

Motor Running & Motor Starting Capacitors KNM

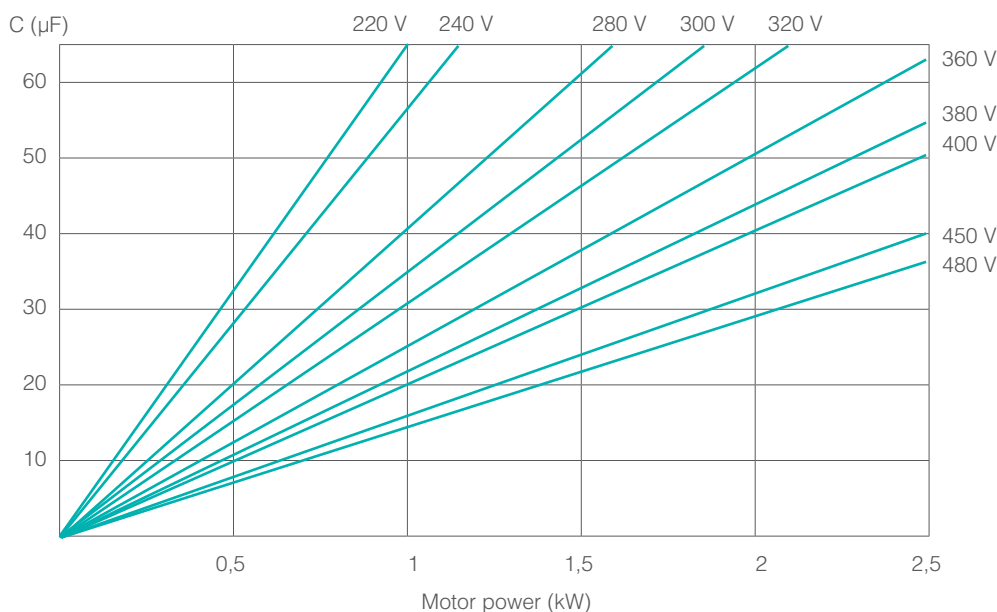
Applications

Motor running capacitors type KNM are designed for obtaining an auxiliary phase in single-phase and in three-phase motors

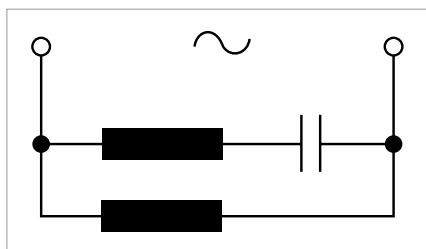
connected to a single phase. The capacitors provide a starting moment of 25 % to 30 % of rated moment.

The approximate values of capacitors with the respect to motor power are given on the draft below.

Selection of capacitors values for different voltages and motor power

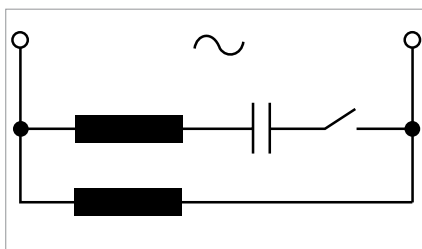


The connection and operation of single-phase motors with capacitor



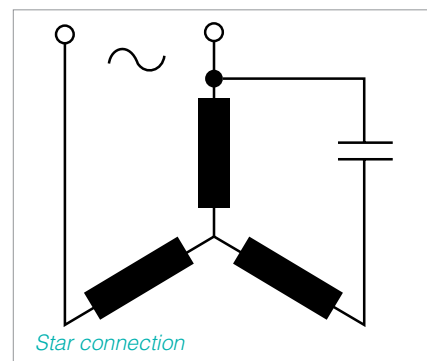
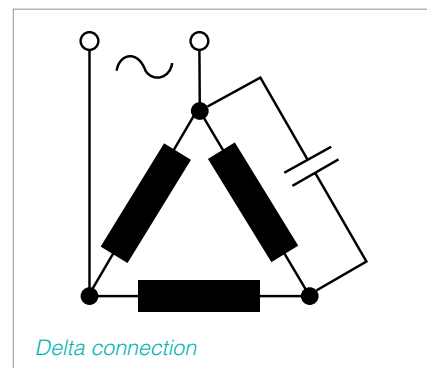
Motor running capacitor

The capacitor is connected for the entire time the motor is in operation.



Motor starting capacitor

The capacitor is connected in series with the auxiliary motor winding only, it operates for short periods of time (3 s max.) and is automatically switched off using a centrifugal switch or electromagnetic relay as soon as the motor has built up speed.



