



ESTAprop®/ESTAdry® Power Factor Correction Capacitors Low Voltage

CAPACITORS IN RECTANGULAR STEEL CASING

APPLICATION

ESTAprop® PhMKP-type capacitors in rectangular steel 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:

- areas with dust and moisture, which require a high degree of protection
- free standing, fixed individual-PFC (e.g. motors, transformers, lightning)
- free standing, fixed central-PFC (e.g. group of loads)
- harmonic trap (e.g. UPS, frequency drives, converter)

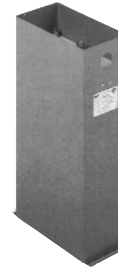
DESIGN

The ESTAprop® MKP capacitor in steel casing consists of a number of three-phase tubular can type capacitors (see PhMKP... Cylindrical Aluminum). The individual aluminum cans are wired together and mounted onto a steel frame. The steel frame together with the cans is housed in a common sheet steel casing. The supply cable may be connected at three or six threaded studs, on top of the capacitor. A threaded stud M10 for grounding is available. Easy mounting will be ensured by 4 drillings, at the bottom of the container.

This design ensures highest safety by:

- self healing technology
- over pressure tear-off fuse
- robust steel container
- massive connection studs

RECTANGULAR CAPACITOR, IP43



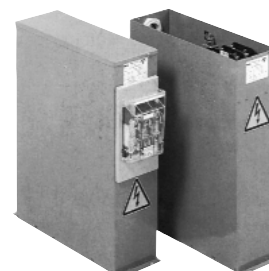
RECTANGULAR CAPACITOR, IP00



RECTANGULAR CAPACITOR, OPEN CIRCUIT, 6 TERMINALS



RECTANGULAR CAPACITOR, WITH HRC-FUSES OR ISOLATOR



PhMKP...Rectangular Steel



Vishay ESTA

ESTAprop®/ESTAdry® Power Factor Correction
Capacitors Low Voltage

TECHNICAL DATA	
STANDARDS:	IEC 60831-1+2, EN 60831-1+2, VDE 0560-46+47
Overtages: (in accordance with the above standards)	U _{cn} + 10% (up to 8 hours daily) U _{cn} + 15% (up to 30 minutes daily) U _{cn} + 20% (up to 5 minutes) U _{cn} + 30% (up to 1 minute) Please also refer to Terms and Definitions
Overcurrent: (in accordance with the above standards)	1.3 * I _n , 1.5 * I _n with 10% overvoltages, 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* U _{cn} , AC, 2 seconds
Test voltage, terminal / casing:	4800VAC, 2 seconds
Inrush current:	300 times rated current I _n
Losses:	< 0.50W / kVAr (inclusive discharge resistors)
Statistical life expectancy:	> 100,000 operating hours
Degree of protection:	IP00, IP43, IP54, indoor mounting
Permitted ambient temperature:	- 25 / up to 55°C (depending on output)
Permitted casing temperature:	max. 60°C (measured on top of the capacitor)
Cooling:	naturally air-cooled
Permissible relative humidity:	maximum 95%
Maximum allowed altitude:	2000 meters above sea level
Mounting position:	vertical and horizontal
Mounting:	4 drillings, Ø 9mm, at the bottom of the container
Safety features:	all-phase over pressure tear-off fuse, self-healing
Casing:	sheet steel casing, colour RAL 7033
Dielectric:	polypropylene film, self-healing
Impregnant: (of the tubular capacitors inside)	natural oil, non-PCB, biodegradable (ESTAprop®) or dry / gas - filled (ESTAdry®)
Terminals:	threaded studs, M6, M8, M12



