275VAC	UL1414 250 V AC	GB/T14472 275VAC
0,01	20	10.5	9.0	4.0	7.5	0.6	▪	▪	▪	▪
0.015	20	10.5	9.0	4.0	7.5	0.6	▪	▪	▪	▪
0.022	20	10.5	9.0	4.0	7.5	0.6	▪	▪	▪	▪
0.033	20	10.5	10.0	5.0	7.5	0.6	▪	▪	▪	▪
0.047	20	10.5	11.0	5.5	7.5	0.6	▪	▪	▪	▪
0.068	20	13	11.0	5.5	10	0.6	▪	▪	▪	▪
0.1	20	13	12.0	6.0	10	0.6	▪	▪	▪	▪
0.1	10, 20	18	11.0	5.0	15	0.8	▪	▪	▪	▪
0.12	20	18	11.0	5.0	15	0.8	▪	▪	▪	▪
0.12	10, 20	18	11.0	5.5	15	0.8	▪	▪	▪	▪
0.15	20	18	11.0	5.5	15	0.8	▪	▪	▪	▪
0.15	10, 20	18	12.0	6.0	15	0.8	▪	▪	▪	▪
0.18	10, 20	18	12.0	6.0	15	0.8	▪	▪	▪	▪
0.22	**20**	**18**	**12.5**	**6.5**	15	0.8	▪	▪	▪	▪
0.22	10, 20	18	13.0	7.0	15	0.8	▪	▪	▪	▪
0.27	20	18	13.0	7.0	15	0.8	▪	▪	▪	▪
0.27	10, 20	18	13.5	7.5	15	0.8	▪	▪	▪	▪
0.33	**10, 20**	**18**	**16.0**	**7.5**	15	0.8	▪	▪	▪	▪
0.33	10, 20	18	14.5	8.2	15	0.8	▪	▪	▪	▪
0.39	**20**	**18**	**19.5**	**7.5**	15	0.8	▪	▪	▪	▪
0.39	10, 20	18	16.5	8.5	15	0.8	▪	▪	▪	▪
0.47	20	18	16.0	9.5	15	0.8	▪	▪	▪	▪
0.47	10, 20	18	18.5	9.0	15	0.8	▪	▪	▪	▪
0.56	20	18	18.5	9.0	15	0.8	▪	▪	▪	▪
0.56	10, 20	18	19.0	10.0	15	0.8	▪	▪	▪	▪
0.56	10, 20	18	18.5	11.0	15	0.8	▪	▪	▪	▪
0.68	20	18	18.5	11.0	15	0.8	▪	▪	▪	▪
0.68	**10, 20**	**18**	**22.0**	**10.0**	15	0.8	▪	▪	▪	▪
0.68	10, 20	18	20.0	11.0	15	0.8	▪	▪	▪	▪
0.68	10, 20	18	20,0	12,5	15	0,8	▪	▪	▪	▪

marking with ⋀ except PCM 7.5 mm
Note: Bold-face printed alternative body dimensions upon request.

Approvals in use = ▪
Approvals in pending = o

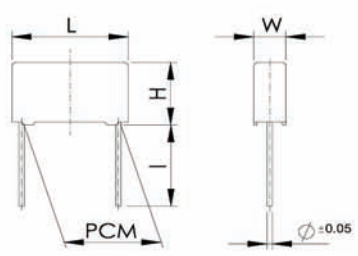
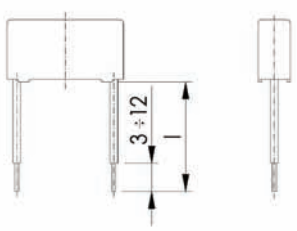
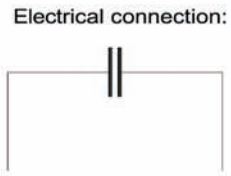
Capacitors

Type KNB1560 Type KNB1562 Type KNB1563	300 V AC + 125 °C	class **X2**



TECHNICAL DATA

Construction:	polypropylene film, metallized
Rated voltage:	300 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0.1 µF and ± 10 % for C > 0.1 µF
Climatic category:	40/125/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 °C to + 125 °C
Test voltage:	2200 V D.C., 1 s for C ≤ 1µF 1900 V D.C., 1 s for C > 1µF
Max. pulse rise time du/dt, at 425 V D.C.:	500 V/µs for PCM C > 1µF 400 V/µs for PCM = 15 mm C ≤ 0,022 µF 250 V/µs for PCM = 15 mm C ≤ 0,022 µF 150 V/µs for PCM = 22.5 mm 100 V/µs for PCM = 27.5 mm pulse test according to IEC 60384-14
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	R_i ≥ 15000 MΩ for C ≤ 0.33 µF Ri × C_n ≥ 5000 s for C > 0.33 µF
Dielectric loss tanδ at f = 1 kHz and 20 °C:	≤ 1 × 10^{-3}
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Self inductance:	approx. 10 nH/cm of capacitor length and terminals
Complies to:	IEC 60384-14, EN 60384-14, UL 1283, UL 1414, CSA C22.2 No.1, GB/T 14472-1998

KNB1560	KNB1562, KNB1563	Electrical connection
		

Available in custom design version. Recommended for serial connection.

Casing: thermoplastic. (PP or on request PBT HF) sealed with synthetical resin	Thermoplastic material and synthetical resin are self-extinguishing according to UL 94. class V-0.

Terminals		
Type	Terminal length	Type of terminals
KNB1560	$3^{\pm0.5}$, $4^{\pm0.5}$, 6^{-1}, 9^{+1},$15^{\pm2}$, $20^{\pm2}$, 25^{+5}, $30^{\pm5}$, $50^{\pm5}$ mm, other on request	Tinned copper wire
KNB1562	20 to 200 mm	Insulated stranded wire 0.5 mm^2
KNB1563	20 to 200 mm	Insulated solid wire ø 0.8 mm End terminals on request

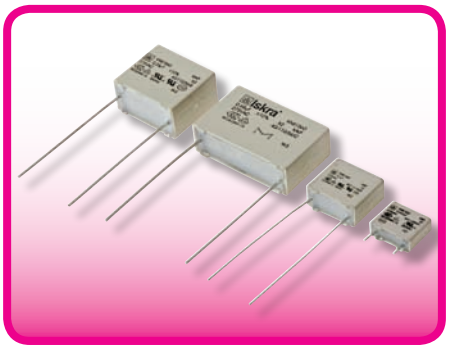
Standard values KNB1560, KNB1562, KNB1563, 300 V AC, class X2, + 125 °C

Capacitance	Dimensions						For capacitors with insulated leads on request		
C (µF)	L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)	ø (mm)	IEC 60384-14 300 V AC	UL 1283 310 V AC	UL 1414 250 V AC	GB/T14472 300 V AC
0.01	13	9	4	10	0.6	▪	▪	▪	▪
0.015	13	9	4	10	0.6	▪	▪	▪	▪
0.022	13	9	4	10	0.6	▪	▪	▪	▪
0.033	13	9	4	10	0.6	▪	▪	▪	▪
0.033	13	10.5	5	10	0.6	▪	▪	▪	▪
0.047	13	10.5	5	10	0.6	▪	▪	▪	▪
0.047	13	11.5	6	10	0.6	▪	▪	▪	▪
0.068	13	11	5.5	10	0.6	▪	▪	▪	▪
0.1	13	12	6	10	0.6	▪	▪	▪	▪
0.01	18	11	5	15	0.8	▪	▪	▪	▪
0.015	18	11	5	15	0.8	▪	▪	▪	▪
0.022	18	11	5	15	0.8	▪	▪	▪	▪
0.033	18	11	5	15	0.8	▪	▪	▪	▪
0.047	18	11	5	15	0.8	▪	▪	▪	▪
0.068	18	11	5	15	0.8	▪	▪	▪	▪
0.1	18	11	5.5	15	0.8	▪	▪	▪	▪
0.12	18	12	6	15	0.8	▪	▪	▪	▪
0.15	18	13	7	15	0.8	▪	▪	▪	▪
0.22	18	14.5	8.2	15	0.8	▪	▪	▪	▪
0.27	18	14.5	9	15	0.8	▪	▪	▪	▪
0.33	18	16	9.5	15	0.8	▪	▪	▪	▪
0.33	18	19.5	7.5	15	0.8	▪	▪	▪	▪
0.47	18	18.5	11	15	0.8	▪	▪	▪	▪
0.56	18	20	12.5	15	0.8	▪	▪	▪	▪
0.15	26.5	14	6	22.5	0.8	▪	▪	▪	▪
0.22	26.5	14	6	22.5	0.8	▪	▪	▪	▪
0.27	26.5	15	6	22.5	0.8	▪	▪	▪	▪
0.33	26.5	16	7	22.5	0.8	▪	▪	▪	▪
0.47	26.5	17	8.5	22.5	0.8	▪	▪	▪	▪
0.56	26.5	18.5	9	22.5	0.8	▪	▪	▪	▪
0.68	26.5	18.5	10	22.5	0.8	▪	▪	▪	▪
1	26.5	21.5	12.5	22.5	0.8	▪	▪	▪	▪
0.47	31.5	16	7.5	27.5	0.8	▪	▪	▪	▪
0.56	32	17	9	27.5	0.8	▪	▪	▪	▪
0.68	32	17	9	27.5	0.8	▪	▪	▪	▪
1	32	20	11	27.5	0.8	▪	▪	▪	▪
1.5	31.5	23.5	14	27.5	0.8	▪	▪		▪
2.2	31.5	26.5	17	27.5	0.8	▪	▪		▪

Approvals in use = ▪
Approvals in pending = o

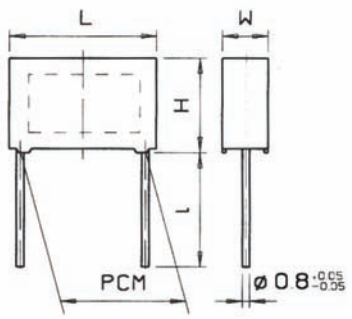
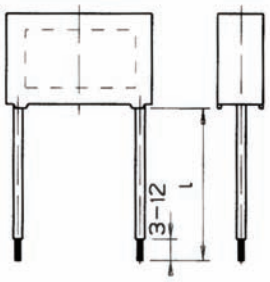
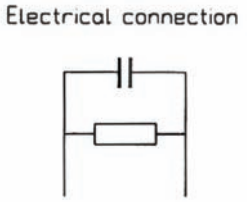
Capacitors with discharge resistor

Type KNB1560 Type KNB1562 Type KNB1563	275 V AC	class **X2**



TECHNICAL DATA

Construction: - capacitor: - resistor:	polypropylene film, metallized metaloxide film
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0.1 µF and ± 10 % for C > 0.1 µF
Resistance tolerance:	± 5 %
Resistance power:	0.6 W
Climatic category:	40/110/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 °C to + 110 °C
Test voltage:	1700 V D.C., 1 s
Max. pulse rise time du/dt, at 390 V D.C.:	250 V/µs for PCM = 15 mm 150 V/µs for PCM = 22.5 mm pulse test according to IEC 60384-14
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Self inductance:	approx. 10 nH/cm of capacitor length and terminals
Complies to:	IEC 60384-14, EN 60384-14, UL 1283, UL 1414, CSA C22.2 No.1, GB/T 14472-1998

KNB1560	KNB1562, KNB1563	Electrical connection
		

Available in custom design version. Recommended for serial connection.

Casing: thermoplastic. (PP or on request PBT HF) sealed with synthetical resin	Thermoplastic material and synthetical resin are self-extinguishing according to UL 94. class V-0.	
Terminals		
Type	Terminal length	Type of terminals
KNB1560	$3^{\pm0.5}$, $4^{\pm0.5}$, 6^{-1}, 9^{+1},$15^{\pm2}$, $20^{\pm2}$, $25^{\pm5}$, $30^{\pm5}$, $50^{\pm5}$ mm, other on request	Tinned copper wire
KNB1562	20 to 200 mm	Insulated stranded wire 0.5 mm^2
KNB1563	20 to 200 mm	Insulated solid wire ø 0.8 mm End terminals on request

Standard values KNB1560, KNB1562, KNB1563, 275 V AC, class X2, with discharge resistor

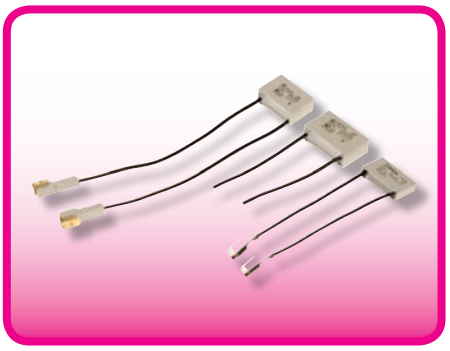
Capacitance C (µF)	Resistance R (kΩ)	Dimensions				IEC 60384-14 275 V AC	For capacitors with insulated leads on request		
		L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)		UL 1283 275 V AC	UL 1414 250 V AC	GB/T14472 275 V AC
0.047		18	12	6	15	▪	▪	▪	▪
0.068		18	12	6	15	▪	▪	▪	▪
0.1	470	18	13	7	15	▪	▪	▪	▪
0.15	to	18	14.5	8.2	15	▪	▪	▪	▪
0.22	2700	18	16.5	8.5	15	▪	▪	▪	▪
0.33		18	18.5	11	15	▪	▪		▪
0.33		26.5	16.5	8.5	22.5	▪	▪	▪	▪
0.47		26.5	18.5	9	22.5	▪	▪	▪	▪

Resistance values according to IEC 60063 range E12.

Approvals in use = ▪
Approvals in pending = o

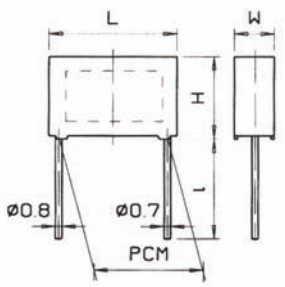
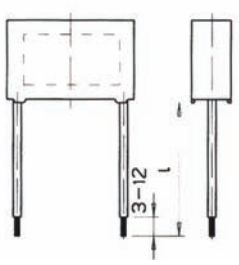
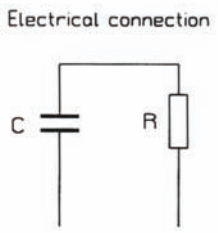
Capacitors

Type KNR1530 Type KNR1532 Type KNR1533	275 V AC	class **X2** **RC** units



TECHNICAL DATA

Construction: - capacitor: - resistor:	polypropylene film, metallized carbon film or wire-wound
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0.1 µF and ± 10 % for C > 0.1 µF other on request
Climatic category:	40/085/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 °C to + 85 °C
Test voltage:	1700 V D.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t =1 min:	R_i ≥ 15000 MΩ for C ≤ 0.33 µF $R_i \times C_n$ ≥ 5000 s for C > 0.33 µF
Resistance tolerance:	± 10 %
Resistor power:	0,5 W
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Complies to:	IEC 60384-14, EN 60384-14

KNR1530	KNR1532, KNR1533	Electrical connection
		

Casing: thermoplastic. sealed with synthetical resin	Thermoplastic material is self-extinguishing according to UL 94. class V-0.	
Terminals		
Type	Terminal length	Type of terminals
KNR1530	$3^{+0.5}$, $4^{\pm0.5}$, 6^{-1}, 9^{+1},$15^{\pm2}$, $20^{\pm2}$, $25^{\pm5}$, $30^{\pm5}$, $50^{\pm5}$ mm, other on request	Tinned copper wire
KNR1532	20 to 200 mm	Insulated stranded wire 0.5 mm^2
KNR1533	20 to 200 mm	Insulated solid wire ø 0.8 mm End terminals on request

Standard values KNR1530, KNR1532, KNR1533, 275 V AC, class X2

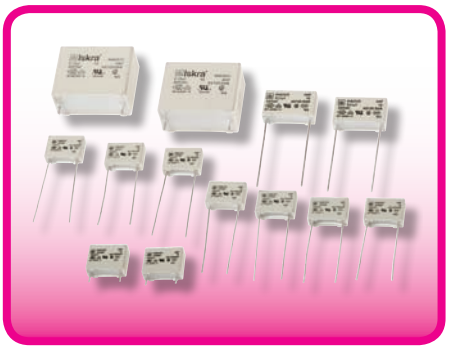
Capacitance C (µF)	Resistance R (Ω)	Dimensions				IEC 60384-14
		L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)	
0.01		21	16.5	8	17.5	▪
0.01		27	15	6	22.5	▪
0.015		21	16.5	8	17.5	▪
0.015		27	15	6	22.5	▪
0.022		21	16.5	8	17.5	▪
0.022		27	15	6	22.5	▪
0.033		21	16.5	8	17.5	▪
0.033		27	15	6	22.5	▪
0.047	2.2	21	16.5	8	17.5	▪
0.047	to	27	15	6	22.5	▪
0.068	470	21	16.5	8	17.5	▪
0.068		27	15	6	22.5	▪
0.1		21	16.5	8	17.5	▪
0.1		27	16.5	7	22.5	▪
0.15		27	17	8.5	22.5	▪
0.15		30	18	8	25	▪
0.22		27	19	10.5	22.5	▪
0.22		30	18	8	25	▪
0.27	2.2 to 330	32	19	10	27.5	▪
0.33	2.2 to 220	32	19	10	27.5	▪
0.47		32	20	11	27.5	▪

Resistance values according to IEC 60063 range E12.

Approvals in use = ▪
Approvals in pending = o

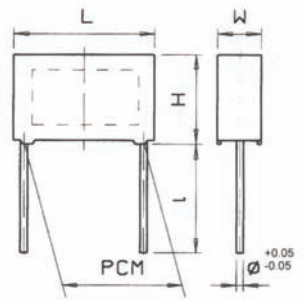
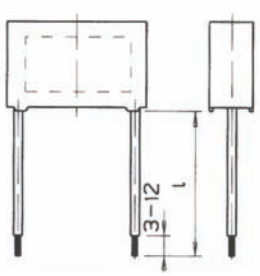
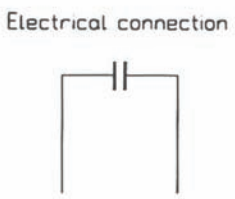
Capacitors

Type KNB2520 Type KNB2522 Type KNB2523	250 V AC 300 V AC	class **Y2**



TECHNICAL DATA

Construction:	polypropylene film, metallized
Rated voltage:	250 V A.C., 300 V A.C.
Capacitance tolerance:	± 20 %, ± 10 %
Climatic category:	40/100/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 °C to + 100 °C
Test voltage:	4000 V D.C., 1 s
Max. pulse rise time du/dt, at 425 V D.C.:	3000 V/µs for 1000 pF 2500 V/µs for 1500 pF 2000 V/µs for 2200 pF up to 6800 pF PCM10 1000 V/µs for PCM ≥ 15 according to IEC 60384-14
Insulation resistance at 20 °C, U_m = 100 V D.C., t =1 min:	R_i ≥ 15000 MΩ
Dielectric loss tanδ at f = 1 kHz and 20 °C:	≤ 15 × 10^{-4}
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Self inductance:	approx. 10nH/cm of capacitors lenght and terminals
Complies to:	IEC 60384-14, EN 60384-14, UL 1283, UL 1414, CSA C22.2 No.1, CSA E384-14, CSA C22.2 No.8, GB/T 14472-1998

KNB2520	KNB2522, KNB2523	Electrical connection
		

Casing: thermoplastic, (PP or on request PBT HF) sealed with synthetical resin	Thermoplastic material and synthetical resin are self-extinguishing according to UL 94, class V-0.