Connecting three-phase motors to a single-phase power supply

Motor Running Capacitors

Type KNM70xx	Safety class P2
Type KNM80xx	
Type KNM90xx	



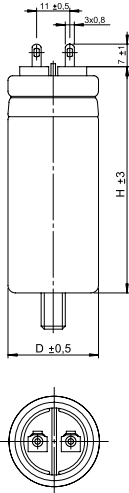
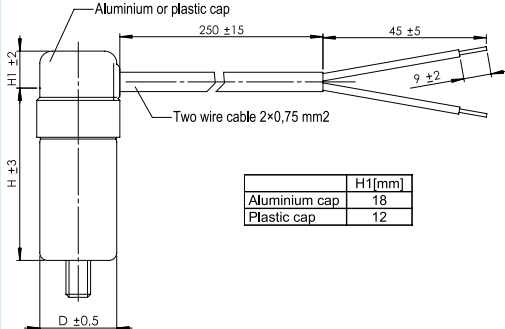
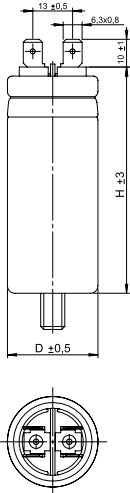
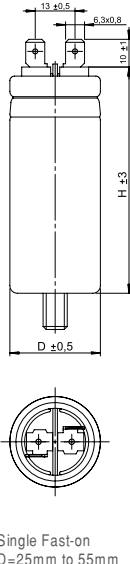
TECHNICAL DATA

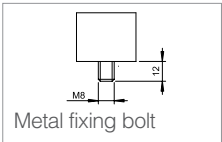
Rated voltage U_n :	as per table
Rated capacitance C_n :	as per table
Capacitance tolerance:	$\pm 10\%$ ($\pm 5\%$ on request)
Rated frequency f_n :	50 to 60 Hz
Loss angle $\tan\delta$:	$\max. 10 \times 10^{-4}$ at U_n and 50 Hz
Test voltage terminal to terminal:	$2 \times U_n$, 50 Hz, 2 s
Test voltage terminal to case:	2400 V, 50 Hz, 2 s
Class of operation:	as per table
Climate class:	according to EN 60252-1
Temperature range:	- 25 °C to + 85 °C
Compliance with standards:	EN 60252-1, UL 810 CSA C22.2 No. 190

Design

Motor running capacitors type KNM70xx, KNM80xx and KNM90xx are made of metallized polypropylene film. The protection against climatic and mechanical influence is reached by using aluminium can and thermoplastic cover as a casing. The capacitors are impregnated with plant oil (non PCB) and protected with a mechanical disconnecter. The leads are designed as soldering tags, two-wire cable lead and single or double fast-on tags.

Standard designs of capacitors type KNM70xx, KNM80xx and KNM90xx

With bolt	KNM7011, 8011, 9011	KNM7011, 8011, 9011	KNM7015, 8015, 9015	KNM7017, 8017, 9017					
Without bolt	KNM7010, 8010, 9010	KNM7010, 8010, 9010	KNM7014, 8014, 9014	KNM7016, 8016, 9016					
 Soldering tags D =25mm to 55mm	 <table><tr><td></td><td>H1[mm]</td></tr><tr><td>Aluminium cap</td><td>18</td></tr><tr><td>Plastic cap</td><td>12</td></tr></table>		H1[mm]	Aluminium cap	18	Plastic cap	12	 Double Fast-on D=30mm to 55mm	 Single Fast-on D=25mm to 55mm
	H1[mm]								
Aluminium cap	18								
Plastic cap	12								



Standard values and dimensions of capacitors type KNM70xx

Capacitance C (μF)	Approvals	 P2 EN 60252-1	 C22.2 No.190
	Voltage Climate class	400 VAC 50/60 Hz 10.000 h 25/85/21	240 VAC 50/60 Hz 10.000 AFC -25/+70 °C
	Type	KNM7010, KNM7011 KNM7016, KNM7017	
	D × H (mm)	KNM7014, KNM7015 (D ≥ 30 mm)	
1	25 × 56	•	
1,5	25 × 56	•	
2	25 × 56	•	
2,5	25 × 56	•	
3	25 × 56	•	
3	35 × 56		•
3,5	25 × 56	•	
4	25 × 61	•	
4	35 × 56		•
4,5	30 × 56	•	
5	30 × 56	•	
5	35 × 56		•
6	30 × 61	•	
6	35 × 56		•
7	30 × 61	•	
7	35 × 61		•
7,5	35 × 56	•	
8	30 × 75	•	
8	35 × 56	•	
8	35 × 61		•
9	30 × 75	•	
9	35 × 61	•	•
10	30 × 75	•	
10	35 × 61	•	•
11	30 × 88	•	
12	30 × 88	•	
12	40 × 61		•
12,5	30 × 88	•	
13	35 × 75	•	
13,5	35 × 75	•	
14	35 × 75	•	•
14	40 × 61		•
15	35 × 75	•	

