



Product Brief 2011

Power Factor Correction

PhaseCap Compact for Power Quality Solutions

The PhaseCap® Compact series is based on the EPCOS MKK-technology, which is known for many years from the successful Phase Cap series with its unique concentric windings.

PhaseCap Compact series are designed for applications like the PhaseCap Premium series, such as

- automatic PFC
- individual/fixed PFC
- fast/dynamic PFC
- harmonic filtering

With an output up to 33 kvar at low height it meets the dimensional requirements of panel builders, especially as for many types the capacitors diameter has been reduced in comparison to the series of PhaseCap Premium.

Highlights of PhaseCap Compact:

- Higher inrush current (up to $400 \cdot I_R$) and overcurrent capability (up to $2.0 \cdot I_R$)
- Enhanced terminals to permit the connection of a wide variety of up to 25 mm² cable cross section
- Life expectancy of up to 200 000 hours at temperature class -40/C

From mid of 2011 onwards, the voltage range will cover types for 690, 800, 900 and 1000 V AC which make the PhaseCap Compact series unique and suitable for almost every industrial application.

PQS



PhaseCap Compact

Feature and Benefits

Construction

- **Concentric winding:** Homogeneous distribution of the winding pressure allows better flow of the self-healing gases. No stress or overload near the core. Less internal soldering points result in more reliability.
- **MKK-technology:** Metallized polypropylene as dielectric and electrode make the MKK-series suitable for very high current load.
- **Wavy cut and heavy edge:** Special way of film cutting leads to lower contact resistance and thus leads to lower contact losses and a higher inrush current capability compared to the straight cut.
- **Compact design:** Thanks to the concentric winding, small dimensions allow high packing density in the panel.
- **Cylindrical aluminum can with stud:** Easy installation, mounting position upright and/or horizontal possible.

Electrical

- **Very high life expectancy:** Reduced investments for maintenance and replacement.
- **High inrush current withstand ability (up to $400 \cdot I_R$) and high overcurrent capability ($1.6 \dots 2.0 \cdot I_R$):** High inrush and overcurrents mean an extreme stress to the capacitor. The higher the value of withstand ability, the longer the device will operate at best performance, thus avoiding premature failure.

Safety

- **Self healing:** The capacitor repairs itself after a punctual overload and remains fully functional during the process. Capacitance losses caused by self-healing are in negligible range.
- **Overpressure disconnecter:** Straightforward disconnection at end of service life or in case of overpressure inside the capacitor.
- **Touch proof terminals:** Protection against electric shock, easy connection.
- **Discharge device:** Ceramic discharge module pre-mounted up to 525 V; discharge module block for types ≥ 690 V.
Cable connection easy to set up, outstanding thermal dissipation, secure clamping point without affecting the main circuit.

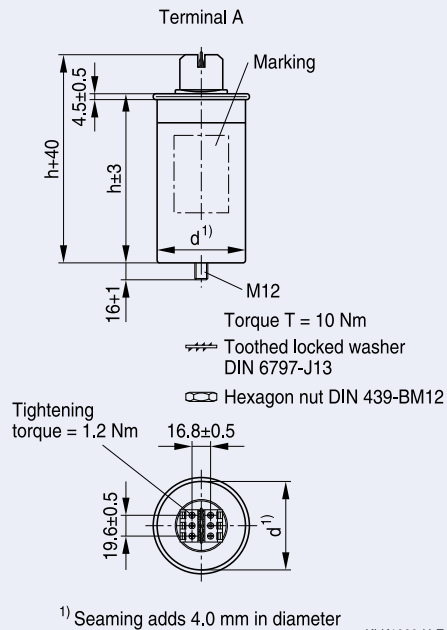
Product range

Voltage:	230 ... 1000 V AC
Output:	5.0 ... 33 kvar
Frequency:	50/60 Hz
Ordering code:	B25673A****A*** B25673S****A***

