capco CAPACITORS

An ISO 9001: 2008 Co.

DADA PRODUCT
AN ISO 9001:2008 CO.

Manufactures of :-

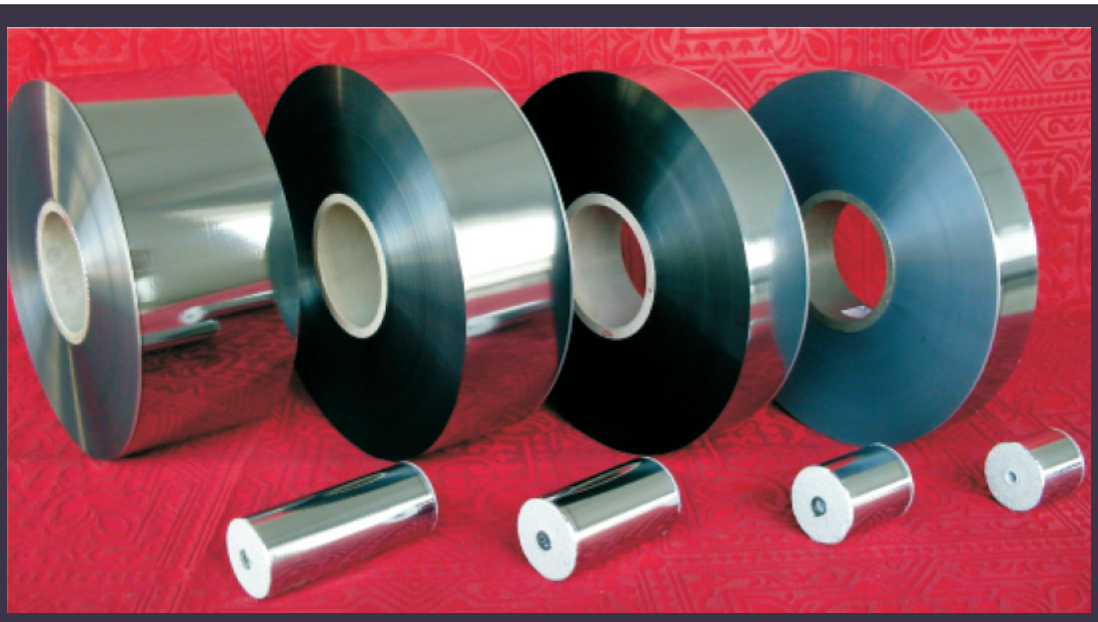
- CAPACITOR GRADE METALLISED PLASTIC FILM
- AC CAPACITORS - MFD
- START CAPACITORS
- DUAL RATING CAPACITORS
- BURST PROOF CAPACITORS
- FLOURESENT & DISCHARGE LAMP CAPACITORS
- U V LAMP HV CAPACITORS
- NON-SELF HEALING FILM FOIL CAPACITORS

&

IS : 13340

CM/L-6097778

MPP SELF HEALING
LT SHUNT CAPACITORS



Let's conserve energy for nation's progress

DADA ENERGIES LTD incorporated in the year 1994, is today an established manufacturer of Capacitor Grade Metallised Plastic Film and complete range of A.C. Motor Run & L.T. Shunt Capacitors under the brand name **"CAPCO"**

CAPCO Capacitors are produced at the most modern plant at Hyderabad under the expertise and experience of the personnel involved in its manufacturing ensures total quality control. The quality management systems are in compliance with ISO 9001:2008.

The unit is located at Jeedimetla Industrial Park, Hyderabad with complete set of sophisticated machinery right from Metallisation Plant of **LEYBOLD, GERMANY** and Automatic Winding Machines of **METAR, SWITZERLAND.**

It is always company's sole motto to serve the customer with the right quality product at the right time & at the most competitive price.

AC Capacitors

AC CAPACITORS :

These capacitors are manufactured by using Zinc Alloy, Heavy Edge Metallised Plastic Film and encapsulated with Flexible Resin in either Aluminium or Plastic containers.