Capacitance C (μF)	Approvals	 P2 EN 60252-1	 C22.2 No.190
	Voltage Climate class	400 VAC 50/60 Hz 10.000 h 25/85/21	240 VAC 50/60 Hz 10.000 AFC -25/+70 °C
	Type	KNM7010, KNM7011 KNM7016, KNM7017	
	D × H (mm)	KNM7014, KNM7015 (D ≥ 30 mm)	
16	40 × 75		•
18	35 × 88	•	•
20	35 × 88	•	•
22	40 × 75	•	
25	40 × 88	•	•
30	45 × 88	•	•
35	45 × 88	•	•
40	45 × 100	•	•
45	45 × 109	•	•
50	45 × 109	•	•
55	50 × 109	•	•
60	50 × 109	•	•
65	50 × 109	•	
65	55 × 109		•
70	55 × 109	•	•

Standard values and dimensions of capacitors type KNM80xx

Capacitance	Approvals	 P2 EN 60252-1	 C22.2 No.190
	Voltage Climate class	420 VAC 30.000 h 470 VAC 10.000 h 50/60 Hz 25/85/21	450 VAC 50/60 Hz 10.000 AFC -25/+85 °C
	Type	KNM8010, KNM8011 KNM8016, KNM8017	
C (μF)	D × H (mm)	KNM8014, KNM8015 (D ≥ 30 mm)	
1,5	25 × 56	•	
2	25 × 56	•	
2,5	25 × 56	•	
3	25 × 61	•	
3	30 × 56	•	•
3,5	30 × 56	•	•
4	25 × 75	•	
4	30 × 56	•	•
4,5	25 × 75	•	
4,5	30 × 61	•	•
5	25 × 75	•	
5	30 × 61	•	•
6	30 × 75	•	•
6	35 × 61	•	•
7	30 × 75	•	•
7	35 × 61	•	•
7,5	30 × 75	•	•
7,5	35 × 61	•	•
8	30 × 75	•	•
8,5	35 × 75	•	•
9	30 × 88	•	•
9	35 × 75	•	•
10	35 × 75	•	•
11	35 × 75	•	•
12	35 × 75	•	•
12,5	35 × 88	•	•
13	35 × 88	•	•
13,5	35 × 88	•	•
14	35 × 88	•	•
14	40 × 75	•	•

Capacitance	Approvals	 P2 EN 60252-1	 C22.2 No.190
	Voltage Climate class	420 VAC 30.000 h 470 VAC 10.000 h 50/60 Hz 25/85/21	450 VAC 50/60 Hz 10.000 AFC -25/+85 °C
	Type	KNM8010, KNM8011 KNM8016, KNM8017	
C (μF)	D × H (mm)	KNM8014, KNM8015 (D ≥ 30 mm)	
16	40 × 75	•	•
18	35 × 100	•	•
18	40 × 88	•	•
20	40 × 88	•	•
22	40 × 88	•	•
25	40 × 100	•	•
25	45 × 88	•	•
30	45 × 100	•	•

Standard values and dimensions of capacitors type KNM90xx

Capacitance	Approvals	P2 EN 60252-1	c  us C22.2 No.190
	Voltage Climate class	300 VAC 50/60 Hz 10.000 h 25/85/21	300 VAC 50/60 Hz 10.000 AFC -25/+85 °C
	Type	KNM9010, KNM9011 KNM9016, KNM9017	
C (μF)	D × H (mm)	KNM9014, KNM9015 (D ≥ 30 mm)	
1,5	25 × 56		
2	25 × 56		
2,5	25 × 56		
3	25 × 56		
3,15	25 × 56		
3,5	25 × 56		
4	25 × 65		
4,5	25 × 56		
5	25 × 56		
6	25 × 61		
6,5	25 × 61		
7	25 × 75		
7	30 × 56	•	
8	25 × 75		
8	30 × 56	•	
9	25 × 75		
9	30 × 61	•	
10	25 × 80		
10	30 × 61	•	
12	30 × 75	•	
12	35 × 61	•	
12,5	30 × 75	•	
13	30 × 75	•	
13,5	30 × 75	•	
13,5	35 × 61	•	
14	30 × 75	•	
15	30 × 75	•	
16	30 × 80	•	
16	35 × 61	•	
18	30 × 88	•	

Capacitance	Approvals	P2 EN 60252-1	c  us C22.2 No.190
	Voltage Climate class	300 VAC 50/60 Hz 10.000 h 25/85/21	300 VAC 50/60 Hz 10.000 AFC -25/+85 °C
	Type	KNM9010, KNM9011 KNM9016, KNM9017	
C (μF)	D × H (mm)	KNM9014, KNM9015 (D ≥ 30 mm)	
22	35 × 75	•	
24	35 × 80	•	
25	35 × 80	•	
30	35 × 125	•	
30	40 × 100	•	
35	40 × 100	•	
40	40 × 125	•	
40	45 × 100	•	
45	45 × 75	•	
45	45 × 100	•	
50	45 × 109	•	
50	50 × 100	•	