PhaseCap Compact

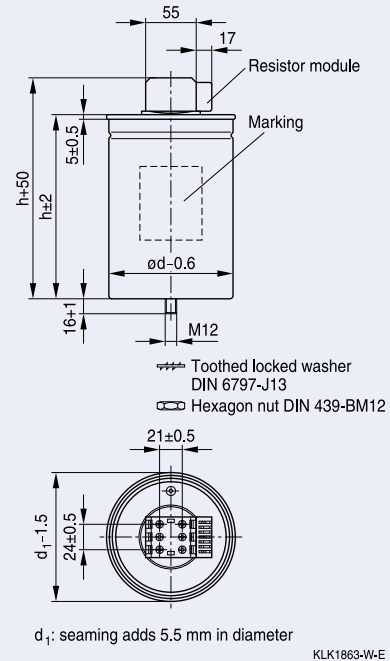
Dimensional drawings

Terminal type A, current up to 50 A
Terminal cross section 16 mm² (without cable end lug)

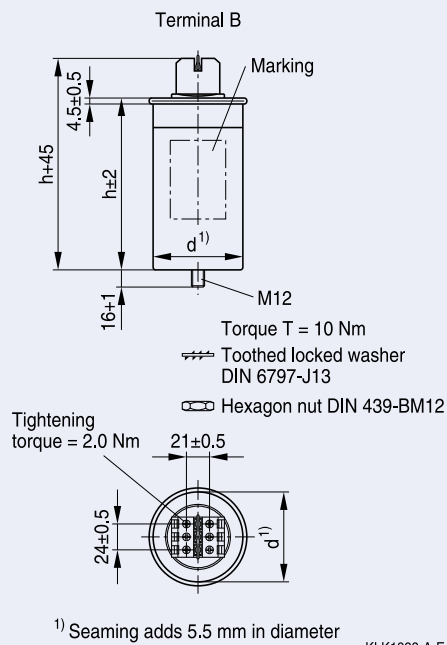


Dimensional drawings

Terminal type C, current up to 80 A (discharge module)
Terminal cross section 25 mm² (without cable end lug)



Terminal type B, current up to 80 A
Terminal cross section 25 mm² (without cable end lug)



PhaseCap Compact

Technical data and limit values		
Standards IEC 60831-1+2, EN 60831-1+2		
Overvoltage	$V_{\max}$	$V_R + 10\%$ (up to 8 h daily) / $V_R + 15\%$ (up to 30 min daily) $V_R + 20\%$ (up to 5 min daily) / $V_R + 30\%$ (up to 1 min daily)
Overcurrent	$I_{\max}$	$1.6 \dots 2.0 \cdot I_R$ (including combined effects of harmonics, overvoltage and capacitance tolerance) depending on the individual type
Inrush current	I_s	up to $400 \cdot I_R$
Losses: - Dielectric - Total ¹⁾		$< 0.2 \text{ W/kvar}$ $< 0.45 \text{ W/kvar}$
Rated frequency	f	50/60 Hz
Capacitance tolerance		$-5\% / +10\%$
Test voltage, terminal / terminal	V_{TT}	$2.15 \cdot V_{R1}$, AC, 10 s
Test voltage, terminal / case	V_{TC}	up to $V_R \leq 660 \text{ V}$: 3000 V AC, 10 s; above $V_R = 660 \text{ V}$: 6000 V AC, 10 s
Mean life expectancy	$t_{LD(Co)}$	up to 200 000 h (temperature class $-40/C$) up to 150 000 h (temperature class $-40/D$)
Ambient temperature		<u>Temperature class $-40/60$</u> : max. short time 60°C , max. mean 24 h = 50°C ; max. mean 1 year = 40°C ; lowest temperature = -40°C <u>Temperature class $-40/C$</u> : max. short time 50°C , max. mean 24 h = 40°C ; max. mean 1 year = 30°C ; lowest temperature = -40°C
Cooling		natural or forced
Humidity	H_{rel}	max. 95%
Altitude		max. 4000 m above sea level
Mounting position		upright/horizontal ²⁾
Mounting and grounding		threaded M12 stud on bottom of case
Safety		self-healing, overpressure disconnecter
Discharge module		ceramic discharge module pre-mounted, up to 525 V, module block for $\geq 690 \text{ V}$; discharge to $\leq 75 \text{ V}$ in 60 s
Case		extruded aluminum can with stud
Enclosure		IP20, indoor mounting (optionally with terminal cap for IP54)
Dielectric		polypropylene film
Impregnation		triple impregnation (semi-dry)
Terminals		optimized capacitor safety terminal with electric shock protection (IP20), (VDE 0106 part 100); for current and connection cable details and the terminal type; capacitor type association please refer to terminal drawings and the particular data sheet
No. of switching operations		max. 10 000 switching operations per year according to IEC 60831