Terminals		
Type	Terminal length	Type of terminals
KNB2520	$3^{\pm0.5}$, $4^{\pm0.5}$, 6^{-1}, 9^{+1}, $15^{\pm2}$, $20^{\pm2}$, $25^{\pm5}$, $30^{\pm5}$, $50^{\pm5}$ mm, other on request	Tinned copper wire
KNB2522	20 to 200 mm	Insulated stranded wire 0.5 mm^2
KNB2523	20 to 200 mm	Insulated solid wire ø 0.8 mm End terminals on request

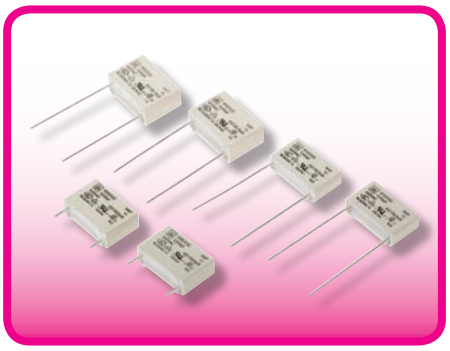
Standard values KNB2520, KNB2522, KNB2523, 250 V AC, 300 V AC, class Y2

Capacitance C (pF)	Dimensions					IEC 60384-14 300 V AC	For capacitors with insulated leads on request					
	L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)	ø (mm)		UL 1283 300 V AC	UL 1414 250 V AC	C22.2 No.8 275 V AC	GB/T14472 250 V AC	C22.2 No.1 125 V/250 V	E384-14-95 300 V AC
1000	13	9.5	4.3	10	0.6	▪	▪	▪	▪	▪	▪	▪
1500	13	9.5	4.3	10	0.6	▪	▪	▪	▪	▪	▪	▪
2200	13	9.5	4.3	10	0.6	▪	▪	▪	▪	▪	▪	▪
2500	13	9.5	4.3	10	0.6	▪						▪
2700	13	9.5	4.3	10	0.6	▪	▪	▪	▪	▪	▪	▪
2800	13	9.5	4.3	10	0.6	▪	▪	▪	▪	▪	▪	▪
3300	13	10.5	5	10	0.6	▪	▪	▪	▪	▪	▪	▪
4700	13	11.5	6	10	0.6	▪	▪	▪	▪	▪	▪	▪
5000	13	11.5	6	10	0.6	▪	▪	▪	▪	▪	▪	▪
6800	13	12	6	10	0.6	▪	▪	▪	▪		▪	▪
6800	18	11	5.5	15	0.8	▪	▪	▪	▪	▪	▪	▪
10000	18	11	5.5	15	0.8	▪	▪	▪	▪	▪	▪	▪
15000	18	12	6	15	0.8	▪	▪	▪	▪	▪	▪	▪
22000	18	13	7	15	0.8	▪	▪	▪	▪	▪	▪	▪
25000	18	13.5	7.5	15	0.8	▪	▪	▪	▪			▪
27000	18	13.5	7.5	15	0.8	▪	▪	▪	▪			▪
33000	18	14.5	9	15	0.8	▪	▪	▪	▪			▪
39000	18	18.5	9	15	0.8	▪	▪	▪	▪			▪
47000	18	18.5	9	15	0.8	▪	▪	▪	▪			▪
33000	26.5	14	6	22.5	0.8	▪	▪	▪	▪			▪
39000	26.5	15	6	22.5	0.8	▪	▪	▪	▪			▪
47000	26.5	16	7	22.5	0.8	▪	▪	▪	▪			▪
56000	26.5	16.5	8.5	22.5	0.8	▪	▪	▪	▪			▪
68000	26.5	17	8.5	22.5	0.8	▪	▪	▪	▪			▪
100000	27	19	10.5	22.5	0.8	▪	▪	▪	▪			▪
120000	26.5	21.5	11	22.5	0.8	▪	▪	▪	▪			▪
150000	26.5	21.5	18.5	22.5	0.8	▪	▪	▪	▪			▪

Approvals in use = ▪
Approvals in pending = o

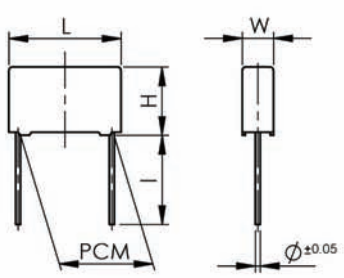
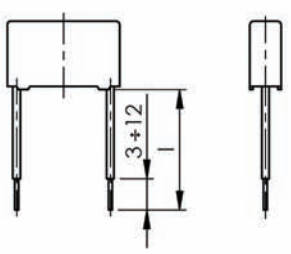
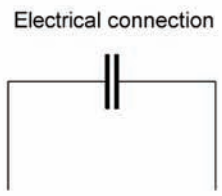
Capacitors

Type KNB2530 Type KNB2532 Type KNB2533	440 V AC	class **Y1**



TECHNICAL DATA

Construction:	polypropylene film, metallized
Rated voltage:	440 V A.C.
Capacitance tolerance:	± 20 %, ± 10 %
Climatic category:	40/100/56 according to IEC 60068-1
Passive flammability:	category B according to IEC 60384-14
Temperature range:	- 40 °C to + 100 °C
Test voltage:	4000 V A.C., 2 s
Max. pulse rise time du/dt, at 622 V D.C.:	6000 V/µs for PCM = 15 mm 3500 V/µs for PCM = 22,5 mm according to IEC 60384-14
Insulation resistance at 20 °C, U_m = 100 V D.C., t =1 min:	$R_i \geq 15000$ MΩ
Dielectric loss tanδ at f = 1 kHz and 20 °C:	$\leq 1 \times 10^{-3}$
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Self inductance:	approx. 10 nH/cm of capacitor length and terminals
Complies to:	IEC 60384-14, EN 60384-14 UL 1283, UL 1414, CSA C22.2 No.8, CSA C22.2 No.1
Permissible continuous A.C. voltage:	750 V 50/60Hz
Permissible continuous D.C. voltage:	3000 V

KNB2530	KNB2532, KNB2533	Electrical connection
		

Casing: thermoplastic. (PP or on request PBT HF) sealed with synthetical resin	Thermoplastic material and synthetical resin are self-extinguishing according to UL 94. class V-0.	
Terminals		
Type	Terminal length	Type of terminals
KNB 2530	$3^{\pm 0.5}$, $4^{\pm 0.5}$, 6^{-1}, 9^{+1},$15^{\pm 2}$, $20^{\pm 2}$, $25^{\pm 5}$, $30^{\pm 5}$, $50^{\pm 5}$ mm, other on request	Tinned copper wire
KNB 2532	20 to 200 mm	Insulated stranded wire 0.5 mm^2
KNB 2533	20 to 200 mm	Insulated solid wire ø 0.8 mm End terminals on request

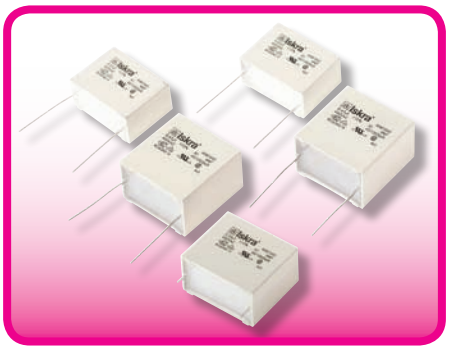
Standard values KNB2530, KNB2532, KNB2533, 440 V AC, class Y1

Capacitance C (pF)	Dimensions					IEC 60384-14 440 V AC	UL 1414 C22.2 No.1 250 V AC	UL 1283 C22.2 No.8 440 V AC
	L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)	ø (mm)			
470	18	11	5	15	0.8	▪	▪	▪
680	18	11	5	15	0.8	▪	▪	▪
1000	18	11	5	15	0.8	▪	▪	▪
1500	18	11	5	15	0.8	▪	▪	▪
2200	18	12	6	15	0.8	▪	▪	▪
2700	18	13	7	15	0.8	▪	▪	▪
2800	18	13	7	15	0.8	▪	▪	▪
3300	18	13	7	15	0.8	▪	▪	▪
4700	18	14.5	8.2	15	0.8	▪	▪	▪
5000	18	14.5	8.2	15	0.8	▪	▪	▪
5600	18	16.5	8.5	15	0.8	▪	▪	▪
6800	18	18.5	9	15	0.8	▪	▪	▪
10000	18	20	12.5	15	0.8	▪	▪	▪
5600	26.5	14	6	22.5	0.8	▪	▪	▪
6800	26.5	16	7	22.5	0.8	▪	▪	▪
10000	26.5	16.5	8.5	22.5	0.8	▪	▪	▪
15000	26.5	18.5	10	22.5	0.8	▪	▪	▪
22000	26.5	21.5	12.5	22.5	0.8	▪	▪	▪

Approvals in use = ▪
Approvals in pending = o

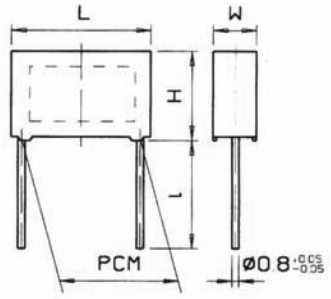
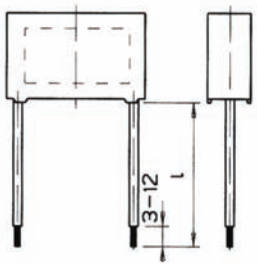
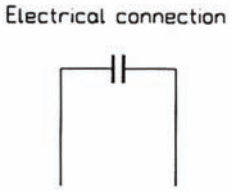
Capacitors

Type KNB1540 Type KNB1542 Type KNB1543	440 V AC	class **X1**



TECHNICAL DATA

Construction:	polypropylene film, metallized
Rated voltage:	440 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0.1 µF ± 10 % for C > 0.1 µF
Climatic category:	40/100/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 °C to + 100 °C
Test voltage:	3500 V D.C., 1 s
Max. pulse rise time du/dt, at 622 V D.C.:	3000 V/µs for PCM = 15 mm 1500 V/µs for PCM = 22.5 mm 1100 V/µs for PCM = 27.5 mm according to IEC 60384-14
Insulation resistance at 20 °C, U_m = 100 V D.C., t =1 min:	R_i ≥ 15000 MΩ for C ≤ 0,33 µF Ri × C_n ≥ 5000 s for C > 0,33 µF
Dielectric loss tanδ at f = 1 kHz and 20 °C:	≤ 5 × 10^{-4}
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Self inductance:	approx. 10 nH/cm of capacitor length and terminals
Complies to:	IEC 60384-14, EN 60384-14, UL 1283, UL 1414, CSA C22.2 No.1

KNB1540	KNB1542, KNB1543	Electrical connection
		

Casing: thermoplastic. (PP or on request PBT HF) sealed with synthetical resin	Thermoplastic material and synthetical resin are self-extinguishing according to UL 94. class V-0.

Terminals		
Type	Terminal length	Type of terminals
KNB1540	$3^{\pm0.5}$, $4^{\pm0.5}$, 6^{-1}, 9^{+1}, $15^{\pm2}$, $20^{\pm2}$, $25^{\pm5}$, $30^{\pm5}$, $50^{\pm5}$ mm, other on request	Tinned copper wire
KNB1542	20 to 200 mm	Insulated stranded wire 0.5 mm^2
KNB1543	20 to 200 mm	Insulated solid wire ø 0.8 mm End terminals on request

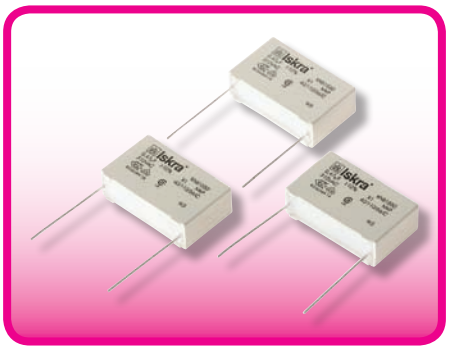
Standard values KNB1540, KNB1542, KNB1543, 440 V AC, class X1

Capacitance C (µF)	Dimensions					For capacitors with insulated leads on request		
	L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)	IEC 60384-14 440 V AC	UL 1283 440 V AC	UL 1414 250 V AC	C22.2 No.1 250 V AC
0.0022	18	11	5.5	15	▪	▪	▪	▪
0.0033	18	11	5.5	15	▪	▪	▪	▪
0.0047	18	11	5.5	15	▪	▪	▪	▪
0.0068	18	11	5.5	15	▪	▪	▪	▪
0.01	18	12	6	15	▪	▪	▪	▪
0.015	18	13	7	15	▪	▪	▪	▪
0.022	18	14.5	8.5	15	▪	▪	▪	▪
0.033	18	18.5	9	15	▪	▪	▪	▪
0.047	18	20	12.5	15	▪	▪	▪	▪
0.015	27	15	6.5	22.5	▪	▪	▪	▪
0.022	27	15	6.5	22.5	▪	▪	▪	▪
0.033	27	15	6.5	22.5	▪	▪	▪	▪
0.047	27	16.5	7	22.5	▪	▪	▪	▪
0.068	27	18.5	8.5	22.5	▪	▪	▪	▪
0.1	27	20	10.5	22.5	▪	▪	▪	▪
0.15	27	23	14	22.5	▪	▪	▪	▪
0.22	27	25	16	22.5	▪	▪	▪	▪
0.1	32	19	10	27.5	▪	▪	▪	▪
0.15	32	20	11	27.5	▪	▪	▪	▪
0.22	32	23.5	14	27.5	▪	▪	▪	▪
0.27	32	24.5	15	27.5	▪	▪	▪	▪
0.33	32	28	18	27.5	▪	▪	▪	▪
0.47	32	33	20	27.5	▪	▪	▪	▪
0.68	32	39	24	27.5				

Approvals in use = ▪
Approvals in pending = o

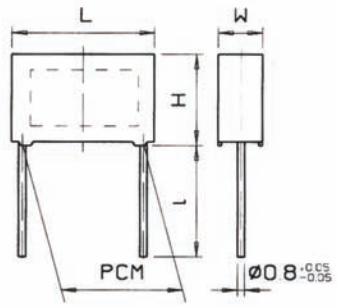
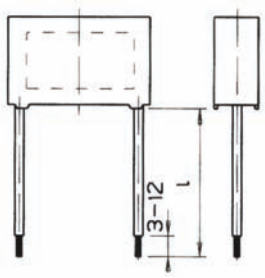
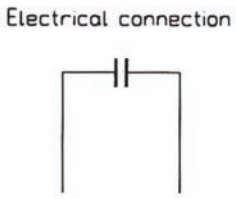
Capacitors

Type KNB1550 Type KNB1552 Type KNB1553	310 V AC 110 °C	class **X1**



TECHNICAL DATA

Construction:	polypropylene film, metallized
Rated voltage:	310 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0.1 µF ± 10 % for C > 0.1 µF
Climatic category:	40/110/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 °C to + 110 °C
Test voltage:	3000 V D.C., 1s for C < 1 µF 2800 V D.C., 1s for C ≥ 1 µF
Max. pulse rise time du/dt, at 438 V D.C.:	600 V/µs for PCM = 10 mm 500 V/µs for PCM = 15 mm 400 V/µs for PCM = 22.5 mm 200 V/µs for PCM = 27.5 mm pulse test according to IEC 60384-14
Insulation resistance at 20 °C, U_m = 100 V D.C., t =1 min:	R_i ≥ 15000 MΩ for C ≤ 0.33 µF Ri × C_n ≥ 5000 s for C > 0.33 µF
Dielectric loss tanδ at f = 1 kHz and 20 °C:	≤ 1 × 10^{-3}
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Self inductance:	approx. 10 nH/cm of capacitor length and terminals
Complies to:	IEC 60384-14, EN 60384-14, UL 1283, CSA E384-14

KNB1550	KNB1552, KNB1553	Electrical connection
		

Casing: thermoplastic. (PP or on request PBT HF) sealed with synthetical resin	Thermoplastic material and synthetical resin are self-extinguishing according to UL 94. class V-0.

Terminals		
Type	Terminal length	Type of terminals
KNB1550	$4^{\pm 0.5}$, 6^{-1}, 25^{+5}, 30^{+5} mm, other on request	Tinned copper wire
KNB1552	20 to 200 mm	Insulated stranded wire 0.5 mm²
KNB1553	20 to 200 mm	Insulated solid wire ø 0.8 mm End terminals on request

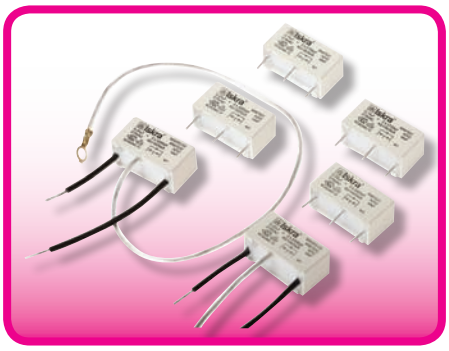
Standard values KNB1550, KNB1552, KNB1553, 310 V AC, +110 °C, class X1

Capacitance C (µF)	Dimensions						For capacitors with insulated leads on request			
	L_{max} (mm)	H_{max} (mm)	W_{max} (mm)	PCM (mm)	ø (mm)	IEC 60384-14 310 V AC	UL 1283 310 V AC	UL 1414 250 V AC	E384-14 310 V AC	GB/T14472 310 V AC
0.01	13	9.5	4.3	10	0.6	▪	▪	o	o	o
0.015	13	10.5	5	10	0.6	▪	▪	o	o	o
0.022	13	11.5	6	10	0.6	▪	▪	o	o	o
0.033	13	13.5	6	10	0.6	▪	▪	o	o	o
0.01	18	11	5	15	0.8	▪	▪	o	o	o
0.015	18	11	5	15	0.8	▪	▪	o	o	o
0.022	18	11	5	15	0.8	▪	▪	o	o	o
0.033	18	11	5	15	0.8	▪	▪	o	o	o
0.047	18	12	6	15	0.8	▪	▪	o	o	o
0.068	18	13	7	15	0.8	▪	▪	o	o	o
0.1	18	13.5	7.5	15	0.8	▪	▪	o	o	o
0.15	18	16	9.5	15	0.8	▪	▪	o	o	o
0.22	18	18.5	11	15	0.8	▪	▪	o	o	o
0.1	26.5	14	6	22.5	0.8	▪	▪	o	o	o
0.15	26.5	14	6	22.5	0.8	▪	▪	o	o	o
0.22	26.5	16.4	8.5	22.5	0.8	▪	▪	o	o	o
0.33	26.5	18.5	10	22.5	0.8	▪	▪	o	o	o
0.47	26.5	21.5	12.5	22.5	0.8	▪	▪	o	o	o
0.33	31.5	17	9	27.5	0.8	▪	▪	o	o	o
0.47	31.5	19	10	27.5	0.8	▪	▪	o	o	o
0.68	31.5	22	13	27.5	0.8	▪	▪	o	o	o
1	32	24.5	15	27.5	0.8	▪	▪	o	o	o
1.5	31.5	32	18	27.5	0.8	▪	▪	o	o	o
2.2	31.5	35.5	24	27.5	0.8	▪	▪		o	o

Approvals in use = ▪
Approvals in pending = o

Capacitors

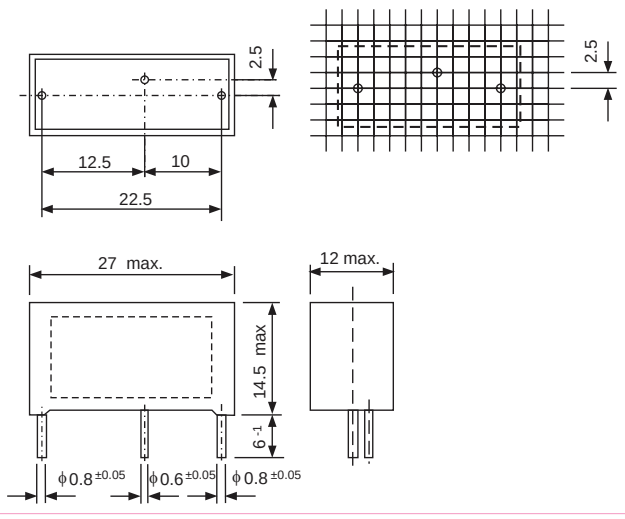
Type KNB753x	275 V AC	class **X2Y2**



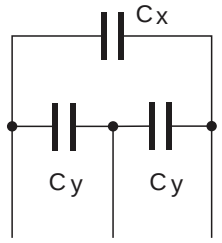
TECHNICAL DATA

Construction:	polypropylene film, metallized
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 % (± 10 % on request)
Climatic category:	40/100/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 °C to + 100 °C
Max. pulse rise time du/dt, at 438 V D.C.:	100 V/µs at 390 V D.C. according to IEC 60384-14
Test voltage:	X2 - capacitors 1700 V D.C., 2 s Y2 - capacitors 2700 V D.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t =1 min:	$R_i \geq 15000$ MΩ
Dielectric loss tanδ at f = 1 kHz and 20 °C:	≤ 20 × 10^{-4}
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 °C
Complies to:	IEC 60384-14

KNB753x



Electrical connection



Standard values KNB753x, 275 V AC, class X2Y2

Capacitance C_x (µF)	Capacitance C_y (pF)
0.1	2 × 1000
0.1	2 × 1500
0.1	2 × 2200
0.1	2 × 3300
0.1	2 × 4700
0.15	2 × 1000
0.15	2 × 1500
0.15	2 × 2200
*0.15	2 × 2700
0.15	2 × 3300
*0.15	2 × 4700
0.22	2 × 1000
0.22	2 × 1500
0.22	2 × 2200
*0.22	2 × 3300
0.22	2 × 4700
0.25	2 × 1000
0.25	2 × 1500
0.25	2 × 2200
0.25	2 × 3300
0.25	2 × 4700

Approval only for values marked with *

IEC 60384-14

Casing: thermoplastic, sealed in synthetical resin	Thermoplastic material is self-extinguishing according to UL 94, class V-0.
Terminals	
Type	Type of terminals
KNB753x	Solid copper tinned wire or insulated stranded wire

Capacitors

Type KPB23xx	two-pole	class **X1**

Last two numbers in the type designation (xx = 00 to 49) indicate the type of terminals and connectors.

