

ESTAprop®/ESTAdry® Power Factor Correction Capacitors Low Voltage

CAPACITORS IN CYLINDRICAL ALUMINUM CASING

APPLICATION

ESTAprop® PhMKP-type capacitors in cylindrical aluminum casing have been designed for Power Factor Correction in low voltage plants. Loads as motors and transformers consume real power as well as reactive power. Generators, supply cables, and other electrical distribution equipment should be relieved from reactive power.

ESTAprop® capacitors may be used for:

- automatic PFC-equipment
- individual fixed PFC (e.g. motors, transformers, lightning)
- group fixed PFC
- tuned and detuned capacitor banks
- harmonic trap (e.g. UPS, frequency drives, converter)

DESIGN

The ESTAprop® MKP capacitor is a metallized polypropylene film capacitor with self-healing properties. The current carrying metal layer of an MKP capacitor is vaporised onto one side of the polypropylene film. The front surface of tubular winding elements are joined by means of the metal spray method (schooping). Three winding elements are encapsulated in one aluminum casing and connected to form a true 3-phase capacitor. The overpressure tear-off fuse prevents the capacitor from bursting at the end of service life, or due to inadmissible electrical or thermal overloads.

The assembly is impregnated with a natural oil (fire point > 300°C) under vacuum and hermetically sealed. This construction method ensures excellent heat dissipation and constant capacitance over an extended period of time.

The capacitor is housed in a tubular aluminum container with a metal lid press-rolled onto it. The current is supplied via screw-on (M5) or push-on (6.3 * 0.8 mm) connectors. A threaded stud (M12) at the bottom of the container serves for both grounding and mounting.

ESTAprop® and ESTAdry® capacitors will be delivered together with discharge resistors and hardware for mounting and connection.

ESTA standard capacitors of 84.4mm diameter will come with a THICK FILM DISCHARGE RESISTOR UNIT, forked terminals for easy mounting and IN-LINE-connection of the capacitors to the supply.

Capacitors are in accordance with protection class IP00. For all types, plastic covers for a higher degree of protection are available.

3-PHASE CAPACITOR, SCREW-TYPE TERMINALS



3-PHASE CAPACITOR, PUSH-ON TYPE TERMINALS



1-PHASE CAPACITOR, PUSH-ON TYPE TERMINALS



THICK FILM DISCHARGE RESISTOR UNIT





CAPACITORS IN CYLINDRICAL ALUMINUM CASING

TECHNICAL DATA	
STANDARDS:	IEC 60831-1+2, EN 60831-1+2, VDE 0560-46+47
Overvoltages: (in accordance with the above standards)	Ucn + 10% (up to 8 hours daily) Ucn + 15% (up to 30 minutes daily) Ucn + 20% (up to 5 minutes) Ucn + 30% (up to 1 minute) Please also refer to Terms and Definitions
Overcurrent: (in accordance with the above standards)	1.3* In, 1.5* In with 10% overvoltage, 15% overcapacitance and harmonics included, continuous operation Please also refer to Terms and Definitions
Tolerance on capacitance:	- 5/ + 10% in accordance with the standards ± 5% as Vishay ESTA standard
Test voltage, terminal / terminal:	2.15 * Ucn, AC, 2 seconds
Test voltage, terminal / casing:	4800 VAC, 2 seconds
Inrush current:	300 times rated current In
Losses:	app. 0.25W/kVAr (without discharge resistors) app. 0.35W/kVAr (inclusive discharge resistors)
Statistical life expectancy:	> 150,000 operating hours (ESTAprop®) > 130,000 operating hours (ESTAdry®)
Degree of protection:	IP00 (terminal cover for higher protection class, for instance IP54 upon request), indoor mounting
Ambient temperature category:	- 25/D (max. 55°C), (- 40/D on request)
Permitted casing temperature:	max. 65°C (measured on top of the can)
Cooling:	naturally air-cooled
Permissible relative humidity:	maximum 95%
Maximum allowed altitude:	2000 meters above sea level
Mounting position:	vertical and horizontal
Mounting and grounding:	threaded M12 stud at the bottom of the container
Safety features:	all-phase overpressure tear-off fuse, self healing
Casing:	deep-drawn aluminum can
Dielectric:	polypropylene film, self-healing
Impregnant:	natural oil, non-PCB, biodegradable (ESTAprop®) or dry/gas - filled (ESTAdry®)
Terminals:	casing Ø 84mm: M5 screw-on terminals casing Ø 64mm: double push-on (6.3*0.8mm) connectors