Capacitors are of Self Healing type with very low dissipation factor, High insulation resistance and longer life. Finds application in Single Phase Motors, Fans, Lighting & Fixtures, Washing Machines, Air Conditioners, Deep Freezers & other special appliances.

SPECIFICATIONS :-

As per IS 2993 (For Motors), IS 1709 (For Fans),

IS : 1569 (For Lighting fixtures).

Range : 1 MFD to 432 MFD & dual rating

Tolerance : ± 5% / ± 10%

Rated Voltage : 230V / 415V / 440V / 600 VAC

Voltage Test

a) Between Terminals : 1.5 X Rated Voltage AC

b) Between Body and Terminals : 2000 VAC

Dissipation Factor

(Tan Delta) : 2×10^{-3} at 50 Hz

Temperature Range : -10° C to $+85^{\circ}$ C

Self-Healing : In the event of Dielectric Puncture, the capacitors self-heals without significant change in capacitance or in other electrical parameter.

SELECTION OF CAPACITORS FOR DIFFERENT APPLICATIONS

S.No.	APPLICATIONS	MFD	VOLTAGE in VAC
1)	Ceiling Fans	1.85, 2.00 2.25, 2.50	400/ 440
2)	Cooler Motors 0.25 H.P.	4.00, 6.00 6.30	 440
3)	Cooler Motors 0.50 H.P. Exhaust Fans	 8.00	 440
4)	1/2 HP Monoblock & 1/2 HP Low Head Pump	 10.00	 440
5)	1/2 HP Self-Priming Pump	12.50	440
6)	1/2 HP Monoblock Pump	15.00	440
7)	1.5 HP Monoblock Pump	20.00	440
8)	1 HP Jet Pump & 1 Ton AC Unit	 25.00	 440
9)	1.5 Ton AC Unit	36.00	440
10)	2 Ton AC Unit	45.00	440
11)	FTL 2 Nos. of 40 Watts	3.15	400
12)	FTL 1 No. of 40 Watts	4.00	250
13)	FTL 1 No. 65 Watts	5.70	400
14)	HPMV 1 No. of 80 Watts LPSV 1 No. of 33 Watts	 8.00	 250
15)	HPMV 1 No. 125 Watts HPSV 1 No. 70 Watts	 10.00	 250
16)	HPMV 1 No. 250 Watts	15.00	250
17)	HPMV 1 No. 400 Watts HPSV 1 No. 150 Watts	 20.00	 250
18)	HPSV 1 No. 250 Watts	33.00	250
19)	HPSV 1 No. 400 Watts	42.00	250

ABBREVIATIONS :

a) FTL : Flourescent Tube Light
b) HPMV : High Pressure Mercury Vapour Lamp
c) HPSV : High Pressure Sodium Vapour Lamp
d) LPSV : Low Pressure Sodium Vapour Lamp
e) AC : Air Conditioner
f) HP : Horse Power

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MPP
LT Shunt Capacitor

1. **BIS Licence No.**	:	CM/L 6097778
2. **Standard Applied**	:	IS 13340 : 1993
3. **Range**	:	1 KVAR to 25 KVAR Thereafter in bank formation.
4. **Tolerance**	:	-5% to +10%
5. **Voltage**	:	250V / 415V / 440V
6. **Frequency**	:	50 Hz.
7. **Insulation Level**	:	3/- KV.
8. **Insulation Resistance**	:	More than 50 Megohms.
9. **Phase & Connection**	:	Single / 3 Phase with Internal delta Connection.
10. **Ambient Temperatures**	:	-10^{0}C to $+55^{0}$C.
11. **Voltage Test Between Terminals**	:	1.75 Un.AC
12. **Voltage Test Between Terminals & Container**	:	3.6 KV. AC
13. **Loss Angle**	:	< 0.0025.
14. **Discharge Device**	:	Through Resistors.
15. **Altitude**	:	Not exceeding 1000 Meters above sea level.
16. **Appearance**	:	Cylindrical / Rectangular