TECHNICAL DATA

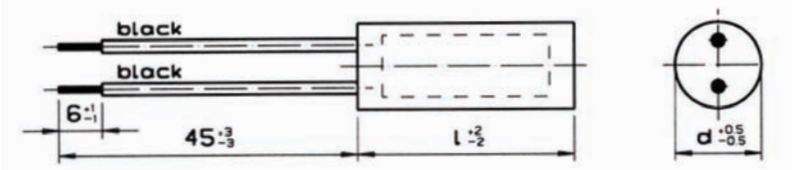
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category:	25/100/21 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 25 °C to + 100 °C
Test voltage:	1790 V D.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	R_i ≥ 6000 MΩ for C ≤ 0.33 µF $R_i \times C_n$ ≥ 2000 s for C > 0.33 µF
Complies to:	IEC 60384-14, EN 60384-14

Standard values KPB23xx

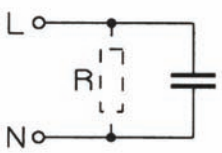
Capacitance C_{x1} (µF)	Dimensions d × l (mm)	IEC 60384-14 (25/100/21)
0.01	8 × 30	▪
0.022	9.5 × 30	▪
0.027	9.5 × 30	▪
0.033	9.5 × 30	▪
0.047	11 × 30	▪
0.068	12 × 30	▪
0.1	14 × 35	▪
0.15	16 × 35	▪
0.22	18 × 35	▪
0.22	18 × 40	▪
0.27	20 × 35	▪
0.27	20 × 40	▪
0.33	20 × 40	▪
0.47	25 × 40	▪

Other values upon request

KPB23xx



Electrical connection

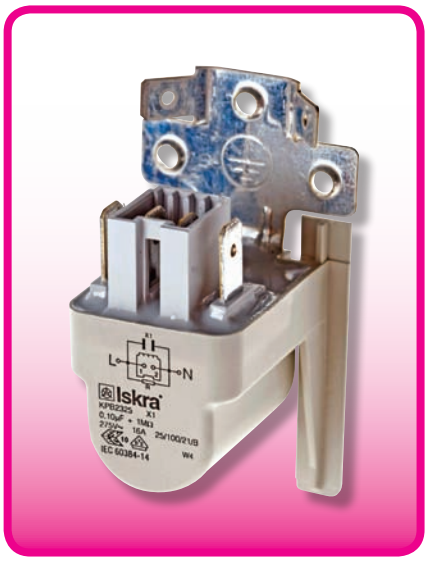


R = 470 kΩ - 2,7 MΩ on request

Casing: thermoplastic, sealed with synthetical resin, flame retardant	Wire dimensions on drawing correspond with type KPB2300 - standard version.
Terminals	
Type	Type of terminals
KPB23xx	insulated stranded wire 0.5 mm², or insulated solid wire ø 0.8 mm Non-insulated part is soldered. Wires can be equipped with connection terminals on request.

Capacitors

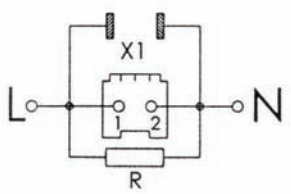
Type KPB2325	four-pole	class **X1**



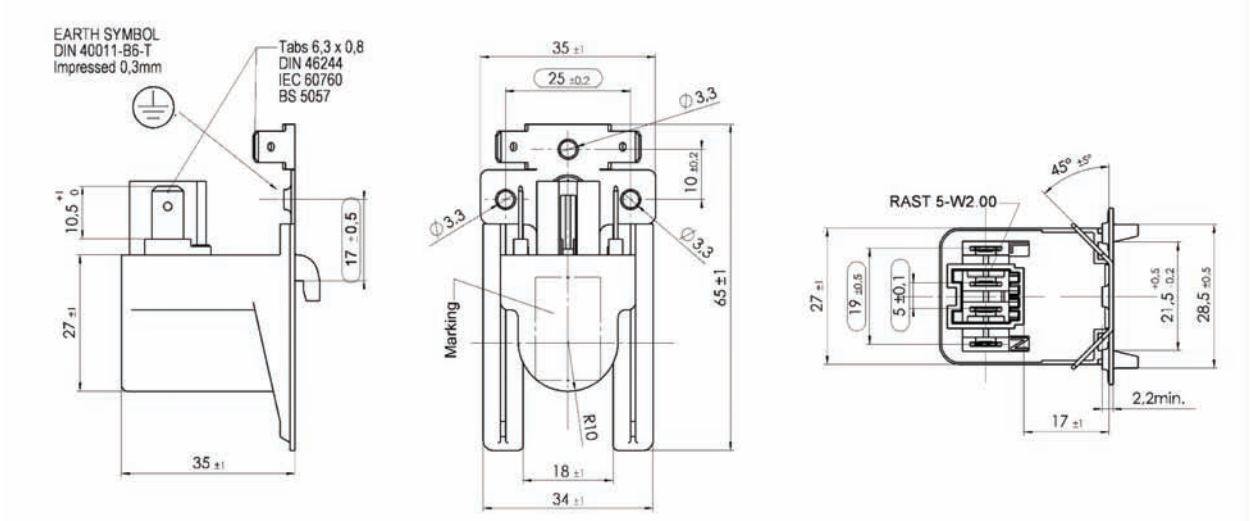
TECHNICAL DATA

Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category + letter indicating passive flammability category:	25/100/21B
Temperature range:	- 25 °C to + 100 °C
Test voltage:	X1-capacitor 1790 V D.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	R_i ≥ 6000 MΩ for C ≤ 0.33 µF
Casing:	Thermoplastic can, sealed with synthetical resin, flame retardant
Terminals:	fast-on connectors 6.3 × 0.8 CuZn/Sn
Complies to:	IEC 60384-14, EN 60384-14

Electrical connection



KPB2325



Standard value KPB23xx

Capacitance C_{x1} (µF)	Discharge resistor R (MΩ)
0.1	1

Other values upon request

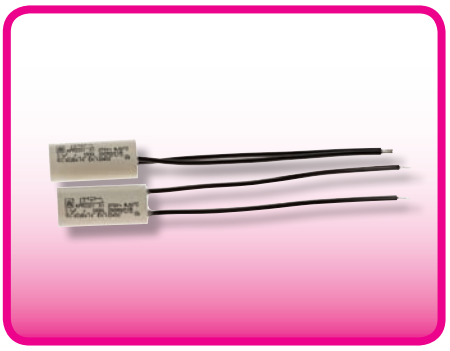
Approval:

IEC 60384-14

Capacitors

Type KPR23xx	two-pole	class **X1** **RC** unit

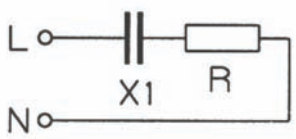
Last two numbers in the type designation (xx = 00 to 49) indicate the type of terminals and connectors.



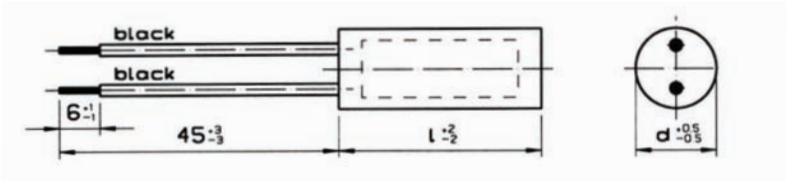
TECHNICAL DATA

Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category:	25/085/21 according to IEC 60068-1
Passive flammabilily:	according to IEC 60384-14
Temperature range:	- 25 °C to + 85 °C
Test voltage:	1790 V D.C., 2 s
Complies to:	IEC 60384-14, EN 60384-14

Electrical connection



KPR23xx



Casing: thermoplastic, sealed with synthetical resin, flame retardant	Wire dimensions on drawing correspond with type KPR2300 - standard version.
Terminals	
Type	Type of terminals
KPB23xx	Insulated stranded wire 0.5 mm², or insulated solid wire ø 0.8 mm Non-insulated part is soldered. Wires can be equipped with connection terminals on request.

Standard values KPR23xx

Capacitance C_{X1} (µF)	Resistor R (MΩ)	Dimensions d × l (mm)
0.01	50	12 × 30
0.1	50	16 × 35

Other values upon request

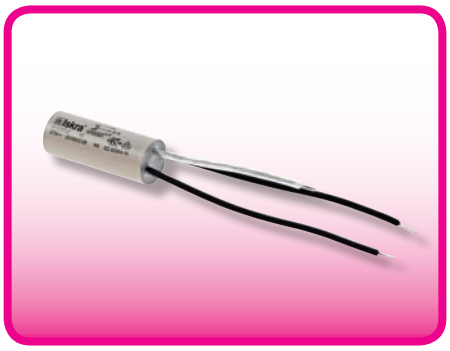
Approval:

IEC 60384-14

Capacitors

Type KPB53xx	two-pole	class **Y2**

Last two numbers in the type designation (xx = 00 to 49) indicate the type of terminals and connectors.



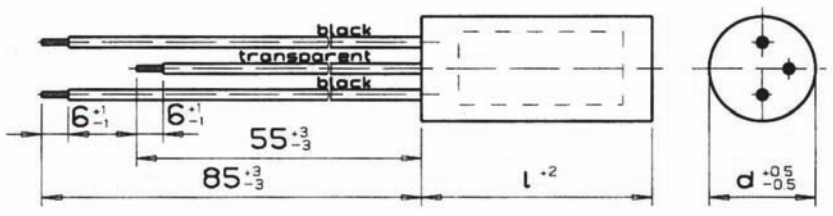
TECHNICAL DATA

Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category:	25/085/21 according to IEC 60068-1
Temperature range:	- 25 °C to + 85 °C
Test voltage:	Y2 - capacitor 2050 V A.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	R_i ≥ 6000 MΩ for C ≤ 0.33 µF (R_i ≥ 2 × 105 MΩ)
Complies to:	IEC 60384-14, EN 132400

Electrical connection

R = 470 kΩ ÷ 2.7 MΩ on request

KPB53xx



Casing: thermoplastic, sealed with synthetical resin, flame retardant	Wire dimensions on drawing correspond with type KPB5300 - standard version.
Terminals	
Type	Type of terminals
KPB53xx	Insulated stranded wire 0.5 mm², or insulated solid wire ø 0.8 mm. Non-insulated part is soldered. Wires can be equipped with connection terminals on request.

Standard values KPB53xx

Capacitance class Y2	Dimensions	
(µF)	D (mm)	L (mm)
2 × 0.0010	11	30
2 × 0.0022	11	30
2 × 0.0025	11	30
2 × 0.0027	11	30
2 × 0.0033	11	30
2 × 0.0047	11	30
2 × 0.0050	11	30
2 × 0.0068	12	30
2 × 0.010	12	30
2 × 0.015	12	30

Capacitance class Y2	Dimensions	
(µF)	D (mm)	L (mm)
2 × 0.010	12	35
2 × 0.015	12	35
2 × 0.022	14	35
2 × 0.027	14	35
2 × 0.033	16	35
2 × 0.047	18	35
2 × 0.068	20	35

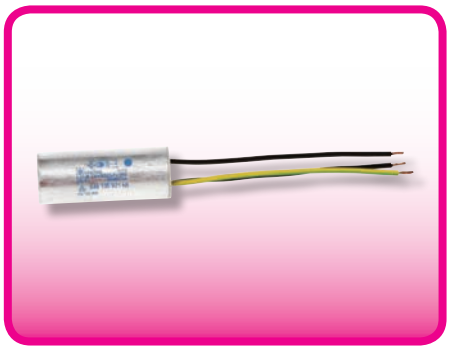
Approval:

IEC 60384-14

Capacitors

Type KPB70xx	two-pole	class **X1Y2**

Last two numbers in the type designation (xx = 00 to 49) indicate the type of terminals and connectors.

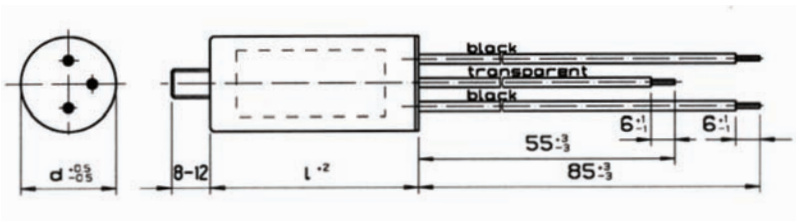


TECHNICAL DATA

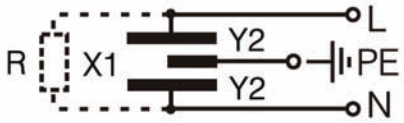
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C. (X1) 250V A.C. (Y2)
Capacitance tolerance:	± 20 %
Climatic category:	25/085/21 according to IEC 60068-1
Temperature range:	- 25 °C to + 85 °C
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 2050 V A.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60384-14, EN 60384-14

Passive flammability category:A

KPB70xx



Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

Standard values KPB70xx

Capacitance		Dimensions
class X1 (µF)	class Y2 (pF)	d x l (mm)
0.27	2 × 27000	20 × 50
0.33	2 × 2700	22 × 40
0.33	2 × 2700	25 × 40
0.33	2 × 4700	22 × 40
0.33	2 × 4700	25 × 40
0.33	2 × 10000	25 × 40
0.33	2 × 15000	25 × 40
0.33	2 × 22000	25 × 40
0.33	2 × 27000	25 × 40
0.47	2 × 2700	25 × 40
0.47	2 × 2700	30 × 40
0.47	2 × 4700	25 × 40
0.47	2 × 4700	30 × 40
0.47	2 × 10000	25 × 40
0.47	2 × 10000	30 × 40
0.47	2 × 15000	30 × 40
0.47	2 × 22000	30 × 40
0.47	2 x 27000	30 × 40

Other values upon request

Approval:

IEC 60384-14

classX1Y2

Note: C = CSA C22.2 No.8; US = UL 1283

Casing: aluminium can, closed with sealing washer, sealed with synthetical resin, flame retardant.	Wire dimensions on drawing correspond with type KPB7000 - standard version.
Terminals	
Type	Type of terminals
KPB70xx	Insulated stranded wire 0.5 mm², or insulated solid wire ø 0.8 mm Non-insulated part is soldered. Connection terminals provided on request.

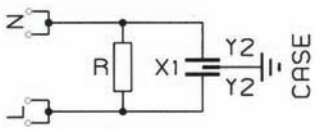
Capacitors

Type KPB7077	four-pole	class **X1Y2**

TECHNICAL DATA

Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category:	25/085/21 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 25 °C to + 85 °C
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 2050 V A.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60384-14, EN 60384-14, CSA C22.2 No.8, UL 1283

Electrical connection



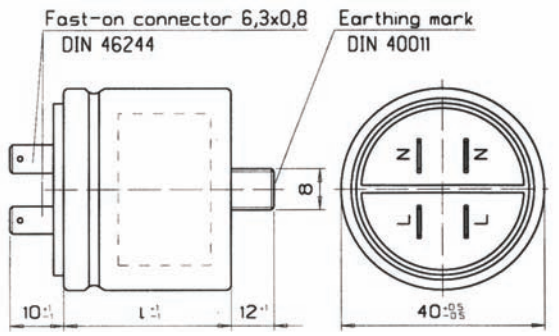
R = 470 kΩ ÷ 2.7 MΩ on request

Terminals

2 × double fast-on connectors CuZn/Sn

Passive flammability category:A

KPB7077



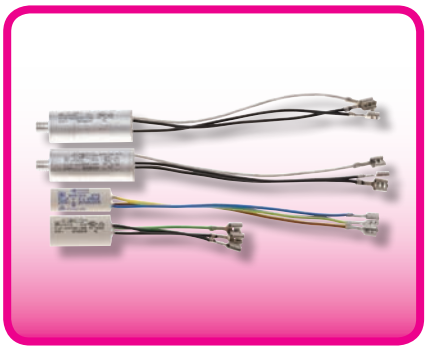
Standard values KPB7077

Capacitance		Dimensions	IEC 60384-14	
class X1 (µF)	class Y2 (pF)	d x l (mm)		
0.1	2 × 5000	30	▪	
0.1	2 × 10000	30	▪	
0.1	2 × 15000	30	▪	
0.1	2 × 27000	30	▪	
0.25	2 × 5000	30	▪	
0.25	2 × 10000	30	▪	
0.25	2 × 15000	30	▪	
0.25	2 × 27000	33	▪	
0.3	2 × 5000	30	▪	▪
0.3	2 × 10000	30	▪	▪
0.3	2 × 15000	33	▪	
0.3	2 × 27000	33	▪	
0.47	2 × 5000	33	▪	
0.47	2 × 10000	33	▪	
0.47	2 × 15000	33	▪	
0.47	2 × 27000	33	▪	▪
0.5	2 × 10000	33	▪	▪

Other values upon request
Note: C = CSA C22.2 No.8; US = UL 1283

Capacitors

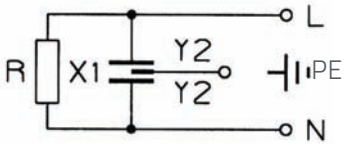
Type KPB7012 Type KPB7312	two-pole	class **X1Y2**



TECHNICAL DATA

Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category:	25/085/21 according to IEC 60068-1
Temperature range:	- 25 °C to + 85 °C
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 2050 V A.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0,33 µF $R_i \times C_n \geq 2000$ s for C > 0,33 µF
Complies to:	IEC 60384-14, EN 60384-14

Electrical connection



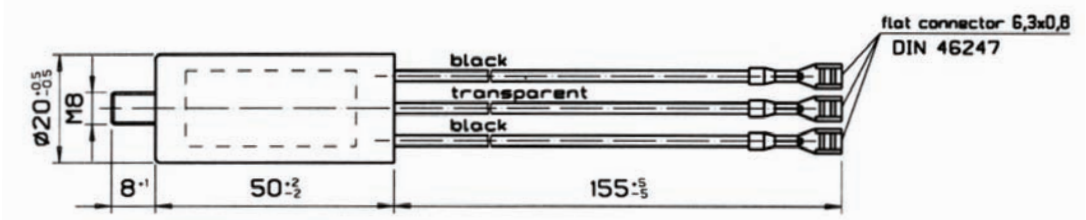
R = 470 kΩ ÷ 2.7 MΩ on request

Terminals

stranded copper wire type H05V2-K
0.5 mm² 105 °C and flat connectors

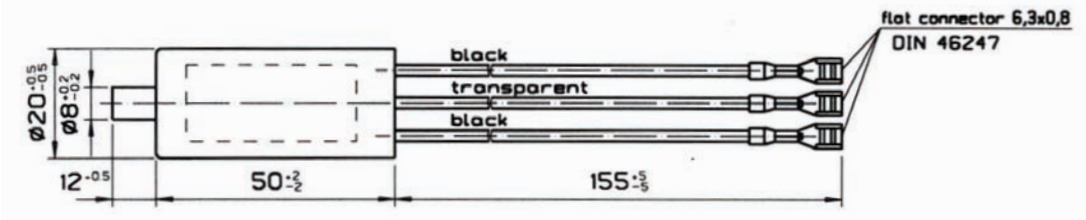
Type KPB7012 - aluminium can, closed with sealing washer.

Passive flammability category: A



Type KPB7312 - thermoplastic can sealed with synthetical resin, flame retardant.

Passive flammability category: B



Standard value KPB7012, KPB7312

Capacitance		Discharging
class X1 (µF)	class Y2 (µF)	R (MΩ)
0.27	2 × 0.027	1

Other values upon request

Approval:

IEC 60384-14

Capacitors

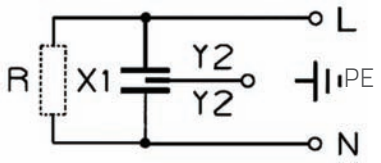
Type KPB73xx	two-pole	class **X1Y2**

Last two numbers in the type designation (xx = 00 to 49) indicate the type of terminals and connectors.

TECHNICAL DATA

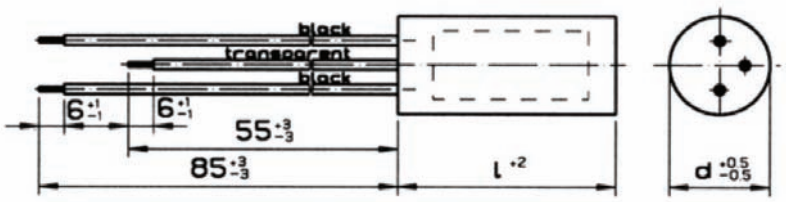
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	250 V A.C., 275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category:	25/100/21 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 25 °C to + 100 °C
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 2050 V A.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60384-14, EN 60384-14, CSA C22.2 No.8, UL 1283

Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPB73xx



Casing: thermoplastic, sealed with synthetical resin, flame retardant.	Wire dimensions on drawing correspond with type KPB7300 - standard version.
Terminals	
Type	Type of terminals
KPB73xx	Insulated stranded wire 0.5 mm², or insulated solid wire ø 0.8 mm. Non-insulated part is soldered. Connection terminals provided on request.