Motor Running Capacitors

Type KNM12xx	Safety class P0
Type KNM22xx	
Type KNM32xx	

TECHNICAL DATA

Rated voltage U_n :	as per table
Rated capacitance C_n :	as per table
Capacitance tolerance:	$\pm 10\%$ ($\pm 5\%$ on request)
Rated frequency f_n :	50 Hz
Loss angle $\tan\delta$:	$<10 \times 10^{-4}$ at U_n at 1 kHz 1V
Test voltage terminal to terminal:	$2 \times U_n$, 50 Hz, 2 s
Class of operation:	as per table
Climate class:	according to EN 60252-1
Temperature range:	- 25 °C to + 85 °C
Allowed pulse loading:	$\leq 1 \mu\text{F}$, 100 V/ μs ; $> 1 \mu\text{F}$, 50 V/ μs
Compliance with standards:	EN 60252-1, UL 810 CSA C22.2 No. 190



Design

Motor running capacitors type KNM12xx, KNM22xx and KNM32xx are made of metalized polypropylene film.

The protection against climatic and mechanical influences is reached by using prismatic plastic case sealed with epoxy resin. The case and the resin are self-extinguishing. Leads are designed as tinned copper wire or insulated copper wires.

Note: Capacitors **KNM12xx**, **KNM22xx** and **KNM32xx** can be used also for other purposes, such as in industrial electronics in electronics circuits where capacitors are lower pulse loaded.

Standard designs of capacitors type KNM12xx, KNM22xx and KNM32xx

KNM1225, 1244, 2225, 2244, 3225, 3244	KNM1228, 2228, 3228

Standard values and dimensions of capacitors type KNM12xx

Capacitance C (μF)	Approvals		 P0 EN 60252-1		 CFLUS C22.2 No.190
	Voltage		275 VAC	400 VAC	400 VAC
	Climate class		50/60 Hz 10.000 h 25/85/21	50/60 Hz 3.000 h 25/85/21	50/60 Hz -25/+85°C
b × h × l (mm)	r (mm)				
0,33	7,5 × 16,5 × 26,5	22,5	•		•
0,47	9,0 × 18,5 × 26,5	22,5	•		•
0,68	11,0 × 20,5 × 26,5	22,5	•		•
0,82	11,0 × 20,0 × 32,0	27,5	•		•
1	11,0 × 20,0 × 32,0	27,5	•		•
1,2	11,0 × 20,0 × 32,0	27,5	•		•
1,3	14,0 × 20,0 × 32,0	27,5	•		•
1,4	14,0 × 20,0 × 32,0	27,5	•		•
1,5	14,0 × 20,0 × 32,0	27,5	•		•
1,6	13,0 × 22,0 × 32,0	27,5	•		•
1,8	15,0 × 24,5 × 32,0	27,5	•		•
2	15,0 × 24,5 × 32,0	27,5	•	•	•
2	14,0 × 25,0 × 38,5	35	•	•	•
2,2	15,0 × 24,5 × 32,0	27,5	•	•	•
2,2	14,0 × 25,0 × 38,5	35	•	•	•
2,5	14,0 × 25,0 × 38,5	35	•	•	•
2,7	14,0 × 25,0 × 38,5	35	•	•	•
2,8	14,0 × 25,0 × 38,5	35	•	•	•
3	14,0 × 25,0 × 38,5	35	•	•	•
3	14,0 × 25,0 × 41,5	37,5	•	•	•
3,2	16,0 × 27,0 × 41,5	37,5	•	•	•
3,5	16,0 × 27,0 × 41,5	37,5	•	•	•
4	16,0 × 27,0 × 41,5	37,5	•	•	•
4,5	18,0 × 31,0 × 41,5	37,5	•	•	•
5	18,0 × 31,0 × 41,5	37,5	•	•	•
5	24,0 × 26,5 × 41,5	37,5	•	•	•
5,5	24,0 × 26,5 × 41,5	37,5	•	•	•
6	24,0 × 26,5 × 41,5	37,5	•	•	•
6,5	33,0 × 35,0 × 41,5	37,5	•	•	•
7	33,0 × 35,0 × 41,5	37,5	•	•	•
7,5	33,0 × 35,0 × 41,5	37,5	•	•	•
8	33,0 × 35,0 × 41,5	37,5	•	•	•
9	33,0 × 35,0 × 41,5	37,5	•	•	•
10	33,0 × 35,0 × 41,5	37,5	•	•	•