MPP
Cylinderical Capacitor

- Compact Design with high outputs up to 25 Kvar.
- Housing made of high quality extruded aluminium.
- M12 / M16 Stud with serrated washer for mounting.
- Can be conveniently used for APFC panels or individually.
- Over pressure cut-off device to ensure safety.
- Discharge Resistors are provided externally in each capacitor unit in order to reduce the residual voltage to 50 volt within 60 sec.
- Earthing stud is an integral part of the extruded aluminum housing.
- Optimized diameter and height for excellent heat dissipation.
- Stacked assembled winding elements reduce the risk of device breakdown.

Double Dielectric Heavy Duty Capacitors

Double Dielectric Capacitor :-

Double Dielectric Capacitors meets the requirement of heavy duty industrial loads, such as rectifiers, arc or induction furnaces, large rolling mills etc. The basic reason which makes these loads arduous in nature is that each load gives rise to high over current or higher over voltage in an irregular manner. Rectifier load or arc furnace generates harmonic voltages which would impose continuous and severe over current on capacitors.

In order to build up the correct degree of protection, a capacitor needs to be given a higher over current and also higher surge voltage withstand capacity. This dual consideration has been taken into account to evolve a different construction of capacitors. This design of the capacitor has been evolved keeping in mind the basic simplicity of construction of primary MPP cell and its superiority in the capital and operating costs. The new design retains all these features and still raises by about a factor of two, over current as also the surge voltage withstand capacity.

All Polypropylene Film + Foil LT Shunt Capacitors

Dielectric	: Aluminium Foil / Hazy Polypropylene
Range	: 1 KVAR to 25 KVAR Thereafter in Bank formation.
Tolerance	: -5% to +10 %
Voltage	: 415 / 440 V
Frequency	: 50 Hz
Insulation Level	: 3/- KV
Insulation Resistance	: >50 Megohms
Ambient Temperature	: -10^{0} to $+55^{0}$C
Voltage Between Terminals	: Ut = 4.3 Un / DC or 2.15 Un
Loss Angle	: <0.0010
Discharge Device	: Through Resistors
Altitude	: Not exceeding 1000 Meter above Sea Level
Impregnation	: NPCB
Appearance	: Rectangular.

DESIGN FEATURES :-

- Employes two sides hazy rough electrical grade Biaxially Oriented Polypropylene Film & Aluminium Foil of 99% + purity.
- Capacitor impregnated under vacuum with environmentally compatible, Non Toxic, Non - PCB insulating oil.

APPLICATIONS :-

● Paper Industries ● Sugar Industries ● Textile Industries ● Cement Industries ● Steel Rolling Mills ● Software Technology/ Parks ● Windmill Application ● Arc Welding Equipments ● Battery Manufacturing Units ● Automobiles Manufacturing Industries ● Motor consoled by variable frequency drives etc.

Benefits of Non-Self Healing Capacitors :-

- Operates at a very low current density
- Can comfortably withstand heavy inrush currents.
- Withstand high current variations as in the case of Arc Welding equipments, and such other loads of a Fluctuating type.
- Withstands heavy and varying currents associated in Automatic Power Factor Correction Panel.
- Operates at a low dielectric stress.
- Withstands frequent and high voltage fluctuations prevalent in the industrial segment power supply system.
- Sustains over voltages occurring due to the presence of harmonics to a reasonable level.

