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.

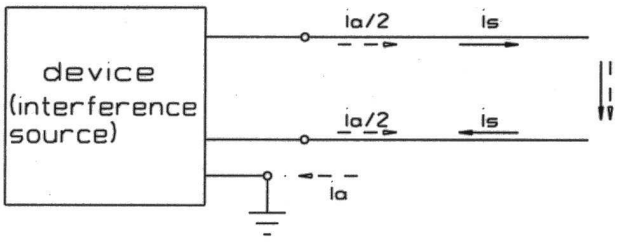


Figure 1

Symmetrical interference current 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 55 011; EN 55 014; etc.
Operational methods during measurement are prescribed with individual stipulations and are given in the recommendations of the CISPR, publication 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:

IEC 60384-14; EN 60384-14; UL 1414;
UL 1283; CSA C22.2 No.1; CSA C22.2 No.8;
CSA E384-14;
GB/T 14472; EN 60939-2.

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.

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 $C_R \leq 1{,}0\ \mu F$: $U_p = 4.0$ kV for $C_R > 1{,}0\ \mu F$: $U_p = (4/\sqrt{C_R})$ kV
X2	≤ 2,5 kV	general requirements	for $C_R \leq 1{,}0\ \mu F$: $U_p = 2{,}5$ kV for $C_R > 1{,}0\ \mu F$: $U_p = (2{,}5/\sqrt{C_R})$ kV
X3	≤ 1,2 kV	general requirements	none

Rated voltage X1, X2 and X3: ≤ 760 V

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:

Sub-Class	Type of the bypass 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

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.

Bipolar capacitors

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

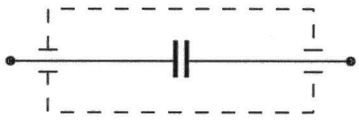


figure 2: bipolar capacitor

RC Combination

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

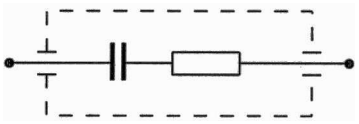


fig.3: RC-combination

Four-polar capacitors

Four-polar capacitors (feed through capacitors/non-coaxial) have, for at least one coating, two electromagnetically mostly de-coupled 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.

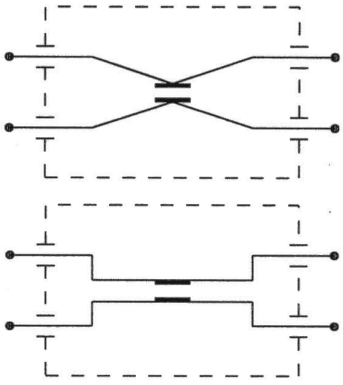


fig. 4: feed through capacitor for symmetrical usage (non-coaxial)

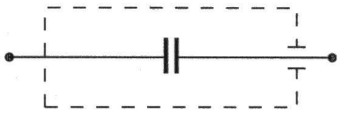


fig. 5a: single by- pass capacitor

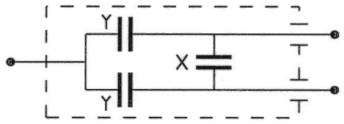


fig. 5b: delta by-pass capacitor

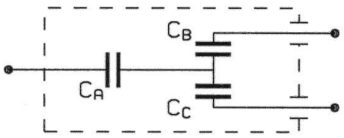


fig. 5c: example for a by-pass capacitor in T-wiring

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, interference's are more or less short circuited. A capacitor incorporated in-parallel with power source terminal, suppresses symmetrical interference's, and between a power conductor terminal and the casing or earth it suppresses asymmetrical interference's. 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 interference suppression components

When ordering, the following data should be given:

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

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

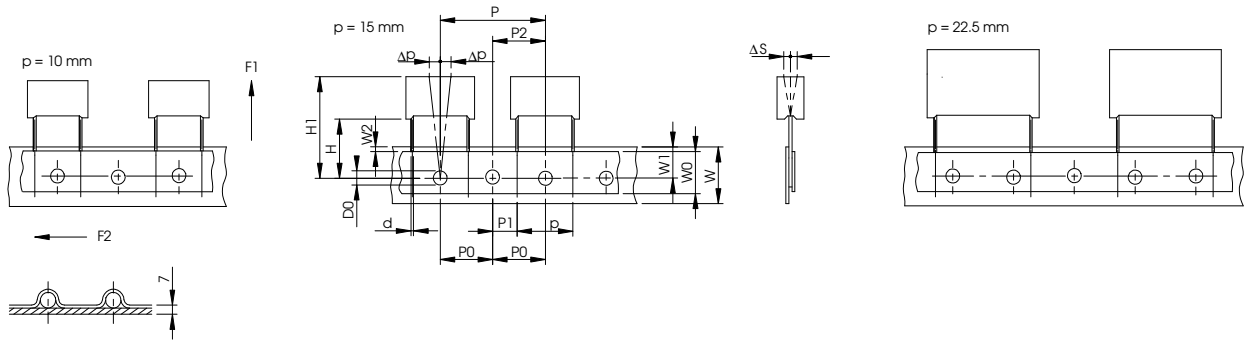
The production date code is indicated with two-characters. The 1st character (letter) indicates the year and the 2nd character (number/letter) indicates the month.

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**		

Examples:

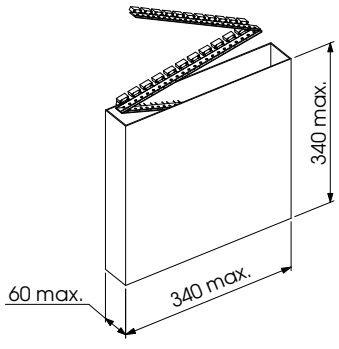
2006 March = **U3**
2008 October = **WO**

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

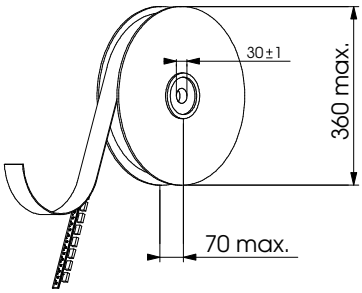


Descriptions	Symbol	Dimensions (mm)			
		Lead spacing 10 mm	Lead spacing 15 mm	Lead spacing 22.5 mm	Tolerances
Carrier tape width	W	18	18	18	+ 1 / - 0,5
Hold-down tape width	W_0	12 or 6	12 or 6	12 or 6	± 0,5
Hotel position	W_1	9	9	9	± 0,5
Hold-down tape position	W_2	3	3	3	max
Feed hole diameter	D_0	4	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



Ammo pack



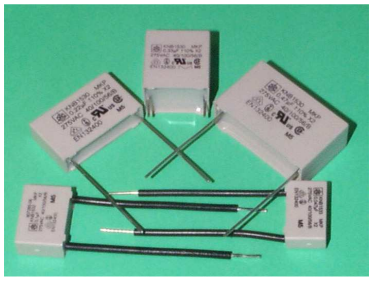
Reel pack

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	350
	7	368	300
	8,5	304	250
	10	256	200
	10,5	240	200

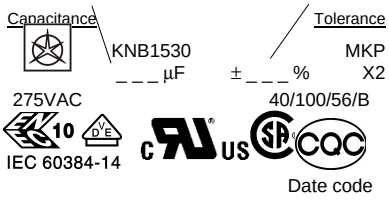
Capacitors: Type **KNB 1530** **275 V AC** class **X2**
1532 **300 V AC**
1533

TECHNICAL DATA:

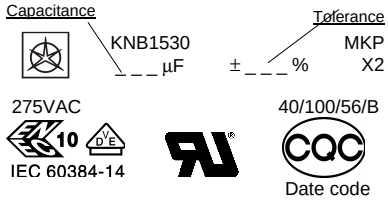


Construction:	polypropylene film, metallized
Rated voltage:	275 V A.C., 300 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0,1 µF and ± 10 % for C > 0,1 µF
Climatic category:	40/100/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 ℃ to + 100 ℃
Test voltage:	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 ℃, 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 ℃:	$\leq 5 \times 10^{-4}$
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 ℃
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

Marking KNB1530 for C = 0,01µF to 1µF:

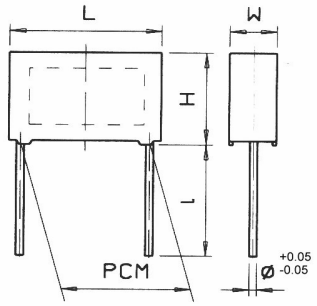


Marking KNB1530 for C > 1µF to 2,2µF:

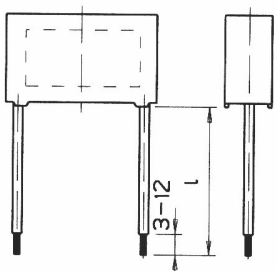


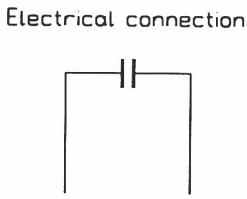
Note: Capacitance tolerance ± 20 % is not marked.

KNB1530



KNB1532, 1533





∅ 0,6 mm for PCM = 10 mm
∅ 0,8 mm for PCM > 10 mm

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
KNB1530	$3^{+0,5}$, $4^{\pm 0,5}$, 6^{-1} ,9^{+1},$15^{\pm 2}$,$20^{\pm 2}$,25^{+5},30^{+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 ∅ 0,8 mm End terminals on request

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

Capa-citance	Dimensions					For capacitors with insulated leads on request				
	Lmax	Hmax	Wmax	PCM	IEC 60384-14	UL 1283	UL 1414	C22.2 No.1	GB/T14472	E384-14-95
C(µF)	(mm)	(mm)	(mm)	(mm)	275 V AC	300 V AC	250 V AC	250 V AC	275 V AC	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

Capa-citance	Dimensions					For capacitors with insulated leads on request			
	Lmax	Hmax	Wmax	PCM	IEC 60384-14	UL 1283	UL 1414	C22,2 No,1	E384-14-95
C(µF)	(mm)	(mm)	(mm)	(mm)	300 V AC	300 V AC	250 V AC	250 V AC	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	•	•			

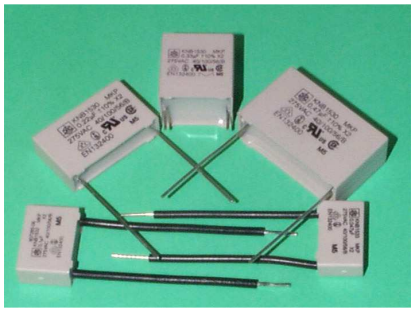
* mini size marking with ⌐

Approvals in use = •
Approvals in pending = o

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

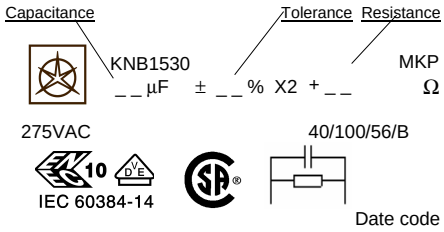
Capacitors: Type **KNB 1530** **With discharge resistor** **275 V AC** **class X2**
1532 **300 V AC**
1533

TECHNICAL DATA:



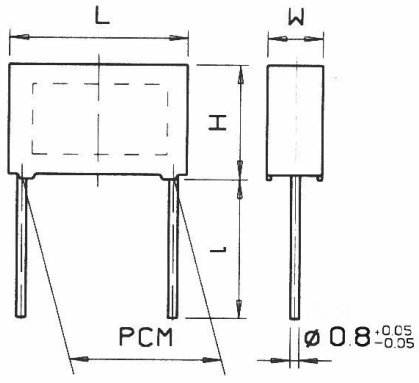
Construction: -capacitor:	polypropylene film, metallized
-resistor:	metaloxide film
Rated voltage:	275 V A.C., 300 V A.C
Capacitance tolerance:	± 20 % for C ≤ 0,1 µF and ± 10 % for C > 0,1 µF
Climatic category:	40/100/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 ℃ to + 100 ℃
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 ℃, U_m = 100V 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 ℃:	$\leq 5 \times 10^{-4}$
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 ℃
Self inductance:	approx. 10 nH/cm of capacitor length and terminals
Complies to:	IEC 60384-14, EN 60384-14, CSA E384-14

Marking KNB1530 with discharge resistor:

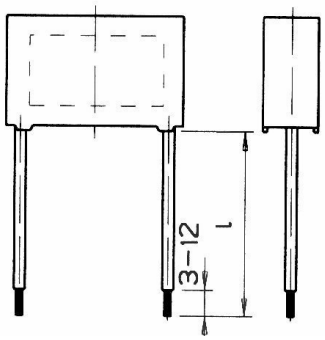


Note: Capacitance tolerance ± 20 % is not marked.

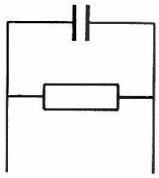
KNB1530



KNB1532, 1533



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
KNB1530	$3^{+0,5}$, $4^{\pm0,5}$, 6^{-1}, 9^{+1}, $15^{\pm2}$, $20^{\pm2}$, 25^{+5}, 30^{+5}, $50^{\pm5}$ 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 ∅ 0,8 mm
		End terminals on request

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

With discharge resistor

Capa-citance C(µF)	Resistance R(kΩ)	Dimensions Lmax (mm)	Hmax (mm)	Wmax (mm)	PCM (mm)	IEC 60384-14	E384-14-95
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	•	•

Approvals in use = •

Resistance values according to IEC 60063 range E12. Approvals in pending = o

Standard values: KNB1530, KNB1532, KNB1533 300 V AC

With discharge resistor

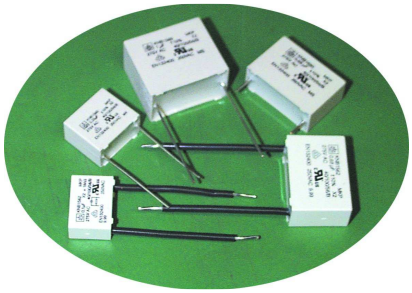
Capa- citance C(µF)	Resistance R(kΩ)	Dimensions Lmax (mm)	Hmax (mm)	Wmax (mm)	PCM (mm)	IEC 60384-14	E 384-14-95
0,047		18	12	6	15	•	•
0,068		18	13	7	15	•	•
0,1		18	13,5	7,5	15	•	•
0,15		18	16,5	8,5	15	•	•
0,22	470	18	18,5	9	15	•	•
0,33	to	18	20	12,5	15	•	•
0,15	2700	27	15	6,5	22,5	•	•
0,22		27	16,5	7	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	•	•

Approvals in use = •

Resistance values according to IEC 60063 range E12. Approvals in pending = o

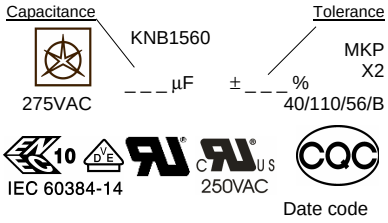
Capacitors: Type **KNB 1560** **275 V AC** class **X2**
1562
1563

TECHNICAL DATA:

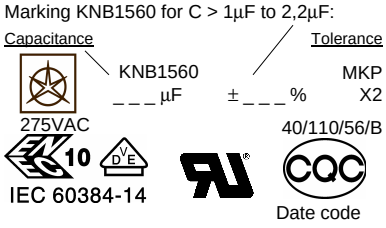


Construction:	polypropylene film, metallized
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0,1µF, ± 10 % for C > 0,1µF
Climatic category:	40/110/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 ℃ to + 110 ℃
Test voltage:	2200 V D.C., 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 = 10 mm 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 ℃, 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 ℃:	$\leq 1 \times 10^{-3}$
Soldering:	IEC publ, 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 ℃
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

Marking KNB1560 for C = 0,01µF to 1µF (for standard version):

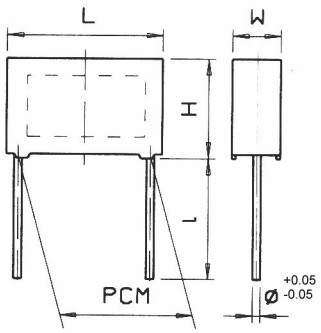


Marking KNB1560 for C > 1µF to 2,2µF:

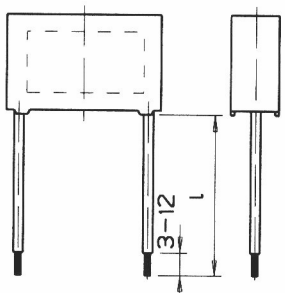


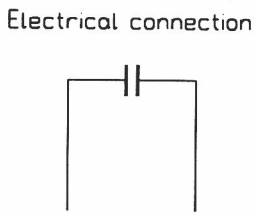
Notes: Capacitance tolerance ± 20 % is not marked.

