

## Interference Suppression Film Capacitors MKP Radial Potted Type

**APPLICATIONS**

X2 class

**REFERENCE STANDARDS**

“IEC 60384-14 2<sup>nd</sup> edition and EN 132400”  
 “IEC 60065, pass. flamm. class B”  
 300 V: UL1283; ENEC; CSA-C22.2 No.8

**MARKING**

C-value; tolerance; rated voltage; sub-class; manufacturer’s type designation; code for dielectric material; manufacturer location; manufacturer’s emblem; year and week

**DIELECTRIC**

Polypropylene film

**ELECTRODES**

Metallized film

**CONSTRUCTION**

Mono construction

**RATED VOLTAGE**

AC 300 V; 50 to 60 Hz

**PERMISSIBLE DC VOLTAGE**

DC 630 V

**ENCAPSULATION**

Plastic case, epoxy resin sealed, flame retardant UL-class 94 V-0

**CLIMATIC TESTING CLASS ACC. TO EN 60068-1**

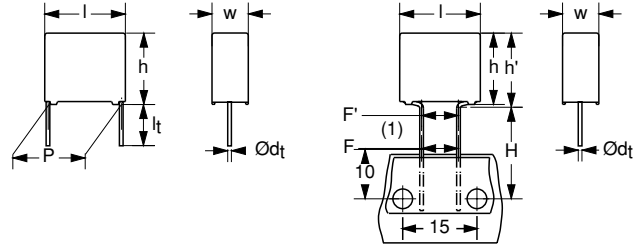
55/105/56/B

**CAPACITANCE RANGE (E12 SERIES)**

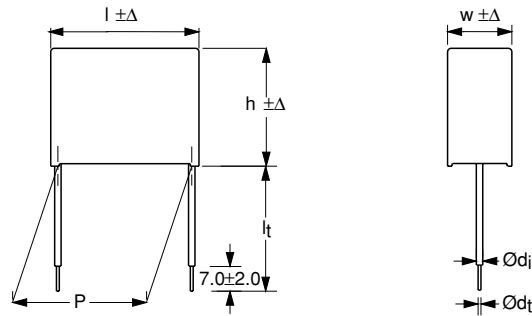
E12 series 0.01 to 10  $\mu$ F  
 Preferred values acc. to E6

**CAPACITANCE TOLERANCE**

$\pm 20\%$ ;  $\pm 10\%$



Dimensions in mm  
 (1)  $|F - F'| < 0.3 \text{ mm}$   
 $F = 7.5 +0.6/-0.1 \text{ mm}$



Dimensions in mm

**LEADS**

Tinned wire

**RATED TEMPERATURE**

105 °C

**MAXIMUM APPLICATION TEMPERATURE**

105 °C

**FEATURES**

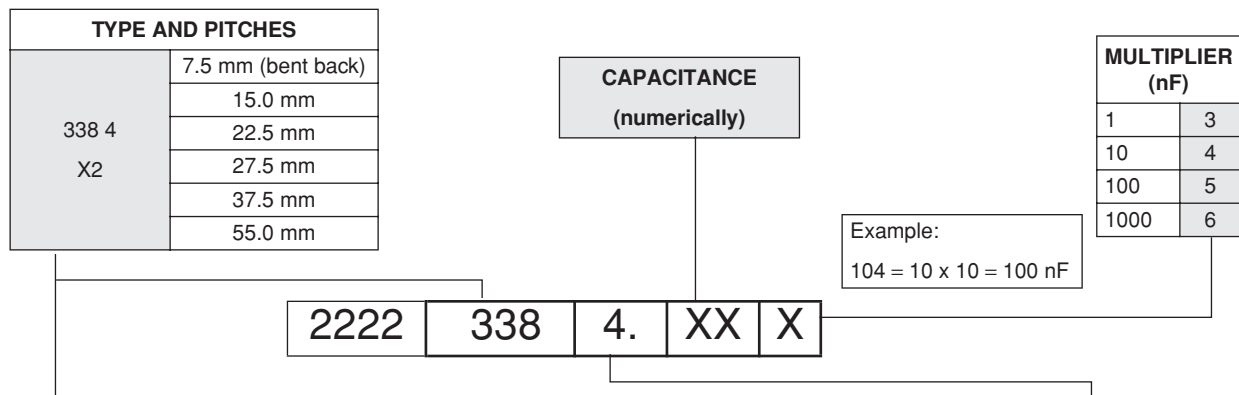
15 to 55 mm lead pitch and 15 mm bent back to 7.5 mm.  
 Supplied loose in box and taped on reel

