UNISTAR

Serving the Nation Since 1962...

Power Capacitors

(Product Catalogue -101)

An ISO : 9001 Organizations

All Poly Propylene (APP) Technology

The All Poly Propylene (APP) Capacitor series is a well proven & reliable Capacitor series for AC applications with long time of field experience, more than 15 years. "'APP" The Technology of High Voltage capacitor is now available for Low Voltage range in India by UNISTAR.

UCL always believe in offering world's best technology to Indian Industries. Infact UCL introduced APP technology in LT (440/525 to 1000 Volts) range long before the introduction of its BIS code i.e.IS:13585/1994.*/ & International standard IEC - 60931 / 1996

*Earlier there was only IS-2834/1986 & IEC - 831 for all HT/LT Capacitors.

ATTENTION !
UCL has discontinued MPP Capacitors (IS - 13340 / IEC-831) due to self healing tendency i.e. deterioration in capacitance & poor field performance of MPP Technology in Indian Conditions / Polluted electrical environments.

Products & Services :

High Voltage Capacitors (1 KV to 220 KV)
Medium Frequency Water Cooled Capacitors for Induction Furnace Application
Surge Protective Capacitors
Tuned & Detuned Filter Capacitors
DC Capacitors
Automatic PF Correction Systems
Harmonic Analysis & PF studies.

Technical data of APP Heavy Duty Low Voltage Capacitors

Parameter		Parameter	
Power	2.0 to 200 KVAr	**Case shape**	Steel/Rectangular
Rated Voltage-Un	230 to 1000 Volts AC	**Terminal**	Stud terminal with Steatite bushings
Frequency	50/60 Hz		
Inrush current-I	300 times Rated current	**Mounting & grounding**	Self standing with mounting bracket
Temperature category	-40 to +65° C		
Losses:		**Enclosure**	IP41, optionally IP54
- Dielectric in W/KVAr	<0.2	**Standard**	IS : 13585 / IEC-60931
- Total in W/KVAr	<0.5	**No. of switching operations per annum**	7500 nos
Max. Humidity	95%		
Safety	Internal High Rupturing Capacity HRC Fuses	**ISI Marking (upto 440V)**	Yes
		Test Voltage	2.15 x Un
Impregnation	Non PCB Oil +	**Hidden Losses**	Nil ++
Useful life	1,50,000 hours	**Type Testing**	CPRI / ERDA / UCL
Cooling	Natural		

+Non PCB Oil Provides Better Cooling. High Voltage Capacitors are also impregnated with same oil World wide.

++All PP Capacitor does not require inrush suppression coils which are used in MPP design capacitors. Coils contribute heavy power losses (2 to 4 Watts / Kvar) in MPP technology.

Applications

- PF Corrections
- Automatic PF Control Systems
- Motor Compensation
- Tuned Filters & De-Tuned Filters
- Uninterruptible Power Supplies (UPS)
- Wind mills
- Rolling Mills
- Furnace Duty
- AC Power Electronics

UNISTAR®
POWER CAPACITORS

QUALITY MANAGEMENT SYSTEM

ONLY A GOOD CAPACITOR CAN GIVE GOOD SAVINGS

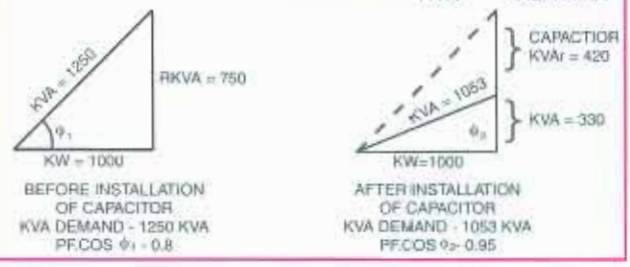
WHY WE NEED CAPACITORS

If the power factor of your plant is low, say below 0.85 or so, then the chances are that you may end up paying penalty, which could be more than 10% of your electricity bill. As against this if you can run your plant at a high power factor of say more than 0.95, then you are not penalized, instead your electric company may offer you rebate on on your bill which could be more than 5% of bill value Hence improving p.f. from existing low level to above 0.95 can bring in savings ranging from 10% to 15% at the very least. This can be achieved by providing capacitors in your system.