Standard values and dimensions of capacitors type KNM22xx

Capacitance C (μF)	Approvals		 P0 EN 60252-1	 C22.2 No. 190
	Voltage		400 VAC	400 VAC
	Climate class		50/60 Hz 30.000 h 25/85/21	50/60 Hz -25/+85°C
	b × h × l (mm)	r (mm)		
0,33	10,0 × 19,0 × 31,5	27,5	•	•
0,33	11,0 × 20,5 × 26,5	22,5	•	•
0,39	11,0 × 20,0 × 32,0	27,5	•	•
0,47	12,0 × 21,0 × 31,5	27,5	•	•
0,56	11,0 × 20,0 × 32,0	27,5	•	•
0,62	11,0 × 20,0 × 32,0	27,5	•	•
0,68	11,0 × 20,0 × 32,0	27,5	•	•
0,75	12,0 × 21,0 × 31,5	27,5	•	•
0,82	13,0 × 22,0 × 32,0	27,5	•	•
1	14,0 × 25,0 × 38,5	35	•	•
1	14,0 × 23,5 × 31,5	27,5	•	•
1,2	14,0 × 25,0 × 38,5	35	•	•
1,5	14,0 × 25,0 × 38,5	35	•	•
1,8	16,0 × 27,0 × 41,5	37,5	•	•
2	16,0 × 27,0 × 41,5	37,5	•	•
2,2	16,0 × 27,0 × 41,5	37,5	•	•
2,5	18,0 × 31,0 × 41,5	37,5	•	•
2,6	18,0 × 31,0 × 41,5	37,5	•	•
2,7	18,0 × 31,0 × 41,5	37,5	•	•
3	24,0 × 26,5 × 41,5	37,5	•	•
3,5	33,0 × 35,0 × 41,5	37,5	•	•
4	33,0 × 35,0 × 41,5	37,5	•	•
4,5	33,0 × 35,0 × 41,5	37,5	•	•
5	33,0 × 35,0 × 41,5	37,5	•	•

Standard values and dimensions of capacitors type KNM32xx

Capacitance C (μF)	Approvals		 P0 EN 60252-1	 US C22.2 No. 190
	Voltage		400 VAC 30.000 h 460 VAC 10.000 h	450 VAC
	Climate class		50/60Hz 40/85/56	50/60 Hz -40/+85°C
	b × h × l (mm)	r (mm)		
0,33	11,0 × 20,5 × 26,5	22,5	•	•
0,33	10,0 × 19,0 × 31,5	27,5	•	•
0,39	11,0 × 20,0 × 32,0	27,5	•	•
0,47	11,0 × 20,5 × 26,5	22,5	•	•
0,50	10,0 × 18,5 × 26,5	22,5	•	•
0,56	11,0 × 20,5 × 26,5	22,5	•	•
0,62	11,0 × 20,5 × 26,5	22,5	•	•
0,68	10,0 × 19,0 × 31,5	27,5	•	•
0,75	11,0 × 20,0 × 32,0	27,5	•	•
0,82	11,0 × 20,0 × 32,0	27,5	•	•
1	12,0 × 21,0 × 31,5	27,5	•	•
1,2	14,0 × 23,5 × 31,5	27,5	•	•
1,5	15,0 × 24,5 × 32,0	27,5	•	•
1,8	17,0 × 26,5 × 31,5	27,5	•	•
2	17,0 × 26,5 × 31,5	27,5	•	•
2,2	14,0 × 25,0 × 41,5	37,5	•	•
2,5	16,0 × 27,0 × 41,5	37,5	•	•
2,6	16,0 × 27,0 × 41,5	37,5	•	•
2,7	16,0 × 27,0 × 41,5	37,5	•	•
3	18,0 × 26,0 × 41,5	37,5	•	•
3,5	18,0 × 31,0 × 41,5	37,5	•	•
4	24,0 × 26,5 × 41,5	37,5	•	•
4,5	33,0 × 35,0 × 41,5	37,5	•	•
4,5	29,0 × 31,0 × 41,5	37,5	•	•
5	33,0 × 35,0 × 41,5	37,5	•	•
5	29,0 × 31,0 × 41,5	37,5	•	•
5,5	33,0 × 35,0 × 41,5	37,5	•	•
5,5	29,0 × 31,0 × 41,5	37,5	•	•
6	33,0 × 35,0 × 41,5	37,5	•	•
6	29,0 × 31,0 × 41,5	37,5	•	•
6,3	33,0 × 35,0 × 41,5	37,5	•	•
7	33,0 × 35,0 × 41,5	37,5	•	•
8	33,0 × 35,0 × 41,5	37,5	•	•

• - Approved

Motor Running Capacitors

Type KNM31xx

Safety
class **P0**



TECHNICAL DATA

Rated voltage U_n :	as per table
Rated capacitance C_n :	as per table
Capacitance tolerance:	$\pm 10\%$ ($\pm 5\%$ on request)
Rated frequency f_n :	50 to 60 Hz
Loss angle $\tan\delta$:	max. 10×10^{-4} at U_n and 50 Hz
Test voltage terminal to terminal:	$2 \times U_n$, 50 Hz, 2 s
Test voltage terminal to case:	2400 V, 50 Hz, 2 s
Class of operation:	as per table
Climate class:	according to EN 60252-1
Temperature range:	- 25 °C to + 85 °C
Compliance with standards:	EN 60252-1, UL 810 CSA C22.2 No. 190

Design

Motor running capacitors type KNM31xx are made of metallized polypropylene film. Case and cover are made with self-extinguishing plastic material, the capacitive element is sealed with polyurethane or epoxy resin. Leads are designed as soldering tags, single or double fast-on tags, two-wire cable, stranded wire or solid wire.