PhMKP...Cylindrical Aluminum



Vishay ESTA

ESTAprop®/ESTAdry® Power Factor Correction Capacitors Low Voltage

THREE PHASE CAPACITORS IN CYLINDRICAL ALUMINUM CASING

RATED VOLTAGE 230V, 50Hz, 3-PHASE, DELTA CONNECTION							
TYPE	ARTICLE No.	OUTPUT kVAr	CAPACITANCE μ F	CURRENT A	DIMENSIONS \varnothing *H (mm)	WEIGHT kg	DRAWING No.
PhMKP230.3.02,5	33476	2.5	3*50.1	6.3	64*190	0.8	1
PhMKP230.3.05	30998	5	3*100.3	12.6	64*265	1.1	1
PhMKP230.3.10	33486	10	3*200.6	25.1	84.4*265	1.9	2
PhMKP230.3.12,5	33303	12.5	3*250.7	31.4	84.4*340	2.4	2
PhMKP230.3.15	35457	15	3*300.9	37.7	84.4*340	2.4	2

RATED VOLTAGE 400V*, 50Hz, 3-PHASE, DELTA CONNECTION							
TYPE	ARTICLE No.	OUTPUT kVAr	CAPACITANCE μ F	CURRENT A	DIMENSIONS \varnothing *H (mm)	WEIGHT kg	DRAWING No.
PhMKP400.3.02,5	26199	2.5	3*16.6	3.6	64*190	0.8	1
PhMKP400.3.05	31116	5	3*33.2	7.2	64*190	0.8	1
PhMKP400.3.06,67	33305	6.67	3*44.2	9.6	64*190	0.8	1
PhMKP400.3.07,50	46228	7.5	3*49.5	10.8	64*190	0.8	1
PhMKP400.3.08,33	46229	8.33	3*55.2	12	64*190	0.8	1
• PhMKP400.3.10	31916	10	3*66.3	14.4	64*265	1.1	1
• PhMKP400.3.12,5	45745	12.5	3*82.9	18	64*265	1.1	1
PhMKP401.3.10	35459	10	3*66.3	14.4	84.4*190	1.4	2
• PhMKP401.3.12,5	35460	12.5	3*82.9	18	84.4*190	1.4	2
PhMKP400.3.15	46230	15	3*99.5	21.6	84.4*190	1.4	2
PhMKP400.3.16,7	35462	16.7	3*110.7	24.1	84.4*265	1.9	2
• PhMKP400.3.20	33483	20	3*132.6	28.8	84.4*265	1.9	2
• PhMKP400.3.25	45746	25	3*165.8	36.1	84.4*265	1.9	2

*Can be used also for 415 V, full overvoltage range.