KNB1560



KNB1562, 1563





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
KNB1560	$3^{+0,5}$, $4^{\pm0,5}$, 6^{-1}, 9^{+1}, $15^{\pm2}$, $20^{\pm2}$, 25^{+5}, 30^{+5}, $50^{\pm5}$ 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 ∅ 0,8 mm

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

Capa-citance	Dimensions						*For capacitors with insulated leads on request*		
	Lmax	Hmax	Wmax	PCM	∅	IEC 60384-14	UL 1283	UL 1414	GB/T 14472
C(µF)	(mm)	(mm)	(mm)	(mm)	(mm)	275 V AC	275 V AC	250 V AC	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 MINIATURE VERSION

275 V AC class X2

Capacitance		Dimensions						For capacitors with insulated leads on request		
C(µF)	Tolerance ± (%)	Lmax (mm)	Hmax (mm)	Wmax (mm)	PCM (mm)	∅ (mm)	IEC 60384-14 275 V AC	UL 1283 250 V AC	UL 1414 250 V AC	GB/T 14472 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	•	•	•	•
0,1	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

Approvals in use = •

Approvals in pending = o

marking with  except PCM 7,5mm

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

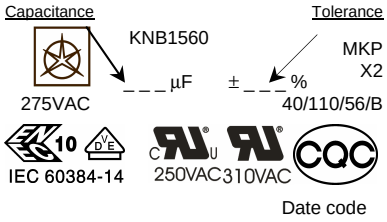
Capacitors: Type **KNB 1560** **300 V AC** **class X2**
1562
1563 **+ 125 °C**

TECHNICAL DATA:

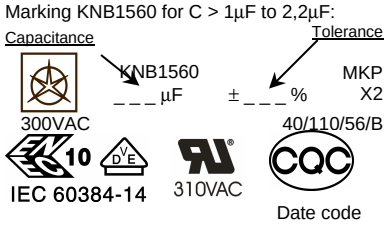
Construction:	polypropylene film, metallized
Rated voltage:	300 V A.C.
Capacitance tolerance:	± 20 % for ≤ 0,1 µF ± 10 % for > 0,1 µF
Climatic category:	40/125/56
	according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 ℃ to + 125 ℃
Test voltage:	2200 V D.C., 1 s for C ≤ 1 µF 1900 V D.C., 1 s for C >1 µF
Max. pulse rise time du/dt, at 425 V D.C.:	500 V/µs for PCM = 10 mm 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 ℃, 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 ℃:	$\leq 1 \times 10^{-3}$
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 ℃
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

NEW

Marking KNB1560 for C = 0,01µF to 1µF (for standard version):

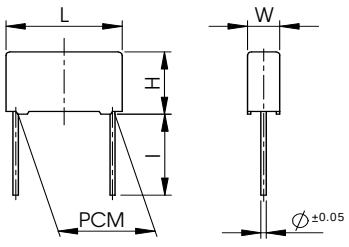


Marking KNB1560 for C > 1µF to 2,2µF:

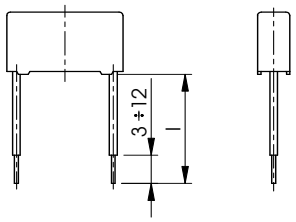


Notes: Capacitance tolerance ±20 % is not marked.

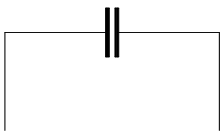
KNB1560



KNB1562, 1563



Electrical connection:



Terminals:

Type	Terminal length	Type of terminals
KNB1560	$3^{+0,5}$, $4^{\pm0,5}$, 6^{-1}, 9^{+1},$15^{\pm2}$,$20^{\pm2}$,$25^{\pm5}$,30^{+5},$50^{\pm5}$ mm, other on request	Tinned copper wire Insulated stranded wire 0,5 mm^2
KNB1562	20 to 200 mm	Insulated solid wire ∅ 0,8 mm
KNB1563	20 to 200 mm	End terminals on request

Casing: thermoplastic, sealed with synthetical resin

Thermoplastic material is self-extinguishing according to UL 94, class V-0.

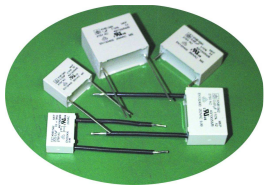
Standard values: KNB1560, KNB1562, KNB1563 + 125 °C 300 V AC class X2

Capa-citance	Dimensions						For capacitors with insulated leads on request		
	Lmax	Hmax	Wmax	PCM	∅	IEC 60384-14	UL 1283	UL 1414	GB/T 14472
C(µF)	(mm)	(mm)	(mm)	(mm)	(mm)	300 V AC	310 V AC	250 V AC	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	•	•		•

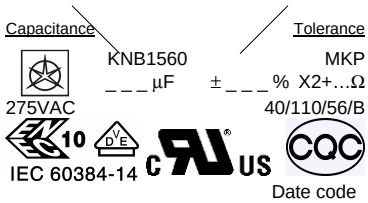
Approvals in use = •
Approvals in pending = o

Capacitors: Type **KNB 1560** **With discharge resistor** **275 V AC** class **X2**
1562
1563

TECHNICAL DATA:

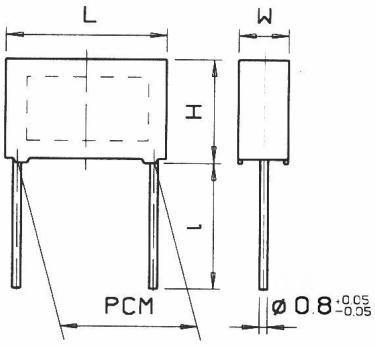


Marking KNB1560:

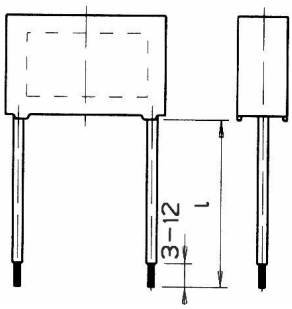


Construction:	
Capacitors:	polypropylene film, metallized
Resistor:	metal oxide film
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0,1 µF and ± 10 % for C > 0,1 µF
Resistance tolerance:	± 5%
Resistance power:	0,6 W
Climatic category:	40/110/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 ℃ to + 110 ℃
Test voltage:	1700 V D.C., 1 s
Max. pulse rise time du/dt, at 390 V D.C.:	250 V/µs for PCM = 15mm 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 ℃
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

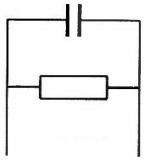
KNB1560



KNB1562, 1563



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
KNB1560	$3^{+0,5}$, $4^{\pm0,5}$, 6^{-1}, 9^{+1},$15^{\pm2}$,$20^{\pm2}$,$25^{\pm5}$,30^{+5},$50^{\pm5}$ 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 ∅ 0,8 mm End terminals on request

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

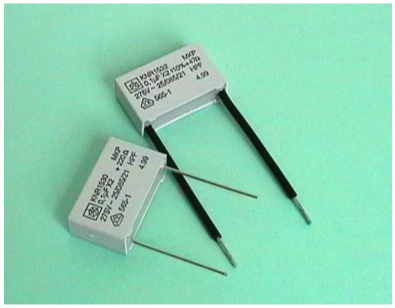
With discharge resistor

Capa-citance	Resistance	Dimensions					For capacitors with insulant leads on request		
						IEC 60384-14	UL 1283	UL 1414	GB/T14472
C(µF)	R(kΩ)	Lmax (mm)	Hmax (mm)	Wmax (mm)	PCM (mm)	275 V AC	275 V AC	250 V AC	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	•	•	•	•

Approvals in use = •
Approvals in pending = o

Resistance values according to IEC 60063 range E12.

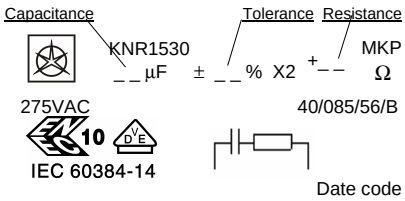
Capacitors: Type **KNR 1530** **275 V AC** **class X2**
1532 **RC - units**
1533



TECHNICAL DATA:

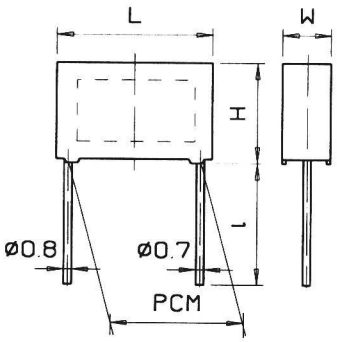
Construction:	
- capacitor:	polypropylene film, metallized
- resistor:	carbon film or wire-wound
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0,1 µF ± 10 % for C > 0,1 µF other on request
Climatic category:	40/085/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 ℃ to + 85 ℃
Test voltage:	1700 V D.C., 2 s
Insulation resistance at 20 ℃, 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
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 ℃
Complies to:	IEC 60384-14, EN 60384-14

Marking KNR1530:

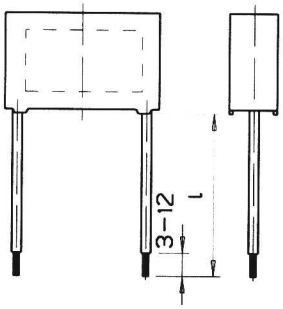


Note: Capacitance tolerance ±20 % is not marked.

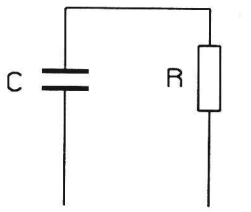
KNR1530



KNR1532, 1533



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^{+5},$50^{\pm5}$ 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 ∅ 0,8 mm End terminals on request

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

Capa-citance C(µF)	Resistance R(Ω)	Dimensions Lmax (mm)	Hmax (mm)	Wmax (mm)	PCM (mm)	IEC 60384-14
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	•

Approvals in use = •
Approvals in pending = o

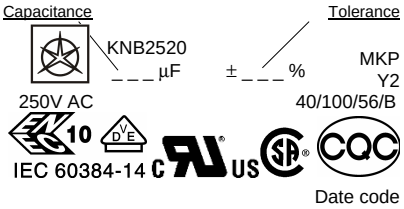
Resistance values according to IEC 60063 range E12.

Capacitors: Type **KNB 2520** **250 V AC, 300 V AC** **class Y2**
2522
2523

TECHNICAL DATA:

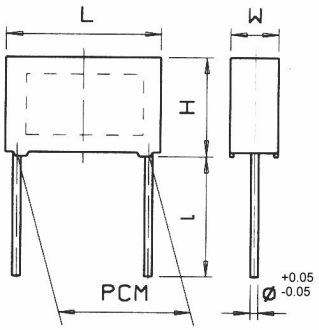
Construction:	polypropylene film, metallized
Rated voltage:	250 V A.C., 300 V A.C.
Capacitance tolerance:	± 20 %, ± 10 %
Climatic category:	40/100/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 ℃ to + 100 ℃
Test voltage:	4000 V D.C., 1 s or 2600 V A.C., 2 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 1500 V/µs for PCM ≥ 15 according to IEC 60384-14
Insulation resistance at 20 ℃, U_m = 100 V D.C., t = 1 min:	$R_i \geq 15000$ MΩ
Dielectric loss tanδ at f = 1 kHz and 20 ℃:	$\leq 15 \times 10^{-4}$
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 ℃
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, CSA E384-14, CSA C22.2 No.8, GB/T 14472-1998

Marking KNB2520:

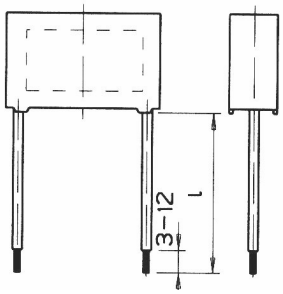


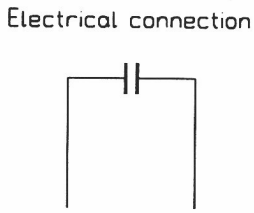
Note: Capacitance tolerance ±20 % is not marked.

KNB2520



KNB2522, 2523





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
KNB2520	$3^{+0,5}$, $4^{\pm0,5}$, 6^{-1}, 9^{+1},$15^{\pm2}$,$20^{\pm2}$,$25^{\pm5}$,30^{+5},$50^{\pm5}$ 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 ∅ 0,8 mm End terminals on request

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

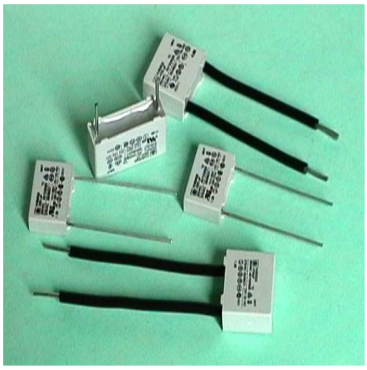
Capa-citance C (pF)	Dimensions						*For capacitors with insulated leads on request*					
	Lmax (mm)	Hmax (mm)	Wmax (mm)	PCM (mm)	∅ (mm)	IEC 60384-14 300 V AC	UL 1283 300 V AC	UL 1414 250 V AC	C22.2 No.8 275 V AC	GB/T14472 250 V AC	C22.2 No.1 125 V/250 V	E384-14-15 300 V AC
1000	13	9,5	4,3	10	0,6	•	•	•	•	•	•	•
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	12,5	22,5	0,8	•	•	•				•

Approvals in use = •
Approvals in pending = o

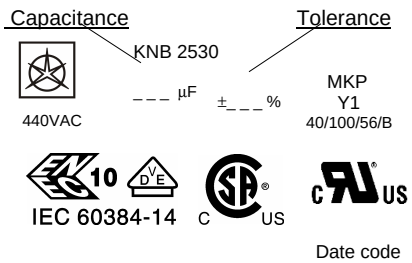
Capacitors: Type **KNB 2530** **440 V AC** **class Y1**
2532
2533

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 ℃ to + 100 ℃
Test voltage:	4000 V A.C. for 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 ℃, U_m = 100 V D.C., t = 1 min:	Ri ≥ 15000 MΩ
Dielectric loss tanδ at f = 1 kHz and 20 ℃:	≤ 1×10^{-3}
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 ℃
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



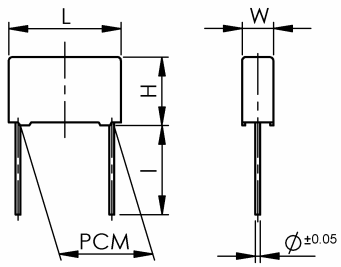
Marking KNB2530:



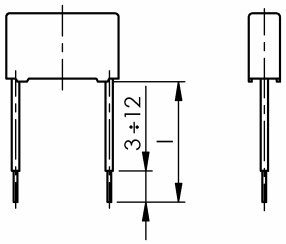
Date code

Note: Capacitance tolerance ± 20% is not marked.

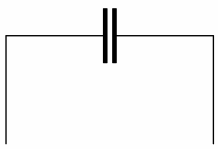
KNB2530



KNB2532, 2533



Electrical connection:



Casing: thermoplastic, sealed with synthetical resin

Thermoplastic material is self extinguishing according to UL 94, class V-0,

Terminals:

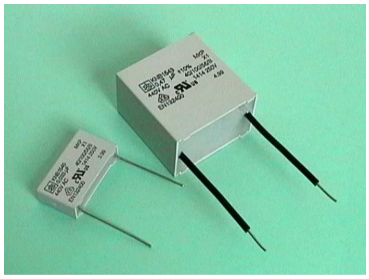
Type	Terminal length	Type of terminals
KNB2530	$3^{+0,5}$, $4^{\pm0,5}$, 6^{-1}, 9^{+1},$15^{\pm2}$,$20^{\pm2}$,$25^{\pm5}$,30^{+5},$50^{\pm5}$ mm, other on request	Tinned copper wire
KNB2532	20 to 200 mm	Insulated stranded wire 0,5 mm^2
KNB2533	20 to 200 mm	Insulated solid wire ∅ 0,8 mm End terminals on request

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

Capa-citance	Dimensions							
	Lmax	Hmax	Wmax	PCM	∅	IEC 60384-14	UL 1414	UL 1283
C (pF)	(mm)	(mm)	(mm)	(mm)	(mm)	440 V AC	C22.2 No.1 250 V AC	C22.2 No.8 440 V AC
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

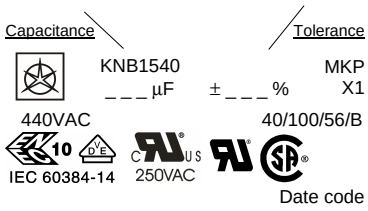
Capacitors: Type **KNB 1540** **440 V AC** **class X1**
1542
1543



TECHNICAL DATA:

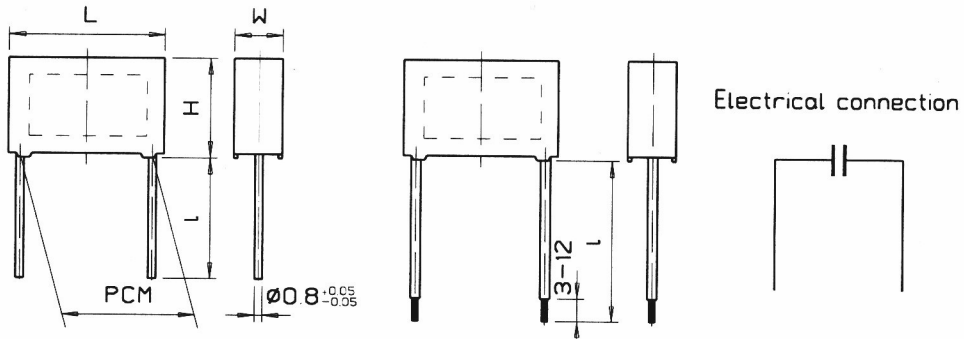
Construction:	polypropylene film, metallized
Rated voltage:	440 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0,1 µF ± 10 % for C > 0,1 µF
Climatic category:	40/100/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 ℃ to + 100 ℃
Test voltage:	3500 V D.C., 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 ℃, 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 ℃:	$\leq 5 \times 10^{-4}$
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 ℃
Self inductance:	approx. 10 nH/cm capacitor length and terminals
Complies to:	IEC 60384-14, EN 60384-14, UL 1283, UL 1414, CSA C22.2 No.1

Marking KNB1540:



Note: Capacitance tolerance ± 20 % is not marked.