HOW CAPACITOR SAVES MONEY

You take power for your plant from electric company. This power (KVA) consists of two components active power (Kw, which is actual load) and reactive power (KVAr, which is apparent load). The relationship of these components can be given as per the following formula as well as can be illustrated in diagram shown below :

$$KVA = \sqrt{(KW)^2 + (KVAr)^2} \qquad \text{Power factor} = \frac{KW}{KVA} \text{ or } \frac{\text{Total KWH}}{\text{Total KVAH}}$$



If your load consists of low rpm induction motors, DC motors, electric furnace or thyristors than you consume more apparent power (KVAr) and hence more total power (KVA) and the power factor is poor. You can get required KVAr by installing capacitors and then you need no KVAr or little KVAr from electric company. So the total power, KVAr requirement, reduces and power factor improves. If electric tariff has demand charges than you save on this as well. So installation of power capacitor definitely helps in reducing your expenses on electricity considerably. These regular monthly savings can recover the cost of capacitors in just a few months to a year or so.

WHICH IS THE BEST CAPACITOR

Proper selection of capacitors is equally important as bad capacitors that fail frequently or loose capacitance continuously can only defeat its purpose of providing it. Only a good capacitor can give good savings. A good capacitor can be judged on two counts (i) performance of capacitor and (ii) track record of the company manufacturing it. Unistar capacitors stand tall on both these counts.

"UNISTAR" CAPACITOR

Universal Cables Ltd., a M.P. Birla Group of companies, is one of the oldest manufacturers of power capacitors having started production in the year 1967. The plant was set in collaboration with Toshiba of Japan. Later we entered into Technical collaboration with General Electric of USA to make mixed Dielectric and then All PP Capacitors. The plant is updated regularly.

UCL is pioneer in introducing All-PP technology in LT range. These capacitors are made using single layer double thickness hazy polypropylene dielectric with Aluminum foil as electrode and imported non PCB oil as impregnate, using the same GE technology of HT capacitors. After extensive trials these capacitors were commercially introduced in the year 1993. Since then their performance have been appreciated by dealers, consultants and customers alike. The stupendous performance of these capacitors over the period muted the critics of All PP and today number of manufacturers have started following technology developed by us.

L.T. Capacitor bank in enclosure with IP-55 Protection

APPLICATION OF CAPACITOR :

Proper application is key to good performance of capacitor which is basically a simple equipment requiring little attention and hardly any maintenance. These LT capacitors when connected to the system through properly rated switch fuse units or circuit breakers, can give long trouble free service. For variable load of the plant automatic control can be provided. However too much emphasis on automatic panels can only increase the cost of compensation. The parallel switching involved in automatic panels require higher rating of contactors to take care of high inrush currents. Inadequate rating can cause frequent burning of contacts, which can increase the cost of replacement and the down time of capacitors.

Capacitors, when switched on, draw high inrush currents for few cycles before it settles for study state rated current. When capacitors are switched off double the voltage may appear across parting contacts, as one side of the contacts is system voltage and on the other side capacitor charge. Therefore every switching of capacitor stresses its switch, connecting cables and other equipment in the line. Restricting switching of capacitor can therefore enhance life of these associated equipments and capacitors. Switching limited to 2 or 3 in a day is the ideal situation.

Capacitor rating needs to be decided very carefully where loads are non-liner having thyristors etc. Such loads have high harmonic currents, which can harm the capacitors. In Such cases it may be necessary to provide detuned reactors with capacitors. We can suggest proper application if details are furnished to us. We can also provide tuned filter banks for such loads, which can improve the p.f. and at the same time absorb predominant harmonics in the system thereby reducing harmonic distortion.

Our All-PP LT capacitors are very sturdy which can take harmonics abuses much better than any other type of capacitors. These capacitors have low losses and therefore run cooler and can also take high inrush current with out requiring inrush limiting coils which makes them best suited for automatic panel. Our All-PP capacitors having low stresses are also able to withstand higher voltage fluctuation.