CAPACITORS IN RECTANGULAR STEEL CASING, IP43

RATED VOLTAGE 400V*, 50Hz, 3-PHASE, DELTA CONNECTION								
TYPE	ARTICLE No.	OUTPUT kVAr	CAPACITANCE µF	CURRENT A	DIMENSIONS L*W*H (mm)	CABLE ENTRY	WEIGHT kg	DRAWING No.
PhMKP400/10	33257	10	3*66.3	14.4	260*135*525	LT21	5	4
PhMKP400/12,5	33258	12.5	3*82.9	18	260*135*525	LT21	5	4
PhMKP400/15	33259	15	3*99.5	21.6	260*135*525	LT21	6	4
PhMKP400/16,7	33260	16.7	3*110.7	24.1	260*135*525	LT21	6	4
PhMKP400/20	33261	20	3*133	28.9	260*135*525	LT21	6.5	4
PhMKP400/25	33262	25	3*166	36	260*135*525	LT21	6.5	4
PhMKP400/30	33263	30	3*199	43.3	260*135*525	LT29	8	4
PhMKP400/33,3	33264	33.3	3*221	48	260*135*525	LT29	8	4
PhMKP400/40	33265	40	3*265	57.7	260*135*525	LT29	9	4
PhMKP400/50	33266	50	3*332	72.2	260*135*525	LT29	10	4
PhMKP400/60	33267	60	3*398	86.6	260*135*525	LT36	11	4
PhMKP400/66,7	33268	66.7	3*442	96.3	260*135*525	LT36	12.5	4
PhMKP400/70	33269	70	3*464	101	395*135*525	LT36	13	4
PhMKP400/75	33270	75	3*497	108	395*135*525	LT36	14	4
PhMKP400/83,3	33271	83.3	3*552	120	395*135*525	LT36	15	4
PhMKP400/100	33272	100	3*663	144	395*135*525	LT42	17	4

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

CAPACITORS IN RECTANGULAR STEEL CASING, IP00

RATED VOLTAGE 400V*, 50 Hz, 3-PHASE, DELTA CONNECTION								
TYPE	ARTICLE No.	OUTPUT kVAr	CAPACITANCE µF	CURRENT A	DIMENSIONS L*W*H (mm)	CABLE ENTRY**	WEIGHT kg	DRAWING No.
PhMKP400/10BE	33240	10	3*66.3	14.4	260*135*445	LT21	5	5
PhMKP400/12,5BE	33241	12.5	3*82.9	18	260*135*445	LT21	5	5
PhMKP400/15BE	33242	15	3*99.5	21.6	260*135*445	LT21	6	5
PhMKP400/16,7BE	33243	16.7	3*110.7	24.1	260*135*445	LT21	6	5
PhMKP400/20BE	33244	20	3*133	28.9	260*135*445	LT21	6.5	5
PhMKP400/25BE	33245	25	3*166	36	260*135*445	LT21	6.5	5
PhMKP400/30BE	33246	30	3*199	43.3	260*135*445	LT29	8	5
PhMKP400/33,3BE	33247	33.3	3*221	48	260*135*445	LT29	8	5
PhMKP400/40BE	33248	40	3*265	57.7	260*135*445	LT29	9	5
PhMKP400/50BE	33249	50	3*332	72.2	260*135*445	LT29	10	5
PhMKP400/60BE	33183	60	3*398	86.6	260*135*445	LT36	11	5
PhMKP400/66,7BE	33250	66.7	3*442	96.3	260*135*445	LT36	12.5	5
PhMKP400/70BE	33251	70	3*464	101	395*135*445	LT36	13	5
PhMKP400/75BE	33252	75	3*497	108	395*135*445	LT36	14	5
PhMKP400/83,3BE	33253	83.3	3*552	120	395*135*445	LT36	15	5
PhMKP400/100BE	33254	100	3*663	144	395*135*445	LT42	17	5

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

**when using terminal covers for IP43 or IP54 (please refer to next page).

Drawings at end of datasheet.

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.