**DETAIL SPECIFICATION**

For more detailed data and test requirements contact:  
[filmcaps.roeselare@vishay.com](mailto:filmcaps.roeselare@vishay.com)



**COMPOSITION OF CATALOG NUMBER**



TYPE	PACKAGING	STANDARD DIMENSIONS	PREFERRED TYPES	
338 4 X2	loose in box	lead length 3.5 ±0.3 mm	44	
		lead length 5.0 ±1.0 mm	40	
		lead length 25.0 ±2.0 mm	41	
	taped	15.0 mm bent back to 7.5 mm	4.	
		<b>ALTERNATIVE PITCH SIZES</b>	<b>ON REQUEST</b>	
338 4 X2	loose in box	lead length 3.5 ±0.3 mm	±20%	see tables for details
		lead length 5.0 ±1.0 mm		
		lead length 25.0 ±2.0 mm		
		<b>ALTERNATIVE TAPED VERSION</b>	<b>ON REQUEST</b>	
338 4 X2	taped	H = 18.5 mm; for P <sub>0</sub> = 12.7 mm	±20%	see tables for details
		<b>STANDARD DIMENSIONS</b>	<b>ON REQUEST</b>	
338 4 X2	loose in box	insulated leads stranded Cu-wire 0.5 mm <sup>2</sup> for 37.5 and 55 mm pitch	±20%	see tables for details
		<b>ALTERNATIVE C-TOL</b>	<b>ON REQUEST</b>	
338 4 X2	loose in box	lead length 3.5 ±0.3 mm	±10%	see tables for details
		lead length 5.0 ±1.0 mm		
		lead length 25.0 ±2.0 mm		
		insulated leads stranded Cu-wire 0.5 mm <sup>2</sup> for 37.5 and 55 mm pitch		
	taped	15.0 mm bent back to 7.5 mm		
		H = 18.5 mm; P <sub>0</sub> = 12.7 mm		

**SPECIFIC REFERENCE DATA**

DESCRIPTION	VALUE		
	at 1 kHz	at 10 kHz	at 100 kHz
Tangent of loss angle:			
pitch = 7.5 mm (bent back); 15 mm; 22.5 mm and 27.5 mm for C ≤ 470 nF	≤10 × 10 <sup>-4</sup>	≤20 × 10 <sup>-4</sup>	≤100 × 10 <sup>-4</sup>
pitch = 7.5 mm (bent back); 15 mm; 22.5 mm and 27.5 mm for 470 nF < C ≤ 1 μF	≤20 × 10 <sup>-4</sup>	≤70 × 10 <sup>-4</sup>	-
pitch = 7.5 mm (bent back); 15 mm; 22.5 mm and 27.5 mm for 1 μF < C ≤ 3.3 μF	≤30 × 10 <sup>-4</sup>	-	-
pitch = 37.5 mm and 55 mm for 2.2 μF < C ≤ 4.7 μF	≤50 × 10 <sup>-4</sup>	-	-
pitch = 37.5 mm and 55 mm for 4.7 μF < C ≤ 10 μF	≤100 × 10 <sup>-4</sup>	-	-
Rated voltage pulse slope (dU/dt) <sub>R</sub> at 420 V (DC)	100 V/μs		
R between leads, for C ≤ 0.33 μF at 100 V; 1 minute	>15000 MΩ		
RC between leads, for C > 0.33 μF at 100 V; 1 minute	>5000 s		
R between leads and case; 100 V; 1 minute	>30000 MΩ		
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s:			
C ≤ 1μF	2200 V; 1 minute		
1 μF < C ≤ 3.3 μF (not pitch = 37.5mm)	1850 V; 1 minute		
pitch = 37.5 mm and 55 mm	1400 V; 1 minute		
Withstanding (AC) voltage between leads and case	2200 V; 1 minute		

