



# How to Calculate Capacitor Output in Detuned Filter Circuits

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## CALCULATION OF THE REQUIRED RATED CAPACITOR OUTPUT IN DETUNED FILTER CIRCUITS (FACTORS TO BE MULTIPLIED WITH THE REQUIRED OUTPUT PER STEP)

SUPPLY VOLTAGE 400 V							
RATED VOLTAGE <sup>(1)</sup> OF CAPACITOR V	DETUNING FACTOR IN %						
	5	5.5	6	7	12.5	13	14
440	1.150	1.143	1.137	1.125	-	-	-
525	1.637	1.628	1.619	1.602	1.507	1.499	1.481

SUPPLY VOLTAGE 415 V							
RATED VOLTAGE <sup>(1)</sup> OF CAPACITOR V	DETUNING FACTOR IN %						
	5	5.5	6	7	12.5	13	14
440	1.068	1.062	1.057	-	-	-	-
525	1.520	1.512	1.504	1.488	1.400	1.392	1.376

SUPPLY VOLTAGE 440 V							
RATED VOLTAGE <sup>(1)</sup> OF CAPACITOR V	DETUNING FACTOR IN %						
	5	5.5	6	7	12.5	13	14
525	1.352	1.345	1.338	1.324	1.246	1.239	1.224

SUPPLY VOLTAGE 480 V							
RATED VOLTAGE <sup>(1)</sup> OF CAPACITOR V	DETUNING FACTOR IN %						
	5	5.5	6	7	12.5	13	14
525	1.136	1.130	1.125	1.113	-	-	-
660	1.796	1.787	1.777	1.758	1.654	1.645	1.626

### Example:

Required output per step at supply voltage: 50 kvar

Supply voltage: 400 V

Detuning factor: 7 %

Rated voltage of the capacitor: 440 V

Factor of the table: 1.125

Required rated output of the capacitors: 50 kvar x 1.125 = 56.25 kvar

Selection: for instance: 2 x PhMKP 440.3.28, 1

### Note

<sup>(1)</sup> For filter circuits the capacitor rated voltage has always to be chosen higher than the supply voltage.  
i.e.: Fundamental voltage increased by the reactor and harmonics