Standard values KPB73xx

Capacitance		Dimensions	IEC 60384-14	On request
class X1 (µF)	class Y2 (pF)	d x l (mm)		
0.022	2 x 2700	11 x 30	▪	▪
0.022	2 x 4700	12 x 30	▪	
0.022	2 x 5000	14 x 35	▪	
0.022	2 x 22000	16 x 35	▪	
0.022	2 x 22000	18 x 35	▪	
0.027	2 x 2700	11 x 30	▪	▪
0.047	2 x 2700	12 x 30	▪	▪
0.047	2 x 4700	14 x 30	▪	▪
0.047	2 x 5000	14 x 30	▪	▪
0.068	2 x 2700	14 x 35	▪	▪
0.068	2 x 4700	14 x 35	▪	▪
0.068	2 x 5000	14 x 35	▪	▪
0.1	2 x 2500	14 x 35	▪	
0.1	2 x 2700	14 x 35	▪	▪
0.1	2 x 4700	14 x 35	▪	▪
0.1	2 x 4700	16 x 35	▪	▪
0.1	2 x 5000	14 x 35	▪	▪
0.1	2 x 5000	16 x 35	▪	▪
0.1	2 x 10000	16 x 35	▪	▪
0.1	2 x 15000	16 x 35	▪	▪
0.1	2 x 22000	18 x 35	▪	▪
0.1	2 x 27000	18 x 40	▪	▪
0.1	2 x 27000	20 x 35	▪	▪
0.15	2 x 2700	16 x 35	▪	▪
0.15	2 x 4700	16 x 35	▪	▪
0.15	2 x 5000	16 x 35	▪	▪
0.15	2 x 5000	18 x 35	▪	▪
0.15	2 x 5000	18 x 40	▪	▪
0.15	2 x 10000	18 x 35	▪	▪
0.15	2 x 15000	18 x 35	▪	▪
0.15	2 x 22000	20 x 35	▪	▪
0.15	2 x 27000	18 x 40	▪	▪
0.15	2 x 27000	20 x 35	▪	▪
0.22	2 x 2700	18 x 40	▪	▪
0.22	2 x 2700	20 x 35	▪	▪
0.22	2 x 4700	18 x 40	▪	▪
0.22	2 x 5000	18 x 40	▪	▪
0.22	2 x 10000	20 x 40	▪	▪
0.22	2 x 15000	20 x 40	▪	▪
0.22	2 x 22000	22 x 40	▪	▪
0.22	2 x 27000	22 x 40	▪	▪

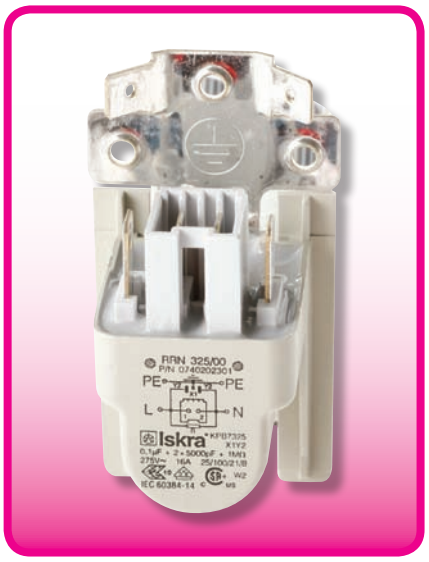
Capacitance		Dimensions	IEC 60384-14	On request
class X1 (µF)	class Y2 (pF)	d x l (mm)		
0.25	2 x 2500	20 x 40	▪	
0.25	2 x 2700	20 x 40	▪	
0.25	2 x 4700	20 x 40	▪	
0.25	2 x 5000	20 x 40	▪	
0.25	2 x 10000	20 x 40	▪	
0.25	2 x 15000	22 x 40	▪	
0.25	2 x 22000	22 x 40	▪	
0.25	2 x 27000	22 x 40	▪	
0.27	2 x 2700	20 x 40	▪	▪
0.27	2 x 4700	20 x 40	▪	▪
0.27	2 x 5000	20 x 40	▪	▪
0.27	2 x 10000	22 x 40	▪	▪
0.27	2 x 15000	22 x 40	▪	▪
0.27	2 x 22000	22 x 40	▪	▪
0.27	2 x 27000	20 x 50	▪	▪
0.27	2 x 27000	22 x 40	▪	▪
0.33	2 x 2700	22 x 40	▪	▪
0.33	2 x 2700	25 x 40	▪	▪
0.33	2 x 4700	22 x 40	▪	▪
0.33	2 x 4700	25 x 40	▪	▪
0.33	2 x 10000	25 x 40	▪	▪
0.33	2 x 15000	25 x 40	▪	▪
0.33	2 x 22000	25 x 40	▪	▪
0.33	2 x 27000	25 x 40	▪	▪
0.47	2 x 2700	25 x 40	▪	▪
0.47	2 x 2700	30 x 40	▪	▪
0.47	2 x 4700	25 x 40	▪	▪
0.47	2 x 4700	30 x 40	▪	▪
0.47	2 x 10000	25 x 40	▪	▪
0.47	2 x 10000	30 x 40	▪	▪
0.47	2 x 15000	30 x 40	▪	▪
0.47	2 x 22000	30 x 40	▪	▪
0.47	2 x 27000	30 x 40	▪	▪

Other values upon request

Note: C = CSA C22.2 No.8; US = UL 1283

Capacitors

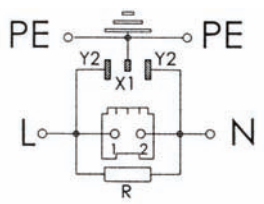
Type KPB7325	four-pole	class **X1Y2**



TECHNICAL DATA

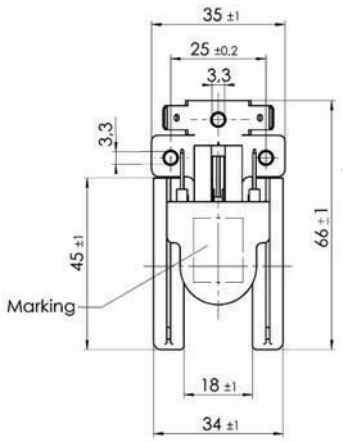
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Rated curent:	16 A
Capacitance tolerance:	± 20 %
Climatic category + letter indicating passive flammability category:	25/100/21/B
Temperature range:	- 25 °C to + 100 °C
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 2050 V A.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ
Casing:	thermoplastic can, sealed with synthetical resin, flame retardant
Terminals:	fast-on connectors 6,3 × 0,8 CuZn/Sn
Complies to:	IEC 60384-14, EN 60384-14, CSA C22.2 No.8, UL 1283

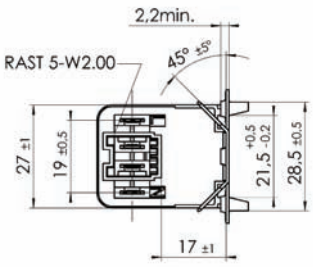
Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPB 7325





Standard values KPB7325

Capacitance	
class X1 (µF)	class Y2 (pF)
0.1	2 × 2500
0.1	2 × 2700
0.1	2 × 4700
0.1	2 × 5000
0.1	2 × 10000
0.1	2 × 15000
0.1	2 × 22000
0.1	2 × 27000
0.15	2 × 2500
0.15	2 × 2700
0.15	2 × 5000
0.15	2 × 10000
0.15	2 × 15000
0.15	2 × 22000
0.15	2 × 27000
0.22	2 × 2500
0.22	2 × 2700
0.22	2 × 4700
0.22	2 × 5000
0.22	2 × 10000
0.22	2 × 15000

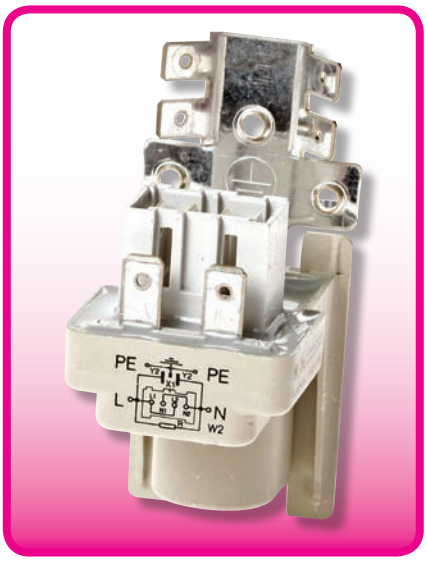
Capacitance	
class X1 (µF)	class Y2 (pF)
0.22	2 × 22000
0.22	2 × 27000
0.24	2 × 15000
0.24	2 × 27000
0.25	2 × 2500
0.25	2 × 2700
0.25	2 × 4700
0.25	2 × 5000
0.25	2 × 10000
0.25	2 × 15000
0.25	2 × 22000
0.25	2 × 27000
0.27	2 × 2500
0.27	2 × 2700
0.27	2 × 4700
0.27	2 × 5000
0.27	2 × 10000
0.27	2 × 15000
0.27	2 × 22000
0.27	2 × 27000

Note: C = CSA C22.2 No.8; US = UL 1283

Approvals: IEC 60384-14

Capacitors

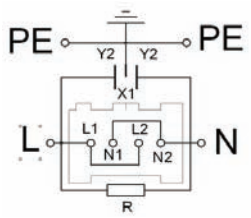
Type KPB7341	four-pole	class **X1Y2**



TECHNICAL DATA

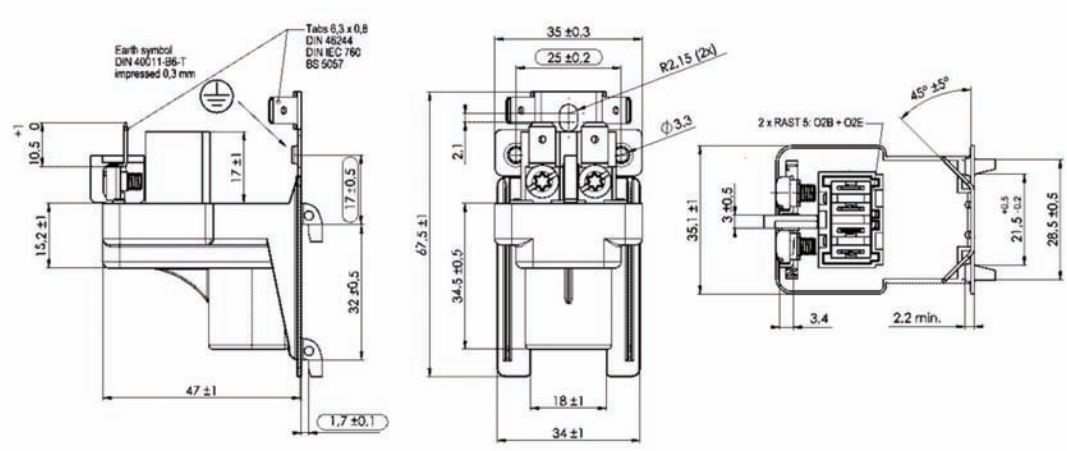
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	250 V A.C., 275 V A.C.
Rated curent:	16 A
Capacitance tolerance:	± 20 %
Climatic category + letter indicating passive flammability category:	25/085/21/B
Temperature range:	- 25 °C to + 100 °C
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 2050 V A.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	R_i ≥ 6000 MΩ
Casing:	thermoplastic can, sealed with synthetical resin, flame retardant
Terminals:	fast-on connectors 6,3 × 0,8 CuZn/Sn
Complies to:	IEC 60384-14, EN 60384-14, CSA C22.2 No.8, UL 1283

Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPB7341



Standard value KPB7341

Capacitance		Discharge
class X1 (µF)	class Y2 (pF)	R (MΩ)
0.1	2 × 0.015	1

Approval:

IEC 60384-14

250 V AC 275 V AC

Note: C = CSA C22.2 No.8; US = UL 1283

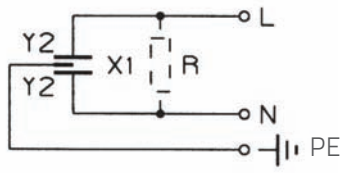
Capacitors

Type KPB7426	two-pole	class **X1Y2**

TECHNICAL DATA

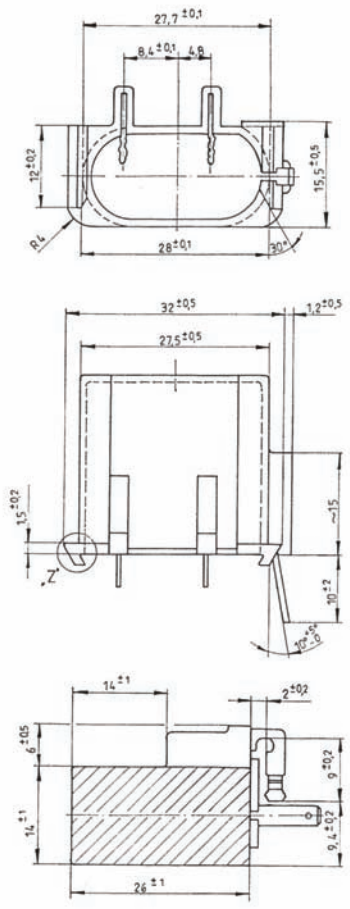
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category + letter indicating passive flammability category:	25/085/21/B
Temperature range:	- 25 °C to + 85 °C
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 2050 V A.C., 2 s
Insulation resistance	R_i ≥ 6000 MΩ for C ≤ 0.33 µF
Casing:	thermoplastic can, sealed with synthetical resin, flame retardant
Terminals:	3 × fast-on connectors 2 × 0,8 CuZn/Sn
Complies to:	IEC 60384-14, EN 60384-14

Electrical connection



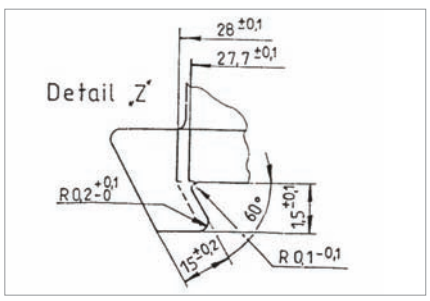
R = 470 kΩ ÷ 2.7 MΩ on request

KPB 7426



Standard values KPB7426

Capacitance	
class X1 (µF)	class Y2 (pF)
0.1	2 × 2500
0.1	2 × 2700
0.1	2 × 4700
0.1	2 × 5000
0.1	2 × 10000
0.1	2 × 15000
0.15	2 × 2500
*0.15	2 × 2700
0.15	2 × 4700
0.15	2 × 5000



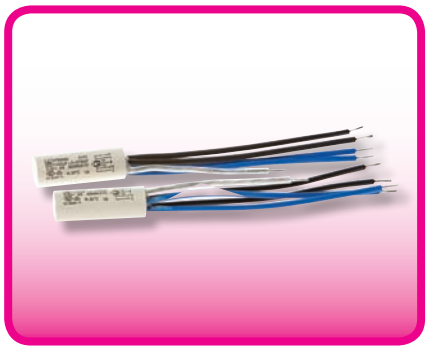
Other values upon request

Approval: IEC 60384-14

Capacitors

Type KPB83xx	four-pole	class **X1Y2**

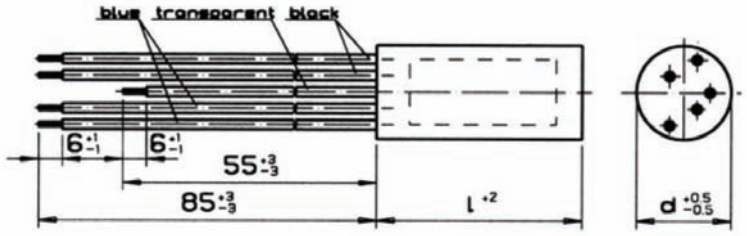
Last two numbers in the type designation (xx = 00 to 49) indicate the type of terminals and connectors.



TECHNICAL DATA

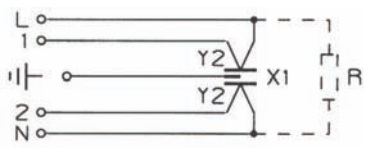
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated current:	6 A
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category:	25/085/21 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 25 °C to + 85 °C
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 1800 V A.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60384-14, EN 60384-14, CSA C22.2 No.8, UL 1283

KPB83xx



Casing: thermoplastic, sealed with synthetical resin, flame retardant.	Wire dimensions on drawing correspond with type KPB8300 - standard version.
Terminals	
Type	Type of terminals
KPB83xx	Insulated stranded wire 0.5 mm², or insulated solid wire ø 0.8 mm. Non-insulated part is soldered. Connection terminals provided on request.

Electrical connection



R = 470 kΩ * 2.7 MΩ on request

Other values upon request

Approval: IEC 60384-14

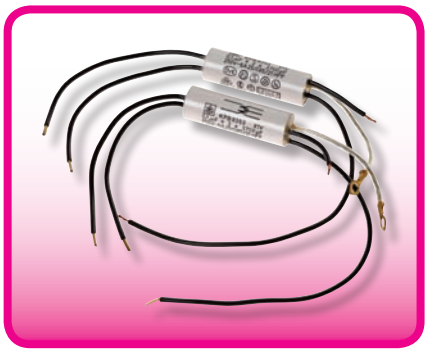
Standard values KPB83xx

Capacitance		Dimensions
class X1 (µF)	class Y2 (pF)	d x l (mm)
0.022	2 × 2700	11 × 30
0.027	2 × 2700	11 × 30
0.047	2 × 2700	12 × 30
0.047	2 × 4700	14 × 30
0.047	2 × 5000	14 × 30
0.068	2 × 2700	14 × 35
0.068	2 × 4700	14 × 35
0.068	2 × 5000	14 × 35
0.1	2 × 2700	14 × 35
0.1	2 × 4700	14 × 35
0.1	2 × 4700	16 × 35
0.1	2 × 5000	14 × 35
0.1	2 × 10000	16 × 35
0.1	2 × 15000	16 × 35
0.1	2 × 22000	18 × 35
0.1	2 × 27000	18 × 40
0.15	2 × 2700	16 × 35
0.15	2 × 4700	16 × 35
0.15	2 × 5000	16 × 35
0.15	2 × 5000	18 × 35
0.15	2 × 5000	18 × 40
0.15	2 × 10000	18 × 35
0.15	2 × 15000	18 × 35
0.15	2 × 22000	20 × 35
0.15	2 × 27000	20 × 35
0.15	2 × 27000	22 × 40
0.22	2 × 2700	18 × 40
0.22	2 × 2700	20 × 35
0.22	2 × 4700	18 × 40
0.22	2 × 5000	18 × 40
0.22	2 × 10000	20 × 40
0.22	2 × 15000	20 × 40
0.22	2 × 22000	22 × 40
0.22	2 × 27000	22 × 40
0.27	2 × 2700	20 × 40
0.27	2 × 4700	20 × 40
0.27	2 × 5000	20 × 40
0.27	2 × 10000	22 × 40
0.27	2 × 15000	22 × 40
0.27	2 × 22000	22 × 40
0.27	2 × 27000	20 × 50
0.27	2 × 27000	22 × 40

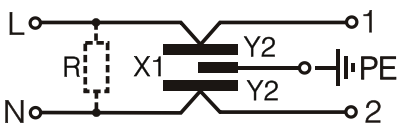
Capacitors

TypeKPB 835x	four-pole	class **X1Y2**

Last two numbers in the type designation (xx = 00 to 49) indicate the type of terminals and connectors.



Electrical connection

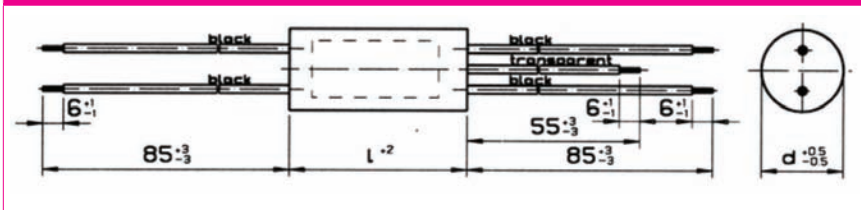


R = 470 kΩ ÷ 2.7 MΩ on request

TECHNICAL DATA

Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated current:	6 A
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category:	25/085/21 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 25 °C to + 85 °C
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 2050 V A.C., 2 s
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60384-14, EN 60384-14

KPB835x



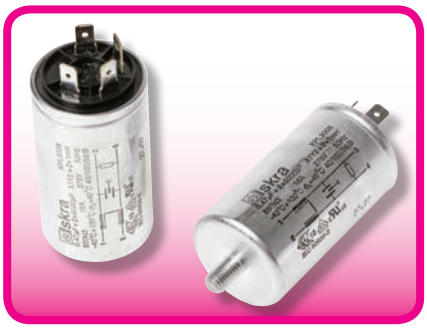
Casing: thermoplastic, sealed with synthetical resin, flame retardant.	Wire dimensions on drawing correspond with type KPB8350 - standard version.
Terminals	
Type	Type of terminals
KPB835x	Insulated stranded wire 0,5 mm², or insulated solid wire ø 0,8 mm. Non-insulated part is soldered. Connection terminals provided on request.