# MKP 338 4 X2



## Vishay BCcomponents Interference Suppression Film Capacitors MKP Radial Potted Type

$U_{Rac} = 300\text{ V}$ ;  $C\text{-tol} = \pm 20\%$

C ( $\mu\text{F}$ )	DIMENSIONS $w \times h \times l$ (mm)	MASS (g)	CATALOG NUMBER 2222 338 ..... AND PACKAGING								
			LOOSE IN BOX						REEL		
			short leads			long leads		$l_t = \text{on request};$ $d_t = \text{stranded}$ Cu-wire; $0.5\text{ mm}^{2(1)}$			
			$l_t =$ $3.5 \pm 0.3\text{ mm}$	$l_t =$ $5.0 \pm 1.0\text{ mm}$	SPQ	$l_t =$ $25.0 \pm 2.0\text{ mm}$	SPQ		SPQ		SPQ
<b>Pitch = <math>15.0 \pm 0.4\text{ mm}</math>; <math>d_t = 0.60 \pm 0.06\text{ mm}</math></b>								<b>reel: <math>\varnothing = 500\text{ mm}</math> <math>H = 18.5\text{ mm}</math>; <math>P_0 = 12.7\text{ mm}</math></b>			
0.01	5.0 × 11.0 × 17.5	1.2	44103	40103	1000	41103	1000		48127	1000	
0.015			44153	40153		41153			48128		
0.022			44223	40223		41223			48129		
0.033			44333	40333		41333			48131		
0.047			44473	40473		41473			48132		
0.068			44683	40683		41683			48133		
0.1	6.0 × 12.0 × 17.5	1.4	44104	40104	1000	41104	1000		48134	1000	
<b>Original pitch = <math>15.0\text{ mm}</math>; bent back pitch = <math>7.5 \pm 0.4\text{ mm}</math>; <math>d_t = 0.60 \pm 0.06\text{ mm}</math></b>								<b>reel: <math>\varnothing = 500\text{ mm}^{(2)}</math> <math>H = 16.0\text{ mm}</math>; <math>P_0 = 15.0\text{ mm}</math></b>			
0.01	5.0 × 13.0 × 17.5	1.2							48001	950	
0.015									48002		
0.022									48003		
0.033									48004		
0.047									48005		
0.068									48006		
0.1	6.0 × 14.0 × 17.5	1.4							48007	800	
<b>Pitch = <math>15.0 \pm 0.4\text{ mm}</math>; <math>d_t = 0.80 \pm 0.08\text{ mm}</math></b>								<b>reel: <math>\varnothing = 500\text{ mm}</math> <math>H = 18.5\text{ mm}</math>; <math>P_0 = 12.7\text{ mm}</math></b>			
0.15	7.0 × 13.5 × 17.5	1.9	44154	40154	750	41154	500		48135	500	
0.22	8.5 × 15.0 × 17.5	2.6	44224	40224	750	41224	500		48136	500	
0.33	10.0 × 16.5 × 17.5	3.1	44334	40334	500	41334	450		48137	450	
<b>Original pitch = <math>15.0\text{ mm}</math>; bent back pitch = <math>7.5 \pm 0.4\text{ mm}</math>; <math>d_t = 0.80 \pm 0.08\text{ mm}</math></b>								<b>reel: <math>\varnothing = 500\text{ mm}^{(2)}</math> <math>H = 16.0\text{ mm}</math>; <math>P_0 = 15.0\text{ mm}</math></b>			
0.15	7.0 × 15.5 × 17.5	1.9							48008	700	
0.22	8.5 × 17.0 × 17.5	2.6							48009	550	
0.33	10.0 × 18.5 × 17.5	3.1							48011	500	
<b>Pitch = <math>22.5 \pm 0.4\text{ mm}</math>; <math>d_t = 0.80 \pm 0.08\text{ mm}</math></b>								<b>reel: <math>\varnothing = 500\text{ mm}</math> <math>H = 18.5\text{ mm}</math>; <math>P_0 = 12.7\text{ mm}</math></b>			
0.22	7.0 × 16.5 × 26.0	3.2	48101	48109	200	48118	250				
0.33			48103	48112		48121					
0.47	8.5 × 18.0 × 26.0	4.5	44474	40474	200	41474	250				
0.68	10.0 × 19.5 × 26.0	5.5	44684	40684	200	41684	200				
1.0	12.0 × 22.0 × 26.0	7.8	44105	40105	150	41105	200				