KNB1540 **KNB1542, 1543**



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
KNB1540	$3^{+0,5}$, $4^{\pm0,5}$, 6^{-1}, 9^{+1}, $15^{\pm2}$, $20^{\pm2}$, $25^{\pm5}$, 30^{+5}, $50^{\pm5}$ 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 ∅ 0,8 mm End terminals on request

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

Capa-citance	Dimensions					*For capacitors with insulated leads on request*		
	Lmax	Hmax	Wmax	PCM	IEC 60384-14	UL 1283	UL 1414	C22.2 No.1
C(µF)	(mm)	(mm)	(mm)	(mm)	440 V AC	440 V AC	250 V AC	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

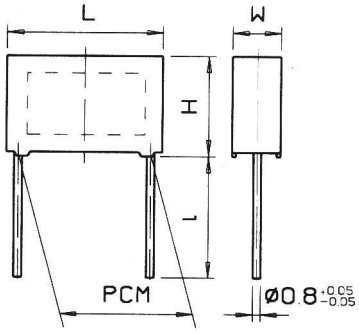
Capacitors: Type **KNB 1550** **310 V AC** **class X1**
1552
1553 **110 °C**

TECHNICAL DATA:

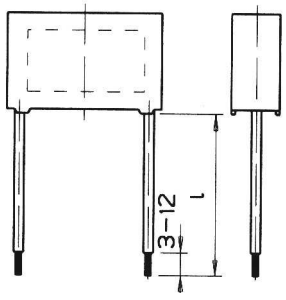
Construction:	polypropylene film metallized
Rated voltage:	310 V A.C.
Capacitance tolerance:	± 20 % for C ≤ 0,1 µF ± 10 % for C > 0,1 µF
Climatic category:	40/110/56 according to IEC 60068-1
Passive flammability:	according to IEC 60384-14
Temperature range:	- 40 ℃ to +110 ℃
Test voltage:	3000 V D.C., 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 ℃, 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 ℃:	$\leq 1 \times 10^{-3}$
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 ℃
Self inductance:	approx. 10 nH/cm of capacitor length and terminals
Complies to:	IEC 60384-14, EN 60384-14, UL 1283, CSA E384-14

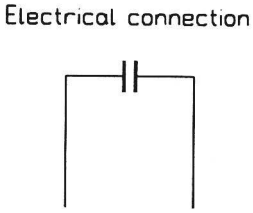
NEW

KNB1550



KNB1552, 1553





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
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 mm^2
KNB1553	20 to 200 mm	Insulated solid wire ∅ 0,8 mm
		End terminals on request

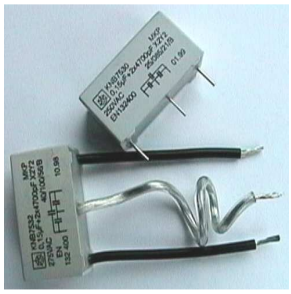
Standard values: KNB1550, KNB1552, KNB1553 **310 V AC** **class X1**
+ 110 °C

Capa-citance	Dimensions						*For capacitors with insulated leads on request*			
	Lmax	Hmax	Wmax	PCM	∅	IEC 60384-14	UL 1283	UL 1414	E384-14	GB/T14472
C(µF)	(mm)	(mm)	(mm)	(mm)	(mm)	310 V AC	310 V AC	250 V AC	310 V AC	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

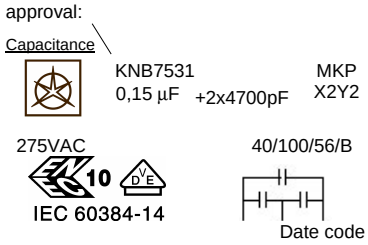
Capacitors: **Type KNB 753x** **275 V AC** **class X2Y2**

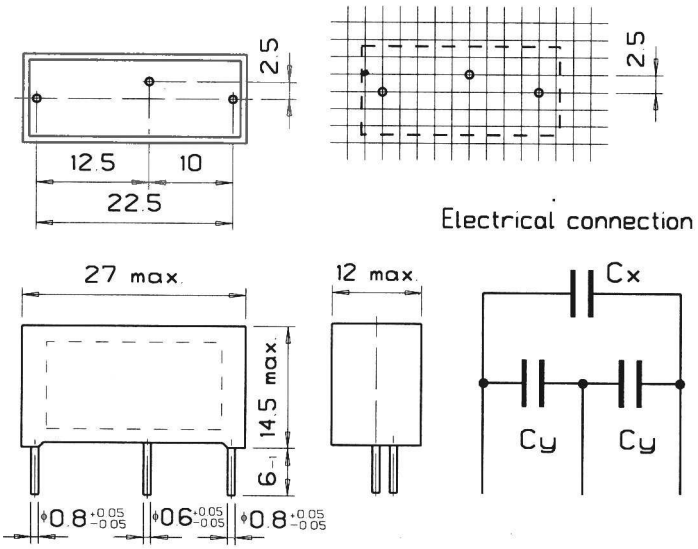
TECHNICAL DATA:



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 ℃ to + 100 ℃
Max. pulse rise time du/dt:	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 ℃, U_m = 100 V D.C., t= 1 min:	$R_i \geq 15000$ MΩ
Dielectric loss tan δ at f = 1 kHz and 20 ℃:	$\leq 20 \times 10^{-4}$
Soldering:	IEC 60068-2-20, max. 2 s
Soldering time on printed circuit:	max. 5 s at 270 ℃
Complies to:	IEC 60384-14

Marking KNB7531 with VDE-ENEC approval:





Terminals:	solid copper tinned wire or insulated stranded wire
Casing:	thermoplastic, sealed in synthetical resin

Thermoplastic material is self-extinguishing to UL 94, class V-0.

Standard values: KNB753x

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

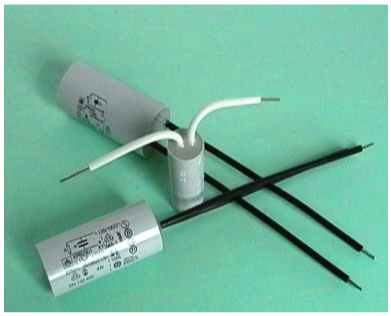
* *Only for these values*

Approval: *

IEC 60384-14

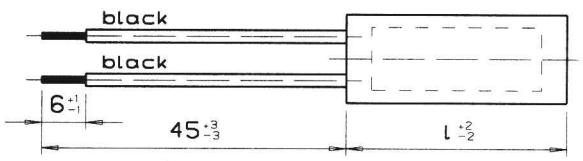
Capacitors: **Type KPB23xx** **two-pole** **class X1**

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

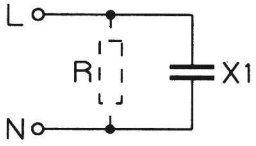


TECHNICAL DATA:

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:	$R_i \geq 6000$ 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: insulated stranded wire 0,5 mm², or insulated solid wire ∅ 0,8 mm. Non-insulated part is soldered. Wires can be equipped with connection terminals on request.

Casing: thermoplastic, sealed with synthetical resin, flame retardant

Wire dimensions on drawing correspond with type KPB2300 - standard version.

Standard values: **KPB23xx**

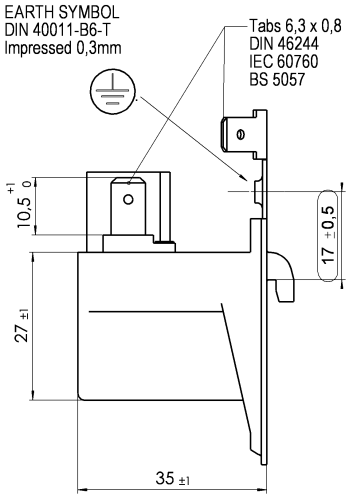
Capacitcance	Dimensions	IEC 60384-14 (25/100/21)
X1(µF)	d (mm) × l (mm)	
0,01	8 × 30	•
0,022	9,5 × 30	•
0,027	9,5 × 30	•
0,033	9,5 × 30	•
0,047	11 × 30	•
0,068	12 × 30	•
0,1	14 × 35	•
0,15	16 × 35	•
0,22	18 × 35	•
0,22	18 × 40	•
0,27	20 × 35	•
0,27	20 × 40	•
0,33	20 × 40	•
0,47	25 × 40	•

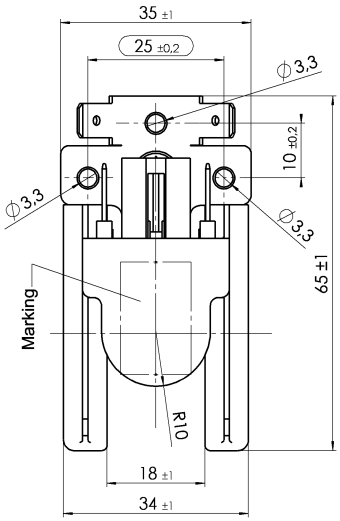
Other values upon request

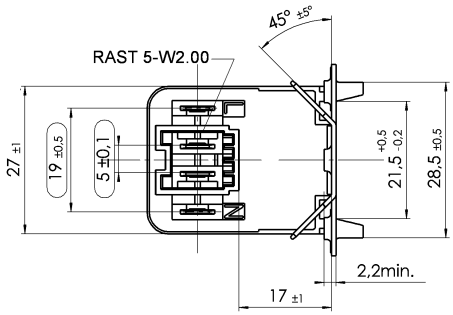
Capacitors: **Type KPB 2325** **four-pole** **class X1**

TECHNICAL DATA:

Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category + letter indicating passive flammability category:	25/100/21/B
Temperature range:	- 25 ℃ to + 100 ℃
Test voltage:	X1-capacitor 1790 V D.C., 2 s
Insulation resistance U_n *= 100 V D.C., t = 1 min:*	$R_i \geq 6000$ 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



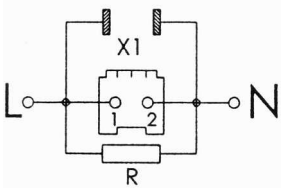




Standard values: KPB2325 ClassX1

Capacitance X1(µF)	Discharge resistor R(MΩ)
0,1	1

Other values upon request



Electrical connection

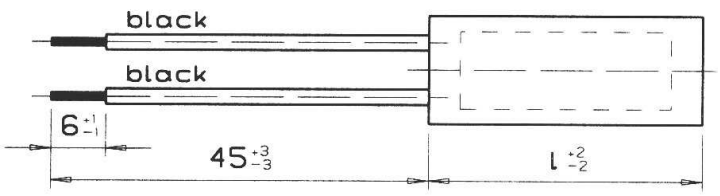
Approval: IEC 60384-14

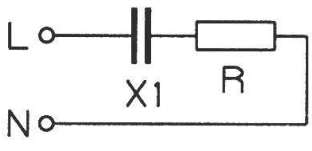
Capacitors: **Type KPR 23xx** **two-pole** **class X1**

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:	25/085/21 according to IEC 60068-1
Passive flammabilily:	according to IEC 60384-14
Temperature range:	- 25 ℃ to + 85 ℃
Test voltage:	1790 V D.C., 2 s
Complies to:	IEC 60384-14, EN 60384-14





Electrical connection

Terminals: insulated stranded wire 0,5 mm^2 or insulated solid wire ∅ 0,8 mm. Noninsulated part is soldered. Wires can be equipped with connection terminals on request.

Casing: thermoplastic, sealed with synthetical resin, flame retardant

Wire dimensions on drawing correspond with type KPR2300 - standard version.

Standard values: KPR23xx

Capacitance X1(µF)	Resistor R(Ω)	Dimensions d(mm) × l(mm)
0,01	50	12 × 30
0,1	50	16 × 35

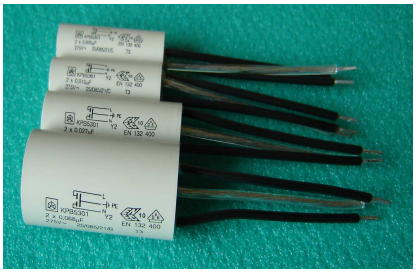
Other values upon request,

Approval: IEC 60384-14

Capacitors: **Type KPB 53xx** **two-pole** **class Y2**

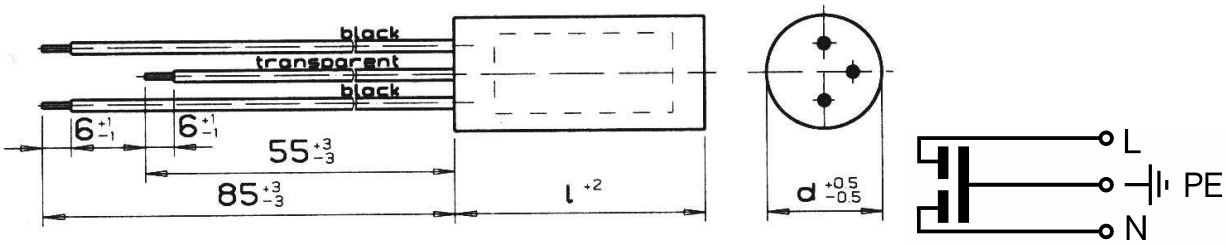
Last two numbers in the type designation (xx = 00 to 49) indicate the type of terminals and connectors.

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 ℃ to + 85 ℃
Test voltage:	Y2 - capacitor 2050 V A.C., 2 s
Insulation resistance at 20 ℃, U_m= 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for C ≤ 0,33 µF ($R_i \geq 2 \times 10^5$ MΩ)
Complies to:	IEC 60384-14, EN 132400

Electrical connection
R = 470 kΩ ÷ 2,7 MΩ on request



Terminals: insulated stranded wire 0,5 mm^2 or insulated solid wire ∅ 0,8 mm. Non-insulated part is soldered. Wires can be equipped with connection terminals on request.

Casing: thermoplastic, sealed with synthetical resin, flame retardant

Wire dimensions on drawing correspond with type KPB5300 - standard version.

Capacitance class Y2	Dimensions D × L (mm)	
(µF)	(D)	(L)
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
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

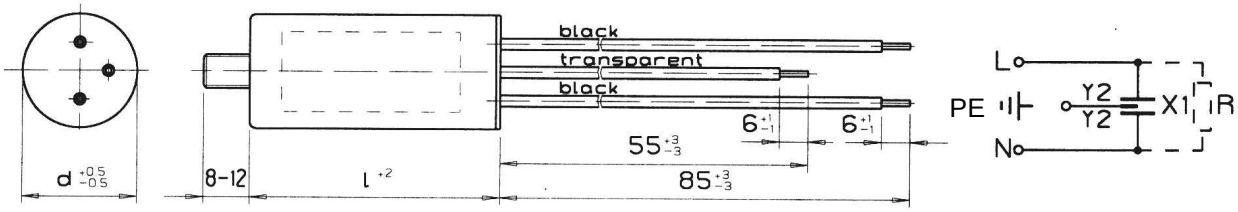
Capacitors: **Type KPB70xx** **two-pole** **class X1Y2**

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 ℃ to + 85 ℃
Test voltage:	X1 capacitor 1790 V D.C., 2 s Y2 capacitor 2050 V A.C., 2 s
Insulation resistance at 20 ℃, 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
Casing:	aluminium can, closed with sealing washer, sealed with synthetical resin, flame retardant.

Passive flammability category: A



Electrical connection
R = 470 kΩ ÷ 2,7 MΩ on request

Terminals: insulated stranded wire 0,5 mm^2, or insulated solid wire ∅ 0,8 mm, non-insulated part is soldered, connection terminals provided on request.

Wire dimensions on drawing correspond with type KPB7000 - standard version.