PhMKP...Rectangular Steel



Vishay ESTA ESTAprop®/ESTAdry® Power Factor Correction
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TERMINAL COVER / CABLE CONNECTION BOX

TYPE	ARTICLE No.	DEGREE OF PROTECTION	FOR CAPACITOR OUTPUT IN kVAr	DRAWING No.
BECOVER 43.10	11141	IP43	10 - 50	6
BECOVER 43.60	18730	IP43	60 - 83.3	6
BECOVER 43.100	18731	IP43	100	7
BECOVER 54.10	26126	IP54	10 - 50	6
BECOVER 54.60	26127	IP54	60 - 83.3	6
BECOVER 54.100	26128	IP54	100	7

CAPACITORS IN RECTANGULAR STEEL CASING, OPEN CIRCUIT, 6 TERMINALS, IP43

RATED VOLTAGE 400V*, 50 Hz								
TYPE	ARTICLE No.	OUTPUT kVAr	CAPACITANCE μ F	CURRENT A	DIMENSIONS L*W*H (mm)	CABLE ENTRY	WEIGHT kg	DRAWING No.
PhMKP400/5/6	11049	5	3*33.2	7.5	183*90*300	2 x LT16	3	8
PhMKP400/7.5/6	11050	7.5	3*49.7	10.8	183*90*300	2 x LT16	4	8
PhMKP400/10/6	11051	10	3*66.3	14.4	183*90*300	2 x LT16	4	8
PhMKP400/12.5/6	11052	12.5	3*82.9	18	183*90*300	2 x LT16	5	8
PhMKP400/15/6	11053	15	3*99.5	21.6	183*90*300	2 x LT16	5	8
PhMKP400/16.7/6	11054	16.7	3*110	24.1	183*90*300	2 x LT16	5	8
PhMKP400/20/6	11055	20	3*133	28.9	183*90*495	LT29 + 21	6.5	9
PhMKP400/25/6	11056	25	3*166	36	183*90*495	LT29 + 21	7.5	9
PhMKP400/30/6	33273	30	3*199	43.3	260*135*525	LT29 + 21	9	9
PhMKP400/33.3/6	33274	33.3	3*221	48	260*135*525	LT29 + 21	10	9
PhMKP400/40/6	33275	40	3*265	57.7	260*135*525	LT29 + 21	11	9
PhMKP400/50/6	33276	50	3*332	72.2	395*135*525	LT29 + 21	12	9
PhMKP400/60/6	33277	60	3*398	86.6	395*135*525	LT36 + 29	13	9
PhMKP400/66.7/6	33278	66.7	3*442	96.3	395*135*525	LT36 + 29	14	9

*Can be used also for 415V, with full overvoltage range.
Drawings at end of datasheet.

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.



CAPACITORS IN RECTANGULAR STEEL CASING, HRC-FUSES INCORPORATED, IP31

RATED VOLTAGE 400V*, 50 Hz, 3-PHASE, DELTA CONNECTION								
TYPE	ARTICLE No.	OUTPUT kVAr	CAPACITANCE μ F	CURRENT A	DIMENSIONS L*W*H (mm)	HCR FUSE A **	CABLE ENTRY	DRAWING No.
PhMKP400/10/SI	33279	10	3*66.3	14.4	260*135*525	3 x 36	Pg 21	10
PhMKP400/12,5/SI	33280	12.5	3*82.9	18	260*135*525	3 x 50	Pg 21	10
PhMKP400/15/SI	33281	15	3*21.6	2	260*135*525	3 x 50	Pg 21	10
PhMKP400/16,7/SI	33282	16.7	3*110	24.1	260*135*525	3 x 50	Pg 29	10
PhMKP400/20/SI	33283	20	3*133	28.9	260*135*525	3 x 63	Pg 29	10
PhMKP400/25/SI	33284	25	3*166	36	260*135*525	3 x 80	Pg 29	10
PhMKP400/30/SI	33285	30	3*199	43.3	260*135*525	3 x 100	Pg 36	10
PhMKP400/33.3/SI	33286	33.3	3*221	48	260*135*525	3 x 100	Pg 36	10
PhMKP400/40/SI	33287	40	3*265	57.7	260*135*525	3 x 125	Pg 36	10
PhMKP400/50/SI	33288	50	3*332	72.2	395*135*525	3 x 125	Pg 36	10
PhMKP400/60/SI	33289	60	3*398	86.6	395*135*525	3 x 160	Pg 42	10
PhMKP400/66,7/SI	33290	66.7	3*442	96.3	395*135*525	3 x 160	Pg 42	10