C (µF)	DIMENSIONS w × h × l (mm)	MASS (g)	CATALOG NUMBER 2222 338 ..... AND PACKAGING							
			LOOSE IN BOX						REEL	
			short leads			long leads			l <sub>t</sub> = on request; d <sub>t</sub> = stranded Cu-wire; 0.5 mm <sup>2</sup> (1)	
			l <sub>t</sub> = 3.5 ±0.3 mm	l <sub>t</sub> = 5.0 ±1.0 mm	SPQ	l <sub>t</sub> = 25.0 ±2.0 mm	SPQ		SPQ	
Pitch = 27.5 ±0.4 mm; d <sub>t</sub> = 0.80 ±0.08 mm								reel: Ø = 500 mm H = 18.5 mm; P <sub>0</sub> = 12.7 mm		
0.47	9.0 × 19.0 × 31.0	5.5	48104	48113	100	48122	150			
0.68	11.0 × 21.0 × 31.0	7.8	48106	48115	100	48124	150			
1.0			48108	48117		48126				
1.5	15.0 × 25.0 × 31.0	12.8	44155	40155	100	41155	125			
2.2	18.0 × 28.0 × 31.0	17.2	44225	40225	100	41225	100			
3.3	21.0 × 31.0 × 31.0	20.4	44335	40335	50	41335	75			
Pitch = 37.5 ±0.7 mm; d <sub>t</sub> = 1.0 ±0.1 mm								reel: Ø = 500 mm H = 18.5 mm; P <sub>0</sub> = 12.7 mm		
4.7	18.0 × 35.0 × 42.0	30.0		40475	120	41475	120	4....	120	
6.8	21.0 × 38.0 × 42.0	35.0		40685	100	41685	100	4....	100	
Pitch = 55.0 ±1.0 mm; d <sub>t</sub> = 1.0 ±0.1 mm								reel: Ø = 500 mm H = 18.5 mm; P <sub>0</sub> = 12.7 mm		
10.0	21.0 × 38.0 × 59.5	50.0		40106	50	41106	50	4....	50	

Notes

1. Ø di isolation = 2.4 mm; part number based on lead length on request.
2. Reel diameter = 356 mm is available on request.

U<sub>Rac</sub> = 300 V; C-tol = ±10%

C (µF)	DIMENSIONS w × h × l (mm)	MASS (g)	CATALOG NUMBER 2222 338 ..... AND PACKAGING							
			LOOSE IN BOX						REEL	
			short leads			long leads			l <sub>t</sub> = on request; d <sub>t</sub> = stranded Cu-wire; 0.5 mm <sup>2</sup> (1)	
			l <sub>t</sub> = 3.5 ±0.3 mm	l <sub>t</sub> = 5.0 ±1.0 mm	SPQ	l <sub>t</sub> = 25.0 ±2.0 mm	SPQ		SPQ	
Pitch = 15.0 ±0.4 mm; d <sub>t</sub> = 0.60 ±0.06 mm								reel: Ø = 500 mm H = 18.5 mm; P <sub>0</sub> = 12.7 mm		
0.01	5.0 × 11.0 × 17.5	1.2	45103	42103	1000	43103	1000		48138	
0.015			45153	42153		43153		48141		
0.022			45223	42223		43223		48143		
0.033			45333	42333		43333		48145		
0.047			45473	42473		43473		48147		
0.068			45683	42683		43683		48149		
0.1	6.0 × 12.0 × 17.5	1.4	45104	42104	1000	43104	1000	48153	1000	
Original pitch = 15.0 mm; bent back pitch = 7.5 ±0.4 mm; d <sub>t</sub> = 0.60 ±0.06 mm								reel: Ø = 500 mm <sup>(2)</sup> H = 16.0 mm; P <sub>0</sub> = 15.0 mm		
0.01	5.0 × 13.0 × 17.5	1.2						48012	950	
0.015							48014			
0.022							48016			
0.033							48018			
0.047							48021			
0.068							48023			
0.1	6.0 × 14.0 × 17.5	1.4					48025	800		