POWER CAPACITOR RATINGS FOR DIRECT CONNECTION

KVAR rating when motor speed is

Motor H.P.	3000 r.p.m	1500 r.p.m	1000 r.p.m	750 r.p.m	500 r.p.m
2.50	1.00	1.00	1.50	2.00	2.50
5.00	2.00	2.00	2.50	3.50	4.00
7.50	2.50	3.00	3.50	4.50	5.50
10.00	3.00	4.00	4.50	5.50	6.50
15.00	4.00	5.00	6.00	7.50	9.00
20.00	5.00	6.00	7.00	9.00	12.00
25.00	6.00	7.00	10.00	10.50	14.50
30.00	7.00	8.00	10.00	12.00	17.00
40.00	9.00	10.00	13.00	15.00	21.00
50.00	11.00	12.50	16.00	18.00	25.00
60.00	13.00	14.50	18.00	20.00	28.00
70.00	15.00	16.50	20.00	22.00	31.00
80.00	17.00	19.00	22.00	24.00	34.00
90.00	19.00	21.00	24.00	26.00	37.00
100	21.00	23.00	26.00	28.00	40.00
110	23.00	25.00	28.00	30.00	43.00
120	25.00	27.00	30.00	32.00	46.00
130	27.00	29.00	32.00	34.00	49.00
140	29.00	31.00	34.00	36.00	52.00
145	30.00	32.00	35.00	37.00	54.00
150	31.00	33.00	36.00	38.00	55.00
155	32.00	34.00	37.00	39.00	56.00
160	33.00	35.00	38.00	40.00	57.00
165	34.00	36.00	39.00	41.00	59.00
170	35.00	37.00	40.00	42.00	60.00
175	36.00	38.00	41.00	43.00	61.00
180	37.00	39.00	42.00	44.00	62.00
185	38.00	40.00	43.00	45.00	63.00
190	38.00	40.00	43.00	45.00	65.00
200	40.00	42.00	45.00	47.00	67.00
250	48.00	50.00	53.00	55.00	76.00

The table is based on average conditions and efficiency to maintain a.p.f. of 0.95 to 0.97 between 33.3% load to 125% and is applicable to motors of 220, to 440, Volts, 50 c/s.

Table for Multiplying factor for calculating required Capacitor for Power Factor Improvement