Standard values: KPB70xx

Capacitance		Dimensions
X1 (µF)	Y2 (pF)	d (mm) × 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 C US

classX1Y2

Note:

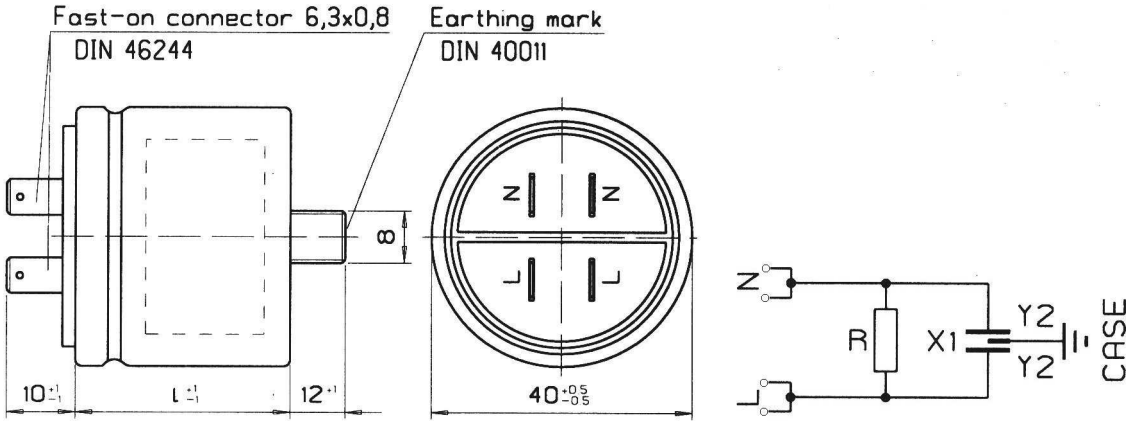
C = CSA C22.2 No.8; US = UL 1283

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 ℃ to + 85 ℃
Test voltage:	X1 - capacitor 1790 V D.C., 2 s Y2 - capacitor 2050 V A.C., 2 s
Insulation resistance at 20 ℃, 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

Passive flammability category: A



Electrical connection
R = 470 kΩ ÷ 2,7 MΩ on request

Terminals: 2 × double fast-on connectors CuZn/Sn

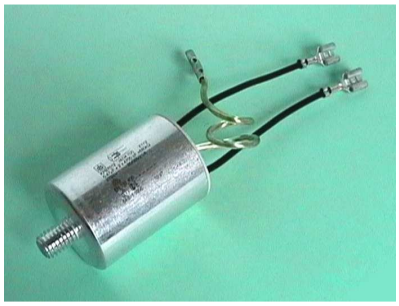
Standard values: KPB7077

Capacitance		Dimensions		
X1 (µF)	Y2 (pF)	d (mm) × l (mm)	IEC 60384-14	C US
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 ×x 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

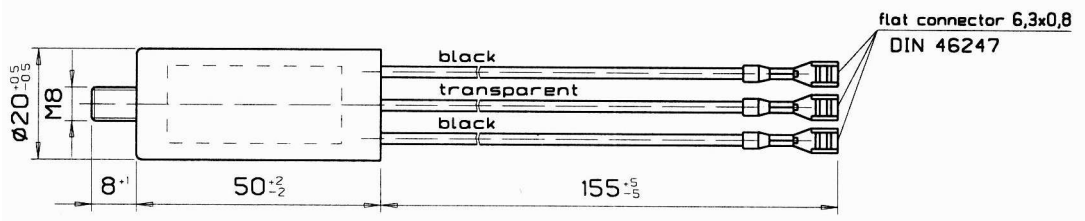
Capacitors: Type **KPB7012** **two-pole** **class X1Y2**
KPB7312

TECHNICAL DATA:

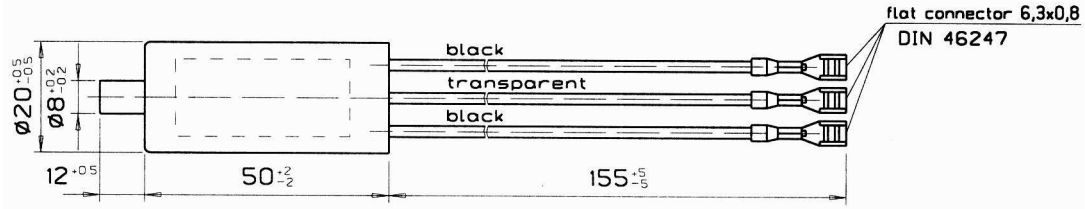


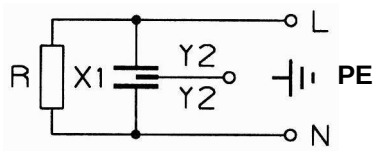
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic category:	25/085/21 according to IEC 60068-1
Temperature range:	- 25 ℃ to + 85 ℃
Test voltage:	X1 - capacitor 1790 V D.C., 2 s Y2 - capacitor 2050 V A.C., 2 s
Insulation resistance at 20 ℃, 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

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





Electrical connection
R = 470 kΩ ÷ 2,7 MΩ on request

Terminals: stranded copper wire type H05V2-K 0,5 mm^2 105 ℃ and flat connectors

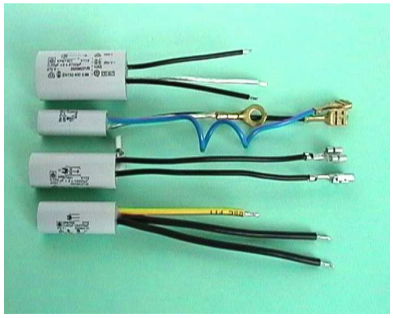
Capacitance		Discharging
X1 (µF)	Y2 (µF)	R(MΩ)
0,27	2 × 0,027	1

Other values upon request

Approval: IEC 60384-14

Capacitors: **Type KPB 73xx** **two-pole** **class X1Y2**

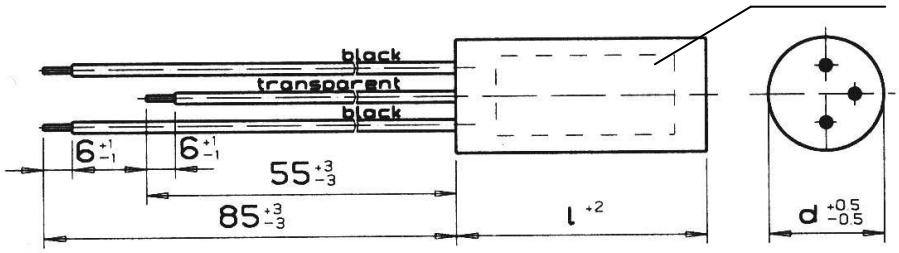
Last two numbers in the type designation (xx = 00 to 49) indicate the type of terminals and connectors,

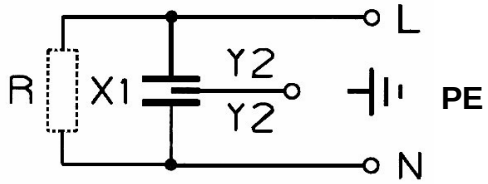


TECHNICAL DATA:

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 ℃ to + 100 ℃
Test voltage:	X1 - capacitor 1790 V D.C., 2 s Y2 - capacitor 2050 V A.C., 2 s
Insulation resistance at 20 ℃, U_m = 100 V D.C., t = 1 min s:	$R_i \geq 6000$ MΩ for C ≤ 0,33 µF R_i X $C_n \geq 2000$ s for C > 0,33 µF
Complies to:	IEC 60384-14, EN 60384-14, CSA C22.2 No.8, UL 1283

Marking





Electrical connection
R = 470 kΩ ÷ 2,7 MΩ on request

Terminals:	insulated stranded wire 0,5 mm^2, or insulated solid wire ∅ 0,8 mm. Non-insulated part is soldered. Connection terminals provided on request.	Casing:	thermoplastic, sealed with synthetical resin, flame retardant

Wire dimensions on drawing correspond with type KPB7300 - standard version.

Standard values: KPB73xx

Capacitance		Dimensions		On request
X1 (µF)	Y2 (pF)	d (mm) × l (mm)	IEC 60384-14	C US
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	•	•
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	•	•

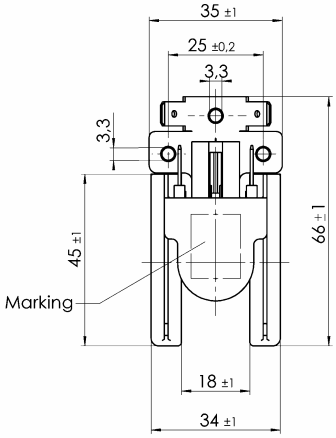
Other values upon request

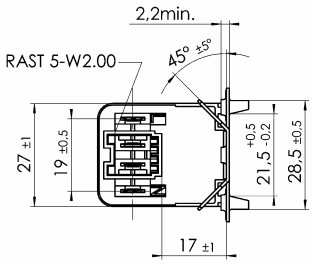
Note: C = CSA C 22.2 No.8; US = UL 1283

Capacitors: **Type KPB7325** **four-pole** **class X1Y2**

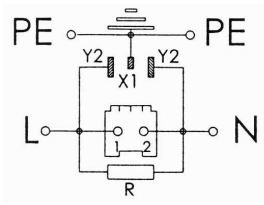
TECHNICAL DATA:

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 ℃ to + 100 ℃
Test voltage:	X1 - capacitor 1790 V D.C., 2 s Y2 - capacitor 2050 V A.C., 2 s
Insulation resistance U_n *= 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

Standard values: KPB7325

Capacitance	
X1 (µF)	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

Capacitance	
X1 (µF)	Y2 (pF)
0,22	2 × 15000
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

Approvals: C US IEC 60384-14

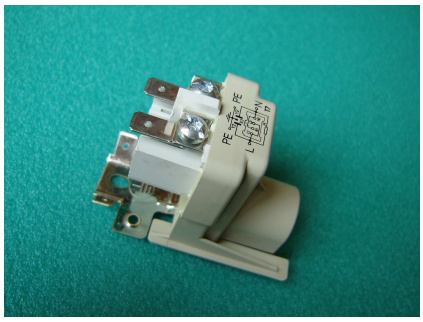
classX1Y2

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

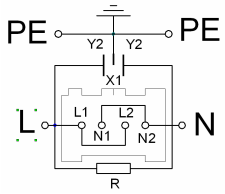
Capacitors: Type **KPB7341** four-pole class **X1Y2**

TECHNICAL DATA:

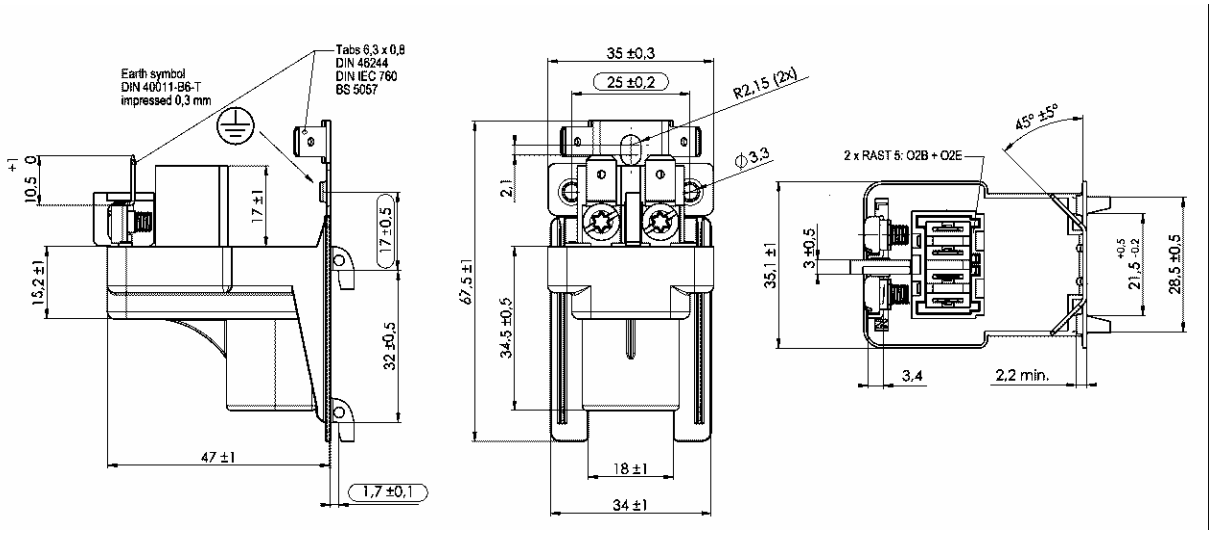
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Rated curent:	16 A
Capacitance tolerance:	± 20 %
Climatic category + letter indicating passive flammability category:	25/085/21/B
Temperature range:	- 25 ℃ to + 100 ℃
Test voltage:	X1 - capacitor 1790 V D.C., 2 s Y2 - capacitor 2050 V A.C., 2 s
Insulation resistance U_n *= 100 V D.C., t = 1 min:*	$R_i \geq 6000$ MΩ
Casing:	thermoplastic can, sealed with synthetical resin, flamme 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



Standard values: KPB7341

Capacitance		Discharge resistor
X1 (µF)	Y2 (pF)	R (MΩ)
0,1	2 × 0,015	1

Approvals:

C US	IEC 60384-14
250 V AC	275 V AC

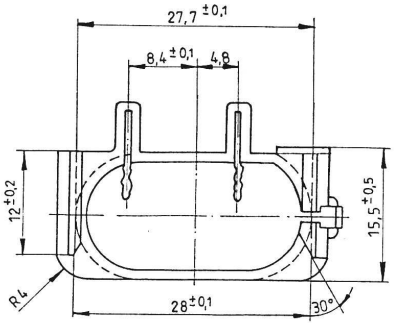
classX1Y2

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

Capacitors: Type **KPB7426** two-pole class **X1Y2**

TECHNICAL DATA:

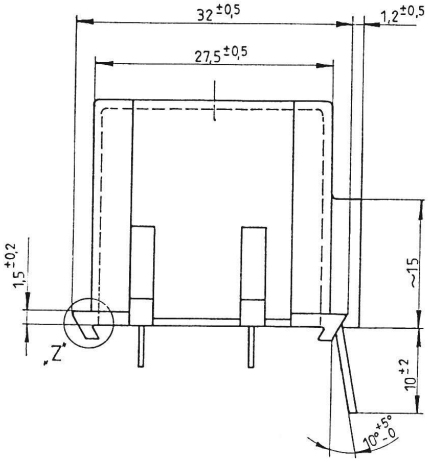
Dielectric:	paper impregnated
Electrodes:	aluminium foil
Rated voltage:	275 V A.C.
Capacitance tolerance:	± 20 %
Climatic categoy + letter indicating passive flammability category:	25/085/21/B
Temperature range:	- 25 ℃ to + 85 ℃
Test voltage:	X1 - capacitor 1790 V D.C., 2 s Y2 - capacitor 1800 V A.C., 2 s
Insulation resistance:	$R_i \geq 6000$ 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



Standard values: KPB7426

Capacitance	
X1 (µF)	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



Approvals:

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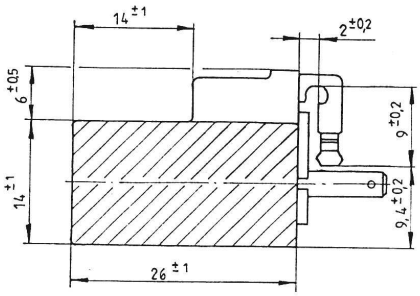
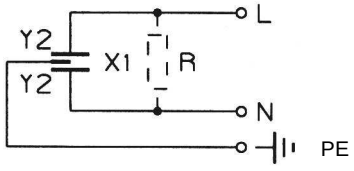
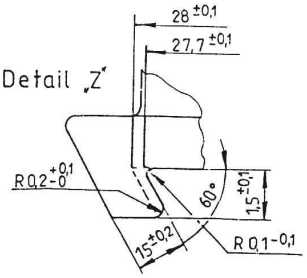
IEC 60384-14





Electrical connection
R = 470 kΩ ÷ 2,7 MΩ on request

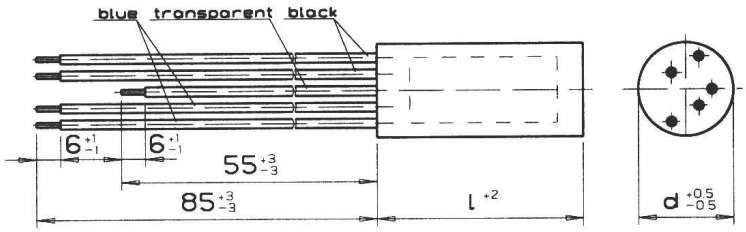


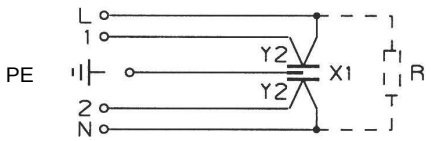
Capacitors: **Type KPB 83xx** **four-pole** **class X1Y2**

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 ℃ to + 85 ℃
Test voltage:	X1 - capacitor 1790 V D.C., 2 s Y2 - capacitor 1800 V A.C., 2 s
Insulation resistance at 20 ℃, 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: insulated stranded wire 0,5 mm^2, or insulated solid wire ∅ 0,8 mm, non-insulated part is soldered, connection terminals on request.

Casing: thermoplastic, sealed with synthetical resin, flame retardant

Wire dimensions on drawing correspond with type KPB8300 - standard version.