RATED VOLTAGE 400V*, 50 Hz, 3-PHASE, DELTA CONNECTION

CAPACITORS IN RECTANGULAR STEEL CASING, ISOLATOR AND FUSES INCORPORATED, IP31

RATED VOLTAGE 400V*, 50 Hz, 3-PHASE, DELTA CONNECTION							
TYPE	ARTICLE No.	OUTPUT kVAr	CAPACITANCE μ F	CURRENT A	DIMENSIONS L*W*H (mm)	CABLE ENTRY	DRAWING No.
PhMKP400/10/LT	33291	10	3 * 66.3	14.4	260 * 135 * 525	Pg 21	11
PhMKP400/12,5/LT	33292	12.5	3 * 82.9	18	260 * 135 * 525	Pg 21	11
PhMKP400/15/LT	33293	15	3 * 99.5	21.6	260 * 135 * 525	Pg 21	11
PhMKP400/16,7/LT	33294	16.7	3 * 110	24.1	260 * 135 * 525	Pg 29	11
PhMKP400/20/LT	33295	20	3 * 133	28.9	260 * 135 * 525	Pg 29	11
PhMKP400/25/LT	33296	25	3 * 166	36	260 * 135 * 525	Pg 29	11
PhMKP400/30/LT	33297	30	3 * 199	43.3	260 * 135 * 525	Pg 36	11
PhMKP400/33.3/LT	33298	33.3	3 * 221	48	260 * 135 * 525	Pg 36	11
PhMKP400/40/LT	33299	40	3 * 265	57.7	260 * 135 * 525	Pg 36	11
PhMKP400/50/LT	33300	50	3 * 332	72.2	395 * 135 * 525	Pg 36	11
PhMKP400/60/LT	33301	60	3 * 398	86.6	395 * 135 * 525	Pg 42	11
PhMKP400/66,7/LT	33302	66.7	3 * 442	96.3	395 * 135 * 525	Pg 42	11

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

**HRC low-voltage delay-action fuse

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PhMKP...Rectangular Steel



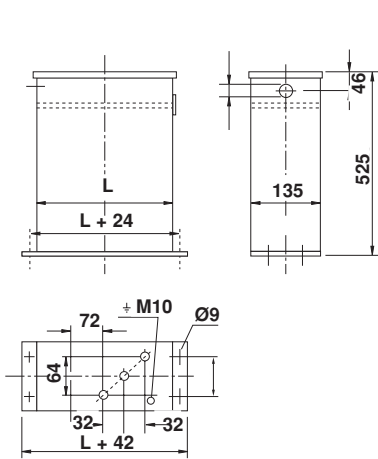
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DIMENSIONS