Power Factor of load before applying Capacitors	Size of Capacitor in KVA per KW of load for raising the Power Factor to												
	0.80	0.85	0.90	0.91	0.92	0.93	0.94	0.95	0.96	0.97	0.98	0.99	Unity
0.40	1.537	1.668	1.805	1.832	1.861	1.895	1.924	1.959	1.998	2.037	2.085	2.146	2.288
0.45	1.230	1.360	1.501	1.532	1.561	1.592	1.626	1.659	1.695	1.737	1.784	1.846	1.988
0.50	0.982	1.112	1.248	1.276	1.303	1.337	1.369	1.403	1.441	1.481	1.529	1.590	1.732
0.55	0.769	0.898	1.035	1.063	1.090	1.124	1.156	1.190	1.228	1.268	1.316	1.377	1.519
0.60	0.584	0.714	0.849	0.878	0.905	0.939	0.971	1.005	1.043	1.083	1.131	1.192	1.334
0.62	0.515	0.645	0.781	0.809	0.836	0.870	0.902	0.936	0.974	1.014	1.062	1.123	1.265
0.64	0.450	0.580	0.716	0.744	0.771	0.805	0.837	0.871	0.909	0.949	0.997	1.058	1.200
0.65	0.419	0.549	0.685	0.713	0.740	0.774	0.806	0.840	0.878	0.918	0.966	1.027	1.169
0.66	0.388	0.518	0.654	0.682	0.709	0.743	0.775	0.809	0.847	0.887	0.935	0.996	1.138
0.69	0.299	0.429	0.565	0.593	0.620	0.654	0.686	0.720	0.758	0.798	0.840	0.907	1.049
0.70	0.270	0.400	0.536	0.564	0.591	0.625	0.657	0.691	0.729	0.769	0.811	0.878	1.020
0.74	0.159	0.289	0.425	0.453	0.480	0.514	0.546	0.580	0.618	0.658	0.700	0.767	0.909
0.75	0.132	0.262	0.398	0.426	0.453	0.478	0.519	0.553	0.591	0.631	0.673	0.740	0.882
0.77	0.079	0.209	0.345	0.373	0.400	0.434	0.466	0.500	0.538	0.578	0.620	0.687	0.829
0.78	0.053	0.183	0.319	0.347	0.374	0.408	0.440	0.574	0.512	0.552	0.594	0.661	0.803
0.80	-	0.130	0.266	0.294	0.321	0.329	0.387	0.421	0.459	0.499	0.541	0.608	0.750
0.81	-	0.104	0.240	0.268	0.295	0.329	0.361	0.395	0.433	0.473	0.515	0.582	0.724
0.82	-	0.078	0.214	0.242	0.269	0.303	0.335	0.369	0.407	0.447	0.489	0.556	0.698
0.84	-	0.026	0.162	0.190	0.217	0.251	0.283	0.317	0.355	0.395	0.437	0.504	0.645
0.85	-	-	0.136	0.164	0.191	0.225	0.257	0.291	0.329	0.369	0.417	0.478	0.620
0.86	-	-	0.109	0.140	0.167	0.198	0.230	0.264	0.301	0.343	0.390	0.450	0.593
0.88	-	-	0.054	0.085	0.112	0.143	0.175	0.209	0.246	0.288	0.335	0.395	0.538
0.89	-	-	0.028	0.059	0.086	0.117	0.149	0.183	0.230	0.262	0.309	0.369	0.512
0.90	-	-	-	0.031	0.058	0.089	0.121	0.155	0.192	0.234	0.281	0.341	0.484
0.91	-	-	-	-	0.027	0.058	0.090	0.124	0.161	0.203	0.250	0.310	0.453
0.92	-	-	-	-	-	0.031	0.063	0.097	0.134	0.176	0.223	0.283	0.426
0.93	-	-	-	-	-	-	0.032	0.066	0.103	0.145	0.192	0.252	0.395
0.94	-	-	-	-	-	-	-	0.034	0.071	0.113	0.160	0.220	0.363
0.95	-	-	-	-	-	-	-	-	0.037	0.079	0.126	0.186	0.329
0.96	-	-	-	-	-	-	-	-	-	0.042	0.089	0.149	0.292
0.97	-	-	-	-	-	-	-	-	-	-	0.047	0.107	0.250
0.98	-	-	-	-	-	-	-	-	-	-	-	0.060	0.203
0.99	-	-	-	-	-	-	-	-	-	-	-	-	0.143

Example: Given 100 KW load to be improved from. 77 to 95 Power Factor.
Multiplying Factor from table is 0.500
Capacitor (KVAr) = 100 x 0.500 = 50 KVAr

Note: The Recommended Capacitor rating given in the table are only a guidance. Capacitor sizes must be selected to compensate up to 90% of the motor magnetization current to avoid self - excitation phenomenon.

Rated output & Recommended Ratings of Cables, Fuses and Contactors

(Recommended ratings of control gear to be used with 415 or 440 Volts, 50Hz AC, 3 Phase delta connected Capacitors)

Unit Rating (kVAr)	Rated Current@ Rated Voltage (A)		Recommended				Unit Rating (kVAr)	Rated Current@ Rated Voltage (A)		Recommended			
	415V Rated	440V Rated	Cable Size (sq.mm) Cu.	Al.	HRC Fuse Rating (A)	Contactor* Rating (A)		415V Rated	440V Rated	Cable Size (sq.mm) Cu.	Al.	HRC Fuse Rating (A)	Contactor* Rating (A)
1	1.39	1.31	0.75	1.50	4	9	8	11.13	10.50	2.50	4	20	32
2	2.78	2.62	0.75	1.50	6	9	9	11.52	11.81	4	6	25	32
3	4.17	3.94	1.00	1.50	10	12	10	13.91	13.12	4	6	25	32
4	5.56	5.25	1.00	1.50	10	12	12.5	17.39	16.40	6	10	32	40
5	6.96	6.56	1.50	2.50	16	16	15	20.87	19.68	10	16	40	63
6	8.35	7.87	2.50	2.50	16	22	20	27.82	26.24	10	16	50	63
7	9.74	9.19	2.50	4	20	22	25	34.78	32.80	16	25	63	63
7.5	10.43	9.84	2.50	4	20	22	30	41.74	39.36	25	35	80	85

*Contactor rating recommended is for individual unit switching only.