## Vishay BCcomponents Interference Suppression Film Capacitors MKP Radial Potted Type

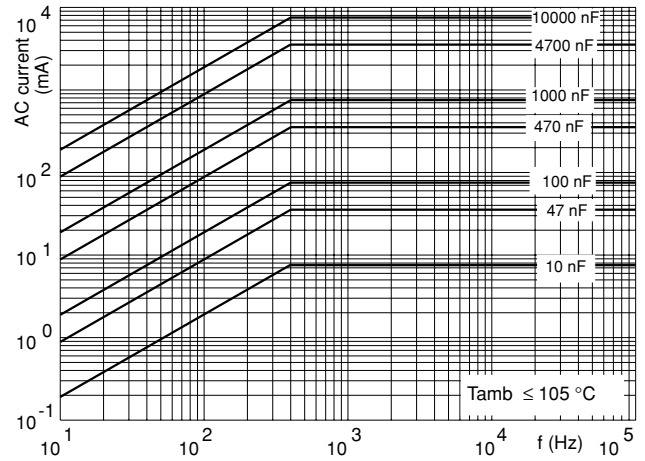
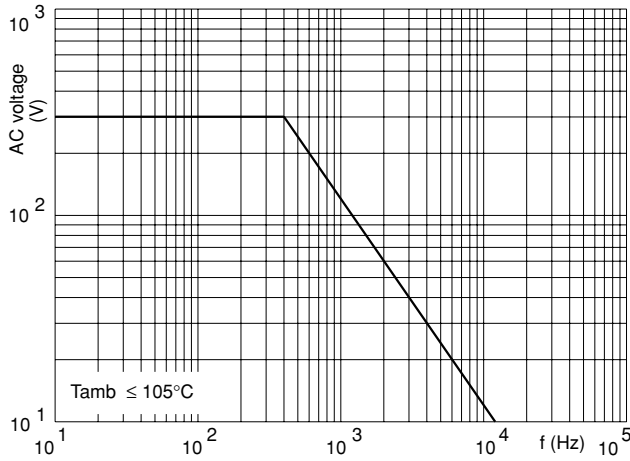
C ( $\mu$ F)	DIMENSIONS w × h × l (mm)	MASS (g)	CATALOG NUMBER 2222 338 ..... AND PACKAGING								
			LOOSE IN BOX							REEL	
			short leads			long leads		l <sub>t</sub> = on request; d <sub>t</sub> = stranded Cu-wire; 0.5 mm <sup>2(1)</sup>		SPQ	SPQ
			l <sub>t</sub> = 3.5 ± 0.3 mm	l <sub>t</sub> = 5.0 ± 1.0 mm	SPQ	l <sub>t</sub> = 25.0 ± 2.0 mm	SPQ				
<b>Pitch = 15.0 ± 0.4 mm; d<sub>t</sub> = 0.80 ± 0.08 mm</b>								<b>reel: <math>\varnothing</math> = 500 mm H = 18.5 mm; P<sub>0</sub> = 12.7 mm</b>			
0.12	7.0 × 13.5 × 17.5	1.9	45124	42124	750	43124	500			48154	500
0.15			45154	42154		43154				48155	
0.18	8.5 × 15.0 × 17.5	2.6	45184	42184	750	43184	500			48156	500
0.22			45224	42224		43224				48157	
0.27	10.0 × 16.5 × 17.5	3.1	45274	42274	500	43274	450			48158	450
<b>Original pitch = 15.0 mm; bent back pitch = 7.5 ± 0.4 mm; d<sub>t</sub> = 0.80 ± 0.08 mm</b>								<b>reel: <math>\varnothing</math> = 500 mm<sup>(2)</sup> H = 16.0 mm; P<sub>0</sub> = 15.0 mm</b>			
0.15	7.0 × 15.5 × 17.5	1.9								48027	700
0.22	8.5 × 17.0 × 17.5	2.6								48029	550
<b>Pitch = 22.5 ± 0.4 mm; d<sub>t</sub> = 0.80 ± 0.08 mm</b>								<b>reel: <math>\varnothing</math> = 500 mm H = 18.5 mm; P<sub>0</sub> = 12.7 mm</b>			
0.33	8.5 × 18.0 × 26.0	4.4	45334	42334	200	43334	250				
0.47	10.0 × 19.5 × 26.0	5.5	45474	42474	200	43474	200				
0.68	12.0 × 22.0 × 26.0	7.8	45684	42684	150	43684	200				
<b>Pitch = 27.5 ± 0.4 mm; d<sub>t</sub> = 0.80 ± 0.08 mm</b>								<b>reel: <math>\varnothing</math> = 500 mm H = 18.5 mm; P<sub>0</sub> = 12.7 mm</b>			
1.0	13.0 × 23.0 × 31.0	10.4	45105	42105	100	43105	125				
1.5	15.0 × 25.0 × 31.0	12.8	45155	42155	100	43155	125				
2.2	21.0 × 31.0 × 31.0	20.4	45225	42225	50	43225	75				
<b>Pitch = 37.5 ± 0.7 mm; d<sub>t</sub> = 1.0 ± 0.1 mm</b>								<b>reel: <math>\varnothing</math> = 500 mm H = 18.5 mm; P<sub>0</sub> = 12.7 mm</b>			
3.3	18.0 × 35.0 × 42.0	30.0		42335	120	43335	120	4....	120		
4.7	21.0 × 38.0 × 42.0	35.0		42475	100	43475	100	4....	100		
<b>Pitch = 55.0 ± 1.0 mm; d<sub>t</sub> = 1.0 ± 0.1 mm</b>								<b>reel: <math>\varnothing</math> = 500 mm H = 18.5 mm; P<sub>0</sub> = 12.7 mm</b>			
6.8	21.0 × 38.0 × 59.5	50.0		42685	50	43685	50	4....	50		
10.0	25.0 × 43.0 × 59.5	69.0		42106	40	43106	40	4....	40		