Standard values KPB835x

Capacitance		Dimensions
class X1 (µF)	class Y2 (pF)	d x l (mm)
0.022	2 × 2500	12 × 33
0.022	2 × 2700	12 × 33
0.027	2 × 2500	12 × 33
0.027	2 × 2700	12 × 33
0.047	2 × 2500	12 × 40
0.047	2 × 2700	12 × 40
0.047	2 × 4700	12 × 40
0.068	2 × 2500	14 × 40
0.068	2 × 2700	14 × 40
0.068	2 × 4700	14 × 40
0.1	2 × 2500	14 × 43
0.1	2 × 2700	14 × 43
0.1	2 × 4700	14 × 43
0.1	2 × 5000	16 × 43
0.1	2 × 10000	16 × 43
0.1	2 × 15000	16 × 43
0.15	2 × 2500	16 × 43
0.15	2 × 2700	16 × 43
0.15	2 × 4700	18 × 43
0.15	2 × 5000	18 × 43
0.15	2 × 10000	18 × 43
0.15	2 × 15000	18 × 43
0.22	2 × 2500	18 × 43
0.22	2 × 2700	18 × 43
0.22	2 × 4700	20 × 43
0.22	2 × 5000	20 × 43
0.22	2 × 10000	20 × 43
0.22	2 × 15000	20 × 43

Filters for radio interference suppression:

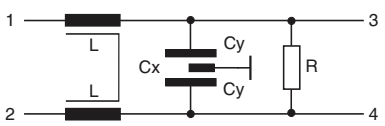
Type KPL3008	class **X1Y2**



TECHNICAL DATA

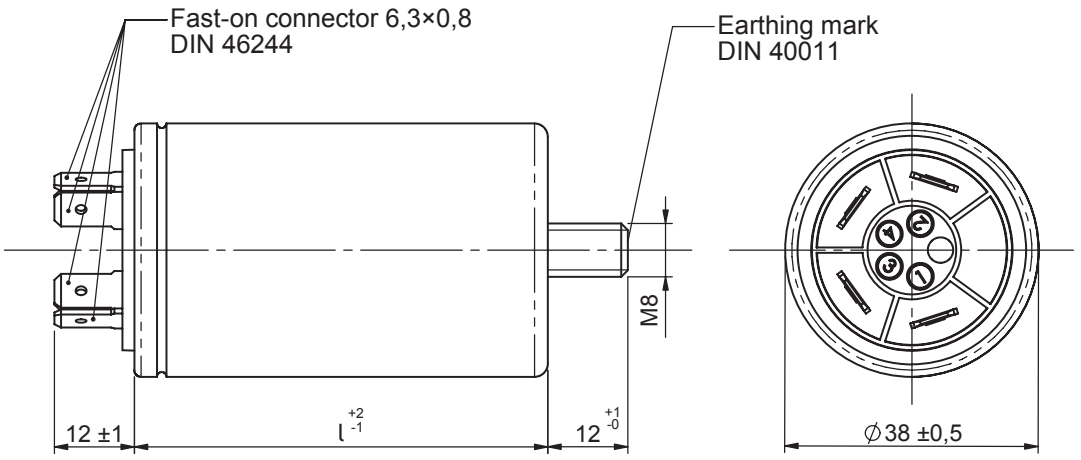
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 3000 V A.C., 2 s (or 2050 V A.C., 2 s)
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, UL1283, CSA C22.2 No.8, capacitor part to IEC 60384-14

Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPL3008



Casing: aluminium can, closed with sealing washer.	
Terminals	
Type	Type of terminals
KPL3008	4 fast-on connectors

Standard values: KPL3008 for upper temperature 100 °C

Current	Nominal values						
	Capacitance		Inductance	Discharging resistor R	Dimensions		
I(A)/T(°C)	X1 (µF)	Y2 (pF)	L (mH)	(MΩ)	l (mm)	IEC 60939-2	
7/40		2×2200	0.5	1.5	38	▪	▪
7/40	0.15	to	1	1.5	44	▪	▪
10/40		2×15000	0.5	1.5	44	▪	▪
10/40			1	1.5	44	▪	▪
16/40			0.3	1	58	▪	▪
16/40			0.5	1	58	▪	▪
16/40			1	1	62	▪	▪
16/40		2×2200	1.5	1	72	▪	▪
10/70	0.25	to	0.3	1	58	▪	
10/70		2×27000	0.5	1	58	▪	
10/70			1	1	62	▪	
10/70			1.5	1	72	▪	
10/40			0.5	0.68	62	▪	▪
10/40			1	0.68	62	▪	
12.5/40			0.3	0.68	62	▪	
12.5/40			0.5	0.68	62	▪	
12.5/40			1	0.68	62	▪	▪
12.5/40			1.3	0.68	62	▪	▪
12.5/40			1.5	0.68	67	▪	▪
12.5/40		2×2200	2	0.68	67		▪
16/40	0.47	to	0.3	0.68	62	▪	▪
16/40		2×27000	0.5	0.68	62	▪	▪
16/40			1	0.68	67	▪	▪
16/40			1.3	0.68	67	▪	
16/40			1.5	0.68	72	▪	
10/70			0.3	0.68	62	▪	
10/70			0.5	0.68	62	▪	
10/70			1	0.68	67	▪	
10/70			1.3	0.68	67	▪	
10/70			1.5	0.68	72	▪	
3/40	0.15	2×6800	10	0.68	58	▪	
12.5/40	0.47	2×25000	1.3	0.68	58		▪
3/40	1	2×10000	1	0.47	80	▪	
10/40			0.5	0.47	80	▪	
10/40			1	0.47	80	▪	
12.5/40			0.3	0.47	80	▪	
12.5/40			0.5	0.47	80	▪	
12.5/40			1	0.47	80	▪	
12.5/40			1.3	0.47	80	▪	
12.5/40		2×2200	1.5	0.47	85	▪	
16/40	1	to	0.3	0.47	80	▪	
16/40		2×27000	0.5	0.47	80	▪	
16/40			1	0.47	85	▪	
16/40			1.3	0.47	85	▪	
16/40			1.5	0.47	90	▪	
10/70			0.3	0.47	80	▪	
10/70			0.5	0.47	80	▪	
10/70			1	0.47	85	▪	
10/70			1.3	0.47	85	▪	
10/70			1.5	0.47	90	▪	

Nominal values for capacitance:

* 0.15µF+2×2200pF
0.15µF+2×2700pF
* 0.15µF+2×4700pF
0.15µF+2×5000pF
0.15µF+2×10000pF
0.15µF+2×15000pF

* 0.25µF+2×2200pF
0.25µF+2×2700pF
* 0.25µF+2×4700pF
0.25µF+2×5000pF
0.25µF+2×10000pF
* 0.25µF+2×15000pF
* 0.25µF+2×18000pF
0.25µF+2×20000pF
* 0.25µF+2×22000pF
* 0.25µF+2×25000pF
0.25µF+2×27000pF

* 0.47µF+2×2200pF
* 0.47µF+2×2700pF
0.47µF+2×4700pF
0.47µF+2×5000pF
0.47µF+2×10000pF
0.47µF+2×15000pF
* 0.47µF+2×18000pF
0.47µF+2×20000pF
* 0.47µF+2×22000pF
0.47µF+2×25000pF
0.47µF+2×27000pF

1µF+2×2200pF
1µF+2×2700pF
1µF+2×4700pF
1µF+2×5000pF
1µF+2×10000pF
1µF+2×15000pF
1µF+2×18000pF
1µF+2×20000pF
1µF+2×22000pF
1µF+2×25000pF
1µF+2×27000pF

* Only for IEC 60939-2

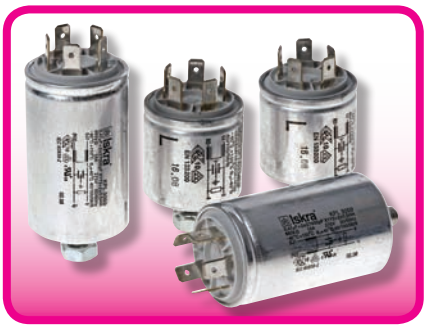
Approval: IEC 60939-2

Approvals in use = ▪
Approvals in pending = o

Approval for climatic category 40/100/56 according to IEC 60068-1

Filters for radio interference suppression:

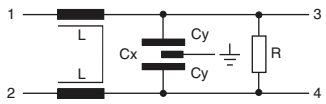
Type KPL3009	class **X1Y2**



TECHNICAL DATA

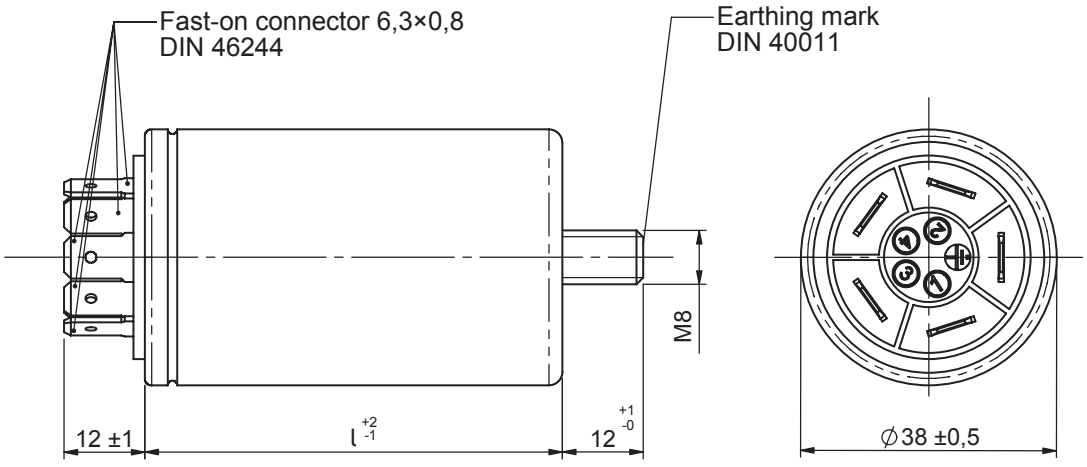
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 3000 V A.C., 2 s (or 2050 V A.C., 2 s) shields against casing 2500 V A.C., 2 s (only filters, where Y2 - capacitor is not connected to casing)
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, UL1283, CSA C22.2 No.8, capacitor part to IEC 60384-14

Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPL3009



Casing: aluminium can, closed with sealing washer	
Terminals	
Type	Type of terminals
KPL3009	5 fast-on connectors

Standard values: KPL3009 for upper temperature 100 °C

Current	Nominal values						
	Capacitance		Inductance	Discharging resistor R	Dimensions		
I(A)/T(°C)	X1 (µF)	Y2 (pF)	L (mH)	(MΩ)	l (mm)	IEC 60939-2	c UL us
7/40		2×2200	0.5	1.5	38	▪	▪
7/40	0.15	to	1	1.5	44	▪	▪
10/40		2×15000	0.5	1.5	44	▪	▪
10/40			1	1.5	44	▪	▪
16/40			0.3	1	58	▪	▪
16/40			0.5	1	58	▪	▪
16/40			1	1	62	▪	▪
16/40		2×2200	1.5	1	72	▪	▪
10/70	0.25	to	0.3	1	58	▪	
10/70		2×27000	0.5	1	58	▪	
10/70			1	1	62	▪	
10/70			1.5	1	72	▪	
10/40			0.5	0.68	62	▪	▪
10/40			1	0.68	62	▪	
12.5/40			0.3	0.68	62	▪	
12.5/40			0.5	0.68	62	▪	
12.5/40			1	0.68	62	▪	▪
12.5/40			1.3	0.68	62	▪	▪
12.5/40			1.5	0.68	67	▪	▪
12.5/40		2×2200	2	0.68	67		▪
16/40	0.47	to	0.3	0.68	62	▪	▪
16/40		2×27000	0.5	0.68	62	▪	▪
16/40			1	0.68	67	▪	▪
16/40			1.3	0.68	67	▪	
16/40			1.5	0.68	72	▪	
10/70			0.3	0.68	62	▪	
10/70			0.5	0.68	62	▪	
10/70			1	0.68	67	▪	
10/70			1.3	0.68	67	▪	
10/70			1.5	0.68	72	▪	
3/40	0.15	2×6800	10	0.68	58	▪	
12.5/40	0.47	2×25000	1.3	0.68	58		▪
3/40	1	2×10000	1	0.47	80	▪	
10/40			0.5	0.47	80	▪	
10/40			1	0.47	80	▪	
12.5/40			0.3	0.47	80	▪	
12.5/40			0.5	0.47	80	▪	
12.5/40			1	0.47	80	▪	
12.5/40			1.3	0.47	80	▪	
12.5/40		2×2200	1.5	0.47	85	▪	
16/40	1	to	0.3	0.47	80	▪	
16/40		2×27000	0.5	0.47	80	▪	
16/40			1	0.47	85	▪	
16/40			1.3	0.47	85	▪	
16/40			1.5	0.47	90	▪	
10/70			0.3	0.47	80	▪	
10/70			0.5	0.47	80	▪	
10/70			1	0.47	85	▪	
10/70			1.3	0.47	85	▪	
10/70			1.5	0.47	90	▪	

Nominal values for capacitance:

* 0.15µF+2×2200pF
0.15µF+2×2700pF
* 0.15µF+2×4700pF
0.15µF+2×5000pF
0.15µF+2×10000pF
0.15µF+2×15000pF

* 0.25µF+2×2200pF
0.25µF+2×2700pF
* 0.25µF+2×4700pF
0.25µF+2×5000pF
0.25µF+2×10000pF
* 0.25µF+2×15000pF
* 0.25µF+2×18000pF
0.25µF+2×20000pF
* 0.25µF+2×22000pF
* 0.25µF+2×25000pF
0.25µF+2×27000pF

* 0.47µF+2×2200pF
* 0.47µF+2×2700pF
0.47µF+2×4700pF
0.47µF+2×5000pF
0.47µF+2×10000pF
0.47µF+2×15000pF
* 0.47µF+2×18000pF
0.47µF+2×20000pF
* 0.47µF+2×22000pF
0.47µF+2×25000pF
0.47µF+2×27000pF

1µF+2×2200pF
1µF+2×2700pF
1µF+2×4700pF
1µF+2×5000pF
1µF+2×10000pF
1µF+2×15000pF
1µF+2×18000pF
1µF+2×20000pF
1µF+2×22000pF
1µF+2×25000pF
1µF+2×27000pF

* Only for IEC 60939-2

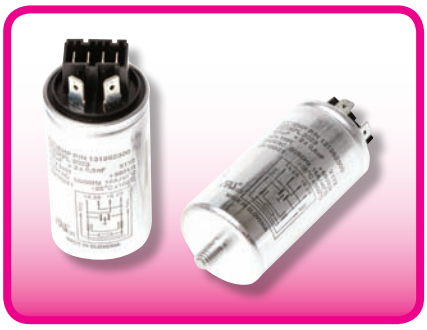
Approval: IEC 60939-2, c UL us

Approvals in use = ▪
Approvals in pending = o

Approval for climatic category 40/100/56 according to IEC 60068-1

Filters for radio interference suppression:

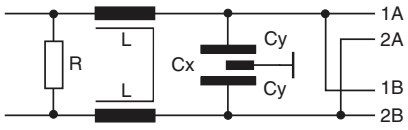
Type KPL3023	class **X1Y2**



TECHNICAL DATA

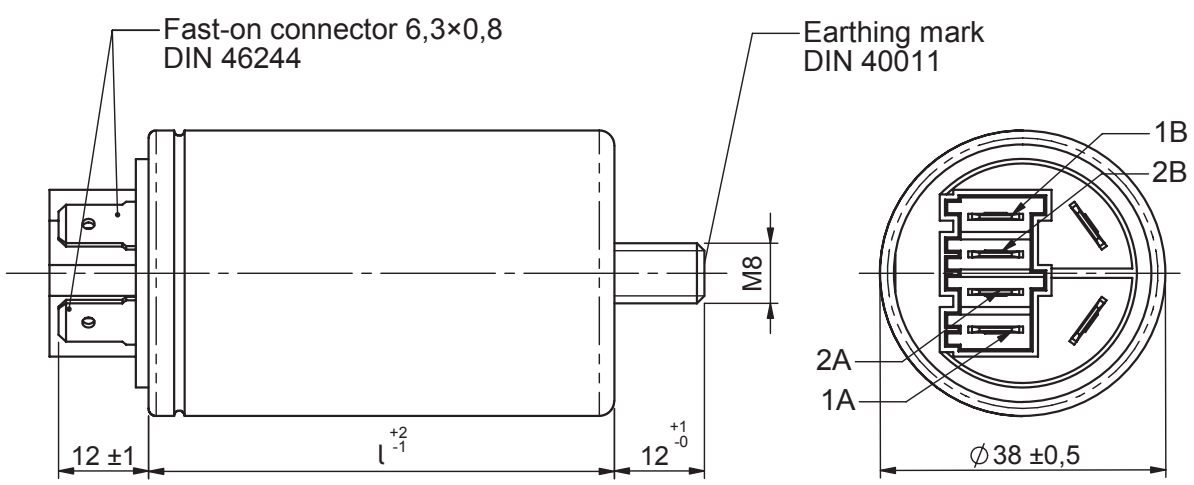
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 3000 V A.C., 2 s (2050 V A.C., 2 s)
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, UL1283, CSA C22.2 No.8, capacitor part to IEC 60384-14

Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPL3023



Casing: aluminium can, closed with sealing washer	
Terminals	
Type	Type of terminals
KPL3023	- 1A, 2A and 1B, 2B for RAST 5 - 2 × fast-on connectors

Standard values: KPL3023 for upper temperature 100 °C

Current	Nominal values						
	Capacitance		Inductance	Discharging resistor R	Dimensions	IEC 60939-2	cULus
I(A)/T(°C)	X1 (µF)	Y2 (pF)	L (mH)	(MΩ)	l (mm)		
7/40		2×2200	0.5	1.5	41	▪	▪
7/40	0.15	to	1	1.5	47	▪	▪
10/40		2×15000	0.5	1.5	47	▪	▪
10/40			1	1.5	47	▪	▪
16/40			0.3	1	61	▪	▪
16/40			0.5	1	61	▪	▪
16/40			1	1	65	▪	▪
16/40		2×2200	1.5	1	75	▪	▪
10/70	0.25	to	0.3	1	61	▪	
10/70		2×27000	0.5	1	61	▪	
10/70			1	1	65	▪	
10/70			1.5	1	75	▪	
10/40			0.5	0.68	65	▪	▪
10/40			1	0.68	65	▪	
12.5/40			0.3	0.68	65	▪	
12.5/40			0.5	0.68	65	▪	
12.5/40			1	0.68	65	▪	▪
12.5/40			1.3	0.68	65	▪	▪
12.5/40			1.5	0.68	70	▪	▪
12.5/40			2	0.68	70		▪
16/40		2×2200	0.3	0.68	65	▪	▪
16/40	0.47	to	0.5	0.68	65	▪	▪
16/40		2×27000	1	0.68	70	▪	▪
16/40			1.3	0.68	70	▪	
16/40			1.5	0.68	75	▪	
10/70			0.3	0.68	65	▪	
10/70			0.5	0.68	65	▪	
10/70			1	0.68	70	▪	
10/70			1.3	0.68	70	▪	
10/70			1.5	0.68	75	▪	
3/40	0.15	2×6800	10	0.68	61	▪	
12.5/40	0.47	2×25000	1.3	0.68	61	▪	▪
16/40	0.5	2×600	1	0.68	67		▪
3/40	1	2×10000	1	0.47	83	▪	
10/40			0.5	0.47	83	▪	
10/40			1	0.47	83	▪	
12.5/40			0.3	0.47	83	▪	
12.5/40			0.5	0.47	83	▪	
12.5/40			1	0.47	83	▪	
12.5/40			1.3	0.47	83	▪	
12.5/40		2×2200	1.5	0.47	88	▪	
16/40	1	to	0.3	0.47	83	▪	
16/40		2×27000	0.5	0.47	83	▪	
16/40			1	0.47	88	▪	
16/40			1.3	0.47	88	▪	
16/40			1.5	0.47	93	▪	
10/70			0.3	0.47	83	▪	
10/70			0.5	0.47	83	▪	
10/70			1	0.47	88	▪	
10/70			1.3	0.47	88	▪	
10/70			1.5	0.47	93	▪	

Nominal values for capacitance:

* 0.15µF+2x2200pF
* 0.15µF+2x2700pF
  0.15µF+2x4700pF
  0.15µF+2x5000pF
  0.15µF+2x10000pF
  0.15µF+2x15000pF

* 0.25µF+2x2700pF
  0.25µF+2x4700pF
  0.25µF+2x5000pF
* 0.25µF+2x10000pF
* 0.25µF+2x15000pF
  0.25µF+2x18000pF
* 0.25µF+2x20000pF
  0.25µF+2x22000pF
  0.25µF+2x25000pF
  0.25µF+2x27000pF

* 0.47µF+2x2700pF
  0.47µF+2x4700pF
  0.47µF+2x5000pF
  0.47µF+2x10000pF
* 0.47µF+2x15000pF
  0.47µF+2x18000pF
* 0.47µF+2x20000pF
  0.47µF+2x22000pF
  0.47µF+2x25000pF
  0.47µF+2x27000pF

* 1µF+2x2200pF
* 1µF+2x2700pF
* 1µF+2x4700pF
* 1µF+2x5000pF
* 1µF+2x10000pF
* 1µF+2x15000pF
* 1µF+2x18000pF
* 1µF+2x20000pF
* 1µF+2x22000pF
* 1µF+2x25000pF
* 1µF+2x27000pF

* Only for IEC 60939-2

Approval: IEC 60939-2, cULus

Approvals in use = ▪
Approvals in pending = o

Approval for climatic category 40/100/56 according to IEC 60068-1

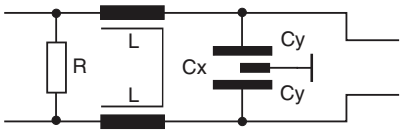
Filters for radio interference suppression:

Type KPL3024	class **X1Y2**

TECHNICAL DATA

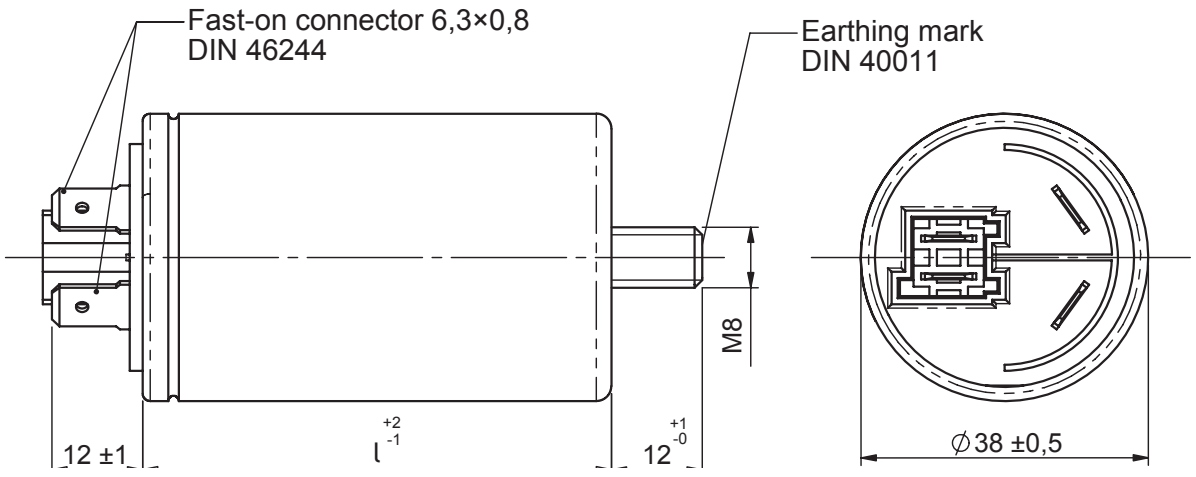
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 3000 V A.C., 2 s (2050 V A.C., 2 s)
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, UL1283, CSA C22.2 No.8, capacitor part to IEC 60384-14

Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPL3024



Casing: aluminium can, closed with sealing washer	
Terminals	
Type	Type of terminals
KPL3024	- for RAST 5 - 2 × fast-on connectors

Standard values: KPL3024 for upper temperature 100 °C

Current	Nominal values						
	Capacitance		Inductance	Discharging resistor R	Dimensions		
I(A)/T(°C)	X1 (µF)	Y2 (pF)	L (mH)	(MΩ)	l (mm)	IEC 60939-2	
7/40		2×2200	0.5	1.5	38	▪	▪
7/40	0.15	to	1	1.5	44	▪	▪
10/40		2×15000	0.5	1.5	44	▪	▪
10/40			1	1.5	44	▪	▪
16/40			0.3	1	58	▪	▪
16/40			0.5	1	58	▪	▪
16/40			1	1	62	▪	▪
16/40		2×2200	1.5	1	72	▪	▪
10/70	0.25	to	0.3	1	58	▪	
10/70		2×27000	0.5	1	58	▪	
10/70			1	1	62	▪	
10/70			1.5	1	72	▪	
10/40			0.5	0.68	62	▪	▪
10/40			1	0.68	62	▪	
12.5/40			0.3	0.68	62	▪	
12.5/40			0.5	0.68	62	▪	
12.5/40			1	0.68	62	▪	▪
12.5/40			1.3	0.68	62	▪	▪
12.5/40			1.5	0.68	67	▪	▪
12.5/40		2×2200	2	0.68	67		▪
16/40	0.47	to	0.3	0.68	62	▪	▪
16/40		2×27000	0.5	0.68	62	▪	▪
16/40			1	0.68	67	▪	▪
16/40			1.3	0.68	67	▪	
16/40			1.5	0.68	72	▪	
10/70			0.3	0.68	62	▪	
10/70			0.5	0.68	62	▪	
10/70			1	0.68	67	▪	
10/70			1.3	0.68	67	▪	
10/70			1.5	0.68	72	▪	
3/40	0.15	2×6800	10	0.68	58	▪	
12.5/40	0.47	2×25000	1.3	0.68	58		▪
16/40	0.5	2×600	1	0.68	67		▪
3/40	1	2×10000	1	0.47	80	▪	
10/40			0.5	0.47	80	▪	
10/40			1	0.47	80	▪	
12.5/40			0.3	0.47	80	▪	
12.5/40			0.5	0.47	80	▪	
12.5/40			1	0.47	80	▪	
12.5/40			1.3	0.47	80	▪	
12.5/40		2×2200	1.5	0.47	85	▪	
16/40	1	to	0.3	0.47	80	▪	
16/40		2×27000	0.5	0.47	80	▪	
16/40			1	0.47	85	▪	
16/40			1.3	0.47	85	▪	
16/40			1.5	0.47	90	▪	
10/70			0.3	0.47	80	▪	
10/70			0.5	0.47	80	▪	
10/70			1	0.47	85	▪	
10/70			1.3	0.47	85	▪	
10/70			1.5	0.47	90	▪	

Nominal values for capacitance:

* 0.15µF+2×2200pF
0.15µF+2×2700pF
* 0.15µF+2×4700pF
0.15µF+2×5000pF
0.15µF+2×10000pF
0.15µF+2×15000pF

* 0.25µF+2×2200pF
0.25µF+2×2700pF
* 0.25µF+2×4700pF
0.25µF+2×5000pF
0.25µF+2×10000pF
* 0.25µF+2×15000pF
* 0.25µF+2×18000pF
0.25µF+2×20000pF
* 0.25µF+2×22000pF
* 0.25µF+2×25000pF

* 0.47µF+2×2200pF
* 0.47µF+2×2700pF
0.47µF+2×4700pF
0.47µF+2×5000pF
0.47µF+2×10000pF
0.47µF+2×15000pF
* 0.47µF+2×18000pF
0.47µF+2×20000pF
* 0.47µF+2×22000pF
0.47µF+2×25000pF

* 1µF+2×2200pF
* 1µF+2×2700pF
* 1µF+2×4700pF
* 1µF+2×5000pF
* 1µF+2×10000pF
* 1µF+2×15000pF
* 1µF+2×18000pF
* 1µF+2×20000pF
* 1µF+2×22000pF
* 1µF+2×25000pF
* 1µF+2×27000pF

* Only for IEC 60939-2

Approval: IEC 60939-2

Approvals in use = ▪
Approvals in pending = o

Approval for climatic category 40/100/56 according to IEC 60068-1

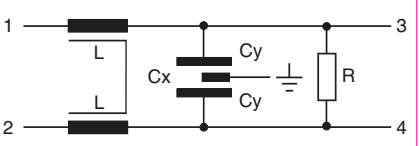
Filters for radio interference suppression:

Type KPL3028	class **X1Y2**

TECHNICAL DATA

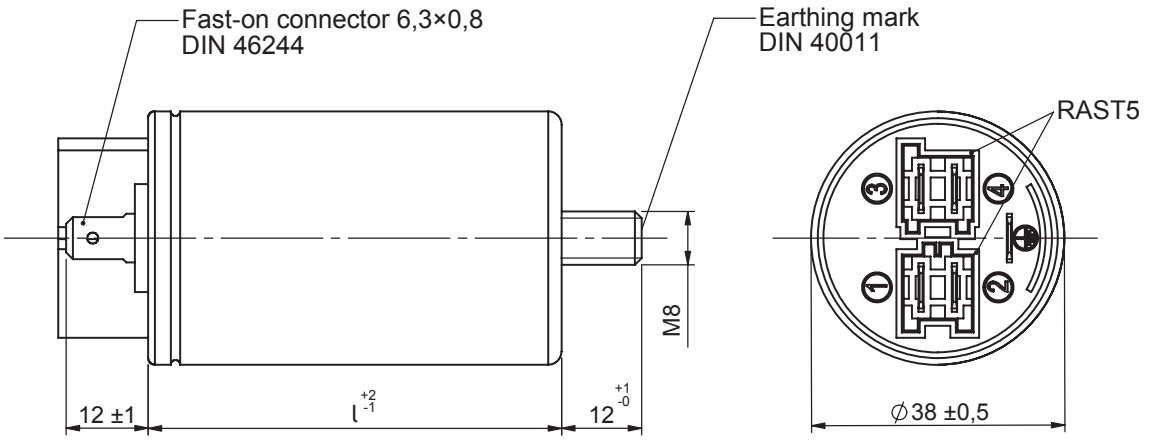
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 3000 V A.C., 2 s (2050 V A.C., 2 s)
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, UL1283, CSA C22.2 No.8, capacitor part to IEC 60384-14

Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPL 3028



Casing: aluminium can, closed with sealing washer	
Terminals	
Type	Type of terminals
KPL3028	- for RAST 5

Standard values: KPL3028 for upper temperature 100 °C

Current	Nominal values						
	Capacitance		Inductance	Discharging resistor R	Dimensions		
I(A)/T(°C)	X1 (µF)	Y2 (pF)	L (mH)	(MΩ)	l (mm)	IEC 60939-2	c UL us
7/40		2×2200	0.5	1.5	38	▪	▪
7/40	0.15	to	1	1.5	44	▪	▪
10/40		2×15000	0.5	1.5	44	▪	▪
10/40			1	1.5	44	▪	▪
16/40			0.3	1	58	▪	▪
16/40			0.5	1	58	▪	▪
16/40			1	1	62	▪	▪
16/40	0.25	2×2200	1.5	1	72	▪	▪
10/70		to	0.3	1	58	▪	
10/70		2×27000	0.5	1	58	▪	
10/70			1	1	62	▪	
10/70			1.5	1	72	▪	
10/40			0.5	0.68	62	▪	▪
10/40			1	0.68	62	▪	
12.5/40			0.3	0.68	62	▪	
12.5/40			0.5	0.68	62	▪	
12.5/40			1	0.68	62	▪	▪
12.5/40			1.3	0.68	62	▪	▪
12.5/40			1.5	0.68	67	▪	▪
16/40		2×2200	0.3	0.68	62	▪	▪
16/40	0.47	to	0.5	0.68	62	▪	▪
16/40		2×27000	1	0.68	67	▪	▪
16/40			1.3	0.68	67	▪	
16/40			1.5	0.68	72	▪	
10/70			0.3	0.68	62	▪	
10/70			0.5	0.68	62	▪	
10/70			1	0.68	67	▪	
10/70			1.3	0.68	67	▪	
10/70			1.5	0.68	72	▪	
10/40			0.5	0.47	80	▪	
10/40			1	0.47	80	▪	
12.5/40			0.3	0.47	80	▪	
12.5/40			0.5	0.47	80	▪	
12.5/40			1	0.47	80	▪	
12.5/40			1.3	0.47	80	▪	
12.5/40		2×2200	1.5	0.47	85	▪	
16/40	1	to	0.3	0.47	80	▪	
16/40		2×27000	0.5	0.47	80	▪	
16/40			1	0.47	85	▪	
16/40			1.3	0.47	85	▪	
16/40			1.5	0.47	90	▪	
10/70			0.3	0.47	80	▪	
10/70			0.5	0.47	80	▪	
10/70			1	0.47	85	▪	
10/70			1.3	0.47	85	▪	
10/70			1.5	0.47	90	▪	

Nominal values for capacitance:

* 0.15µF+2×2200pF
0.15µF+2×2700pF
* 0.15µF+2×4700pF
0.15µF+2×5000pF
* 0.15µF+2×6800pF
0.15µF+2×10000pF
0.15µF+2×15000pF

* 0.25µF+2×2200pF
0.25µF+2×2700pF
* 0.25µF+2×4700pF
0.25µF+2×5000pF
* 0.25µF+2×10000pF
* 0.25µF+2×15000pF
0.25µF+2×18000pF
0.25µF+2×20000pF
* 0.25µF+2×22000pF
* 0.25µF+2×25000pF
0.25µF+2×27000pF

* 0.47µF+2×2200pF
* 0.47µF+2×2700pF
0.47µF+2×4700pF
0.47µF+2×5000pF
0.47µF+2×10000pF
0.47µF+2×15000pF
* 0.47µF+2×18000pF
0.47µF+2×20000pF
* 0.47µF+2×22000pF
0.47µF+2×25000pF
0.47µF+2×27000pF

* 1µF+2×2200pF
* 1µF+2×2700pF
* 1µF+2×4700pF
* 1µF+2×5000pF
* 1µF+2×10000pF
* 1µF+2×15000pF
* 1µF+2×18000pF
* 1µF+2×20000pF
* 1µF+2×22000pF
* 1µF+2×25000pF
* 1µF+2×27000pF

* Only for IEC 60939-2

Approval: IEC 60939-2, c UL us

Approvals in use = ▪
Approvals in pending = o

Approval for climatic category 40/100/56 according to IEC 60068-1

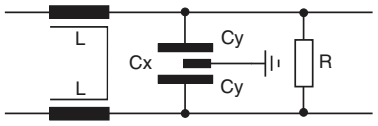
Filters for radio interference suppression:

Type KPL3508	class **X1Y2**

TECHNICAL DATA

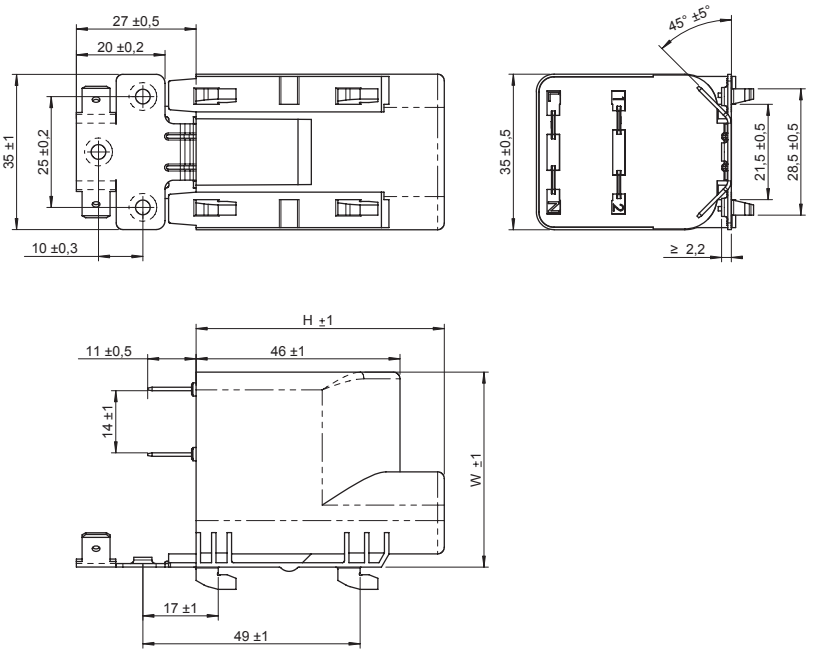
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 3000 V A.C., 2 s (2050 V A.C., 2 s)
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, UL1283, CSA C22.2 No.8, capacitor part to IEC 60384-14

Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPL3508



Casing: thermoplastic can, sealed with synthetical resin, flame retardant	
Terminals	
Type	Type of terminals
KPL3508	fast-on connectors

Standard values: KPL3508 for upper temperature 100 °C

Current	Nominal values								Nominal values for capacitance:
	Capacitance		Inductance	Discharging resistor R	Dimensions		IEC 60939-2		
I(A)/T(°C)	X1 (µF)	Y2 (pF)	L (mH)	(MΩ)	H (mm)	W (mm)			
10/40			0.47	1	46	41	▪	▪	
10/40			0.5	1	46	41	▪	▪	
10/40			1	1	46	41	▪	▪	
10/40			1.8	1	46	41	▪	▪	0.25µF+2x2200pF
12.5/40			0.3	1	46	41	▪	▪	0.25µF+2x2700pF
12.5/40			0.47	1	46	41	▪	▪	0.25µF+2x4700pF
12.5/40			1	1	46	41	▪	▪	0.25µF+2x5000pF
12.5/40		2×2200	1.3	1	46	41	▪	▪	0.25µF+2x10000pF
12.5/40	0.25	to	1.5	1	46	41	▪	▪	0.25µF+2x15000pF
12.5/40		2×27000	1.8	1	46	41	▪	▪	0.25µF+2x20000pF
16/40			0.3	1	46	41	▪	▪	0.25µF+2x22000pF
16/40			0.47	1	46	41	▪	▪	0.25µF+2x25000pF
16/40			1	1	46	41	▪	▪	0.25µF+2x27000pF
10/70			0.3	1	46	41	▪	▪	
10/70			0.47	1	46	41	▪	▪	
10/70			1	1	46	41	▪	▪	
10/40			0.47	0.68	46	41	▪	▪	
10/40			0.5	0.68	46	41	▪		
10/40			1	0.68	46	41	▪		
10/40			1.8	0.68	46	41	▪		0.33µF+2x2200pF
12.5/40			0.3	0.68	46	41	▪		0.33µF+2x2700pF
12.5/40			0.47	0.68	46	41	▪		0.33µF+2x4700pF
12.5/40			1	0.68	46	41	▪		0.33µF+2x5000pF
12.5/40		2×2200	1.3	0.68	46	41	▪		0.33µF+2x10000pF
12.5/40	0.33	to	1.5	0.68	46	41	▪		0.33µF+2x15000pF
12.5/40		2×27000	1.8	0.68	46	41	▪		0.33µF+2x20000pF
16/40			0.3	0.68	46	41	▪		0.33µF+2x22000pF
16/40			0.47	0.68	46	41	▪		0.33µF+2x25000pF
16/40			1	0.68	46	41	▪		0.33µF+2x27000pF
10/70			0.3	0.68	46	41	▪		
10/70			0.47	0.68	46	41	▪		
10/70			1	0.68	46	41	▪		
10/40			0.47	0.68	46	41	▪	▪	
10/40			0.5	0.68	46	41	▪	▪	
10/40			1	0.68	46	41	▪	▪	
10/40			1.8	0.68	46	41	▪	▪	
12.5/40			0.3	0.68	46	41	▪	▪	
12.5/40			0.47	0.68	46	41	▪	▪	0.47µF+2x2200pF
12.5/40			1	0.68	46	41	▪	▪	0.47µF+2x2700pF
12.5/40		2×2200	1.3	0.68	46	41	▪	▪	0.47µF+2x4700pF
12.5/40	0.47	to	1.5	0.68	46	41	▪	▪	0.47µF+2x5000pF
12.5/40		2×27000	1.8	0.68	46	41	▪	▪	0.47µF+2x10000pF
16/40			0.3	0.68	46	41	▪	▪	0.47µF+2x15000pF
16/40			0.47	0.68	46	41	▪	▪	0.47µF+2x20000pF
16/40			1	0.68	46	41	▪	▪	0.47µF+2x22000pF
10/70			0.3	0.68	46	41	▪		0.47µF+2x25000pF
10/70			0.47	0.68	46	41	▪		0.47µF+2x27000pF
10/70			1	0.68	46	41	▪		

Continued on the next page

Standard values: KPL3508 for upper temperature 100 °C

Current	Nominal values							
	Capacitance		Inductance	Discharging resistor R	Dimensions			
I(A)/T(°C)	X1 (µF)	Y2 (pF)	L (mH)	(MΩ)	H (mm)	W (mm)	IEC 60939-2	c UL us
10/40			0.47	0.68	56	44	▪	
10/40			0.5	0.68	56	44	▪	
10/40			1	0.68	56	44	▪	
10/40			1.8	0.68	56	44	▪	
12.5/40			0.3	0.68	56	44	▪	
12.5/40			0.47	0.68	56	44	▪	
12.5/40			1	0.68	56	44	▪	
12.5/40		2×2200	1.3	0.68	56	44	▪	
12.5/40	0.56	to	1.5	0.68	56	44	▪	
12.5/40		2×27000	1.8	0.68	56	44	▪	
16/40			0.3	0.68	56	44	▪	
16/40			0.47	0.68	56	44	▪	
16/40			1	0.68	56	44	▪	
10/70			0.3	0.68	56	44	▪	
10/70			0.47	0.68	56	44	▪	
10/70			1	0.68	56	44	▪	
10/40			0.47	0.68	56	44	▪	▪
10/40			0.5	0.68	56	44	▪	▪
10/40			1	0.68	56	44	▪	▪
10/40			1.8	0.68	56	44	▪	▪
12.5/40			0.3	0.68	56	44	▪	▪
12.5/40			0.47	0.68	56	44	▪	▪
12.5/40			1	0.68	56	44	▪	▪
12.5/40		2×2200	1.3	0.68	56	44	▪	▪
12.5/40	0.68	to	1.5	0.68	56	44	▪	▪
12.5/40		2×27000	1.8	0.68	56	44	▪	▪
16/40			0.3	0.68	56	44	▪	▪
16/40			0.47	0.68	56	44	▪	▪
16/40			1	0.68	56	44	▪	▪
10/70			0.3	0.68	56	44	▪	
10/70			0.47	0.68	56	44	▪	
10/70			1	0.68	56	44	▪	
10/40			0.47	0.68	56	44	▪	▪
10/40			0.5	0.68	56	44	▪	▪
10/40			1	0.68	56	44	▪	▪
10/40			1.8	0.68	56	44	▪	▪
12.5/40			0.3	0.68	56	44	▪	▪
12.5/40			0.47	0.68	56	44	▪	▪
12.5/40			1	0.68	56	44	▪	▪
12.5/40		2×2200	1.3	0.68	56	44	▪	▪
12.5/40	1	to	1.5	0.68	56	44	▪	▪
12.5/40		2×27000	1.8	0.68	56	44	▪	▪
16/40			0.3	0.68	56	44	▪	▪
16/40			0.47	0.68	56	44	▪	▪
16/40			1	0.68	56	44	▪	▪
10/70			0.3	0.68	56	44	▪	
10/70			0.47	0.68	56	44	▪	
10/70			1	0.68	56	44	▪	