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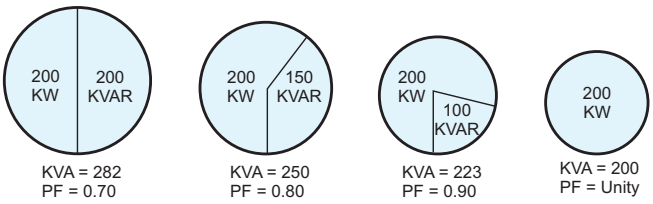


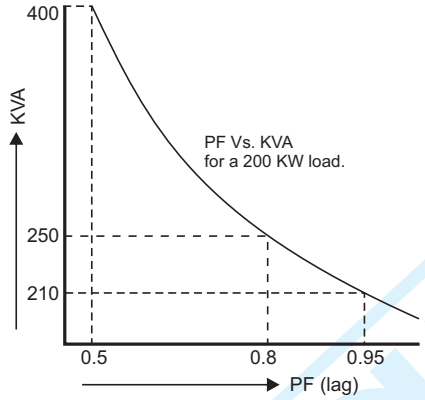
KVA = 282 PF = 0.70 | KVA = 250 PF = 0.80 | KVA = 223 PF = 0.90 | KVA = 200 PF = Unity

Size of Conductors Required

400 mm² | 300 mm² | 240 mm² | 185 mm²

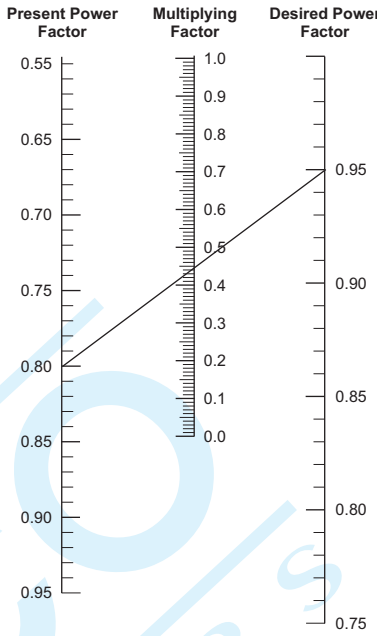
Decreasing size of conductors required to carry the same 200 KW (Working power) with improved Power Factors ranging from 0.7 lag to Unity.

* Reduction in line losses and consequent increase in the efficiency and life of electrical transmission equipment.
* Reduction in voltage drop resulting in better system voltage regulation and performance of electrical equipment.



Better utilisation of installed transformer, switchgear and cable capacities.

NOMOGRAM FOR CALCULATION OF REQUIRED CAPACITOR RATING



EXAMPLE : For given load of 100 HP
Corresponding KW = 100 X 0.746 = 74.6
Present Power Factor = 0.80
Desired Power Factor = 0.95
Multiplying Factor = 0.43
Capacitor Rating Required in KVAR
= KW X Multiplying Factor = 74.6 X 0.43 =32.078
Capacitor of 30 KVAR Max. should be selected.

NOTE :-

Product development is a continuous process, consequently the data indicated in the leaflet is subject to change without prior notice.

Capacitors of rating other than those mentioned in this catalogue can be supplied on request.

This edition of the catalogue has been simplified for quick reference. Any further information regarding the application of these capacitors will be furnished on request.

IS : 13340
CM/L-6097778
Self Healing Capacitor

An ISO 9001: 2008 Co.

PRODUCT REGD & APPROVED
- NSIC
- DGS & D
- IRE
- MDNL
- NRSA
- DEFENCE
- RAILWAYS
- ELECTRICITY BOARDS

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DADA PRODUCT
AN ISO 9001:2008 CO.

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