Standard values: KPB83xx

Capacitance		Dimensions
X1 (µF)	Y2 (pF)	d (mm) × 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	1 6 × 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

Other values upon request

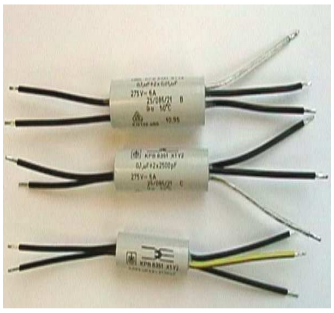
Approval:

275 V IEC 60384-14 **class X1Y2**

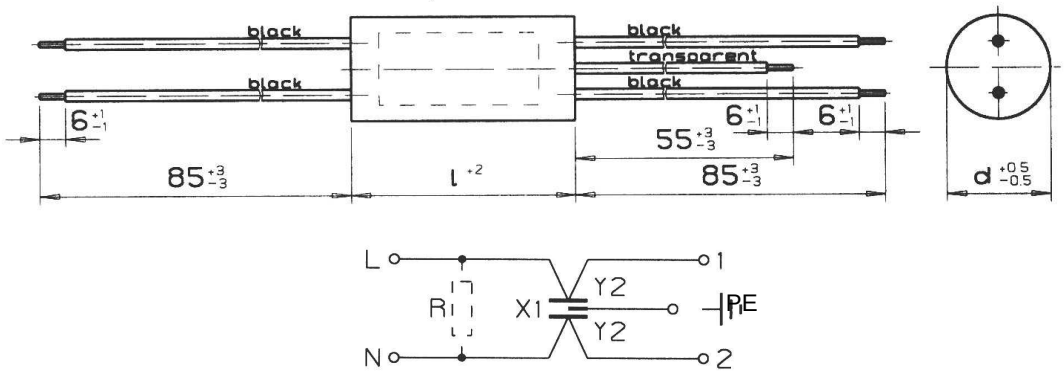
Capacitors: **Type KPB 835x** **four-pole** **class X1Y2**

Last two numbers in the type designation (xx=50 to 99) 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 ℃ to + 85 ℃
Test voltage:	X1 - capacitor 1790 V D.C., 2 s Y2 - capacitor 2050 V A.C., 2 s
Insulation resistance at 20 ℃, 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:	insulated stranded wire 0,5 mm^2, or insulated solid wire ∅ 0,8 mm, non-insulated part is soldered, connection terminals on request.
Casing:	thermoplastic, sealed with synthetical resin, flame retardant.

Wire dimensions on drawing correspond with type KPB8350 - standard version.

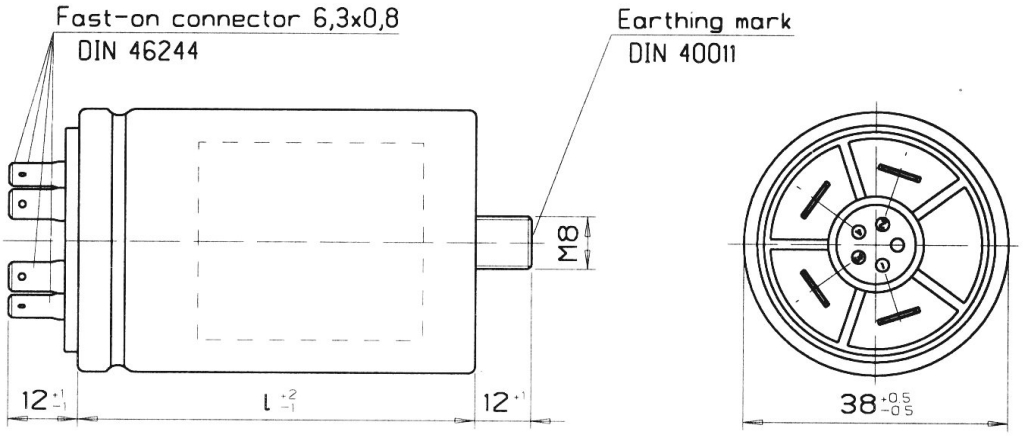
Standard values: KPB835x

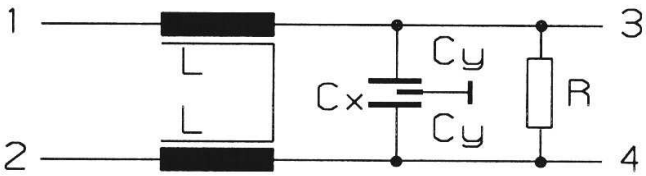
Capacitance		Dimensions
X1 (µF)	Y2 (pF)	d (mm) × l (mm)
0,022	2 × 2500	12 × 33
0,022	2 × 2700	12 × 33
0,027	2 × 2500	12 × 33
0,027	2 × 2700	12 × 33
0,047	2 × 2500	12 × 40
0,047	2 × 2700	12 × 40
0,047	2 × 4700	12 × 40
0,068	2 × 2500	14 × 40
0,068	2 × 2700	14 × 40
0,068	2 × 4700	14 × 40
0,1	2 × 2500	14 × 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 KPL 3008** **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 D.C., 2 s (or 2050 V A.C., 2 s)
Insulation resistance at 20 ℃, 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

Terminals: 4 fast-on connectors *Casing:* aluminium can, closed with sealing washer

Standard values: KPL3008 for upper temperature 100 °C

Current	Nominal values					IEC 60939-2	
	Capacitance		Inductance	Discharging resistor	Dimensions		
I(A)/T(℃)	CX1(µF)	CY2(pF)	L(mH)	R(MΩ)	l(mm)		
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	•	

Approvals in use = •
Approvals in pending = o

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

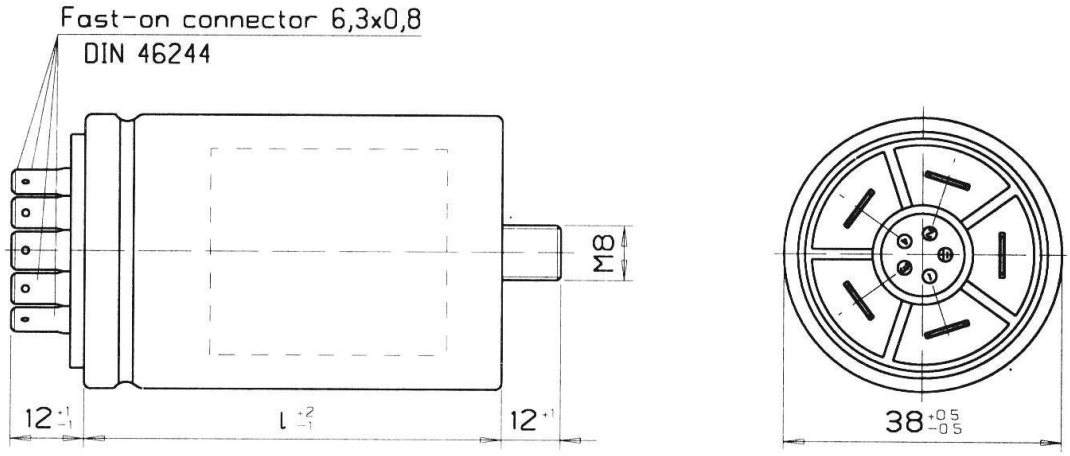
IEC 60939-2

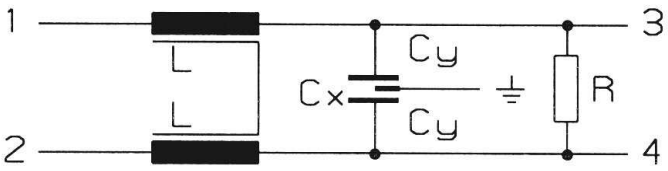
approval for climatic category 40/100/56
according to IEC 60068-1

Filters for radio interference suppression: **Type KPL 3009** **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 D.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

Terminals: 5 fast-on connectors *Casing:* aluminium can, closed with sealing washer

Standard values: KPL3009 for upper temperature 100 °C

Current	Nominal values					IEC 60939-2	cULus
	Capacitance		Induc-tance	Discharg-ing resistor	Dimen-sions		
I(A)/T(℃)	CX1(µF)	CY2(pF)	L(mH)	R(MΩ)	l(mm)		
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

Approvals in use = •
Approvals in pending = o

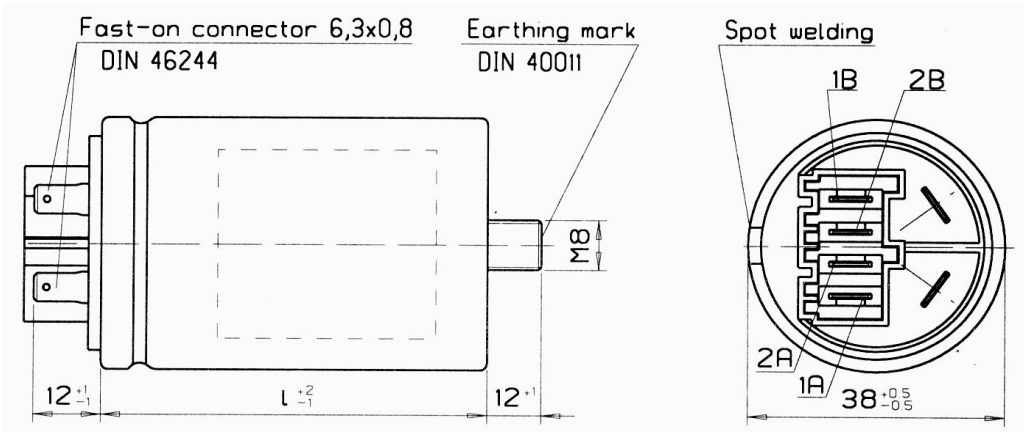
cULus IEC 60939-2

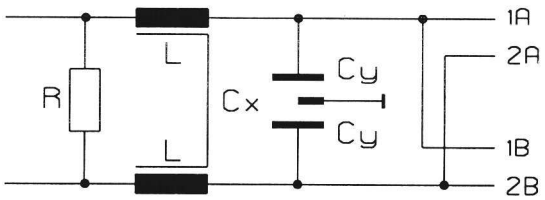
approval for climatic category 40/100/56
according to IEC 60068-1

Filters for radio interference suppression: **Type KPL 3023** **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 D.C., 2 s (2050 V A.C., 2 s)
Insulation resistance at 20 ℃, 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

Terminals: - 1A, 2A and 1B, 2B for RAST 5
- 2 × fast-on connectors

Casing: aluminium can, closed with sealing washer

Standard values: KPL3023 for upper temperature 100 °C

Current	Nominal values					IEC 60939-2		Nominal values for capacitance:
	Capacitance		Induc-tance	Dischar-ging resistor	Dimen-sions			
I(A)/T(℃)	CX1(µF)	CY2(pF)	L(mH)	R(MΩ)	l(mm)			
7/40		2×2200	0,5	1,5	41	•	•	* 0,15µF+2x2200pF
7/40	0,15	to	1	1,5	47	•	•	* 0,15µF+2x2700pF
10/40		2×15000	0,5	1,5	47	•	•	0,15µF+2x4700pF
10/40			1	1,5	47	•	•	0,15µF+2x5000pF
16/40			0,3	1	61	•	•	0,15µF+2x10000pF
16/40			0,5	1	61	•	•	0,15µF+2x15000pF
16/40			1	1	65	•	•	
16/40		2×2200	1,5	1	75	•	•	* 0,25µF+2x2700pF
10/70	0,25	to	0,3	1	61	•		0,25µF+2x4700pF
10/70		2×27000	0,5	1	61	•		0,25µF+2x5000pF
10/70			1	1	65	•		* 0,25µF+2x10000pF
10/70			1,5	1	75	•		* 0,25µF+2x15000pF
10/40			0,5	0,68	65	•	•	0,25µF+2x18000pF
10/40			1	0,68	65	•		* 0,25µF+2x20000pF
12,5/40			0,3	0,68	65	•		* 0,25µF+2x22000pF
12,5/40			0,5	0,68	65	•		0,25µF+2x25000pF
12,5/40			1	0,68	65	•	•	0,25µF+2x27000pF
12,5/40			1,3	0,68	65	•	•	*
12,5/40			1,5	0,68	70	•	•	0,47µF+2x2700pF
12,5/40			2	0,68	70		•	0,47µF+2x4700pF
16/40		2×2200	0,3	0,68	65	•	•	0,47µF+2x5000pF
16/40	0,47	to	0,5	0,68	65	•	•	0,47µF+2x10000pF
16/40		2×27000	1	0,68	70	•	•	* 0,47µF+2x15000pF
16/40			1,3	0,68	70	•		0,47µF+2x18000pF
16/40			1,5	0,68	75	•		* 0,47µF+2x20000pF
10/70			0,3	0,68	65	•		0,47µF+2x22000pF
10/70			0,5	0,68	65	•		0,47µF+2x25000pF
10/70			1	0,68	70	•		0,47µF+2x27000pF
10/70			1,3	0,68	70	•		*
10/70			1,5	0,68	75	•		* 1µF+2x2200pF
3/40	0,15	2×6800	10	0,68	61	•		* 1µF+2x2700pF
12,5/40	0,47	2×25000	1,3	0,68	61	•	•	* 1µF+2x4700pF
16/40	0,5	2×600	1	0,68	67		•	* 1µF+2x5000pF
3/40	1	2×10000	1	0,47	83	•		* 1µF+2x10000pF
10/40			0,5	0,47	83	•		* 1µF+2x15000pF
10/40			1	0,47	83	•		* 1µF+2x18000pF
12,5/40			0,3	0,47	83	•		* 1µF+2x20000pF
12,5/40			0,5	0,47	83	•		* 1µF+2x22000pF
12,5/40			1	0,47	83	•		* 1µF+2x25000pF
12,5/40			1,3	0,47	83	•		1µF+2x27000pF
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	•		Only for IEC 60939-2
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	•		

Approvals in use = ●
Approvals in pending = o

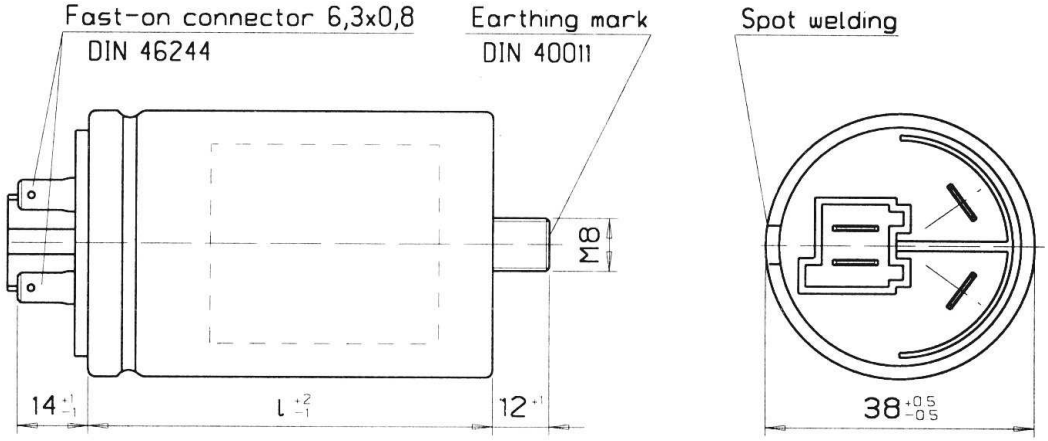
IEC 60939-2

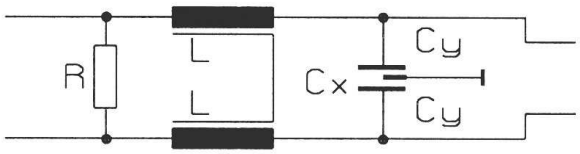
approval for climatic category 40/100/56
according to IEC 60068-1

Filters for radio interference suppression: **Type KPL 3024** **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 D.C., 2s (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

Terminals: - for RAST 5
- 2 × fast-on connectors

Casing: aluminium can, closed with sealing washer

Standard values: KPL3024 for upper temperature 100 °C

Current	Nominal values						
	Capacitance		Induc-tance	Dischar-ging resistor	Dimen-sions	IEC 60939-2	c UL us
I(A)/T(℃)	CX1(µF)	CY2(pF)	L(mH)	R(MΩ)	l(mm)		
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	•	

Approvals in use = •
Approvals in pending = o

c UL us

IEC 60939-2

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

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

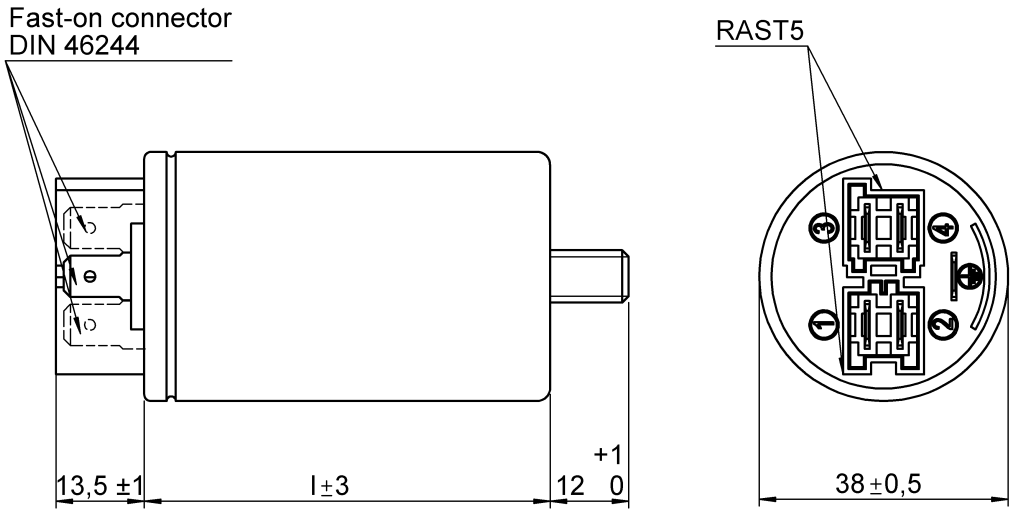
* 1µF+2×2200pF
* 1µF+2×2700pF
* 1µF+2×4700pF
* 1µF+2×5000pF
* 1µF+2×10000pF
* 1µF+2×15000pF
* 1µF+2×18000pF
* 1µF+2×20000pF
* 1µF+2×22000pF
* 1µF+2×25000pF
* 1µF+2×27000pF

