SINGLE / THREE PHASE HIGH VOLTAGE CAPACITORS 50 HZ / 60 HZ FROM 1 kV TO 24 kV

- Maximum voltage 24 kV
- Maximum output 1000 kVAR (Single Phase)
- All Polypropylene (APP) film dielectric
- Low Losses
- Indoor or outdoor application upto 200 kV BIL
- Superior electrical performance
- Improved tank rupture characteristics

Shreem - All film capacitors (fig-1) are latest designed, manufactured and tested to meet or exceed the requirements of applicable IEC / IS / IEEE standards.

Their low cost per kVAR makes these capacitors a simple, economical source of reactive power on electric power systems for :-

- Improving power factor
- Reducing line losses
- Decreasing voltage drop

Power capacitors can be installed at single station or in factory - assembled, switched or unswitched banks in

- Pole mounted racks
- Open substation bank
- Pad mounted bank

CAPACITOR APPLICATION

Capacitor application requires an evaluation of the power system to determine :-

- The kVAR needs
- The most effective location
- The necessary protection.

In general capacitors are installed

- At the substaion : To supply the system kVAR needs most effectively.
- At or near, the load center : To obtain the optimum kVAR supply and voltage correction
- At the end of the line : To achieve maximum voltage correction.

RATINGS

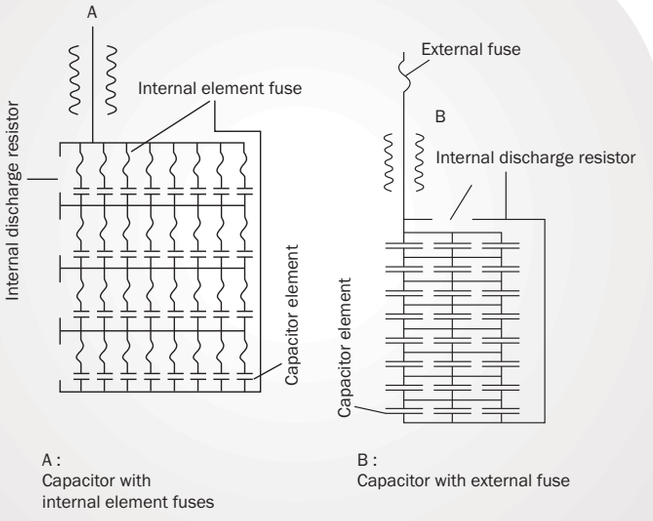
SHREEM Capacitors are rated in continuous kVAR, voltage and frequency for operating within the -40^{o} to $+55^{o}$ Celsius ambient temperature range. Designed to product not less than rated kVAR at rated voltage and frequency, these are subjected to all applicable IEC/IS/IEEE standard dielectric tests.

Capacitors will operate safely at 135% of kVAR rating under following operating conditions :-

- kVAR caused by excess voltage at rated frequency
- kVAR added by the harmonic voltage superimposed on the power frequency voltage.
- kVAR attributable to manufacturing tolerance

The maximum recommended working voltage of capacitor is 110% of rated voltage, Shreem capacitors include a safety factor that permits them to tolerate without damage momentary over voltages caused due to switching/load fluctuation.

Capacitor-rated frequency is 50/60 Hz, kVAR output varies directly as the ratio applied frequency to rated frequency. Capacitors designed to operate at other frequencies are also available.



A :
Capacitor with
internal element fuses

B :
Capacitor with external fuse

Fig : 2

CONSTRUCTION FEATURES

- Impregnated by non-PCB bio-degradable low viscosity capacitor oil
- Capacitors are protected by internal elements fuses or by external unit fuse (Fig.2)
- Mild or stainless steel tank with polyurethane light gray paint finish for resistant to severely corrosive atmospheres other paint shade can be available on request also
- Wet process - porcelain bushing glazed for high strength and durability and hermetically sealed to the capacitor tank
- Internal discharge resistors that reduce terminal voltage at 50Volts or less within 10/5 minutes after capacitor has been disconnected from source
- Aluminum nameplate containing requited data as per relevant standard

CAPACITOR BANK-SIZING

A capacitive kVAR required for improvement of power factor at a given load can be made from the nomogram in Table1. However, in most cases the capacitor bank rating has to be carefully selected after due consideration of rated voltage of the system, system over-voltages, harmonics in the system, rating of series reactor if any, etc. Besides the correct sizing of the capacitor bank, the reliability also depends on the right selection of associated equipment such as the circuit breaker, series reactor, protective relays, etc.

Above all, it is essential to check that the capacitor installation will not cause dangerous stress to the user's system due to resonance.

Table 1 is used for calculating the necessary capacitor power rating Q (kVAR), required to improve the power factor of a load P (kW).

$Q_C = k \times P$

Example :

What is the capacitor power rating required to increase the power factor of an installation 0.8 to 0.98 if the load P is 1500 kW ?

From the nomogram K = 0.55 and hence $Q_C = 0.55 \times 1500 = 825$ kVAR

MULTIFICATION FACTOR (Table 1)

Existing COS Ø	Achievable (TARGET) COS Ø 0.80	0.82	0.85	0.88	0.90	0.92	0.94	0.96	0.98	1.00
0.67	0.36	0.41	0.49	0.57	0.63	0.68	0.75	0.82	0.90	1.11
0.68	0.33	0.38	0.46	0.54	0.59	0.65	0.72	0.79	0.88	1.08
0.69	0.30	0.35	0.43	0.51	0.56	0.62	0.69	0.76	0.85	1.05
0.70	0.27	0.32	0.40	0.48	0.54	0.59	0.66	0.73	0.82	1.02
0.71	0.24	0.29	0.37	0.45	0.51	0.57	0.63	0.70	0.79	0.99
0.72	0.21	0.26	0.34	0.42	0.48	0.54	0.60	0.67	0.76	0.96
0.73	0.19	0.24	0.32	0.40	0.45	0.51	0.58	0.65	0.73	0.94
0.74	0.16	0.21	0.29	0.37	0.42	0.48	0.55	0.62	0.71	0.91
0.75	0.13	0.18	0.26	0.34	0.40	0.46	0.52	0.59	0.68	0.88
0.76	0.11	0.16	0.24	0.32	0.37	0.43	0.50	0.57	0.65	0.86
0.77	0.08	0.13	0.21	0.29	0.34	0.40	0.47	0.54	0.63	0.83
0.78	0.05	0.10	0.18	0.26	0.32	0.38	0.44	0.51	0.60	0.80
0.79	0.03	0.08	0.16	0.24	0.29	0.35	0.42	0.49	0.57	0.78
0.80		0.05	0.13	0.21	0.27	0.32	0.39	0.46	0.55	0.75
0.81			0.10	0.18	0.24	0.30	0.36	0.43	0.52	0.72
0.82			0.08	0.16	0.21	0.27	0.34	0.41	0.49	0.70
0.83			0.05	0.13	0.19	0.25	0.31	0.38	0.47	0.67
0.84			0.03	0.11	0.16	0.22	0.29	0.36	0.44	0.65
0.85				0.08	0.13	0.19	0.26	0.33	0.42	0.62
0.86				0.05	0.11	0.17	0.23	0.30	0.39	0.59
0.87					0.08	0.14	0.21	0.28	0.36	0.57
0.88					0.05	0.11	0.18	0.25	0.34	0.54
0.89						0.09	0.15	0.22	0.31	0.51
0.90						0.06	0.12	0.19	0.28	0.48