RATED VOLTAGE 440V, 50 Hz, 3-PHASE, DELTA CONNECTION can be used also for 415V								
TYPE	ARTICLE No.	OUTPUT kVAr 440 V	OUTPUT kVAr 415 V	CAPACITANCE μ F	CURRENT A 415/440 V	DIMENSIONS \varnothing *H (mm)	WEIGHT kg	DRAWING No.
PhMKP440.3.05	33989	5	4.4	3*27.4	6.1/6.6	64*190	0.8	1
PMKP440.3.08,33	46231	8.33	7.4	3*45.7	10.3/10.9	64*190	0.8	1
PhMKP440.3.10	36130	10	8.9	3*54.8	12.4/13.1	64*265	1.1	1
PhMKP440.3.11,2	33307	11.2	10	3*61.4	13.9/14.7	64*265	1.1	1
PhMKP440.3.12,5	45747	12.5	11.1	3*68.5	15.4/16.4	64*265	1.1	1
PhMKP440.3.14,0	45748	14.05	12.5	3*76.7	17.4/18.4	64*265	1.1	1
PhMKP440.3.12,5	35597	12.5	11.1	3*68.5	15.4/16.4	84.4*190	1.4	2
PhMKP440.3.14,0	35465	14.05	12.5	3*76.7	17.4/18.4	84.4*190	1.4	2
PhMKP440.3.15	46219	15	13.3	3*82.2	18.5/19.7	84.4*190	1.4	2
PhMKP440.3.16,9	45749	16.9	15	3*92.6	20.9/22.2	84.4*190	1.5	2
PhMKP440.3.18,8	35467	18.8	16.67	3*103.0	23.2/24.7	84.4*265	1.9	2
• PhMKP440.3.20	35599	20	17.8	3*109.6	24.8/26.2	84.4*265	1.9	2
• PhMKP440.3.22,5	45750	22.5	20	3*123.3	27.8/29.5	84.4*265	1.9	2
• PhMKP440.3.25	45751	25	22.2	3*137.0	30.9/32.8	84.4*265	1.9	2
• PhMKP440.3.28,1	45752	28.1	25	3*154	34.7/36.9	84.4*265	1.9	2
PhMKP440.3.30	35470	30	26.7	3*164.4	37.1/39.4	84.4*340	2.3	2

• main type available from stock
 Drawings at end of data sheet.

Other voltage ratings, outputs, and frequencies upon request. All PhMKP-type capacitors may be used for 60Hz, the output will be 1.2 times higher.

All oil-impregnated part types can also be produced in a PhMKPg dry version. Dimensions and ratings are unchanged. Dry types are not standard stock items, with production upon request.



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THREE PHASE CAPACITORS IN CYLINDRICAL ALUMINUM CASING

RATED VOLTAGE 525V, 50 Hz, 3-PHASE, DELTA CONNECTION can be used also for 480V								
TYPE	ARTICLE No.	OUTPUT kVAr 525 V	OUTPUT kVAr 480 V	CAPACITANCE μ F	CURRENT A 480/525 V	DIMENSIONS I * H (mm)	WEIGHT kg	DRAWING No.
PhMKP525.3.03	30210	3	2.5	3*11.5	3.0/3.3	64*190	0.8	1
PhMKP525.3.05	33313	5	4.2	3*19.2	5.0/5.5	64*190	0.8	1
PhMKP525.3.8,33	33314	8.33	7	3*32.1	8.4/9.2	64*190	0.8	1
PhMKP525.3.10	33315	10	8.33	3*38.5	10.1/11.0	64*265	1.1	1
PhMKP525.3.10	33316	10	8.33	3*38.5	10.1/11.0	84.4*190	1.4	2
PhMKP525.3.12,5	33317	12.5	10.4	3*48.1	12.6/13.7	84.4*190	1.4	2
PhMKP525.3.13,8	33318	13.8	11.5	3*53.1	13.8/15.2	84.4*190	1.4	2
• PhMKP525.3.15	35472	15	12.5	3*57.7	15.0/16.5	84.4*190	1.4	2
• PhMKP525.3.20	33320	20	16.7	3*77.0	20.1/22.0	84.4*265	1.9	2
• PhMKP525.3.25	45753	25	20	3*96.2	24.6/27.5	84.4*265	1.9	2

RATED VOLTAGE 660V, 50 Hz, 3-PHASE, DELTA CONNECTION							
TYPE	ARTICLE No.	OUTPUT kVAr	CAPACITANCE μ F	CURRENT A	DIMENSIONS I * H (mm)	WEIGHT kg	DRAWING No.
PhMKP660.3.05	41456	5	3*12.2	4.4	64*190	0.8	1
PhMKP660.3.08,33	41457	8.33	3*20.3	7.3	64*265	1.4	1
PhMKP660.3.08,33	41458	8.33	3*20.3	7.3	84.4*190	1.4	2
PhMKP660.3.10	41459	10	3*24.4	8.7	84.4*190	1.9	2
PhMKP660.3.12,5	41460	12.5	3*30.4	10.9	84.4*265	1.9	2
PhMKP660.3.15	41461	15	3*36.5	13.1	84.4*265	2.0	2
PhMKP660.3.16,7	41462	16.7	3*40.7	14.6	84.4*265	2.4	2
• PhMKP660.3.20	41463	20	3*48.7	17.5	84.4*340	2.4	2
• PhMKP660.3.22,9	41464	22.9	3*55.8	20.0	84.4*340	2.5	2

Can be used also for 690V, full overvoltage range.