1) without discharge resistors

2) PhaseCap Compact S-types: when mounting in horizontal position, additional mechanical support recommended to prevent breaking of the mounting bolt in case of mechanical shock or vibrations. This support should be placed at short distance below the bead at the top end of the capacitor.

PhaseCap Compact

Three-phase capacitors								
50 Hz Output kvar	60 Hz Output kvar	C _R μF	d x h mm	Weight kg	Type	Ordering code	Terminal type	Packing unit pcs
Rated voltage 230 V AC								
5.0	60	3 • 100.3	85 x 200	1.2	MKK230-D-5-02	B25673A2052A040	A	9
7.5	9.0	3 • 150.5	100 x 200	1.7	MKK230-D-7.5-02	B25673A2072A540	B	6
10.0	12.0	3 • 200.7	116 x 200	2.2	MKK230-D-10-02	B25673A2102A040	B	4
12.5	15.0	3 • 250.8	116 x 200	2.2	MKK230-D-12.5-02	B25673A2122A540	B	4
Rated voltage 400 V AC								
5.0	6.0	3 • 33.2	85 x 125	0.7	MKK400-D-5-02	B25673A4052A000	A	9
7.5	9.0	3 • 49.9	85 x 162	1.0	MKK400-D-7.5-02	B25673A4072A500	A	9
10.0	12.0	3 • 66.3	85 x 162	1.0	MKK400-D-10-02	B25673A4102A000	A	9
12.5	15.0	3 • 82.9	100 x 162	1.4	MKK400-D-12.5-02	B25673A4122A500	B	6
15.0	18.0	3 • 99.5	100 x 162	1.4	MKK400-D-15-02	B25673A4152A000	B	6
20.0	24.0	3 • 132.7	100 x 200	2.2	MKK400-D-20-02	B25673A4201A000	B	6
25.0	30.0	3 • 165.9	116 x 200	2.2	MKK400-D-25-02	B25673A4252A000	B	4
Rated voltage 415 V AC								
5.0	6.0	3 • 30.8	85 x 125	0.8	MKK415-D-5-02	B25673A4052A010	A	9
6.2	7.4	3 • 38.2	85 x 162	1.0	MKK415-D-6.2-02	B25673A4062A010	A	9
10.4	12.5	3 • 64.1	100 x 162	1.4	MKK415-D-10.4-02	B25673A4102A010	B	6
12.5	15.0	3 • 77.0	100 x 200	1.7	MKK415-D-12.5-02	B25673A4122A510	B	6
15.0	18.0	3 • 92.5	100 x 200	1.7	MKK415-D-15-02	B25673A4152A010	B	6
20.8	25.0	3 • 128.2	116 x 200	2.2	MKK415-D-20-02	B25673A4202A810	B	4
25.0	--	3 • 154.0	136 x 200	3.2	MKK415-D-25-02	B25673A4282A140	B	2
25.0	--	3 • 154.0	116 x 224	2.7	MKK415-D-25-02A	B25673S4282A140	B	1
Rated voltage 440 V AC								
5.0	6.0	3 • 27.4	85 x 125	0.8	MKK440-D-5-02	B25673A4052A040	A	9
7.5	9.0	3 • 41.1	85 x 162	1.0	MKK440-D-7.5-02	B25673A4072A540	A	9
10.4	12.5	3 • 57.0	100 x 162	1.4	MKK440-D-10.4-02	B25673A4102A040	B	6
12.5	15.0	3 • 68.5	100 x 162	1.4	MKK440-D-12.5-02	B25673A4122A540	B	6
15.0	18.0	3 • 82.2	100 x 200	1.7	MKK440-D-15-02	B25673A4152A040	B	6
16.7	20.0	3 • 92.0	116 x 200	2.2	MKK440-D-16.7-02	B25673A4202A080	B	4
20.0	24.0	3 • 109.7	116 x 200	2.2	MKK440-D-20-02	B25673A4202A040	B	4
25.0	30.0	3 • 137.1	116 x 200	2.2	MKK440-D-25-02	B25673A4252A040	B	4
28.1	--	3 • 154.0	136 x 200	3.2	MKK440-D-28-02	B25673A4282A140	B	2
28.1	--	3 • 154.0	116 x 224	2.7	MKK440-D-28-02A	B25673S4282A140	B	1
30.0	--	3 • 164.0	136 x 200	3.2	MKK440-D-30-02	B25673A4302A040	B	2
30.0	--	3 • 164.0	116 x 224	2.7	MKK440-D-30-02A	B25673S4302A040	B	1
33.0	--	3 • 181.0	136 x 200	3.2	MKK440-D-33-02	B25673A4332A040	B	2
33.0	--	3 • 181.0	116 x 248	3.0	MKK440-D-33-0.2A	B25673S4332A040	B	1
Rated voltage 480 V AC								
6.3	7.6	3 • 29.0	85 x 162	1.0	MKK480-D-6.3-02	B25673A4062A380	A	9
8.3	10.0	3 • 38.5	100 x 162	1.4	MKK480-D-8.3-02	B25673A5102A020	B	6
10.4	12.5	3 • 48.1	100 x 200	1.7	MKK480-D-10-02	B25673A5122A520	B	6
12.5	15.0	3 • 58.0	100 x 200	1.7	MKK480-D-12.5-02	B25673A4122A580	B	6
15.0	18.0	3 • 69.1	100 x 200	1.7	MKK480-D-15-02	B25673A4152A080	B	6
16.7	20.0	3 • 77.0	116 x 200	2.2	MKK480-D-16.7-02	B25673A5202A020	B	4
20.0	24.0	3 • 92.0	100 x 200	2.2	MKK480-D-20-02	B25673A4202A080	B	4
25.0	30.0	3 • 115.0	136 x 200	3.2	MKK480-D-25-02	B25673A4252A080	B	2
28.0	33.6	3 • 129.0	136 x 200	3.2	MKK480-D-28-02	B25673A4282A080	B	2
28.0	--	3 • 129.0	116 x 248	3.0	MKK480-D-28-02A	B25673S4282A080	B	1
30.0	--	3 • 138.0	136 x 200	3.2	MKK480-D-30-02	B25673A4302A080	B	2
30.0	--	3 • 138.0	116 x 248	3.0	MKK480-D-30-02A	B25673S4302A080	B	1