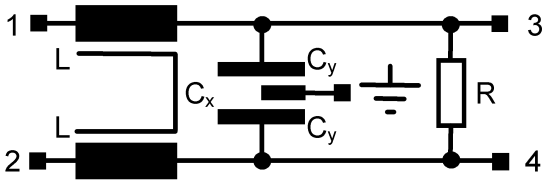
*Only for IEC 60939-2

Filters for radio interference suppression: **Type KPL 3028** **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 D.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

Terminals: - for RAST 5 *Casing:* aluminium can, closed with sealing washer

Standard values: KPL3028 for upper temperature 100 °C

Current	Nominal values					IEC 60939-2	cULus
	Capacitance		Inductance	Discharging resistor	Dimensions		
I(A)/T(℃)	CX1(µF)	CY2(pF)	L(mH)	R(MΩ)	l(mm)		
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	•	

Approvals in use = •
Approvals in pending = o

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

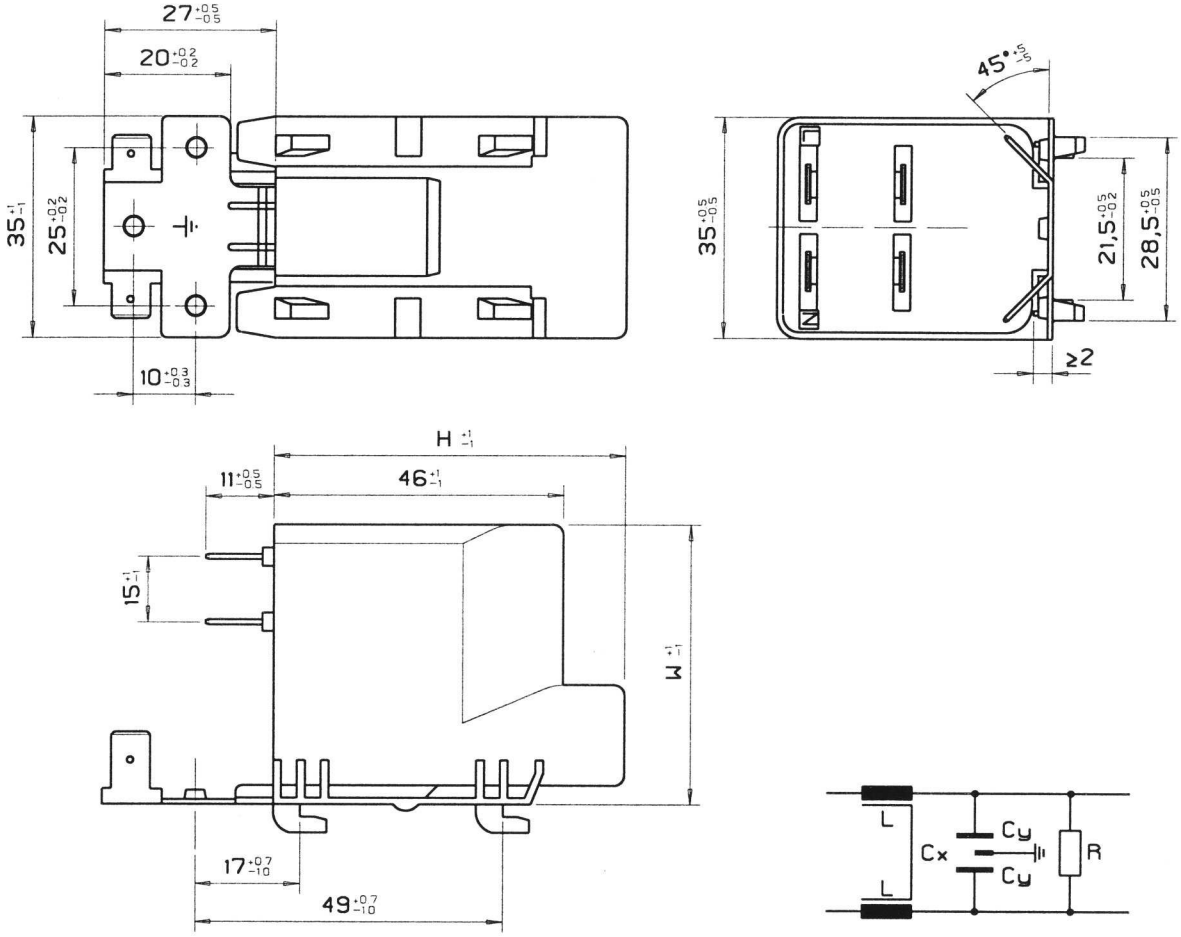
cULus IEC 60939-2

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

Filters for radio interference suppression: **Type KPL 3508** **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 D.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

Terminals:	fast-on connectors	*Casing:*	thermoplastic can, sealed with synthetical resin, flame retardant

Standard values: KPL3508 for upper temperature 100 °C

Current	Nominal values						IEC 60939-2		*Nominal values for capacitance:*
	Capacitance		Induc-tance	Dischar-ging resistor	Dimensions				
I(A)/T(℃)	CX1(µF)	CY2(pF)	L(mH)	R(MΩ)	H(mm)	W(mm)			
10/40			0,47	1	46	41	•	•	0,25µF+2x2200pF
10/40			0,5	1	46	41	•	•	0,25µF+2x2700pF
10/40			1	1	46	41	•	•	0,25µF+2x4700pF
10/40			1,8	1	46	41	•	•	0,25µF+2x5000pF
12,5/40			0,3	1	46	41	•	•	0,25µF+2x10000pF
12,5/40			0,47	1	46	41	•	•	0,25µF+2x15000pF
12,5/40			1	1	46	41	•	•	0,25µF+2x20000pF
12,5/40		2×2200	1,3	1	46	41	•	•	0,25µF+2x22000pF
12,5/40	0,25	to	1,5	1	46	41	•	•	0,25µF+2x25000pF
12,5/40		2×27000	1,8	1	46	41	•	•	0,25µF+2x27000pF
16/40			0,3	1	46	41	•	•	
16/40			0,47	1	46	41	•	•	
16/40			1	1	46	41	•	•	0,33µF+2x2200pF
10/70			0,3	1	46	41	•	•	0,33µF+2x2700pF
10/70			0,47	1	46	41	•	•	0,33µF+2x4700pF
10/70			1	1	46	41	•	•	0,33µF+2x5000pF
10/40			0,47	0,68	46	41	•	•	0,33µF+2x10000pF
10/40			0,5	0,68	46	41	•		0,33µF+2x15000pF
10/40			1	0,68	46	41	•		0,33µF+2x20000pF
10/40			1,8	0,68	46	41	•		0,33µF+2x22000pF
12,5/40			0,3	0,68	46	41	•		0,33µF+2x25000pF
12,5/40			0,47	0,68	46	41	•		0,33µF+2x27000pF
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	•		0,47µF+2x2200pF
12,5/40		2×27000	1,8	0,68	46	41	•		0,47µF+2x2700pF
16/40			0,3	0,68	46	41	•		0,47µF+2x4700pF
16/40			0,47	0,68	46	41	•		0,47µF+2x5000pF
16/40			1	0,68	46	41	•		0,47µF+2x10000pF
10/70			0,3	0,68	46	41	•		0,47µF+2x15000pF
10/70			0,47	0,68	46	41	•		0,47µF+2x20000pF
10/70			1	0,68	46	41	•		0,47µF+2x22000pF
10/40			0,47	0,68	46	41	•	•	0,47µF+2x25000pF
10/40			0,5	0,68	46	41	•	•	0,47µF+2x27000pF
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	0,47	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	•		

Continued on the next page

Standard values: KPL3508 for upper temperature 100 °C

Current I(A)/T(℃)	Nominal values: Capacitance CX1(µF)	Capacitance CY2(pF)	Inductance L(mH)	Discharging resistor R(MΩ)	Dimensions H(mm)	Dimensions W(mm)	IEC 60939-2	cULus
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

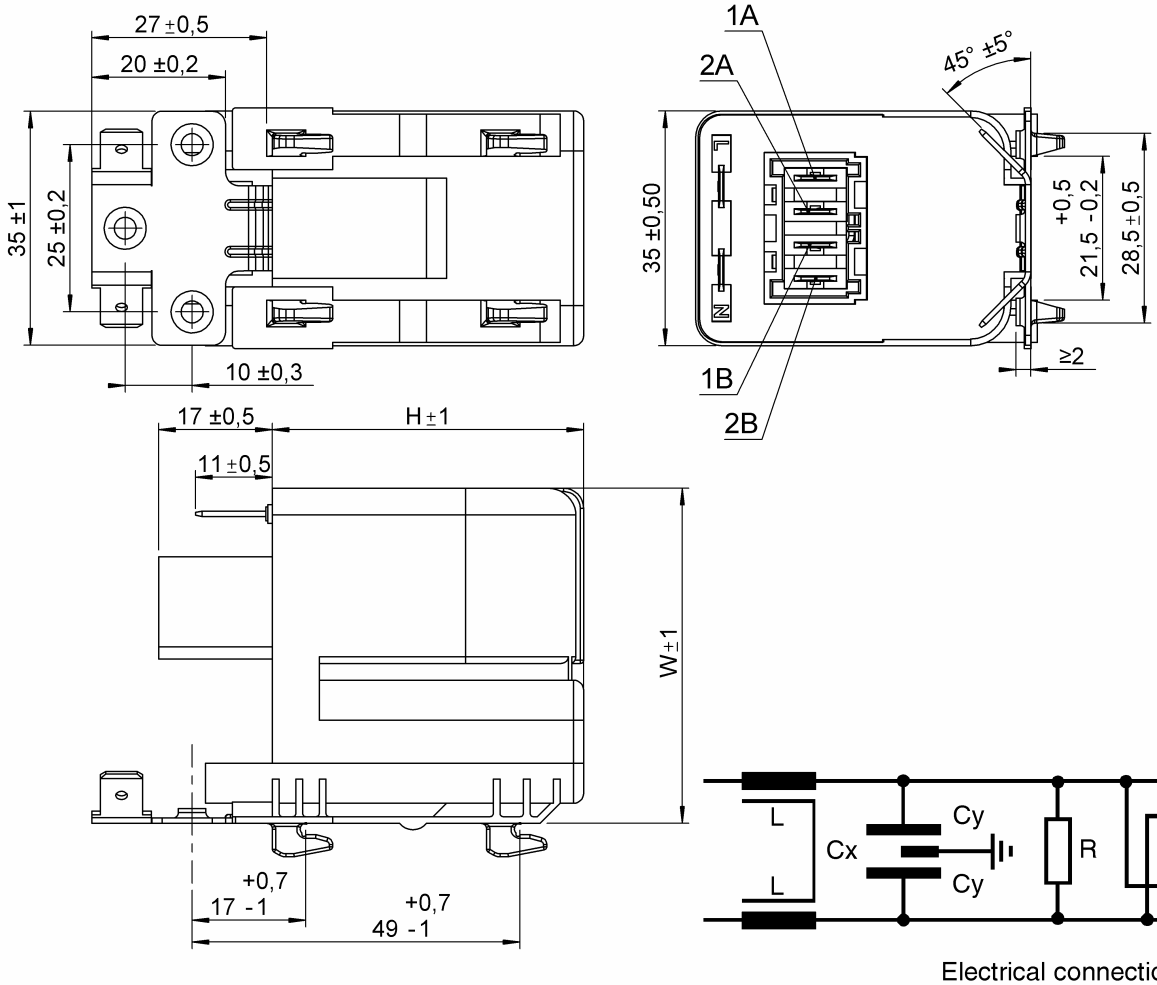
1µF+2x2200pF
1µF+2x2700pF
1µF+2x4700pF
1µF+2x5000pF
1µF+2x10000pF
1µF+2x15000pF
1µF+2x20000pF
1µF+2x22000pF
1µF+2x25000pF
1µF+2x27000pF

Approvals in use = ·
Approvals in pending = o

Filters for radio interference suppression: **Type KPL 3523** **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 D.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

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

Standard values: KPL3523 for upper temperature 100 °C

Current	Nominal values						IEC 60939-2		*Nominal values for capacitance:*
	Capacitance		Induc-tance	Dischar-ging resistor	Dimensions				
I(A) / T(℃)	CX1(µF)	CY2(pF)	L(mH)	R(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	•	•	0,25µF+2×2200pF
10/40			1,8	1	46	50	•	•	0,25µF+2×2700pF
12,5/40			0,3	1	46	50	•	•	0,25µF+2×4700pF
12,5/40			0,47	1	46	50	•	•	0,25µF+2×5000pF
12,5/40			1	1	46	50	•	•	0,25µF+2×10000pF
12,5/40		2×2200	1,3	1	46	50	•	•	0,25µF+2×15000pF
12,5/40	0,25	to	1,5	1	46	50	•	•	0,25µF+2×20000pF
12,5/40		2×27000	1,8	1	46	50	•	•	0,25µF+2×22000pF
16/40			0,3	1	46	50	•	•	0,25µF+2×25000pF
16/40			0,47	1	46	50	•	•	0,25µF+2×27000pF
16/40			1	1	46	50	•	•	
10/70			0,3	1	46	50	•		
10/70			0,47	1	46	50	•		0,33µF+2×2200pF
10/70			1	1	46	50	•		0,33µF+2×2700pF
10/40			0,47	0,68	46	50	•		0,33µF+2×4700pF
10/40			0,5	0,68	46	50	•		0,33µF+2×5000pF
10/40			1	0,68	46	50	•		0,33µF+2×10000pF
10/40			1,8	0,68	46	50	•		0,33µF+2×15000pF
12,5/40			0,3	0,68	46	50	•		0,33µF+2×20000pF
12,5/40			0,47	0,68	46	50	•		0,33µF+2×22000pF
12,5/40			1	0,68	46	50	•		0,33µF+2×25000pF
12,5/40		2×2200	1,3	0,68	46	50	•		0,33µF+2×27000pF
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	•		0,47µF+2×2200pF
16/40			0,47	0,68	46	50	•		0,47µF+2×2700pF
16/40			1	0,68	46	50	•		0,47µF+2×4700pF
10/70			0,3	1	46	50	•		0,47µF+2×5000pF
10/70			0,47	1	46	50	•		0,47µF+2×10000pF
10/70			1	1	46	50	•		0,47µF+2×15000pF
10/40			0,47	0,68	56	50	•	•	0,47µF+2×20000pF
10/40			1	0,68	56	50	•	•	0,47µF+2×22000pF
10/40			1,8	0,68	56	50	•	•	0,47µF+2×25000pF
12,5/40			0,3	0,68	56	50	•	•	0,47µF+2×27000pF
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	•		

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Standard values: KPL3523 for upper temperature 100 °C

Current	Nominal values						IEC 60939-2		Nominal values for capacitance:
	Capacitance		Induc-tance	Dischar-ging resistor	Dimensions				
I(A) / T(℃)	CX1(µF)	CY2(pF)	L(mH)	R(MΩ)	H(mm)	W(mm)			
10/40			0,47	0,68	46	50	•		
10/40			0,5	0,68	46	50	•		0,56µF+2×2200pF
10/40			1	0,68	46	50	•		0,56µF+2×2700pF
10/40			1,8	0,68	46	50	•		0,56µF+2×4700pF
12,5/40			0,3	0,68	46	50	•		0,56µF+2×5000pF
12,5/40			0,47	0,68	46	50	•		0,56µF+2×10000pF
12,5/40			1	0,68	46	50	•		0,56µF+2×15000pF
12,5/40		2×2200	1,3	0,68	46	50	•		0,56µF+2×20000pF
12,5/40	0,56	to	1,5	0,68	46	50	•		0,56µF+2×22000pF
12,5/40		2×27000	1,8	0,68	46	50	•		0,56µF+2×25000pF
16/40			0,3	0,68	46	50	•		0,56µF+2×27000pF
16/40			0,47	0,68	46	50	•		
16/40			1	0,68	46	50	•		0,68µF+2×2200pF
10/70			0,3	0,68	46	50	•		0,68µF+2×2700pF
10/70			0,47	0,68	46	50	•		0,68µF+2×4700pF
10/70			1	0,68	46	50	•		0,68µF+2×5000pF
10/40			0,47	0,47	56	50	•	•	0,68µF+2×10000pF
10/40			1	0,47	56	50	•	•	0,68µF+2×15000pF
10/40			1,8	0,47	56	50	•	•	0,68µF+2×20000pF
12,5/40			0,3	0,47	56	50	•	•	0,68µF+2×22000pF
12,5/40			0,47	0,47	56	50	•	•	0,68µF+2×25000pF
12,5/40			1	0,47	56	50	•	•	0,68µF+2×27000pF
12,5/40		2×2200	1,3	0,47	56	50	•	•	
12,5/40	0,68	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
10/40			0,47	0,47	56	50	•	•	1µF+2×25000pF
10/40			1	0,47	56	50	•	•	1µF+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	•	•	
12,5/40		2×27000	1,8	0,47	56	50	•	•	
16/40			0,3	0,47	56	50	•	•	
16/40			0,47	0,47	56	50	•	•	
16/40			1	0,47	56	50	•	•	
10/70			0,3	0,47	56	50	•		
10/70			0,47	0,47	56	50	•		
10/70			1	0,47	56	50	•		
16/40	0,47	-	0,47	0,68	46	50	•	•	