Drawings at end of data sheet.

Rated voltages > 660 < 1000V / 50 / 60Hz upon request.

Preferred voltage ratings are according to delta-connected types times $\sqrt{3}$.

- main types available from stock

Other voltage ratings, outputs, and frequencies upon request. All PhMKP-type capacitors may be used for 60Hz, the output will be 1.2 times higher.

All oil-impregnated part types can also be produced in a PhMKPg dry version. Dimensions and ratings are unchanged. Dry types are not standard stock items, with production upon request.

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SINGLE PHASE CAPACITORS IN CYLINDRICAL ALUMINUM CASING

RATED VOLTAGE 230V, 50 HZ, 1-PHASE							
TYPE	ARTICLE No.	OUTPUT kVAr	CAPACITANCE μ F	CURRENT A	DIMENSIONS \varnothing *H (mm)	WEIGHT kg	DRAWING No.
PhMKP230.1.02,5	26183	2.5	150.0	10.9	64*140	0.6	3
• PhMKP230.1.03,33	36378	3.33	200.4	14.5	64*190	0.7	3
PhMKP230.1.04,17	26184	4.17	251.0	18.1	64*190	0.8	3
PhMKP230.1.05	35479	5	300.0	21.7	84.4*140	0.9	2

RATED VOLTAGE 400V*, 50HZ, 1-PHASE							
TYPE	ARTICLE No.	OUTPUT kVAr	CAPACITANCE μ F	CURRENT A	DIMENSIONS \varnothing *H (mm)	WEIGHT kg	DRAWING No.
PhMKP400.1.02,50	46232	2.50	49.7	6.3	64*82	0.3	3
• PhMKP400.1.03,33	43553	3.33	66.2	8.3	64*109	0.4	3
• PhMKP400.1.05	33325	5	99.5	12.5	64*140	0.5	3
PhMKP400.1.06,67	33326	6.67	132.7	16.7	64*190	0.7	3
• PhMKP400.1.08,33	46233	8.33	165.7	20.8	64*190	0.8	3
• PhMKP400.1.10	46234	10	198.9	25.0	64*240	0.9	3
• PhMKP400.1.08,33	26189	8.33	165.7	20.8	84.4*140	0.9	2
PhMKP400.1.10	46235	10	198.9	25.0	84.4*140	1.0	2
PhMKP400.1.16,7	33413	16.7	332.2	41.7	84.4*240	1.7	2

*Can be used also for 415 V, full overvoltage range.

RATED VOLTAGE 525 V, 50 HZ, 1-PHASE							
TYPE	ARTICLE No.	OUTPUT kVAr	CAPACITANCE μ F	CURRENT A	DIMENSIONS \varnothing *H (mm)	WEIGHT kg	DRAWING No.
PhMKP525.1.05	33327	5	57.7	9.5	64*140	0.5	3
• PhMKP525.1.08,33	33328	8.33	96.2	15.9	64*190	0.7	3
• PhMKP525.1.10	33329	10	115.5	19.0	64*240	0.9	3
PhMKP525.1.16,7	33414	16.7	192.9	31.6	84.4*240	1.7	2
PhMKP525.1.20	33415	20	231.0	38.0	84.4*240	2.4	2

- main type available from stock

Drawings at end of data sheet.

Other voltage ratings, outputs, and frequencies upon request. All PhMKP-type capacitors may be used for 60Hz, the output will be 1.2 times higher.

All oil-impregnated part types can also be produced in a PhMKPg dry version. Dimensions and ratings are unchanged. Dry types are not standard stock items, with production upon request.