PhaseCap Compact

50 Hz Output kvar	60 Hz Output kvar	C _R μF	d x h mm	Weight kg	Type	Ordering code	Terminal type	Packing unit pcs
Rated voltage 525 V AC								
8.3	10.0	3 • 32.0	100 x 162	1.4	MKK525-D-8.3-02	B25673A5082A320	B	6
10.0	12.0	3 • 38.5	100 x 162	1.4	MKK525-D-10-02	B25673A5102A020	B	6
12.5	15.0	3 • 48.1	100 x 200	1.7	MKK525-D-12.5-02	B25673A5122A520	B	6
15.0	18.0	3 • 57.8	100 x 200	1.7	MKK525-D-15-02	B25673A5152A020	B	6
16.7	20.0	3 • 64.3	116 x 200	2.2	MKK525-D-16.7-02	B25673A5162A720	B	4
20.0	24.0	3 • 77.0	116 x 200	2.2	MKK525-D-20-02	B25673A5202A020	B	4
25.0	--	3 • 96.0	136 x 200	3.2	MKK525-D-25-02	B25673A5252A020	B	2
25.0	--	3 • 96.0	116 x 224	2.7	MKK525-D-25-02A	B25673S5252A020	B	1
30.0	--	3 • 115.0	136 x 200	3.2	MKK525-D-30-02	B25673A5302A020	B	2
30.0	--	3 • 115.0	116 x 248	3.0	MKK525-D-30-02A	B25673S5302A020	B	1