Standard designs of capacitors type KNM31xx

With bolt	KNM3111	KNM3117	KNM3115	KNM3138	KNM3126	KNM3147
Without bolt	KNM3110	KNM3116	KNM3114	KNM3137	KNM3125	KNM3144
Fast Fix	KNM3101	KNM 3107	KNM3105	KNM3108	KNM3106	KNM3104
	Soldering tags	Single fast-on	Double fast-on	Two-wire cable 2x0,75 mm²	Standard wire 0,5 mm²	Solid wire 0,5 mm²
	Metal fixing bolt	FAST FIX (D = 30 to 40 mm) Drilling Plate thickness: 0.8 - 1.5 mm				

Standard values and dimensions of capacitors type KNM31xx - motor running: 400 VAC 30.000 h

Capacitance	Approvals	 P0 EN 60252-1		 US C22.2 No.190
	Voltage	400 VAC 50/60 Hz	450 VAC 50/60 Hz	450 VAC 50/60 Hz
	Climate class	30.000 h 25/85/21	10.000 h 25/85/21	-25/+85°C
	C (μF)	D x H (mm)		
1	25 × 57	•	•	•
1,25	25 × 57	•	•	•
1,5	25 × 57	•	•	•
2	25 × 57	•	•	•
2,5	25 × 57	•	•	•
3	25 × 57	•	•	•
3,15	25 × 57	•	•	•
3,15	30 × 57	•	•	•
3,5	30 × 57	•	•	•
4	30 × 57	•	•	•
4,5	30 × 57	•	•	•
5	30 × 57	•	•	•
5,5	35 × 57	•	•	•
6	30 × 71	•	•	•
6	35 × 57	•	•	•
6,3	30 × 71	•	•	•
6,3	35 × 57	•	•	•
6,8	35 × 57	•	•	•
7	30 × 71	•	•	•
7	35 × 57	•	•	•
7,5	30 × 71	•	•	•
7,5	35 × 57	•	•	•
8	35 × 57	•	•	•
9	35 × 71	•	•	•
10	35 × 71	•	•	•
11	35 × 71	•	•	•
12	35 × 71	•	•	•
12,5	40 × 71	•	•	•
13	40 × 71	•	•	•
14	40 × 71	•	•	•
15	35 × 95	•	•	•
15	40 × 71	•	•	•
16	35 × 95	•	•	•
16	40 × 71	•	•	•
17	45 × 71	•	•	•
17,5	35 × 95	•	•	•
17,5	45 × 71	•	•	•

Capacitance	Approvals	 P0 EN 60252-1		 US C22.2 No.190
	Voltage	400 VAC 50/60 Hz	450 VAC 50/60 Hz	450 VAC 50/60 Hz
	Climate class	30.000 h 25/85/21	10.000 h 25/85/21	-25/+85°C
	C (μF)	D x H (mm)		
18	40 × 95	•	•	
18	45 × 71	•	•	•
20	40 × 95	•	•	
20	45 × 71	•	•	•
22	40 × 95	•	•	•
25	40 × 95	•	•	•
30	45 × 95		•	•
31,5	45 × 95		•	•
35	45 × 120			•
36	45 × 120			•
40	45 × 120			•
45	45 × 120			•
50	50 × 120			•
55	50 × 120			•
60	55 × 120			•
65	55 × 120			•
70	55 × 120			•
75	60 × 120			•
80	60 × 120			•
90	65 × 120			•
100	65 × 120			•

• - Approved

Standard values and dimensions of capacitors type KNM31xx - motor running: 400 VAC 10.000 h

Capacitance C (μF)	Approvals	 P0 EN 60252-1		 C22.2 No.190
	Voltage	400 VAC 50/60 Hz	450 VAC 50/60 Hz	450 VAC 50/60 Hz
	Climate class	10.000 h 25/85/21	3.000 h 25/85/21	-25/+85°C
	D x H (mm)			
0,5	25 x 57	•	•	•
1	25 x 57	•	•	•
1,5	25 x 57	•	•	•
2	25 x 57	•	•	•
2,5	25 x 57	•	•	•
3	25 x 57	•	•	•
3,15	25 x 57	•	•	•
3,5	25 x 57	•	•	•
4	30 x 57	•	•	•
4,5	30 x 57	•	•	•
5	30 x 57	•	•	•
5,5	30 x 57	•	•	•
6	30 x 57	•	•	•
6,3	30 x 57	•	•	•
6,8	30 x 57	•	•	•
7	30 x 57	•	•	•
7,5	30 x 71	•	•	•
7,5	35 x 57	•	•	•
8	30 x 71	•	•	•
8	35 x 57	•	•	•
8,5	30 x 71	•	•	•
9	30 x 71	•	•	•
9	35 x 57	•	•	•
10	30 x 71	•	•	•
10	35 x 57	•	•	•
11	30 x 71	•	•	•