UNISTAR- OTHER PRODUCTS & SERVICES :

We also manufacture MPP Capacitors in 415/440 volt range which are best suited for agricultural loads and for small industries having purely inductive loads. For industries having harmonics or high voltage variation, we would recommend to go for our All-PP Capacitors.

Universal Cables are the leading manufacturers of HT Capacitors. We execute orders on turnkey basis which may include study of system, and supply of capacitors with associated equipments like breakers, reactors. CTs, PTs, Control panel etc. In certain cases we can alsc take up erection & commissioning of the complete system. Our range also includes water cooled Capacitors for furnace and Surge Capacitors.

We also carry out harmonic analysis and design and supply harmonic filter banks.

Selected Customers of All-PP Unistar Lt Capacitor

CUSTOMER	KVAR SUPPLIED	YEAR OF SUPPLY	CUSTOMER	KVAR SUPPLIED	YEAR OF SUPPLY
Surat Electric Co.	43180	1995-1998	Vasavadatta Cement	2200	1998-2004
BSES	33000	1999	Hindustan Gum	1300	1996-2002
BEST	15960	1999	Maihar Cement	2805	1995-1997
AECO	6600	1995-1996	Indo Gulf Industries	4360	1995-2004
TNEB, Chennai	38628	2001	India Cement	2500	1999-2004
Century Pulp	4300	1995-1999	Telco	11550	1997-2004
T.N. Newsprint	13300	1995-2004	Grasim Industries	4255	1995-2004
Ballarpur Paper	2000	1997	Raymonds	4375	1996-2004
Sinar Mas	5900	1995	Hindalco	2433	1998-2004
Jindal Steel	500	1994	Siemens Ltd.	13130	1997-2004
Pioneer Furnace	30123	1994-2004	Pearl Engg. Polymers	1100	1994
Ispat Industries	11175	1998-2004	NCPL	1800	1995-2002
Tata SSL	3600	2001-2002	Welspun (I) Ltd.	3900	1997-2004
Nachmo Textiles	600	2002	Sanghi Industries	10250	2001-2004
ICL Sugar Ltd.	600	1999	ITC	1600	2000
BARC	2200	1999-2002	Orient Cement	1900	1998
OCL	4148	2004			

3.3 to 22 KV Capacitor Units

440 V Capacitor Units

RECOMMENDED RATINGS OF SWITCHING EQUIPMENTS AND CABLES FOR 3 PHASE 415/440 VOLTS 50 HZ. CAPACITORS.

Capacitor Output in KVAr	Al, Conductor PVC insulated armoured cable size in sq. mm	Cable gland for PVC cable	HRC fuse rating in Amps	Switch fuse rating in Amps	Contactor rating in Amps.
1	2.5	1/2"	5	15	30
2	2.5	1/2"	5	15	30
3	5	1/2"	10	30	30
4	5	1/2"	15	30	30
5	10	1"	15	60	30
10	10	1"	15	60	30
12.5	10	1"	35	60	30
15	16	1"	50	60	45
17.5	16	1"	50	60	45
20	16	1"	50	60	45
25	26	1 1/4"	63	100	100
30	35	1 1/4"	80	100	100
40	50	1 1/4"	100	125	125
50	70	1 1/2"	125	200	145
60	95	1 3/4"	150	200	200
75	120	1 3/4"	200	400	200
100	185	2"	250	400	250
125	300	2 3/4"	300	400	300
150	400	3"	400	500	400

50 KVAr / 440 V 3 ph Capacitor with switch Fuse arrangement

POWER CAPACITOR RATINGS FOR DIRECT CONNECTION

(A) INDUCTION MOTORS

CAPACITOR KVA at Motor speed of :

Motor H.P	3000 rpm (KVAr)	1500 rpm (KVAr)	1000 rpm (KVAr)	750 rpm (KVAr)	600 rpm (KVAr)	500 rpm (KVAr)
5	2	2	2	3	3	3
7.5	2	2	3	3	4	4
10	3	3	4	5	5	6
15	3	4	5	7	7	7
20	5	6	7	8	8	10
25	6	7	8	9	9	12
30	7	8	9	10	10	15
40	9	10	12	15	16	20
50	10	12	15	18	20	22
60	12	14	15	20	22	25
75	15	16	20	22	25	30
100	20	22	25	26	32	35
125	25	26	30	32	35	40
150	30	32	35	40	45	50
200	40	45	45	50	55	60
250	45	50	55	60	65	70