Nominal values for capacitance:

0.56µF+2x2200pF
0.56µF+2x2700pF
0.56µF+2x4700pF
0.56µF+2x5000pF
0.56µF+2x10000pF
0.56µF+2x15000pF
0.56µF+2x20000pF
0.56µF+2x22000pF
0.56µF+2x25000pF
0.56µF+2x27000pF

0.68µF+2x2200pF
0.68µF+2x2700pF
0.68µF+2x4700pF
0.68µF+2x5000pF
0.68µF+2x10000pF
0.68µF+2x15000pF
0.68µF+2x20000pF
0.68µF+2x22000pF
0.68µF+2x25000pF
0.68µF+2x27000pF

1µF+2x2200pF
1µF+2x2700pF
1µF+2x4700pF
1µF+2x5000pF
1µF+2x10000pF
1µF+2x15000pF
1µF+2x20000pF
1µF+2x22000pF
1µF+2x25000pF
1µF+2x27000pF

Approvals in use = ▪
Approvals in pending = o

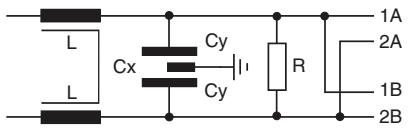
Filters for radio interference suppression:

Type KPL3523	class **X1Y2**

TECHNICAL DATA

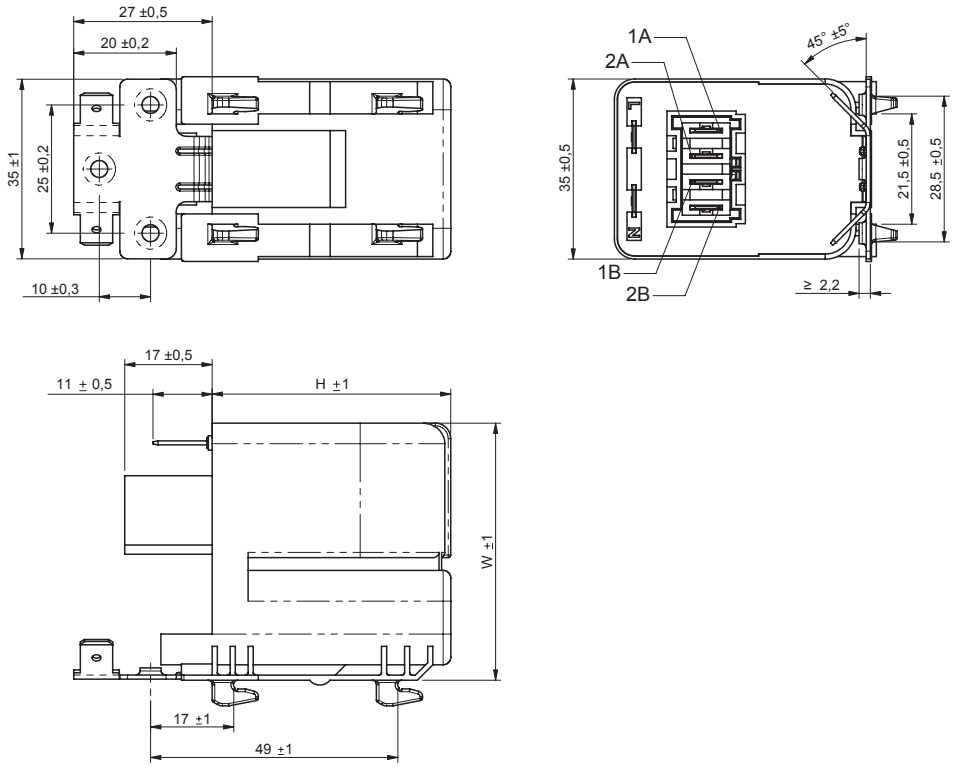
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	250 V A.C., 275 V A.C.
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 3000 V A.C., 2 s (2050 V A.C., 2 s)
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, UL1283, CSA C22.2 No.8, capacitor part to IEC 60384-14

Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPL3523



Casing: thermoplastic can, sealed with synthetical resin, flame retardant	
Terminals	
Type	Type of terminals
KPL3523	- 1A, 2A and 1B, 2B for RAST 5 - 2 × fast-on connectors

Standard values: KPL3523 for upper temperature 100 °C

Current	Nominal values							
	Capacitance		Inductance	Discharging resistor R	Dimensions		IEC 60939-2	c UL us
I(A)/T(°C)	X1 (µF)	Y2 (pF)	L (mH)	(MΩ)	H (mm)	W (mm)		
10/40			0.47	1	46	50	▪	▪
10/40			0.5	1	46	50	▪	▪
10/40			1	1	46	50	▪	▪
10/40			1.8	1	46	50	▪	▪
12.5/40			0.3	1	46	50	▪	▪
12.5/40			0.47	1	46	50	▪	▪
12.5/40			1	1	46	50	▪	▪
12.5/40		2×2200	1.3	1	46	50	▪	▪
12.5/40	0.25	to	1.5	1	46	50	▪	▪
12.5/40		2×27000	1.8	1	46	50	▪	▪
16/40			0.3	1	46	50	▪	▪
16/40			0.47	1	46	50	▪	▪
16/40			1	1	46	50	▪	▪
10/70			0.3	1	46	50	▪	
10/70			0.47	1	46	50	▪	
10/70			1	1	46	50	▪	
10/40			0.47	0.68	46	50	▪	
10/40			0.5	0.68	46	50	▪	
10/40			1	0.68	46	50	▪	
10/40			1.8	0.68	46	50	▪	
12.5/40			0.3	0.68	46	50	▪	
12.5/40			0.47	0.68	46	50	▪	
12.5/40			1	0.68	46	50	▪	
12.5/40		2×2200	1.3	0.68	46	50	▪	
12.5/40	0.33	to	1.5	0.68	46	50	▪	
12.5/40		2×27000	1.8	0.68	46	50	▪	
16/40			0.3	0.68	46	50	▪	
16/40			0.47	0.68	46	50	▪	
16/40			1	0.68	46	50	▪	
10/70			0.3	0.68	46	50	▪	
10/70			0.47	0.68	46	50	▪	
10/70			1	0.68	46	50	▪	
10/40			0.47	0.68	56	50	▪	▪
10/40			1	0.68	56	50	▪	▪
10/40			1.8	0.68	56	50	▪	▪
12.5/40			0.3	0.68	56	50	▪	▪
12.5/40			0.47	0.68	56	50	▪	▪
12.5/40		2×2200	1	0.68	56	50	▪	▪
12.5/40	0.47	to	1.3	0.68	56	50	▪	▪
12.5/40		2×27000	1.5	0.68	56	50	▪	▪
12.5/40			1.8	0.68	56	50	▪	▪
16/40			0.3	0.68	56	50	▪	▪
16/40			0.47	0.68	56	50	▪	▪
16/40			1	0.68	56	50	▪	▪
10/70			0.3	0.68	56	50	▪	
10/70			0.47	0.68	56	50	▪	
10/70			1	0.68	56	50	▪	

Nominal values for capacitance:

0.25µF+2×2200pF
0.25µF+2×2700pF
0.25µF+2×4700pF
0.25µF+2×5000pF
0.25µF+2×10000pF
0.25µF+2×15000pF
0.25µF+2×20000pF
0.25µF+2×22000pF
0.25µF+2×25000pF
0.25µF+2×27000pF

0.33µF+2×2200pF
0.33µF+2×2700pF
0.33µF+2×4700pF
0.33µF+2×5000pF
0.33µF+2×10000pF
0.33µF+2×15000pF
0.33µF+2×20000pF
0.33µF+2×22000pF
0.33µF+2×25000pF
0.33µF+2×27000pF

0.47µF+2×2200pF
0.47µF+2×2700pF
0.47µF+2×4700pF
0.47µF+2×5000pF
0.47µF+2×10000pF
0.47µF+2×15000pF
0.47µF+2×20000pF
0.47µF+2×22000pF
0.47µF+2×25000pF
0.47µF+2×27000pF

Standard values: KPL3523 for upper temperature 100 °C

Current	Nominal values								Nominal values for capacitance:
	Capacitance		Inductance	Discharging resistor R	Dimensions		IEC 60939-2	cULus	
I(A)/T(°C)	X1 (µF)	Y2 (pF)	L (mH)	(MΩ)	H (mm)	W (mm)			
10/40			0.47	0.68	46	50	▪		
10/40			0.5	0.68	46	50	▪		
10/40			1	0.68	46	50	▪		
10/40			1.8	0.68	46	50	▪		0.56µF+2×2200pF
12.5/40			0.3	0.68	46	50	▪		0.56µF+2×2700pF
12.5/40			0.47	0.68	46	50	▪		0.56µF+2×4700pF
12.5/40			1	0.68	46	50	▪		0.56µF+2×5000pF
12.5/40		2×2200	1.3	0.68	46	50	▪		0.56µF+2×10000pF
12.5/40	0.56	to	1.5	0.68	46	50	▪		0.56µF+2×15000pF
12.5/40		2×27000	1.8	0.68	46	50	▪		0.56µF+2×20000pF
16/40			0.3	0.68	46	50	▪		0.56µF+2×22000pF
16/40			0.47	0.68	46	50	▪		0.56µF+2×25000pF
16/40			1	0.68	46	50	▪		0.56µF+2×27000pF
10/70			0.3	0.68	46	50	▪		
10/70			0.47	0.68	46	50	▪		
10/70			1	0.68	46	50	▪		
10/40			0.47	0.47	56	50	▪	▪	
10/40			1	0.47	56	50	▪	▪	
10/40			1.8	0.47	56	50	▪	▪	
12.5/40			0.3	0.47	56	50	▪	▪	
12.5/40			0.47	0.47	56	50	▪	▪	
12.5/40			1	0.47	56	50	▪	▪	
12.5/40		2×2200	1.3	0.47	56	50	▪	▪	
12.5/40	0.68	to	1.5	0.47	56	50	▪	▪	0.68µF+2×2200pF
12.5/40		2×27000	1.8	0.47	56	50	▪	▪	0.68µF+2×2700pF
16/40			0.3	0.47	56	50	▪	▪	0.68µF+2×4700pF
16/40			0.47	0.47	56	50	▪	▪	0.68µF+2×5000pF
16/40			1	0.47	56	50	▪	▪	0.68µF+2×10000pF
10/70			0.3	0.47	56	50	▪		0.68µF+2×15000pF
10/70			0.47	0.47	56	50	▪		0.68µF+2×20000pF
10/70			1	0.47	56	50	▪		0.68µF+2×22000pF
10/40			0.47	0.47	56	50	▪	▪	0.68µF+2×25000pF
10/40			1	0.47	56	50	▪	▪	0.68µF+2×27000pF
10/40			1.8	0.47	56	50	▪	▪	
12.5/40			0.3	0.47	56	50	▪	▪	
12.5/40			0.47	0.47	56	50	▪	▪	
12.5/40			1	0.47	56	50	▪	▪	
12.5/40		2×2200	1.3	0.47	56	50	▪	▪	
12.5/40	1	to	1.5	0.47	56	50	▪	▪	1µF+2×2200pF
12.5/40		2×27000	1.8	0.47	56	50	▪	▪	1µF+2×2700pF
16/40			0.3	0.47	56	50	▪	▪	1µF+2×4700pF
16/40			0.47	0.47	56	50	▪	▪	1µF+2×5000pF
16/40			1	0.47	56	50	▪	▪	1µF+2×10000pF
10/70			0.3	0.47	56	50	▪		1µF+2×15000pF
10/70			0.47	0.47	56	50	▪		1µF+2×20000pF
10/70			1	0.47	56	50	▪		1µF+2×22000pF
16/40	0.47	-	0.47	0.68	46	50	▪	▪	1µF+2×25000pF
									1µF+2×27000pF

Approvals in use = ▪
Approvals in pending = o

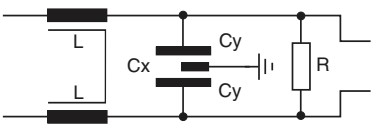
Filters for radio interference suppression:

Type KPL3524	class **X1Y2**

TECHNICAL DATA

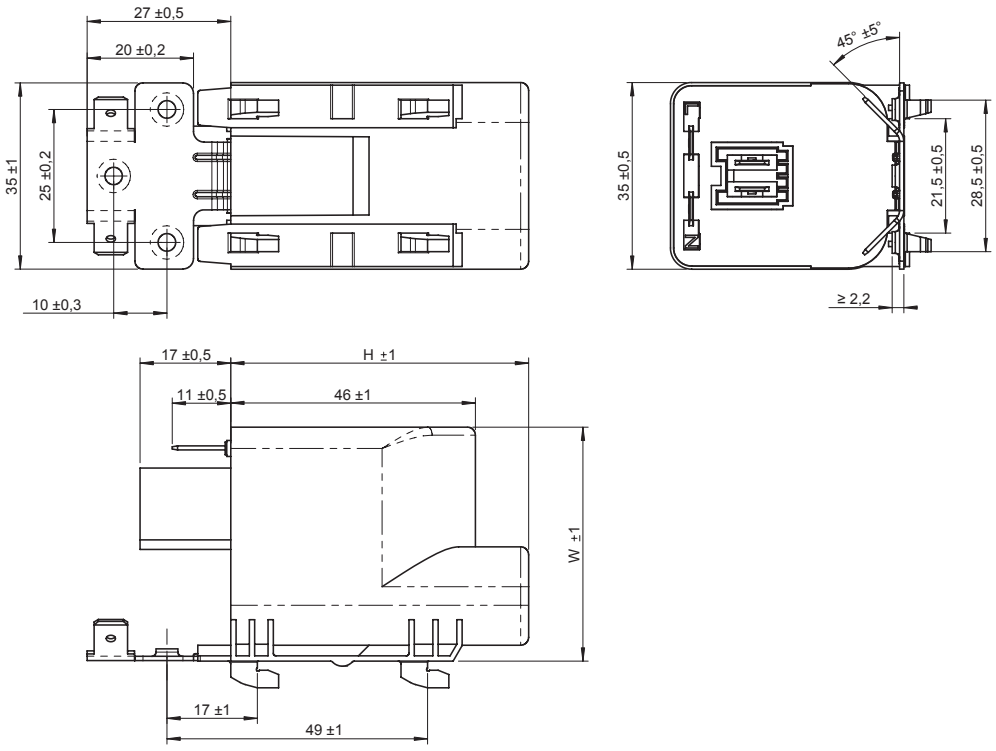
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	250 V A.C., 275 V A.C.
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 3000 V A.C., 2 s (2050 V A.C., 2 s)
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, UL1283, CSA C22.2 No.8, capacitor part to IEC 60384-14

Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPL3524



Casing: thermoplastic can, sealed with synthetical resin, flame retardant	
Terminals	
Type	Type of terminals
KPL3524	- for RAST 5 - 2 × fast-on connectors

Standard values: KPL3524 for upper temperature 100 °C

Current	Nominal values							
	Capacitance		Inductance	Discharging resistor R	Dimensions			
I(A)/T(°C)	X1 (µF)	Y2 (pF)	L (mH)	(MΩ)	H (mm)	W (mm)	IEC 60939-2	
10/40			0.47	1	46	41	▪	▪
10/40			0.5	1	46	41	▪	▪
10/40			1	1	46	41	▪	▪
10/40			1.8	1	46	41	▪	▪
12.5/40			0.3	1	46	41	▪	▪
12.5/40			0.47	1	46	41	▪	▪
12.5/40			1	1	46	41	▪	▪
12.5/40		2×2200	1.3	1	46	41	▪	▪
12.5/40	0.25	to	1.5	1	46	41	▪	▪
12.5/40		2×27000	1.8	1	46	41	▪	▪
16/40			0.3	1	46	41	▪	▪
16/40			0.47	1	46	41	▪	▪
16/40			1	1	46	41	▪	▪
10/70			0.3	1	46	41	▪	
10/70			0.47	1	46	41	▪	
10/70			1	1	46	41	▪	
10/40			0.47	0.68	46	41	▪	
10/40			0.5	0.68	46	41	▪	
10/40			1	0.68	46	41	▪	
10/40			1.8	0.68	46	41	▪	
12.5/40			0.3	0.68	46	41	▪	
12.5/40			0.47	0.68	46	41	▪	
12.5/40			1	0.68	46	41	▪	
12.5/40		2×2200	1.3	0.68	46	41	▪	
12.5/40	0.33	to	1.5	0.68	46	41	▪	
12.5/40		2×27000	1.8	0.68	46	41	▪	
16/40			0.3	0.68	46	41	▪	
16/40			0.47	0.68	46	41	▪	
16/40			1	0.68	46	41	▪	
10/70			0.3	0.68	46	41	▪	
10/70			0.47	0.68	46	41	▪	
10/70			1	0.68	46	41	▪	
10/40			0.47	0.47	56	44	▪	▪
10/40			1	0.47	56	44	▪	▪
10/40			1.8	0.47	56	44	▪	▪
12.5/40		2×2200	0.3	0.47	56	44	▪	▪
12.5/40	0.47	to	0.47	0.47	56	44	▪	▪
12.5/40		2×27000	1	0.47	56	44	▪	▪
12.5/40			1.3	0.47	56	44	▪	▪
12.5/40			1.5	0.47	56	44	▪	▪
12.5/40			1.8	0.47	56	44	▪	▪
16/40			0.3	0.47	56	44	▪	▪
16/40			0.47	0.47	56	44	▪	▪
16/40			1	0.47	56	44	▪	▪
10/70			0.3	0.47	56	44	▪	
10/70			0.47	0.47	56	44	▪	
10/70			1	0.47	56	44	▪	

Nominal values for capacitance:

0.25µF+2×2200pF
0.25µF+2×2700pF
0.25µF+2×4700pF
0.25µF+2×5000pF
0.25µF+2×10000pF
0.25µF+2×15000pF
0.25µF+2×20000pF
0.25µF+2×22000pF
0.25µF+2×27000pF

0.33µF+2×2200pF
0.33µF+2×2700pF
0.33µF+2×4700pF
0.33µF+2×5000pF
0.33µF+2×10000pF
0.33µF+2×15000pF
0.33µF+2×20000pF
0.33µF+2×22000pF
0.33µF+2×27000pF

0.47µF+2×2200pF
0.47µF+2×2700pF
0.47µF+2×4700pF
0.47µF+2×5000pF
0.47µF+2×10000pF
0.47µF+2×15000pF
0.47µF+2×20000pF
0.47µF+2×22000pF
0.47µF+2×27000pF

Continued on the next page

Standard values: KPL3524 for upper temperature 100 °C

Current	Nominal values							
	Capacitance		Inductance	Discharging resistor R	Dimensions		IEC 60939-2	c UL us
I(A)/T(°C)	X1 (µF)	Y2 (pF)	L (mH)	(MΩ)	H (mm)	W (mm)		
10/40			0.47	0.68	56	44	▪	
10/40			0.5	0.68	56	44	▪	
10/40			1	0.68	56	44	▪	
10/40			1.8	0.68	56	44	▪	
12.5/40			0.3	0.68	56	44	▪	
12.5/40			0.47	0.68	56	44	▪	
12.5/40			1	0.68	56	44	▪	
12.5/40		2×2200	1.3	0.68	56	44	▪	
12.5/40	0.56	to	1.5	0.68	56	44	▪	
12.5/40		2×27000	1.8	0.68	56	44	▪	
16/40			0.3	0.68	56	44	▪	
16/40			0.47	0.68	56	44	▪	
16/40			1	0.68	56	44	▪	
10/70			0.3	0.68	56	44	▪	
10/70			0.47	0.68	56	44	▪	
10/70			1	0.68	56	44	▪	
10/40			0.47	0.47	56	44	▪	▪
10/40			0.5	0.47	56	44	▪	▪
10/40			1	0.47	56	44	▪	▪
10/40			1.8	0.47	56	44	▪	▪
12.5/40			0.3	0.47	56	44	▪	▪
12.5/40			0.47	0.47	56	44	▪	▪
12.5/40			1	0.47	56	44	▪	▪
12.5/40		2×2200	1.3	0.47	56	44	▪	▪
12.5/40	0.68	to	1.5	0.47	56	44	▪	▪
12.5/40		2×27000	1.8	0.47	56	44	▪	▪
16/40			0.3	0.47	56	44	▪	▪
16/40			0.47	0.47	56	44	▪	▪
16/40			1	0.47	56	44	▪	▪
10/70			0.3	0.47	56	44	▪	
10/70			0.47	0.47	56	44	▪	
10/70			1	0.47	56	44	▪	
10/40			0.47	0.47	56	44	▪	▪
10/40			1	0.47	56	44	▪	▪
10/40			1.8	0.47	56	44	▪	▪
12.5/40			0.3	0.47	56	44	▪	▪
12.5/40			0.47	0.47	56	44	▪	▪
12.5/40		2×2200	1	0.47	56	44	▪	▪
12.5/40	1	to	1.3	0.47	56	44	▪	▪
12.5/40		2×27000	1.5	0.47	56	44	▪	▪
12.5/40			1.8	0.47	56	44	▪	▪
16/40			0.3	0.47	56	44	▪	▪
16/40			0.47	0.47	56	44	▪	▪
16/40			1	0.47	56	44	▪	▪
10/70			0.3	0.47	56	44	▪	
10/70			0.47	0.47	56	44	▪	
10/70			1	0.47	56	44	▪	