### Notes

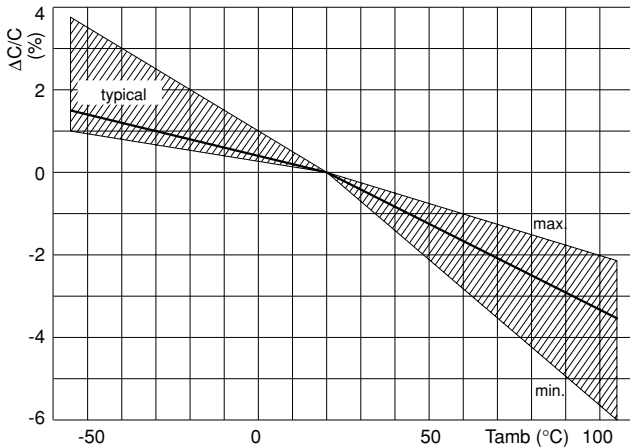
1.  $\varnothing$  d<sub>t</sub> isolation = 2.4 mm; part number based on lead length on request.
2. Reel diameter = 356 mm is available on request.



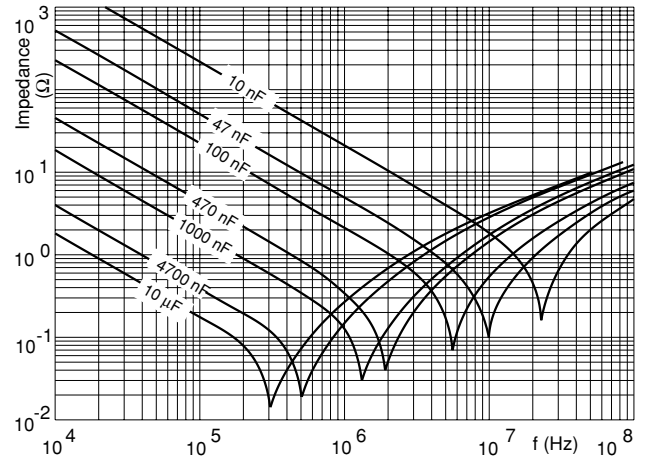
**MAXIMUM RMS VOLTAGE AND AC CURRENT (SINEWAVE) AS A FUNCTION OF FREQUENCY**



**CAPACITANCE**



**IMPEDANCE**



**APPROVALS**

COUNTRY	SPECIFICATION	ELECTRICAL VALUES	FILE NUMBERS	APPROVAL MARK
U.S.A. and Canada (for AC 300 V)	UL1283 and CSA-C22.2 No.8	10 nF to 3.3 μF	E109565	
U.S.A. (for AC 300 V)	UL1283	3.3 μF to 10 μF	E109565	
CB TEST CERTIFICATE (for AC 300 V)		10 nF to 10 μF: 55/105/56/B 3.3 μF to 10 μF: 55/105/56/B	FI 1890 FI 1925	
Europe (for AC 300 V)	EN132400 IEC 60384-14 2 <sup>nd</sup> edition	10 nF to 10 μF 3.3 μF to 10 μF	ENEC/B12/2001 ENEC/B20/2001	