Capacitance C (μF)	Approvals	 P0 EN 60252-1		 C22.2 No.190
	Voltage	400 VAC 50/60 Hz	450 VAC 50/60 Hz	450 VAC 50/60 Hz
	Climate class	10.000 h 25/85/21	3.000 h 25/85/21	-25/+85°C
	D x H (mm)			
12	35 x 71	•	•	•
12,5	35 x 71	•	•	•
13	35 x 71	•	•	•
14	35 x 71	•	•	•
15	35 x 71	•	•	•
16	40 x 71	•	•	•
18	40 x 71	•	•	•
20	40 x 71	•	•	•
22	35 x 95	•	•	•
22	40 x 71	•	•	•
25	40 x 95	•	•	•
30	40 x 95	•	•	•
40	45 x 95	•	•	•

• - Approved

Standard values and dimensions of capacitors type KNM31xx - motor running: 250 VAC 10.000 h

Capacitance	Approvals	 P0 EN 60252-1	 C22.2 No.190
	Voltage	250 VAC 50/60 Hz	250 VAC 50/60 Hz
	Climate class	10.000 h 25/85/21	-25/+85°C
C (μF)	D x H (mm)		
1	25 × 57	•	•
1,5	25 × 57	•	•
2	25 × 57	•	•
2,5	25 × 57	•	•
3	25 × 57	•	•
3,2	25 × 57	•	•
3,5	25 × 57	•	•
4	25 × 57	•	•
4,5	25 × 57	•	•
5	25 × 57	•	•
6	25 × 57	•	•
6,3	30 × 57	•	•
7	30 × 57	•	•
7,5	30 × 57	•	•
8	30 × 57	•	•
9	30 × 57	•	•
10	30 × 57	•	•
11	35 × 57	•	•
12	35 × 57	•	•
12,5	35 × 57	•	•
13	35 × 57	•	•
13,5	35 × 57	•	•
14	35 × 57	•	•
15	35 × 57	•	•
16	35 × 71	•	•
17,5	35 × 71	•	•
18	35 × 71	•	•
20	35 × 71	•	•
22	35 × 71	•	•
25	40 × 71	•	•
30	40 × 71	•	•
40	40 × 95	•	•
50	45 × 95	•	•

• - Approved

Motor Starting Capacitors

Type KNM31xx	Safety class P0
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TECHNICAL DATA

Rated voltage U_n :	280 VAC
Capacitance ($C_{min} - C_{max}$):	as per table
Rated frequency f_n :	40 to 60 Hz
Test voltage terminal to terminal:	$1,3 \times U_n$, 50 Hz, 2 s
Test voltage terminal to case:	2400 V, 50 Hz, 2 s
Temperature range:	- 25 °C to + 70 °C
Duty cycle:	3/1.7 % Hours applications $N = 20$ Application time $t = 3$ s $N \times t = 60$



Design

Motor starting capacitors type KNM31xx are made of metallized polypropylene film. Case is made of self-extinguishing plastic material, the capacitive element is sealed with polyurethane or epoxy resin. Leads are designed as two-wire cable.

Standard designs of capacitors type KNM31xx

With bolt	KNM3138
Without bolt	KNM3137

Two-wire cable 2 x 0.75 mm²

Standard values and dimensions of capacitors type KNM31xx - motor starting

Capacitance	
$C_{min} - C_{max}$ (μF)	D x H (mm)
50 - 63	45 x 95
63 - 80	45 x 120
80 - 100	45 x 120
100 - 125	50 x 120
108 - 132	55 x 120
125 - 156	55 x 120
156 - 200	60 x 120

Type designation data:

	A1	A2	A3	A4	A5	A6	A7
K							
Dielectric							
Application							
Manufacture							
Case material and finish							
Design							

A1	K	Capacitor
A2	N	Dielectric metallized polypropylene film
A3	M	Motor running
A4	1, 2, 3	in casing sealed with epoxy or polyurethane resin
	5, 7, 8	in casing impregnated, closed with plastic cover, mechanical disconnector incorporated
A5	0	aluminium, cylindrical
	1	plastic, cylindrical
	2	plastic, prismatic
A6	01	soldering tags 3.0x0.8 mm, FAST FIX
	04	solid wire with insulation, FAST FIX
	05	double fast-on terminals 6.3 × 0.8 mm as per DIN 46244, FAST FIX
	06	stranded wire with insulation, FAST FIX
	07	single fast-on terminals 6.3 × 0.8 mm as per DIN 46244, FAST FIX
	08	two wire insulated cable lead, FAST FIX
	10	soldering tags 3.0 × 0.8 mm
	11	soldering tags 3.0 × 0.8 mm, fixing bolt
	12	plastic cap, two-wire insulated cable lead
	13	plastic cap, two-wire insulated cable lead, fixing bolt
A7	14	double fast-on terminals 6.3 × 0.8 mm as per DIN 46244
	15	double fast-on terminals 6.3 × 0.8 mm as per DIN 46244, fixing bolt
	16	single fast-on terminals 6.3 × 0.8 mm as per DIN 46244
	17	single fast-on terminals 6.3 × 0.8 mm as per DIN 46244, fixing bolt
	25	stranded wire with insulation
	26	stranded wire with insulation, fixing bolt