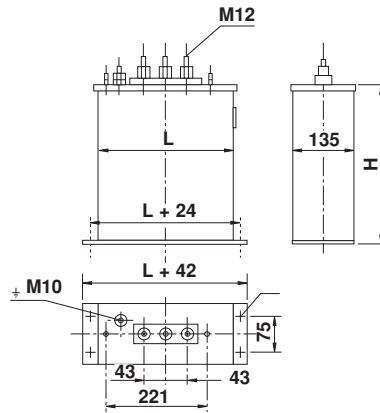
Drawing 4

rectangular-type capacitor,
three phase, IP43



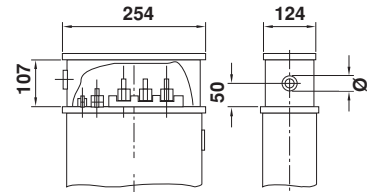
Drawing 5

rectangular-type, BE-capacitor,
three phase, IP00 445mm high



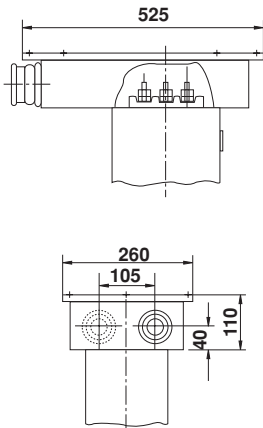
Drawing 6

terminal cover for BE-capacitor,
10 - 83.3kVAR



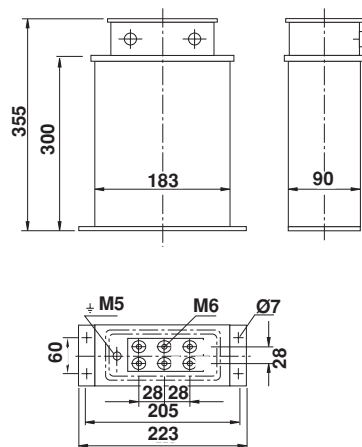
Drawing 7

terminal cover for BE-capacitor,
100kVAR



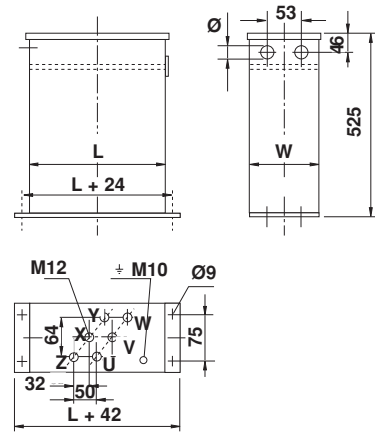
Drawing 8

rectangular-type capacitor open circuit,
6 terminals, 183*90*300mm



Drawing 9

rectangular-type capacitor, open
circuit, 6 terminals, 525mm high



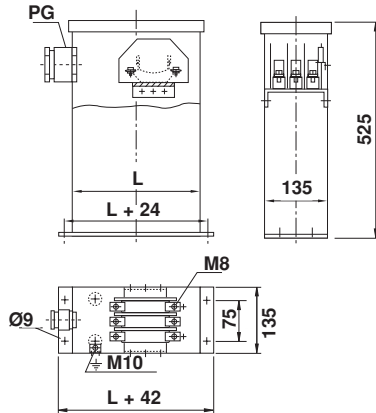


DIMENSIONS

Drawing 10

SI-TYPE

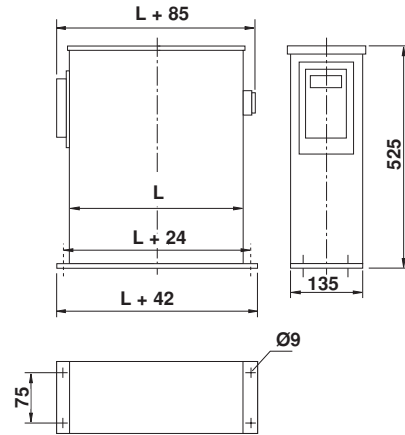
rectangular-type capacitor, three phase, including HRC-fuses



Drawing 11

LT-TYPE

rectangular-type capacitor, three phase, including ISOLATOR



RECOMMENDED TORQUES:

TERMINAL STYLE	RECOMMENDED TORQUE
terminals M6	3Nm
terminals M8	6Nm
terminals M10	10Nm
terminals M12	15.5Nm

CABLE GLANDS:

OUTPUT IN kVAr / 400V, 50Hz	PG	Ø IN mm
1 . . 7.5	16	22.5
10 . . 20	21	28.5
25 . . 40	29	38
50 . . 75	36	48
83.3 . . 100	42	55

ORDERING INFORMATION

Minimum order quantity per type and order: 1 Unit	Delivery time Delivery time is approximately 3 - 4 weeks
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