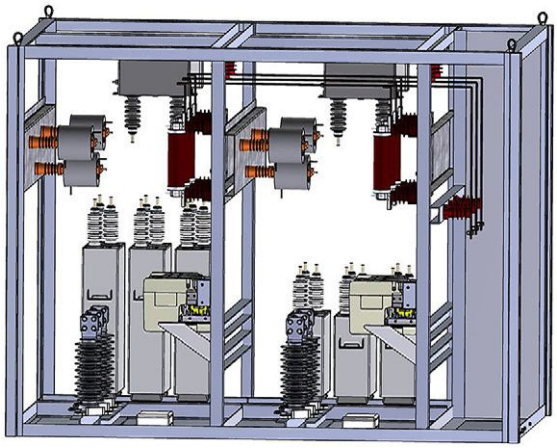
High Voltage AC Power Capacitors
Metal Enclosed Capacitor Banks (MECB)



FEATURES

- Fixed or switched type
- Modular design
- Cabinet protection class up to IP55
- Enclosed design providing full protection of live parts

APPLICATIONS

- Power factor correction
- Filter circuit systems
- Individual or group compensation
- Harmonic filtering
- Industrial converter
- Thermal power station
- Solar
- Wind

QUICK REFERENCE DATA	
Series	C/... HVAC MECB
Description	MECB, indoor or outdoor
Type	Fixed or switched
Technology	Metal enclosed power modules, air insulated
Voltage min. (V)	1000
Voltage max. (V)	36 000
Frequency min. (Hz)	50
Frequency max. (Hz)	60
Output min. (kvar)	150
Output max. (kvar)	20 000

TECHNICAL DATA	
Rated frequency	50 Hz or 60 Hz (other frequencies on request)
Insulation class	3.6 kV to 36 kV
Internal connection	1-phase or 3-phase
Temperature category	-50 °C to +55 °C
Protection	HRC fuses, unbalance / overheat / overpressure protection
Cabinet material	Aluminum / stainless steel available upon request
Cooling system	Forced ventilation or natural convection
Standards	IEC / other standards upon request
Capacitor bushings	Porcelain, screw and welded type, M12 / M16
Casing	Aluminum / stainless steel available upon request
Standard color	Non-painted / colors for stainless steel cabinet available upon request
Additional equipment for protection [1]	Reactors - quick discharge reactors, damping reactors, detuned reactors; vacuum contactors, SF6 circuit breakers, earthing switches, surge arresters, unbalance protection relays, thermostat

Note

[1] Can be installed inside the cabinet according to the customer requirement

ADDITIONAL EQUIPMENT FOR PROTECTION

In addition to the protection devices specific to each capacitor type, namely internal fuses or pressure switches, other accessories have to be used and incorporated into the capacitor bank:

HRC FUSES

Protection using HRC fuses integrated in the capacitor bank is ideal from the technical and economical point a view. The rating of the HRC fuse will be selected to have a value between 1.7 and 2.2 times nominal current of the capacitor bank. Short circuit current inside the capacitor is usually main reason that fuse blows.

PRESSURE SWITCH

With the pressure sensor is the internal pressure being monitored in a capacitor. If the stipulated limiting value is exceeded, a signal contact (change-over contact) initiates the disconnection of the electrical supply to the capacitor. Such an early disconnection from the source of supply, after an internal breakdown, can stop the gas evolution in the capacitor before the casing bursts.

UNBALANCE OR DIFFERENTIAL PROTECTION

This type of bank protection is usually applied for applications above 12 kV and reactive power above 1000 kvar. It consists of a current transformer connected between two electrically balanced points combined with the current relay. In the event of a failure, i.e., element breakdown or group short-circuit, the star point of the respective branch is shifted and causes a current flow between the star points.

QUICK DISCHARGE REACTORS

Installation of two quick discharge reactors between the phases of capacitor bank will reduce capacitor discharge time from 10 minutes to approximately 10 seconds. To ensure correct cooling of the reactors it is necessary to take 30 minutes time after which the next discharging of the capacitor units can take place.

DAMPING REACTORS

Installation of the 1-phase damping reactors in series on each phase makes it possible to reduce switching current value (inrush current) which will secure efficient protection of capacitor units.

DETUNED REACTORS

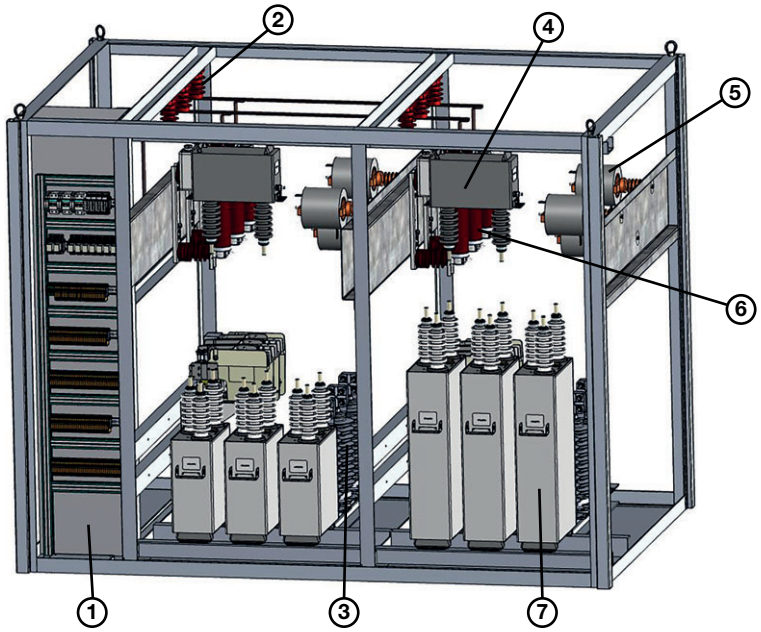
The only effective protection against the high level of harmonic that can be present in the network is by installing usually 3-phase detuned reactors in series with the capacitor units. Detuned reactor will increase impedance of the capacitor units to the harmonic currents and will also perform the function of a damping reactor.

CONTACTOR

Contactor is designed to switch capacitive currents and is generally of vacuum type. The device must always be used with three damping reactors or a detuned reactor in order to damp the inrush currents.

FORMS OF CONSTRUCTION (Example)

1-phase capacitor units



List of equipment:

1. Auxiliary compartment
2. Support insulator
3. Surge arrester
4. Unbalance current transformer
5. Inrush current reactor
6. Protection fuse
7. Capacitor unit

TYPE NOMENCLATURE

C	4.16	100 + 200	50	D	L	LD	QD	HH	CB	S	6 %
1	2	3	4	5	6	7	8	9	10	11	12

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Capacitance (capacitor bank)	Voltage (V or kV)	Total output in steps (kvar or Mvar)	Frequency (Hz)	Pressure switch, n.E. unbalance protection	Filter reactor, n.E. without	Damping reactor, n.E. without	Quick discharge reactor, n.E. without	HRC fuses, n.E. without	Contactor, n.E. without	Cabinet	Detuned factor, n.E. not a filter

Note

- n. E. = no entry

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