Nominal values for capacitance:

0.56µF+2×2200pF
0.56µF+2×2700pF
0.56µF+2×4700pF
0.56µF+2×5000pF
0.56µF+2×10000pF
0.56µF+2×15000pF
0.56µF+2×20000pF
0.56µF+2×22000pF
0.56µF+2×27000pF

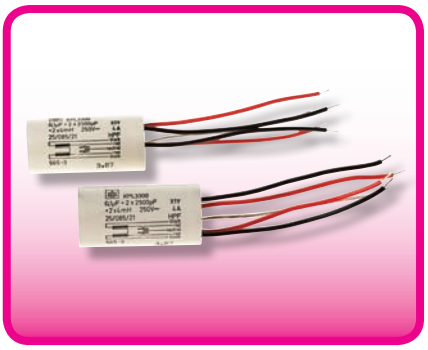
0.68µF+2×2200pF
0.68µF+2×2700pF
0.68µF+2×4700pF
0.68µF+2×5000pF
0.68µF+2×10000pF
0.68µF+2×15000pF
0.68µF+2×20000pF
0.68µF+2×22000pF
0.68µF+2×27000pF

1µF+2×2200pF
1µF+2×2700pF
1µF+2×4700pF
1µF+2×5000pF
1µF+2×10000pF
1µF+2×15000pF
1µF+2×20000pF
1µF+2×22000pF
1µF+2×27000pF

Approvals in use = ▪
Approvals in pending = o

Filters for radio interference suppression:

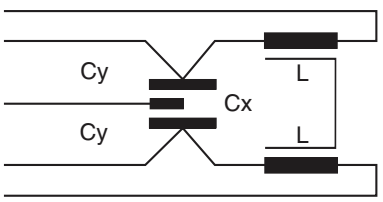
Type KPL3300	class **X1Y2**



TECHNICAL DATA

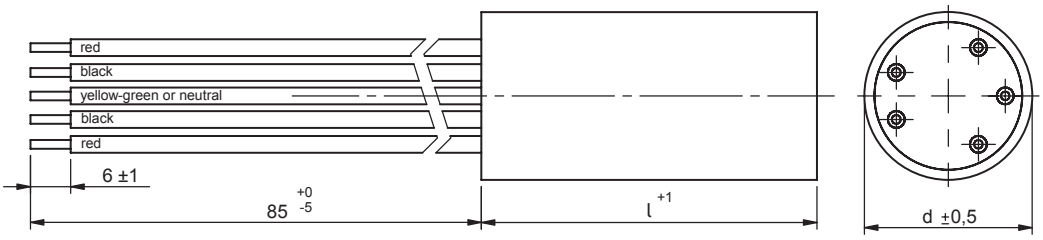
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	250 V A.C., 275 V A.C.
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Climatic category:	25/085/21 according to IEC 60068-1
Temperature range:	- 25 °C to + 85 °C
Test voltage:	X1 - capacitor 1625 V D.C., 2 s for U_R = 250 V X1 - capacitor 1790 V D.C., 2 s for U_R = 275 V Y2 - capacitor 2700 V D.C., 2 s (or 1800 V A.C., 2 s)
Insulation resistance at 20°C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, capacitor section IEC 60384-14

Electrical connection



R = 470 kΩ ÷ 2.7 MΩ on request

KPL3300



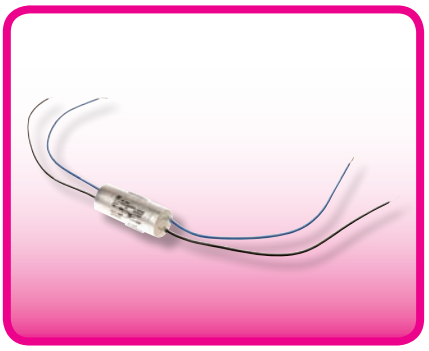
Casing: thermoplastic, sealed with synthetical resin.	
Terminals	
Type	Type of terminals
KPL3300	stranded wire 0.5 mm² with PVC insulation

Standard values: KPL3300

Rated current I (A)	Rated values			
	Capacitance		Inductance L (mH)	Dimensions d x l (mm)
	X1 (µF)	Y2 (pF)		
4	0.1	2 × 2500	2 × 1	25 × 50
6	0.1	2 × 2500	2 × 1	25 × 50
3	0.1	2 × 2500	2 × 4	25 × 50
4	0.1	2 × 2500	2 × 2	25 × 50
2	0.1	2 × 2500	2 × 6	25 × 50

Filters for radio interference suppression:

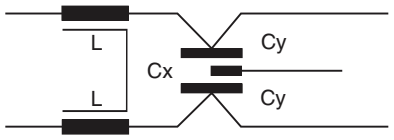
Type KPL305x	class **X1Y2**



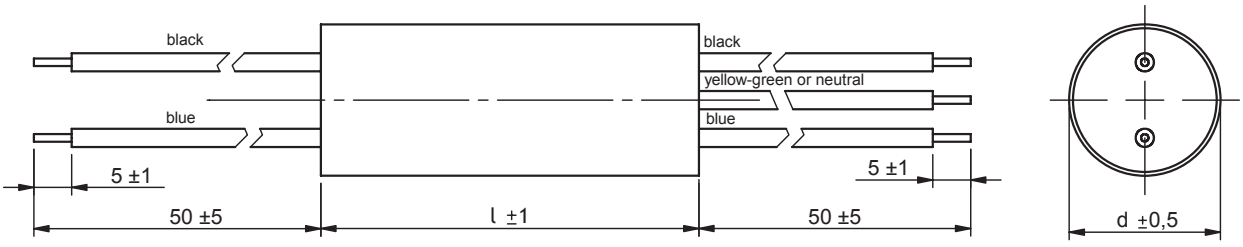
TECHNICAL DATA

Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	250 V A.C., 275 V A.C.
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Climatic category:	25/085/21 according to IEC 60068-1
Temperature range:	- 25 °C to + 85 °C
Test voltage:	X1 - capacitor 1625 V D.C., 2 s for U_R = 250 V X1 - capacitor 1790 V D.C., 2 s for U_R = 275 V Y2 - capacitor 2700 V D.C., 2 s (or 1800 V A.C., 2 s)
Insulation resistance at 20°C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, capacitor section IEC 60384-14

Electrical connection



KPL305x



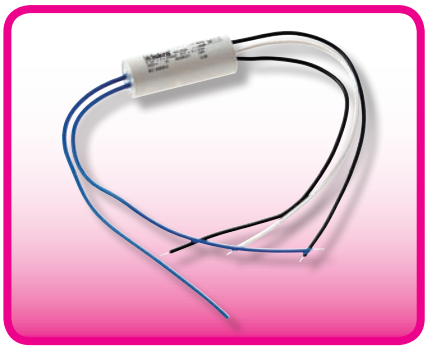
Casing: aluminium, sealed with synthetical resin. Casing also available with bracket.	
Terminals	
Type	Type of terminals
KPL305x	stranded wire 0.5 mm² up to 6 A or 1.5 mm² up to 16 A with PVC insulation

Standard values: KPL305x

Rated current I (A)	Rated values			
	Capacitance		Inductance L (mH)	Dimensions d x l (mm)
	X1 (µF)	Y2 (pF)		
1	0.1	2 × 2500	2 × 4	20 × 50
2	0.1	2 × 2500	2 × 1	20 × 50
2	0.1	2 × 2500	2 × 2	20 × 50
2	0.1	2 × 2500	2 × 6	25 × 55
3	0.1	2 × 2500	2 × 4	25 × 55
4	0.1	2 × 2500	2 × 2	25 × 55
5	0.1	2 × 2500	2 × 2	30 × 60
6	0.1	2 × 2500	2 × 1	25 × 55
6	0.1	2 × 2500	2 × 4	35 × 60
10	0.1	2 × 2500	2 × 2	35 × 60
16	0.1	2 × 2500	2 × 1	35 × 60

Filters for radio interference suppression:

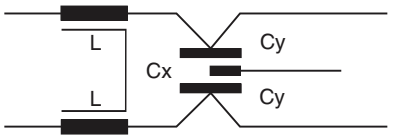
Type KPL3350	class **X1Y2**



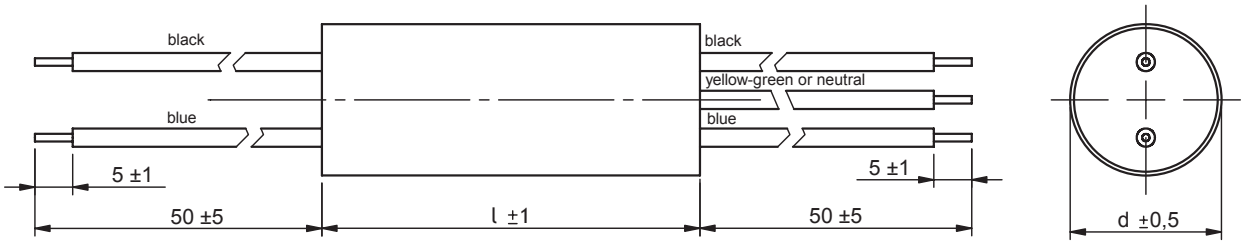
TECHNICAL DATA

Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	250 V A.C., 275 V A.C.
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Climatic category:	25/085/21 according to IEC 60068-1
Temperature range:	- 25 °C to + 85 °C
Test voltage:	X1 - capacitor 1625 V D.C., 2 s for U_R = 250 V X1 - capacitor 1790 V D.C., 2 s for U_R = 275 V Y2 - capacitor 2700 V D.C., 2 s (or 1800 V A.C., 2 s)
Insulation resistance at 20°C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, capacitor section IEC 60384-14

Electrical connection



KPL3350



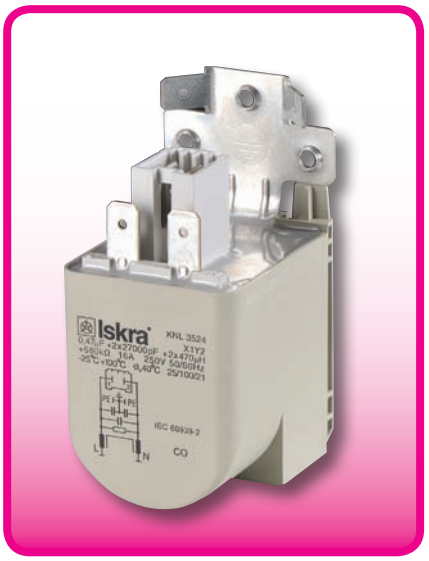
Casing: thermoplastic tube, sealed with synthetical resin.	
Terminals	
Type	Type of terminals
KPL3350	Stranded wire 0.5 mm² with PVC insulation.

Standard values: KPL3350

Rated current I (A)	Rated values			
	Capacitance		Inductance L (mH)	Dimensions d x l (mm)
	X1 (µF)	Y2 (pF)		
1	0.1	2 × 2500	2 × 2	18 × 48
2	0.1	2 × 2500	2 × 1	18 × 48

Filters for radio interference suppression:

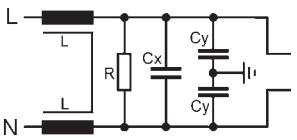
Type KNL3524	class **X1Y2**



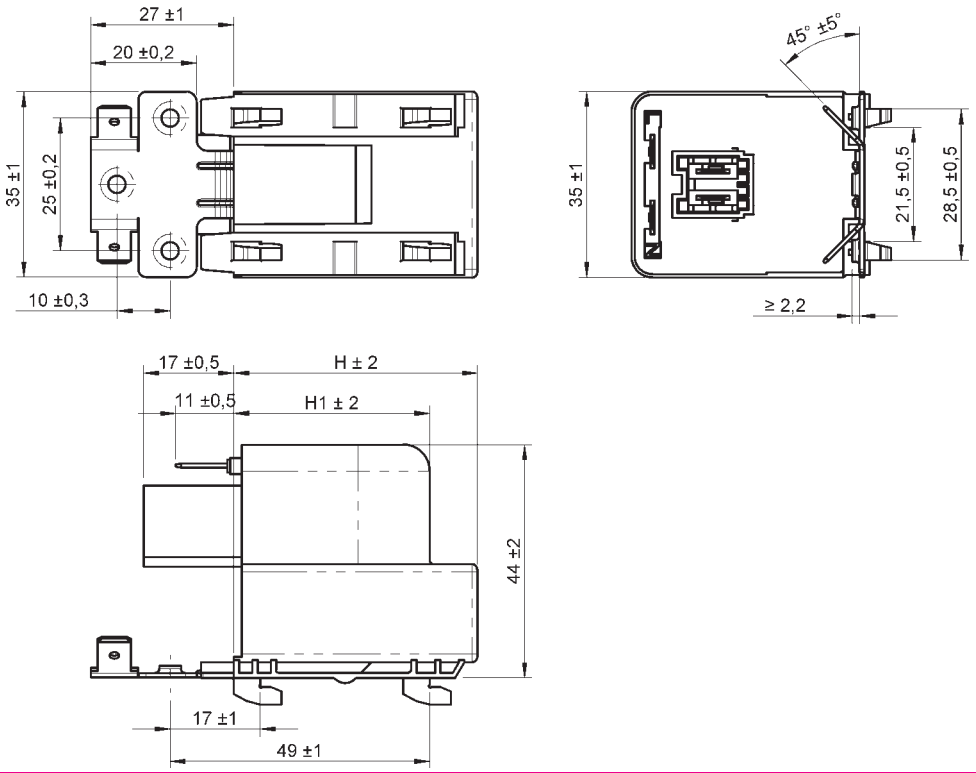
TECHNICAL DATA

Construction:	polypropylene film, metallized
Rated voltage:	250 V A.C
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Test voltage:	X1 capacitor 1625 V D.C., 2 s Y2 capacitor 3000 V A.C., 2 s (2050 V A.C., 2 s)
Insulation resistance at 20 °C, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0.33 µF $R_i \times C_n \geq 2000$ s for C > 0.33 µF
Complies to:	IEC 60939-2, EN 60939-2, UL1283, CSA C22.2 No.8, capacitor part to IEC 60384-14

Electrical connection



KNL3524



Casing: thermoplastic can, sealed with synthetical resin, flame retardant	
Terminals	
Type	Type of terminals
KNL3524	- for RAST 5 - 2 × fast-on connectors

Rated Current	Rated values								Rated capacitance values		
	Capacitance		Inductance	Discharging	Dimensions						
I(A)/T(°C)	X1 (µF)	Y2 (pF) optional	L (mH)	resistor R (MΩ)	H (mm)	H1 (mm)	IEC 60939-2		Cx(µF)	+2 ×	Cy(pF)
10/40			0.3	0.68	46	37	o	o			
10/40			0.47	0.68	46	37	o	o			
10/40			0.5	0.68	46	37	o	o			
10/40			1	0.68	46	46	o	o			
10/40			1.3	0.68	46	46	o	o			
10/40			1.5	0.68	46	46	o	o	0.33	+2 ×	2200
10/40			1.8	0.68	46	46	o	o	0.33	+2 ×	2700
12.5/40		2×2200	0.3	0.68	46	37	o	o	0.33	+2 ×	4700
12.5/40	0.33	up to	0.47	0.68	46	37	o	o	0.33	+2 ×	5000
12.5/40		2×27000	0.5	0.68	46	37	o	o	0.33	+2 ×	10000
12.5/40			1	0.68	46	46	o	o	0.33	+2 ×	15000
12.5/40			1.3	0.68	46	46	o	o	0.33	+2 ×	20000
12.5/40			1.5	0.68	46	46	o	o	0.33	+2 ×	22000
12.5/40			1.8	0.68	46	46	o	o	0.33	+2 ×	25000
16/40 or 10/70			0.3	0.68	46	37	o	o	0.33	+2 ×	27000
16/40 or 10/70			0.47	0.68	46	37	o	o			
16/40 or 10/70			0.5	0.68	46	37	o	o			
16/40 or 10/70			1	0.68	46	46	o	o			
16/40 or 10/70			1.3	0.68	46	46	o	o			
16/40 or 10/70			1.5	0.68	46	46	o	o			
16/40 or 10/70			1.8	0.68	46	46	o	o			
10/40			0.3	0.68	46	37	o	o			
10/40			0.47	0.68	46	37	o	o			
10/40			0.5	0.68	46	37	o	o			
10/40			1	0.68	46	46	o	o			
10/40			1.3	0.68	46	46	o	o			
10/40			1.5	0.68	46	46	o	o	0.47	+2 ×	2200
10/40			1.8	0.68	46	46	o	o	0.47	+2 ×	2700
12.5/40			0.3	0.68	46	37	o	o	0.47	+2 ×	4700
12.5/40		2×2200	0.47	0.68	46	37	o	o	0.47	+2 ×	5000
12.5/40	0.47	up to	0.5	0.68	46	37	o	o	0.47	+2 ×	10000
12.5/40		2×27000	1	0.68	46	46	o	o	0.47	+2 ×	15000
12.5/40			1.3	0.68	46	46	o	o	0.47	+2 ×	20000
12.5/40			1.5	0.68	46	46	o	o	0.47	+2 ×	22000
12.5/40			1.8	0.68	46	46	o	o	0.47	+2 ×	25000
16/40 or 10/70			0.3	0.68	46	37	o	o	0.47	+2 ×	27000
16/40 or 10/70			0.47	0.68	46	37	o	o			
16/40 or 10/70			0.5	0.68	46	37	o	o			
16/40 or 10/70			1	0.68	46	46	o	o			
16/40 or 10/70			1.3	0.68	46	46	o	o			
16/40 or 10/70			1.5	0.68	46	46	o	o			
16/40 or 10/70			1.8	0.68	46	46	o	o			

Ⓓ Approvals in pending

Rated Current I(A)/T(°C)	Rated values								Rated capacitance values		
	Capacitance		Inductance L (mH)	Discharging resistor R (MΩ)	Dimensions		IEC 60939-2	c UL us			
	X1 (µF)	Y2 (pF) optional			H (mm)	H1 (mm)			Cx(µF)	+2 ×	Cy(pF)
10/40			0.5	0.47	46	46	o	o			
10/40			1	0.47	46	46	o	o			
10/40			1.3	0.47	46	46	o	o	0.68	+2 ×	1000
10/40			1.5	0.47	46	46	o	o	0.68	+2 ×	2200
10/40			1.8	0.47	46	46	o	o	0.68	+2 ×	2700
12.5/40			0.3	0.47	46	46	o	o	0.68	+2 ×	4700
12.5/40		2×1000	0.47	0.47	46	46	o	o	0.68	+2 ×	5000
12.5/40	0.68	up to	0.5	0.47	46	46	o	o	0.68	+2 ×	10000
12.5/40		2×27000	1	0.47	46	46	o	o	0.68	+2 ×	15000
12.5/40			1.3	0.47	46	46	o	o	0.68	+2 ×	20000
12.5/40			1.5	0.47	46	46	o	o	0.68	+2 ×	22000
12.5/40			1.8	0.47	46	46	o	o	0.68	+2 ×	25000
16/40 or 10/70			0.3	0.47	46	46	o	o	0.68	+2 ×	27000
16/40 or 10/70			0.47	0.47	46	46	o	o			
16/40 or 10/70			0.5	0.47	46	46	o	o			
16/40 or 10/70			1	0.47	46	46	o	o			
16/40 or 10/70			1.3	0.47	46	46	o	o			
16/40 or 10/70			1.5	0.47	46	46	o	o			
16/40 or 10/70			1.8	0.47	46	46	o	o			
10/40			0.3	0.47	46	46	o	o			
10/40			0.47	0.47	46	46	o	o			
10/40			0.5	0.47	46	46	o	o			
10/40			1	0.47	46	46	o	o			
10/40			1.3	0.47	46	46	o	o	1	+2 ×	1000
10/40			1.5	0.47	46	46	o	o	1	+2 ×	2200
10/40			1.8	0.47	46	46	o	o	1	+2 ×	2700
12.5/40		2×1000	0.3	0.47	46	46	o	o	1	+2 ×	4700
12.5/40	1	up to	0.47	0.47	46	46	o	o	1	+2 ×	5000
12.5/40		2×27000	0.5	0.47	46	46	o	o	1	+2 ×	10000
12.5/40			1	0.47	46	46	o	o	1	+2 ×	15000
12.5/40			1.3	0.47	46	46	o	o	1	+2 ×	20000
12.5/40			1.5	0.47	46	46	o	o	1	+2 ×	22000
12.5/40			1.8	0.47	46	46	o	o	1	+2 ×	25000
16/40 or 10/70			0.3	0.47	46	46	o	o	1	+2 ×	27000
16/40 or 10/70			0.47	0.47	46	46	o	o			
16/40 or 10/70			0.5	0.47	46	46	o	o			
16/40 or 10/70			1	0.47	46	46	o	o			
16/40 or 10/70			1.3	0.47	46	46	o	o			
16/40 or 10/70			1.5	0.47	46	46	o	o			
16/40 or 10/70			1.8	0.47	46	46	o	o			

℗ Approvals in pending

Notes

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