Three-phase capacitors – New types

50 Hz Output kvar	60 Hz Output kvar	C _R μF	d x h mm	Weight kg	Type	Ordering code	Terminal type	Packing unit pcs
Rated voltage 690 V AC								
5.0	6.0	3 • 11.2	116 x 164	2.1	MKK690-D-5-02	B25673A6052A090	C	4
7.5	9.0	3 • 16.7	116 x 164	2.1	MKK690-D-7.5-02	B25673A6072A590	C	4
10.0	12.0	3 • 22.5	116 x 164	2.1	MKK690-D-10-02	B25673A6102A090	C	4
12.5	15.0	3 • 27.9	116 x 164	2.1	MKK690-D-12.5-02	B25673A6122A590	C	4
15.0	18.0	3 • 33.5	116 x 164	2.2	MKK690-D-15-02	B25673A6152A090	C	4
20.8	25.0	3 • 46.5	136 x 200	3.2	MKK690-D-20.8-02	B25673A6202A890	C	2
25.0	30.0	3 • 55.7	136 x 200	3.2	MKK690-D-25-02	B25673A6252A090	C	2
Rated voltage 800 V AC								
5.0	6.0	3 • 8.3	116 x 164	2.1	MKK800-D-5-02	B25673A8052A000	C	4
7.5	9.0	3 • 12.4	116 x 164	2.1	MKK800-D-7.5-02	B25673A8072A500	C	4
10.0	12.0	3 • 16.6	116 x 164	2.1	MKK800-D-10-02	B25673A8102A000	C	4
12.5	15.0	3 • 20.7	116 x 164	2.1	MKK800-D-12.5-02	B25673A8122A500	C	4
15.0	18.0	3 • 24.9	116 x 164	2.1	MKK800-D-15-02	B25673A8152A000	C	4
20.8	25.0	3 • 33.2	136 x 200	3.2	MKK800-D-20-02	B25673A8202A000	C	2
25.0	30.0	3 • 41.4	136 x 200	3.2	MKK800-D-25-02	B25673A8252A000	C	2
28.0	33.6	3 • 46.4	136 x 200	3.2	MKK800-D-28-02	B25673A8282A000	C	2
Rated voltage 900 V AC								
10.4	12.5	3 • 13.6	116 x 164	2.0	MKK900-D-10.4-02	B25673A9102A400	C	4
12.5	15.0	3 • 16.4	116 x 164	2.0	MKK900-D-12.5-02	B25673A9122A500	C	4
15.0	18.0	3 • 19.7	116 x 200	2.4	MKK900-D-15.0-02	B25673A9152A000	C	4
20.8	24.0	3 • 26.2	136 x 200	3.1	MKK900-D-20.0-02	B25673A9202A000	C	2
25.0	30.0	3 • 32.7	136 x 200	3.1	MKK900-D-25.0-02	B25673A9252A000	C	2
Rated voltage 1000 V AC								
10.4	12.5	3 • 11.0	116 x 164	2.0	MKK1000-D-10.4-02	B25673A0102A400	C	4
12.5	15.0	3 • 13.3	116 x 164	2.0	MKK1000-D-12.5-02	B25673A0122A500	C	4
15.0	18.0	3 • 15.9	116 x 200	2.4	MKK1000-D-15.0-02	B25673A0152A000	C	4
20.8	24.0	3 • 21.2	136 x 200	3.1	MKK1000-D-20.0-02	B25673A0202A000	C	2
25.0	30.0	3 • 26.5	136 x 200	3.1	MKK1000-D-25.0-02	B25673A0252A000	C	2

Important information: Some parts of this publication contain statements about the suitability of our products for certain areas of application. These statements are based on our knowledge of typical requirements that are often placed on our products. We expressly point out that these statements cannot be regarded as binding statements about the suitability of our products for a particular customer application. It is incumbent on the customer to check and decide whether a product is suitable for use in a particular application. This publication is only a brief product survey which may be changed from time to time. Our products are described in detail in our data sheets. The Important notes (www.epcos.com/ImportantNotes) and the product-specific Cautions and warnings must be observed. All relevant information is available through our sales offices.