

# DSHM series Low Voltage Fixed Capacitor Bank



Multiple Type DSHM **240, 480 and 600 volts,  
3 phase, 60 Hertz,  
120 to 600 kVAR indoor**

## GENERAL

Indoor industrial DSHM capacitor assemblies provide power factor correction to industrial power systems utilizing the new technology of the dry self-healing type DSHI capacitor. A wide range of kvar ratings are provided in single equipments for large motor and bulk system correction.

The addition of capacitors makes it possible to achieve reduced power costs, increased system capacity and improved voltage control. With most utility rate structures the power factor influences the billing in some manner. Some rate structures increase the billing if the power factor falls below a specified level. Others provide a bonus for raising the power factor to desirable levels. Depending on the system conditions and the local utility rate practices, capacitors can often pay for themselves in less than one year.



DSHM Capacitors increase system capacity by supplying the non-productive magnetizing currents created by inductive loads. Magnetizing currents which may increase line current flow by 2/3 or more must be supplied by the same system that supplies the working current. DSHM Capacitors supply the "non-productive" magnetizing current locally thereby confining it to the smallest possible segment of the system.

This releases the balance of the system capacity to carry useful, working current. In the case of a growing load this may forestall the necessity of purchasing additional system capacity.

The use of capacitors to supply reactive current required by inductive loads can help keep the system voltage at desirable levels. Excessive voltage drop increases slip and creates motor killing heat. Low voltage can make an otherwise adequate lighting system ineffective. Motor controls and instruments operate below par. Furnaces may produce less than rated temperature or take longer to reach rated heat. The cancelling effect of the capacitive reactance supplied by the addition of capacitors on the inductive reactance created by magnetizing currents reduces the non-productive power and stabilizes the voltage as the system is loaded.

## APPLICATION

Industrial capacitor banks are supplied in the type DSHM design for fixed applications and in the type C100 design when automatic switching is required. In both designs, type DSHI individual capacitors are mounted in steel enclosures and pre-wired at the factory to give the desired kvar ratings. The type DSHI dry self-healing capacitor unit, as discussed before, now offers the latest "state-of-the-art" technology for all low voltage power factor correction applications.

## FEATURES

The DSHM capacitor bank provides large amounts of correction needed by power centres. This assembly reduces the number of capacitors that would normally be required for individual motor installations by taking advantage of the load diversity factor thereby giving a more economical means of power factor correction. Preventative maintenance and initial installation costs are reduced as fewer capacitors of larger capacity are located in one central location as opposed to being scattered over the whole plant electrical system.

### TECHNICAL DATA - DSHM series

Rated Voltage / Phase	200 to 1000 Volts / 3 phases
Rated Frequency	50Hz or 60Hz
Rated Power	120 to 600 kVAR / unit
Tolerance	-5 to +10%
Insulation level	5 kV
Power losses	0.4 w/kVAR
Continuous overvoltage	110 %
Continuous overcurrent	135 %
Mounting type	Floor mounting brakel
Enclosure type	Indoor and outdoor
Temperature class	-40 °C to 55° C
o Average 24h :	+ 45° C
o Average 1 year :	+ 35° C
Color	RAL 7032 9light grey)
Construction Standard	UL, CSA, IEC

## CONSTRUCTION

The Dry Self-Healing multiple type DSHM is an indoor, UL and CSA approved capacitor assembly. The multiple type DSHM consists of groups of DSHI capacitors completely assembled

and wired to form a single unit assembly with line terminals, fuses and capacitor connections enclosed in a compartment thereby protecting against accidental contact with live parts. The kvar rating may be increased or decreased by adding, subtracting or by substituting units of other ratings as required. When the number of units supplied is less than the total capacity of the bank, top covers are furnished for the vacant openings.

The terminal enclosure encloses live components. Mounting holes ½ inch are located in the enclosure supports to allow anchorage to floor without the need for additional bracing. Housings can be supplied in either 2, 3, 4 and 6 unit sizes as illustrated in the product application guide. The entire assembly is finished with a 2 mil coating of light beige enamel paint.

The splitter bus to each capacitor unit is fused using current limiting HRC fuses having 200,000 amperes interrupting capacity. The DSHM capacitor bank has been designed to offer power factor correction with maximum dependability and safety at an affordable price.

## MOUNTING

The multiple banks are designed for floor mounting indoors without the need of additional brackets. Base channels are slotted for the addition of anchor bolts.

## INSTALLATION

The equipment is shipped completely assembled and ready for connection. Upon receiving the equipment, place the bank in the selected location, with terminal compartment on the top. Fasten the assembly with 0.5 inch diameter screws or bolts.

## Note:

All sides of the bank should be clear so that air can circulate. Also, this equipment should not be placed near a heat source. Maximum ambient temperature is 40°C (124°F) with unrestricted ventilation and freedom from adjacent sources.

## SELECTION OF SWITCHES, BREAKERS ,WIRE SIZE

Capacitors may operate with a maximum of 135% rated kvar in line with UL and CSA standards. This permits to provide operation up to 110% rated volts including a safe allowance for harmonic. Rated three phase line current will be:

$$\frac{\text{kvar} \times 1000}{\text{volts} \times 1.73}$$

When equipment is installed with less than the full number of units, the switch or circuit breaker should be that listed for the full kvar of the equipment. Breakers and switches for use with capacitors must have a current rating in excess of rated capacitor current to provide for over current due to over voltage of fundamental frequency and harmonic currents. Refer to Gentec Application Guide for sizing of over-current device.

## CONNECTIONS

The capacitor units in the equipment are connected in parallel to obtain a bank of the required kvar rating. Connection is normally made through the front or back enclosure panel.

## CAUTION

The capacitor units are equipped with discharge resistors to decrease residual voltage to 50 volts or less in one minute. Before handling equipment or removing a unit, wait one minute after disconnecting from service, then short each of the terminals to ground to be certain capacitor is completely discharged

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