(B) WELDING TRANSFORMERS

Single Phase, Single Operator		Three Phase, Multi - operator		
Welding Transformer Continuous rating KVA.	Required Capacitor rating KVAr.	Type	Welding Transformer Continuous rating KVA.	Required Capacitor rating KVAr.
9	4	300/3	54	16.5
12	6	300/6	90	30
18	8	300/9	122	45
24	12	300/12	153	60
30	15			
36	18			

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, 400/440, 2200 & 3300 volts, 50 c/s. A.C. Supply.

PRODUCT RANGE

POWERFACTOR IMPROVEMENT CAPACITORS

HIGH VOLTAGE (1 KV to 220 KV)

*A Polypropylene Film Dielectric, with extended/folded. Al. Foil and impregnment with Non-PCB Oil confirming to IS-13925 Part I-1998, suitable for all types of electric loads and applications.

LOW VOLTAGE (400 V to 1000 V)

*All Polypropylene Film Dielectric with Al. Foil and Non-PCB Oil (Film+Foil) design, confirming to IS-13585 Part I-1994. Suitable for heavy duty applications like Automatic power factory improvement panels, steel rolling mills, DC drives having moderate harmonics.

***ALL 440V CAPACITORS ARE ISI MARKETED**

Self healing, metalized PP film Dielectric, oil cooled, confirming to IS-13384-1993

MEDIUM FREQUENCY CAPACITORS

(Water-cooled) for induction furnace application up to frequency of 600Hz.

DC CAPACITOR

For special application like impulse generator, filter circuit

SURGE CAPACITORS

For motor, transformer, Generator protection.

145KV/38000 KVAr Capacitor Banks at PSEB

UNISTAR® CAPACITORS

Serving the Nation Since 1961...

An ISO 9001 certified Organization

Figure out... what you are..?.? A good entrepreneur Or "SMART INVESTOR"

UNIVERSAL CABLES LTD. is Pioneer of LT ALL PP Heavy Duty Capacitors in INDIA

440 V Capacitor Units

HIGHLIGHTS

- Low Operating stresses.
- Low Temperature rise.
- Low losses.
- Absence of paper reduces the chances of gas formation, bulging & bursting.
- Fire Proof.
- Having Much higher Break down strength.
- Suitable for systems having high & frequent Voltage fluctuations and Harmonics.
- Enhanced Capacity to with stand high Inrush Current.
- Best suitable for Industrial Applications.

DEMERITS OF MPP CAPACITORS

- Lower electrical Break-down strength
- Incapable to sustain high voltage fluctuations & Harmonics.
- Poor voltage withstand capacity
- Prone to fire.
- susceptible to premature failure

"One time investment for ALL-PP Heavy Duty Capacitor would be more ECONOMICAL than frequent replacement of failed MPP Capacitors.....

.....It cause KVAr Loss of your power system during replacement period, which results in heavy loss in electricity bill.....

So is it justified to install such type of capacitors, which could not fulfill it's OBLIGATIONS.?

"Give new life to your power system with Latest technology of ALL-PP Heavy Duty Power Capacitors"

IS-13585

ISI MARKED

Our Product Range.

High Voltage (1 KV to 220 KV)
ALL-PP film CAPACITOR, suitable for all types of electric Loads and Applications.
Surge Capacitors

Low Voltage (400 V to 1000V)
Suitable for Heavy Duty Application, steel rolling, DC drives,etc.
Water Cooled Capacitors

We believe in QUALITY, our Customers believe on US

Our Capacitors are Type Tested at CPRI

Tested By ERDA VADODARA

FEW OF OUR VALUED CUSTOMERS

NDPL, TATA, HP, ONGC, IFFCO, CESC Limited, KRIBHCO, SIEMENS, BSES RAJDHANI, BSES YAMUNA, JINDAL

Our Capacitors are Approved by

EIL, HOLTEC, MECON

UDHE India
PDIL,SPB,TCS