A6 A7	28	tinned copper wire leads of 0.8 mm diameter and 3.5 to 25 mm length
	37	two wire insulated cable lead
	38	two wire insulated cable lead, fixing bolt
	44	44 - solid wire with insulation
	47	47 - solid wire with insulation, fixing bolt
	51	51 - aluminium cap, two wire insulated cable lead, fixing bolt

Details according to DIN EN 60252-1

Class of operation:

The minimum total life for which the capacitor has been designed at rated duty, voltage, temperature and frequency.

Class A 30.000 hours

Class B 10.000 hours

Class C 3.000 hours

Class D 1.000 hours

Climate class:

The first number represents the lower limit, the second one represents the higher limit, the third one represents the number of days necessary to the humidity test (example:25/85/21).

Safety class:

(P2) Indicates that the capacitor type has been designed to fail in the open-circuit mode only and is protected against fire or shock hazard.

(P1) Indicates that the capacitor type may fail in the open-circuit mode or short-circuit mode and is protected against fire or shock hazard.

(P0) Indicates that the capacitor type has no specific failure protection.

CAUTION: In case of overload, they may burst or catch fire.

Other Markings

Temperature range:

- First number: - 25 °C lowest allowed ambient temperature

DEGREE OF PROTECTION (IP)

According to IEC publication 529

1 st code letter	Degree of protection Short description	2 nd code letter	Degree of protection Short description
0	Non-protected	0	Non-protected
1	Protected against solid objects greater than 50mm	1	Protected against dripping water
2	Protected against solid objects greater than 12mm	2	Protected against dripping water when tilted up to 15°
3	Protected against solid objects greater than 2.5 mm	3	Protected against spraying water
4	Protected against solid objects greater than 1.0 mm	4	Protected against splashing water
5	Dust-protected	5	Protected against water jets
6	Total dust-protected	6	Protected against water jets

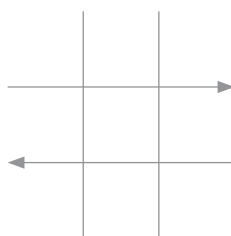
- Second number: + 85 °C highest allowed ambient temperature



Disconnecter incorporated

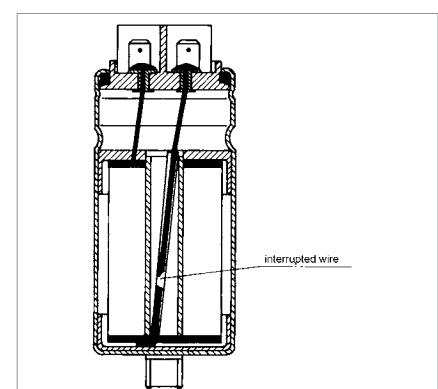
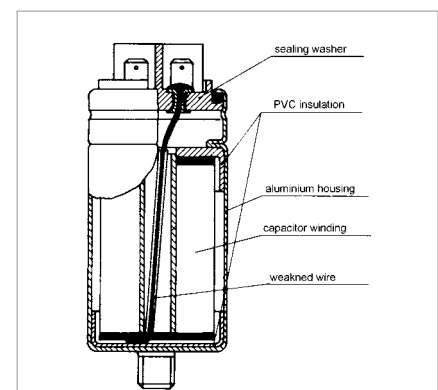


Discharging resistor incorporated



Self-healing capacitor version

to expand. One terminal, which is also weakened, cannot withstand the expansion and consequently breaks resulting in an interruption of the electrical circuit.



Operating of the Mechanical Disconnecter

After many breakdowns, the pressure inside the capacitor case begins to enlarge and the weaker (intended) areas of the case begin

Instructions for Ordering

When the buyer intends to order Iskra capacitors, the following data are needed:

- type designation of the capacitor
- rated voltage and rated frequency
- rated capacitance and capacitance tolerance
- class of operation
- quantity of capacitors and required lead time
- climate class

Example:

*The motor running, impregnated, cylindrical capacitor with mechanical disconnect, fast-on tags and fixing screw, for the climate class 25/85/21 and class of operation of 10000 hours, for the rated voltage 470 V 50/60 Hz, rated capacitance 10 μ F $\pm$ 10 %, is written as it is shown below:
KNM8017 10 μ F $\pm$ 10 % 470 VAC
50/60 Hz 10.000 h 25/85/21.*

Production Program

Capacitors for use in electronics:

- polyester film capacitors, metallized and nonmetallized
- polypropylene film capacitors, metallized and nonmetallized

Capacitors and filters for radio interference suppression

Motor running & motor starting capacitors

Power factor correction capacitors for lamps

Power factor capacitors and automatic power factor banks

Electronic regulators for power factor banks

Tools and production equipment and machinery