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ACCESSORIES FOR CAPACITORS IN CYLINDRICAL ALUMINUM CASING

TERMINAL COVER (MAX. IP 54, COMPLETED WITH CABLE GLAND AND CONNECTION CABLE)			
TYPE	ARTICLE No.	DRILLING (FOR CABLE GLAND)	CAPACITOR Ø in mm
CAP64_18,5x14	41263	18.5 (SR-30-1)	64
CAP64_20,4	14249	20.4 (PG-13, 5)	64
CAP64_22,5	18727	22.5 (PG 16)	64
CAP84_22,5	12010	22.5 (PG 16)	84.4
CAP84_28,5	11979	28.5 (PG 21)	84.4

CABLE GLAND		
TYPE	ARTICLE No.	OUTSIDE Ø in mm
SR-30-1	15828	14/18.5
PG13,5	14258	20.4
PG16	13303	22.5
PG21	14259	28.5

CONNECTION CABLE, APPROX. 0.5m LONG (RANGE -5 °C/+70 °C)		
TYPE	ARTICLE No.	MAXIMUM CURRENT in A
FLKK 3*1.5 mm2	15831	6
LIYYO 3*2.5 mm2	14255	12
LIYYO 3*4.0 mm2	14256	15
LIYYO 3*6.0 mm2	14257	24

TERMINAL COVER (IP20), AVAILABLE FOR 84.4mm and 64mm DIAMETER TUBULAR CAN CAPACITORS*		
TYPE	ARTICLE No.	CAPACITOR Ø in mm
CAP64_IP20	46734	64
CAP84_IN_LINE	40941	84.4

*Cable gland not available for use with this cover

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TYPE CAP84_IN_LINE

- Protection class IP20
- Protective cover prevents unintentional touching of live terminals
- Proper ventilation is provided by use of additional holes in the protective cover's top.
- Six slots located on the cover, three on each side, allow easy IN-LINE connection between two capacitors

TYPE CAP64_IP20

- Protection class IP20
- Protective cover prevents unintentional touching of live terminals
- Proper ventilation is provided by use of six slots around and additional holes in the protective cover's top
- Both, slots and holes allow easy entry and connection of cables

TERMINAL COVER IP20 CAP84_IN_LINE



IN-LINE CONNECTION BETWEEN TWO CAPACITORS, IP20

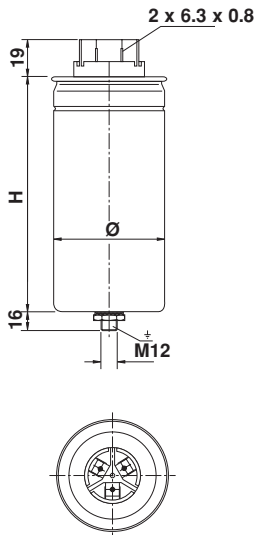


TERMINAL COVER IP20: CAP64_IP20

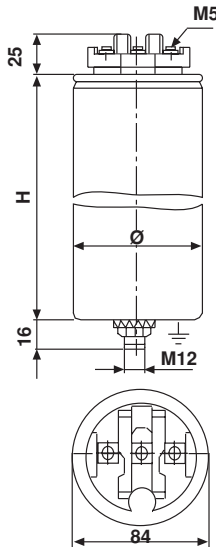


DIMENSIONS

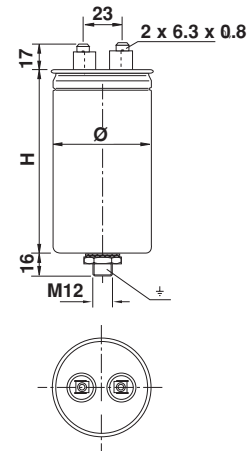
Drawing 1
cylindrical-type capacitor,
three phase, 64 mm diameter



Drawing 2
cylindrical-type capacitor, single
and three phase, 84.4 mm diameter



Drawing 3
cylindrical-type capacitor,
single phase



RECOMMENDED TORQUES:

CYLINDRICAL TYPE CAPACITORS	RECOMMENDED TORQUE
M12 mounting stud	10 Nm
M5 screw-on terminals	2.0 Nm

ORDERING INFORMATION

Minimum order quantities per type and order:

Full cardboard boxes: Ø64 mm - 9 pcs per carton
 Ø84.4 mm - 4 pcs per carton

Delivery time

Most types are normally available within 2 weeks. This may be extended during busy periods