



Low Voltage Products

CLMD Capacitors Standard Range for Power Factor Correction Quick Selection Guide

Product selection

Generic calculations

- Step 1** – Know your starting power factor ($\cos \Phi_1$) and Target power factor ($\cos \Phi_2$)
- Step 2** – Take inverse cosines of both $\cos \Phi_1$ and $\cos \Phi_2$, to obtain the angles Φ_1 and Φ_2
- Step 3** – Take the tangents of the angles Φ_1 and $\cos \Phi_2$ and subtract one from the other ($\tan \Phi_1 - \tan \Phi_2$)
- Step 4** – Finally, capacitor size in KVAR = $P * (\tan \Phi_1 - \tan \Phi_2)$, where P = load power in KW

Using the tables

To make it easy, the $(\tan \Phi_1 - \tan \Phi_2)$ factors are already listed in the table below, so simply multiply that value with P (the actual kW load) to directly obtain the KVAR value of the capacitor. Next, pick the closest part number from the list on the opposite page.

Note: As we normally use horse power values in North America, the simple relationship is 1HP = 0.745kW

Starting cos Φ	Target cos Φ											
	0.85	0.90	0.91	0.92	0.93	0.94	0.95	0.96	0.97	0.98	0.99	1.00
0.60	0.714	0.849	0.878	0.907	0.938	0.970	1.005	1.042	1.083	1.130	1.191	1.333
0.61	0.679	0.815	0.843	0.873	0.904	0.936	0.970	1.007	1.048	1.096	1.157	1.299
0.62	0.646	0.781	0.810	0.839	0.870	0.903	0.937	0.974	1.015	1.062	1.123	1.265
0.63	0.613	0.748	0.777	0.807	0.837	0.870	0.904	0.941	0.982	1.030	1.090	1.233
0.64	0.581	0.716	0.745	0.775	0.805	0.838	0.872	0.909	0.95	0.998	1.058	1.201
0.65	0.549	0.685	0.714	0.743	0.774	0.806	0.840	0.877	0.919	0.966	1.027	1.169
0.66	0.519	0.654	0.683	0.712	0.743	0.775	0.810	0.847	0.888	0.935	0.996	1.138
0.67	0.488	0.624	0.652	0.682	0.713	0.745	0.779	0.816	0.857	0.905	0.966	1.108
0.68	0.459	0.594	0.623	0.652	0.683	0.715	0.750	0.787	0.828	0.875	0.936	1.078
0.69	0.429	0.565	0.593	0.623	0.654	0.686	0.720	0.757	0.798	0.846	0.907	1.049
0.70	0.400	0.536	0.565	0.594	0.625	0.657	0.692	0.729	0.770	0.817	0.878	1.020
0.71	0.372	0.508	0.536	0.566	0.597	0.629	0.663	0.700	0.741	0.789	0.849	0.992
0.72	0.344	0.480	0.508	0.538	0.569	0.601	0.635	0.672	0.713	0.761	0.821	0.964
0.73	0.316	0.452	0.481	0.510	0.541	0.573	0.608	0.645	0.686	0.733	0.794	0.936
0.74	0.289	0.425	0.453	0.483	0.514	0.546	0.580	0.617	0.658	0.706	0.766	0.909
0.75	0.262	0.398	0.426	0.456	0.487	0.519	0.553	0.590	0.631	0.679	0.739	0.882
0.76	0.235	0.371	0.400	0.429	0.460	0.492	0.526	0.563	0.605	0.652	0.713	0.855
0.77	0.209	0.344	0.373	0.403	0.433	0.466	0.500	0.537	0.578	0.626	0.686	0.829
0.78	0.183	0.318	0.347	0.376	0.407	0.439	0.474	0.511	0.552	0.599	0.660	0.802
0.79	0.156	0.292	0.320	0.350	0.381	0.413	0.447	0.484	0.525	0.573	0.634	0.776
0.80	0.130	0.266	0.294	0.324	0.355	0.387	0.421	0.458	0.499	0.547	0.608	0.750
0.81	0.104	0.240	0.268	0.298	0.329	0.361	0.395	0.432	0.473	0.521	0.581	0.724
0.82	0.078	0.214	0.242	0.272	0.303	0.335	0.369	0.406	0.447	0.495	0.556	0.698
0.83	0.052	0.188	0.216	0.246	0.277	0.309	0.343	0.380	0.421	0.469	0.530	0.672
0.84	0.026	0.162	0.190	0.220	0.251	0.283	0.317	0.354	0.395	0.443	0.503	0.646
0.85	-	0.135	0.164	0.194	0.225	0.257	0.291	0.328	0.369	0.417	0.477	0.620
0.86	-	0.109	0.138	0.167	0.198	0.230	0.265	0.302	0.343	0.390	0.451	0.593
0.87	-	0.082	0.111	0.141	0.172	0.204	0.238	0.275	0.316	0.364	0.424	0.567
0.88	-	0.055	0.084	0.114	0.145	0.177	0.211	0.248	0.289	0.337	0.397	0.540
0.89	-	0.028	0.057	0.086	0.117	0.149	0.184	0.221	0.262	0.309	0.370	0.512
0.90	-	-	0.029	0.058	0.089	0.121	0.156	0.193	0.234	0.281	0.342	0.484