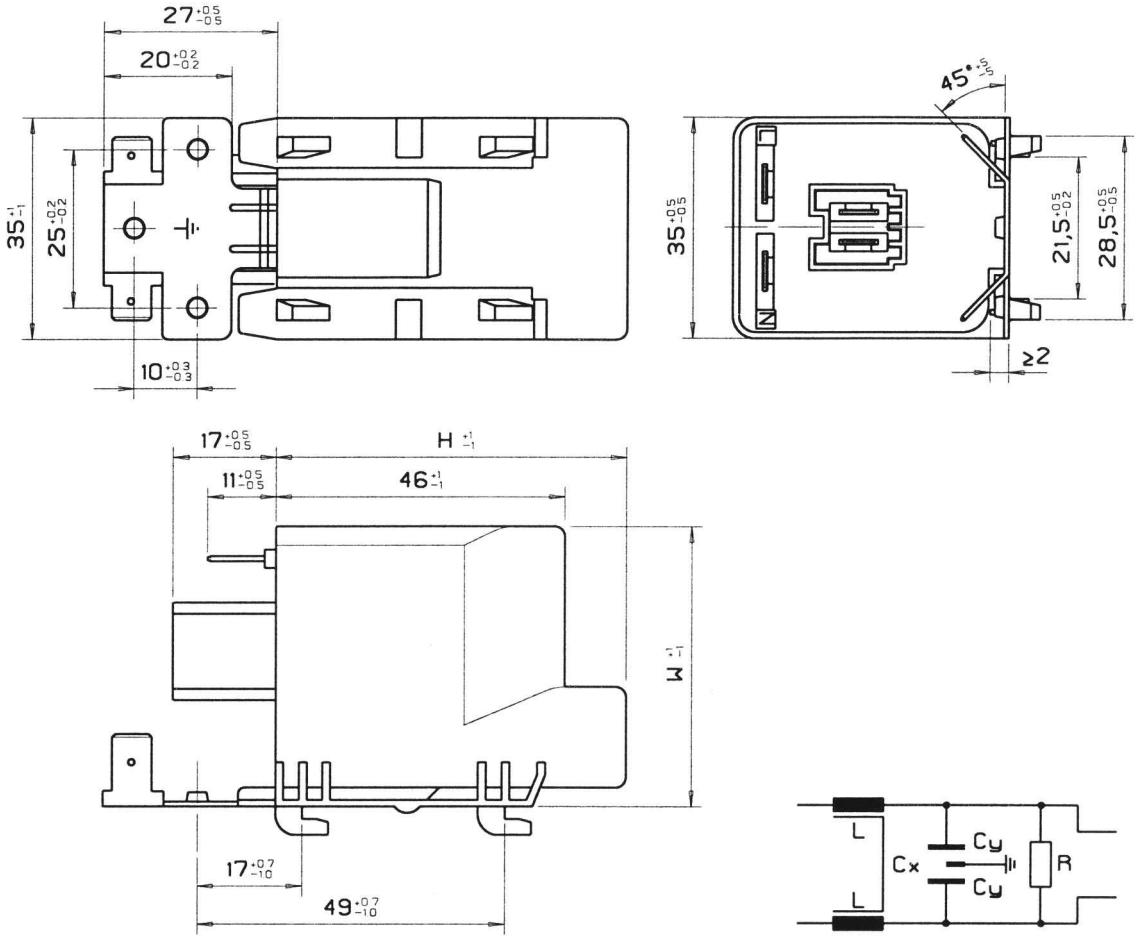
Approvals in use = •

Approvals in pending = o

Filters for radio interference suppression: **Type KPL 3524** **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 D.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
C omplies to:	IEC 60939-2, EN 60939-2, UL1283, CSA C22.2 No.8, capacitor part to IEC 60384-14



Electrical connection

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

Standard values: KPL3524 for upper temperature 100 °C

Current	Nominal values						IEC 60939-2	
	Capacitance		Induc-tance	Discharging resistor	Dimensions			
I(A) / T(℃)	CX1(µF)	CY2(pF)	L(mH)	R(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	•	•
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

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Standard values: KPL3524 for upper temperature 100 °C

Current	Nominal values							
	Capacitance		Induc-tance	Discharging resistor	Dimensions		IEC 60939-2	
I(A) / T(℃)	CX1(µF)	CY2(pF)	L(mH)	R(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

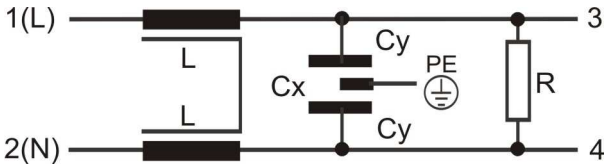
Approvals in use = •
Approvals in pending = o

Filters for radio interference suppression: Type **KNL 3309** class **X2Y2**

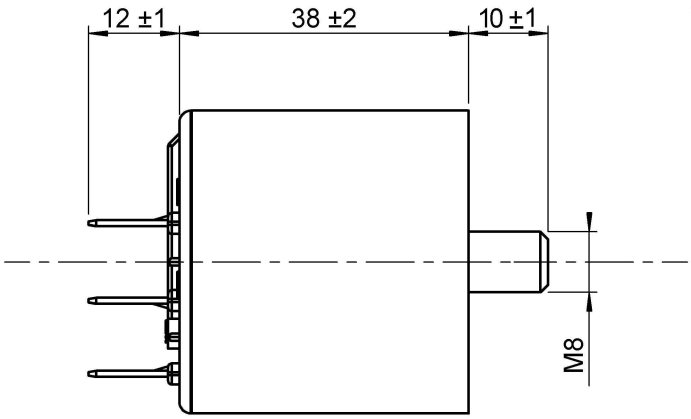
TECHNICAL DATA:

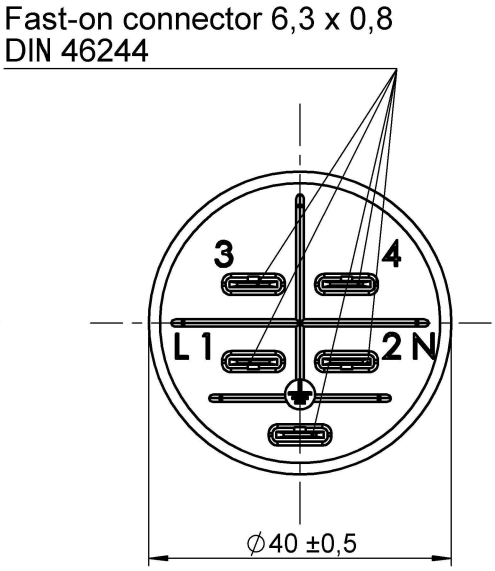
Construction:	polypropylene film, metallized
Rated voltage:	275 V A.C., 50 / 60 Hz
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Resistor tolerance:	± 10 %
Climatic category:	25/100/21
Test voltage:	X2 - capacitor 1790 V D.C., 2 s Y2 - capacitor 3000 V D.C., 2 s or 2050 V D.C., 2 s
Complies to:	IEC 60939-2, EN 60939-2, UL 1283, CSA C22.2 No.8
Terminals:	fast-on connectors DIN 46244
Casing:	thermoplastic can closed with sealing washer

Electrical connection:



Dimensions (mm) and connections:





Standard values: KNL3309 for upper temperature 100 °C

Current	Nominal values					IEC 60939-2		Nominal values for capacitance:
	Capacitance		Induc-tance	Dischar-ging resistor	Dimen-sions			
I(A)/T(℃)	CX2(µF)	CY2(pF)	L(mH)	R(MΩ)	l(mm)			
7/40			0,5	1,5	38	•	•	
7/40			1	1,5	38	•	•	
10/40			0,5	1,5	38	•	•	
10/40			1	1,5	38	•	•	0,15µF+2×2200pF
10/40			1,3	1,5	38	•	•	0,15µF+2×2700pF
10/40			1,5	1,5	38	•	•	0,15µF+2×4700pF
10/40			1,8	1,5	38	•	•	0,15µF+2×5000pF
10/40			2	1,5	38	•	•	0,15µF+2×10000pF
12,5/40			0,3	1,5	38	•	o	0,15µF+2×15000pF
12,5/40			0,5	1,5	38	•	o	0,15µF+2×20000pF
12,5/40			1	1,5	38	•	o	0,15µF+2×22000pF
12,5/40			1,3	1,5	38	•	o	0,15µF+2×27000pF
12,5/40		2×2200	1,5	1,5	38	•	o	
12,5/40	0,15	to	1,8	1,5	38	•	o	
12,5/40		2×27000	2	1,5	38	•	o	0,25µF+2×2200pF
16/40			0,3	1,5	38	•	o	0,25µF+2×2700pF
10/70			0,3	1,5	38	•	o	0,25µF+2×4700pF
16/40			0,5	1,5	38	•	o	0,25µF+2×5000pF
10/70			0,5	1,5	38	•	o	0,25µF+2×10000pF
16/40			1	1,5	38	•	o	0,25µF+2×15000pF
10/70			1	1,5	38	•	o	0,25µF+2×20000pF
16/40			1,3	1,5	38	•	o	0,25µF+2×22000pF
10/70			1,3	1,5	38	•	o	0,25µF+2×27000pF
16/40			1,5	1,5	38	•	o	
10/70			1,5	1,5	38	•	o	
7/40			0,5	1	38	•	•	
7/40			1	1	38	•	•	
10/40			0,5	1	38	•	•	
10/40			1	1	38	•	•	
10/40			1,3	1	38	•	•	
10/40			1,5	1	38	•	•	
10/40			1,8	1	38	•	•	
10/40			2	1	38	•	•	
12,5/40			0,3	1	38	•	o	
12,5/40			0,5	1	38	•	o	
12,5/40			1	1	38	•	o	
12,5/40			1,3	1	38	•	o	
12,5/40		2×2200	1,5	1	38	•	o	
12,5/40	0,25	to	1,8	1	38	•	o	
12,5/40		2×27000	2	1	38	•	o	
16/40			0,3	1	38	•	o	
10/70			0,3	1	38	•	o	
16/40			0,5	1	38	•	o	
10/70			0,5	1	38	•	o	
16/40			1	1	38	•	o	
10/70			1	1	38	•	o	
16/40			1,3	1	38	•	o	
10/70			1,3	1	38	•	o	
16/40			1,5	1	38	•	o	
10/70			1,5	1	38	•	o	

Continued on the next page

Standard values: KNL3309 for upper temperature 100 °C

Current	Nominal values					IEC 60939-2	c UL us
	Capacitance		Induc-tance	Dischar-ging resistor	Dimen-sions		
I(A)/T(℃)	CX2(µF)	CY2(pF)	L(mH)	R(MΩ)	l(mm)		
7/40			0,5	0,68	38	•	•
7/40			1	0,68	38	•	•
10/40			0,5	0,68	38	•	•
10/40			1	0,68	38	•	•
10/40			1,3	0,68	38	•	•
10/40			1,5	0,68	38	•	•
10/40			1,8	0,68	38	•	•
10/40			2	0,68	38	•	•
12,5/40			0,3	0,68	38	•	o
12,5/40			0,5	0,68	38	•	o
12,5/40			1	0,68	38	•	o
12,5/40			1,3	0,68	38	•	o
12,5/40		2×2200	1,5	0,68	38	•	o
12,5/40	0,33	to	1,8	0,68	38	•	o
12,5/40		2×27000	2	0,68	38	•	o
16/40			0,3	0,68	38	•	o
10/70			0,3	0,68	38	•	o
16/40			0,5	0,68	38	•	o
10/70			0,5	0,68	38	•	o
16/40			1	0,68	38	•	o
10/70			1	0,68	38	•	o
16/40			1,3	0,68	38	•	o
10/70			1,3	0,68	38	•	o
16/40			1,5	0,68	38	•	o
10/70			1,5	0,68	38	•	o
7/40			0,5	0,68	38	•	•
7/40			1	0,68	38	•	•
10/40			0,5	0,68	38	•	•
10/40			1	0,68	38	•	•
10/40			1,3	0,68	38	•	•
10/40			1,5	0,68	38	•	•
10/40			1,8	0,68	38	•	•
10/40			2	0,68	38	•	•
12,5/40			0,3	0,68	38	•	o
12,5/40			0,5	0,68	38	•	o
12,5/40			1	0,68	38	•	o
12,5/40			1,3	0,68	38	•	o
12,5/40		2×2200	1,5	0,68	38	•	o
12,5/40	0,47	to	1,8	0,68	38	•	o
12,5/40		2×27000	2	0,68	38	•	o
16/40			0,3	0,68	38	•	o
10/70			0,3	0,68	38	•	o
16/40			0,5	0,68	38	•	o
10/70			0,5	0,68	38	•	o
16/40			1	0,68	38	•	o
10/70			1	0,68	38	•	o
16/40			1,3	0,68	38	•	o
10/70			1,3	0,68	38	•	o
16/40			1,5	0,68	38	•	o
10/70			1,5	0,68	38	•	o

Nominal values for capacitance:

0,33µF+2×2200pF
0,33µF+2×2700pF
0,33µF+2×4700pF
0,33mF+2x5000pF
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

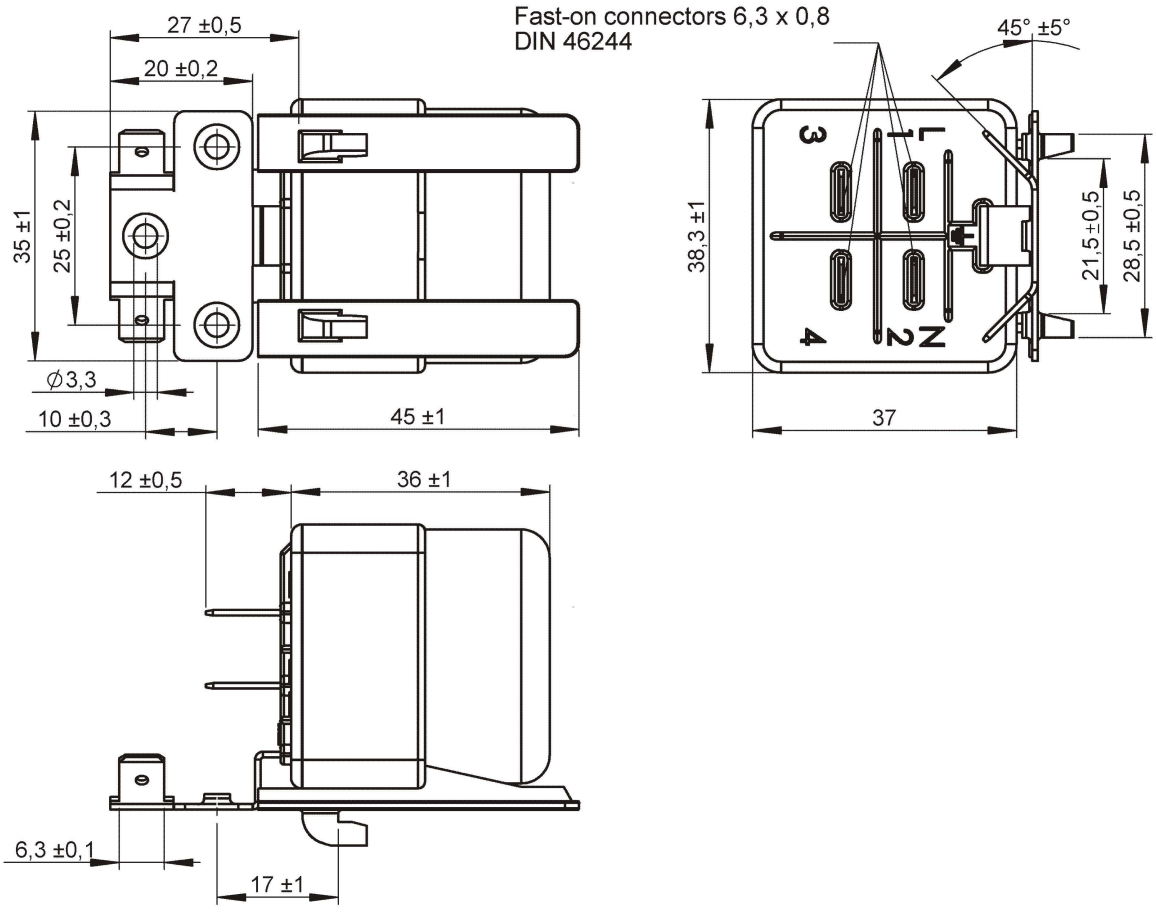
Approvals in use = •
Approvals in pending = o

Filters for radio interference suppression: **Type KNL 3508** **class X2Y2**

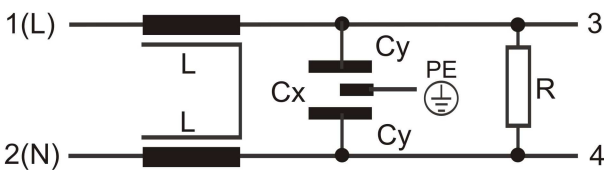
TECHNICAL DATA:

Construction:	polypropylene film,metallized
Rated voltage:	275 V A.C., 50 / 60 Hz
Capacitance tolerance:	± 20 %
Inductance tolerance:	- 30 % to + 50 %
Resistor tolerance:	± 10 %
Climatic category:	25/100/21
Test voltage:	X2 - capacitor 1790 V D.C., 2 s Y2 - capacitor 3000 V D.C., 2 s or 2050 V D.C., 2 s
Complies to:	IEC 60939-2,EN 60939-2, UL 1283, CSA C22.2 No.8
Terminals:	fast-on connectors DIN 46244
Casing:	thermoplastic can closed with sealing washer

Dimensions (mm) and connections:



Electrical connection:



Standard values: KNL3508 for upper temperature 100 °C

Current	Nominal values						IEC 60939-2	cULus
	Capacitance		Induc-tance	Discharging resistor	Dimensions			
I(A) / T(℃)	CX2(µF)	CY2(pF)	L(mH)	R(MΩ)	H(mm)	W(mm)		
7/40			0,5	1,5	36	37	•	•
7/40			1	1,5	36	37	•	•
10/40			0,5	1,5	36	37	•	•
10/40			1	1,5	36	37	•	•
10/40			1,3	1,5	36	37	•	•
10/40			1,5	1,5	36	37	•	•
10/40			1,8	1,5	36	37	•	•
10/40			2	1,5	36	37	•	•
12,5/40			0,3	1,5	36	37	•	o
12,5/40			0,5	1,5	36	37	•	o
12,5/40			1	1,5	36	37	•	o
12,5/40		2×2200	1,3	1,5	36	37	•	o
12,5/40	0,15	to	1,5	1,5	36	37	•	o
12,5/40		2×27000	1,8	1,5	36	37	•	o
12,5/40			2	1,5	36	37	•	o
16/40			0,3	1,5	36	37	•	o
10/70			0,3	1,5	36	37	•	o
16/40			0,5	1,5	36	37	•	o
10/70			0,5	1,5	36	37	•	o
16/40			1	1,5	36	37	•	o
10/70			1	1,5	36	37	•	o
16/40			1,3	1,5	36	37	•	o
10/70			1,3	1,5	36	37	•	o
16/40			1,5	1,5	36	37	•	o
10/70			1,5	1,5	36	37	•	o
7/40			0,5	1,5	36	37	•	•
7/40			1	1,5	36	37	•	•
10/40			0,5	1,5	36	37	•	•
10/40			1	1,5	36	37	•	•
10/40			1,3	1,5	36	37	•	•
10/40			1,5	1,5	36	37	•	•
10/40			1,8	1,5	36	37	•	•
10/40			2	1,5	36	37	•	•
12,5/40			0,3	1,5	36	37	•	o
12,5/40			0,5	1,5	36	37	•	o
12,5/40			1	1,5	36	37	•	o
12,5/40		2×2200	1,3	1,5	36	37	•	o
12,5/40	0,25	to	1,5	1,5	36	37	•	o
12,5/40		2×27000	1,8	1,5	36	37	•	o
12,5/40			2	1,5	36	37	•	o
16/40			0,3	1,5	36	37	•	o
10/70			0,3	1,5	36	37	•	o
16/40			0,5	1,5	36	37	•	o
10/70			0,5	1,5	36	37	•	o
16/40			1	1,5	36	37	•	o
10/70			1	1,5	36	37	•	o
16/40			1,3	1,5	36	37	•	o
10/70			1,3	1,5	36	37	•	o
16/40			1,5	1,5	36	37	•	o
10/70			1,5	1,5	36	37	•	o

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
0,15µF+2×20000pF
0,15µF+2×22000pF
0,15µF+2×27000pF

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

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Standard values: KNL3508 for upper temperature 100 °C

Current	Nominal values						IEC 60939-2	
	Capacitance		Induc-tance	Discharging resistor	Dimensions			
I(A) / T(℃)	CX2(µF)	CY2(pF)	L(mH)	R(MΩ)	H(mm)	W(mm)		
7/40			0,5	1,5	36	37	•	•
7/40			1	1,5	36	37	•	•
10/40			0,5	1,5	36	37	•	•
10/40			1	1,5	36	37	•	•
10/40			1,3	1,5	36	37	•	•
10/40			1,5	1,5	36	37	•	•
10/40			1,8	1,5	36	37	•	•
10/40			2	1,5	36	37	•	•
12,5/40			0,3	1,5	36	37	•	o
12,5/40			0,5	1,5	36	37	•	o
12,5/40			1	1,5	36	37	•	o
12,5/40		2×2200	1,3	1,5	36	37	•	o
12,5/40	0,33	to	1,5	1,5	36	37	•	o
12,5/40		2×27000	1,8	1,5	36	37	•	o
12,5/40			2	1,5	36	37	•	o
16/40			0,3	1,5	36	37	•	o
10/70			0,3	1,5	36	37	•	o
16/40			0,5	1,5	36	37	•	o
10/70			0,5	1,5	36	37	•	o
16/40			1	1,5	36	37	•	o
10/70			1	1,5	36	37	•	o
16/40			1,3	1,5	36	37	•	o
10/70			1,3	1,5	36	37	•	o
16/40			1,5	1,5	36	37	•	o
10/70			1,5	1,5	36	37	•	o
7/40			0,5	1,5	36	37	•	•
7/40			1	1,5	36	37	•	•
10/40			0,5	1,5	36	37	•	•
10/40			1	1,5	36	37	•	•
10/40			1,3	1,5	36	37	•	•
10/40			1,5	1,5	36	37	•	•
10/40			1,8	1,5	36	37	•	•
10/40			2	1,5	36	37	•	•
12,5/40			0,3	1,5	36	37	•	o
12,5/40			0,5	1,5	36	37	•	o
12,5/40			1	1,5	36	37	•	o
12,5/40		2×2200	1,3	1,5	36	37	•	o
12,5/40	0,47	to	1,5	1,5	36	37	•	o
12,5/40		2×27000	1,8	1,5	36	37	•	o
12,5/40			2	1,5	36	37	•	o
16/40			0,3	1,5	36	37	•	o
10/70			0,3	1,5	36	37	•	o
16/40			0,5	1,5	36	37	•	o
10/70			0,5	1,5	36	37	•	o
16/40			1	1,5	36	37	•	o
10/70			1	1,5	36	37	•	o
16/40			1,3	1,5	36	37	•	o
10/70			1,3	1,5	36	37	•	o
16/40			1,5	1,5	36	37	•	o
10/70			1,5	1,5	36	37	•	o

Nominal values for capacitance:

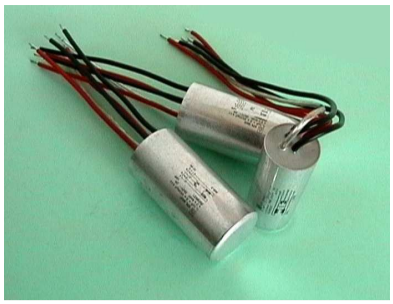
0,33µF+2×2200pF
0,33µF+2×2700pF
0,33µF+2×4700pF
0,33µF+2×5000pF
0,33µF+2×10000pF
0,33µF+2×15000pF
0,33µF+2×20000pF
0,33µF+2×22000pF
0,33µF+2×27000pF

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

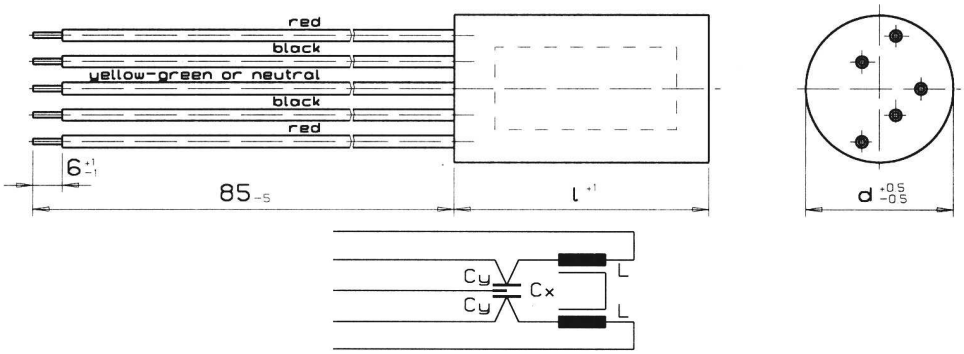
Approvals in use = •
Approvals in pending = o

Filters for radio interference suppression: **Type KPL 3000** **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 ℃ to + 85 ℃
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) shields against case with 2500 V A.C., 2 s (for filters where the Y capacitor is not connected to the case)
Insulation resistance at 20℃, 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

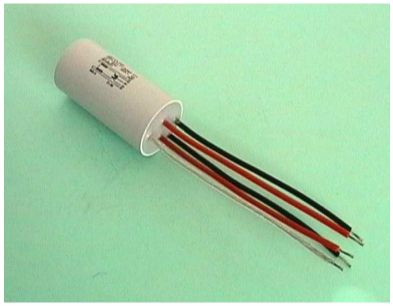
Terminals: stranded wire 0,5 mm^2 with PVC insulation, Type KPL3001, with four terminals and Y capacitor connected to case, and sealed with synthetical resin, is also available.

Casing: aluminium; on request casing is also available with screw M8×8.

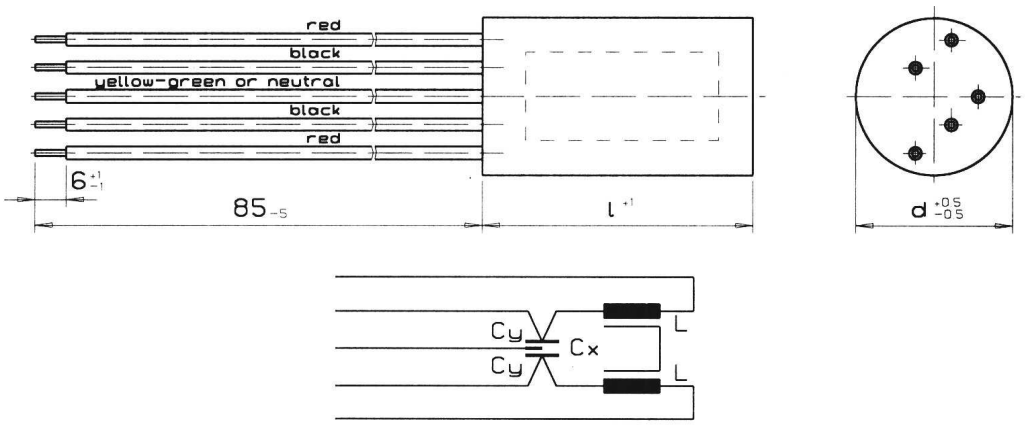
Rated current	Rated values			
	Capacitance		Inductance	Dimensions
(A)	CX1 (µF)	CY2 (pF)	L(mH)	d (mm) x l (mm)
1	0,1	2 × 2500	2 × 4	20 × 45
2	0,05	2 × 2500	2 × 1	20 × 40
2	0,1	2 × 2500	2 × 2	20 × 45
2	0,1	2 × 2500	2 × 1	25 × 45
2	0,1	2 × 2500	2 × 6	25 × 50
6	0,1	2 × 2500	2 × 1	25 × 50
4	0,1	2 × 2500	2 × 2	25 × 50
3	0,1	2 × 2500	2 × 4	25 × 50

Filters for radio interference suppression: **Type KPL 3300** **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 ℃ to + 85 ℃
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 resistrance at 20 ℃, 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

Terminals: stranded wire 0,5 mm^2 with PVC in sulation.

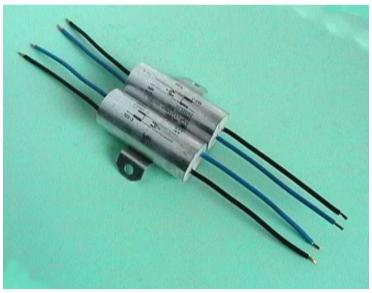
Casing: thermoplastic, sealed with synthetical resin.

Standard values: KPL3300

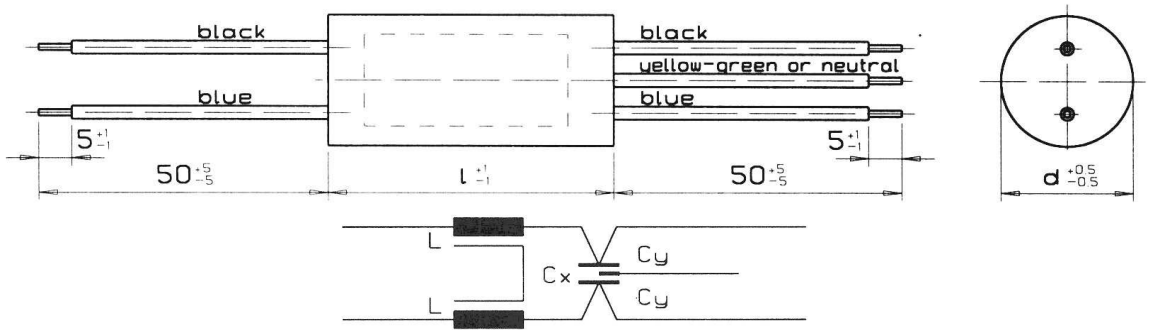
Rated current	Rated values			
	Capacitance		Inductance	Dimensions
(A)	CX1 (µF)	CY2 (pF)	L(mH)	d (mm) x l (mm)
4	0,1	2 × 2500	2 × 1	25 × 50
6	0,1	2 × 2500	2 × 1	25 × 50
3	0,1	2 × 2500	2 × 4	25 × 50
4	0,1	2 × 2500	2 × 2	25 × 50
2	0,1	2 × 2500	2 × 6	25 × 50

Filters for radio interference suppression: **Type KPL 305x** **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 ℃ to + 85 ℃
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 ℃, U_m = 100 V D.C., t = 1 min:	$R_i \geq 6000$ MΩ for $C \leq 0{,}33$ 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

Terminals: stranded wire 0,5 mm^2 up to 6 A or 1,5 mm^2 up to 16 A with PVC insulation.

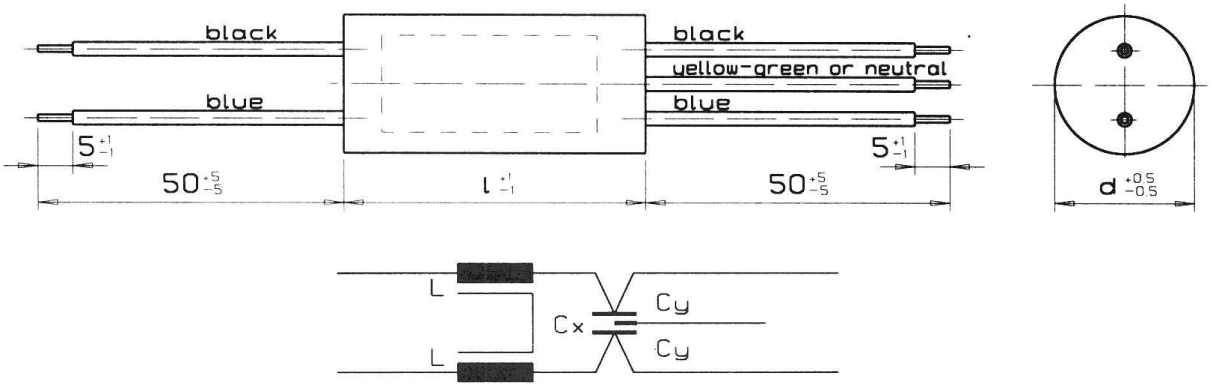
Casing: aluminium, sealed with synthetical resin. Casing also available with bracket.

Rated current	Rated values			
	Capacitance		Inductance	Dimensions
(A)	CX1 (µF)	CY2 (pF)	L(mH)	d (mm) x l (mm)
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 KPL 3350** **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 publ, 60068-1
Temperature range:	- 25 ℃ to + 85 ℃
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 ℃, 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

Terminals:	stranded wire 0,5 mm^2 with PVC insulation.	*Casing:*	thermoplastic tube, sealed with synthetical resin.

Standard values: KPL3350

Rated current	Rated values			
	Capacitance		Inductance	Dimensions
(A)	CX1 (µF)	CY2 (pF)	L(mH)	d (mm) × l (mm)
1	0,1	2 × 2500	2 × 2	18 × 48
2	0,1	2 × 2500	2 × 1	18 × 48