Example

- Starting power factor = 0.75 and target power factor = 0.90
- Factor from table = 0.398
- Motor HP = 100 horsepower = $100 * 0.745 = 74.5$ kW
- Hence, required capacitor size = $74.5 * 0.398 = 29.65$, rounded up to 30 KVAR
- Part number for a 600V, 3-ph network would be **C603G30** if installed inside a panel or **C605G30** if standalone
- Part numbers suffixed "HZ" are compatible for use with a reactor, 227Hz default. Reactors not included in the price

Fast runners

kVAR	Series 13 and 33			Series 43, 53, 63 and 83		
	240V	480V	600V	480V	600V	660V
3.50	C241G3.5	-	-	-	-	-
4.00	-	C481G4	-	-	-	-
5.00	C241G5	C481G5	-	-	C604G5	-
7.50	-	C481G7.5	C601G7.5	C484G7.5	C604G7.5	-
10.00	-	-	C601G10	-	C604G10	-
15.00	-	C483G15	C601G15	C484G15	C604G15	-
20.00	-	-	-	C484G20	C604G20	-
25.00	-	C483G25	C603G25-O and C663G28-HZ-O	C484G25	C604G25	-
30.00	-	-	C603G30	-	C605G30	C665G30
35.00	-	-	-	C485G35	C605G35	C665G38
40.00	-	-	-	C485G40	C605G40	-
45.00	-	-	-	C485G45	C606G45	-
50.00	-	-	-	C485G50	C606G50	C666G56-HZ
60.00	-	-	-	C486G60	C606G60	C665G63
75.00	-	-	-	C486G75	C606G75	C666G75
90.00	-	-	-	-	C608G90	C668G88
100.00	-	-	-	C488G100	C608G100	C668G113-HZ
120.00	-	-	-	-	-	C668G120

Notes

- If reactors other than 227Hz are to be used, please inform us prior to ordering
- Reactors strongly recommended in the event of harmonics on the network
- Above part numbers and prices are all available on TOPS
- Lead time 2-7 working days, ex-works Lachine, depending on type/options
- Drawings and other related product information available on request
- Part numbers suffixed "O" are open-type, stud-connected, with terminals exposed

General dimensional details

CLMD series	Generic part	H mm (inch)	W mm (inch)	D mm (inch)	Approx. Wt lb (kg)
13	C601Gxx	274.4 (10.8")	200 (7.87)	57 (2.24")	8.00 (3.65)
33	C603Gxx	274.4 (10.8")	370 (14.57")	57 (2.24")	12.50 (5.70)
43	C604Gxx	274.4 (10.8")	266.7 (10.5")	152 (6")	14.00 (6.40)
53	C605Gxx	401.5 (15.8")	437 (17.21")	152 (6")	25.00 (11.50)
53-3R3F	C605Rxx	528.5 (20.8")	437 (17.21")	152 (6")	28.00 (12.80)
63	C606Gxx	575.5 (22.8")	437 (17.21")	152 (6")	38.00 (17.50)
63-3R3F	C606Rxx	703.5 (27.79")	437 (17.21")	152 (6")	41.00 (18.65)
83	C608Gxxx	761.5 (29.97")	437 (17.21")	152 (6")	55.00 (25.00)
83-3R3F	C608Rxx	888.5 (34.97")	437 (17.21")	152 (6")	50.00 (22.75)

Notes: Actual packed weight may vary (higher or lower) from the average values indicated above as also in case of variants within the generic types listed. Dimensions will not usually vary much from the values listed above. Specific dimensions and/or weight can be informed on request.

General technical specifications

Voltages	Standard 240V, 480V and 600V, all 3-ph, 60 Hz; other specific voltages available on request
Discharging	Permanently connected discharge resistors, sized to ensure capacitor discharge down to 50V within 1 minute from switching off
Losses	Total losses less than 0.5W per kVAR, including discharge resistors, for 380V and above
Enclosure	NEMA 1 standard, with NEMA 12 and NEMA 3R available on request. Material Zinc electroplated mild steel. Color ASA61 or ANSI-61 gray powder coat finish
Tolerances	Overcurrent up to 135% of rated current, continuous. Overvoltage up to 110% of rated voltage, continuous. Tolerance on Capacitance = 0% to +10%
Conductors	All internal conductors use stranded, tin plated copper wire with fire-retardant insulation rated 105°C (220°F)
Fixing	Mounting feet with 2 fixing holes
Approvals	Fully CSA approved (C22.2) and UL listed. Complies with applicable requirements of IEC, EEMAC, ANSI and IEEE
Temperature	Range: -25°C to +55°C (-13°F to +130°F). Rated ambient: 40°C (104°F)
Clearances	Minimum distance between units and between units and enclosure wall: 19mm (3/4") for CLMD 13 & 33 / 51mm (2") for CLMD 43, 53, 63 & 83
Voltage Test	Between terminals: 2.15 Un for 10 seconds. Between terminals and ground: 3 kVAc for 1 minute

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