



PRODUCT CATALOG

Sharda Electronics & Co.

An ISO 9001:2015 Certified Company





Sharda Electronics & Co.

Manufacturer of : L.T., H.T. & Special Capacitors



An ISO 9001:2008 Certified Company

SHARDA Make Harmonics Filter



SHARDA offers perfect solution to minimize **Harmonics level** of industries where non-linear load like, **VFD, Electronics load, Convertors, Voltage booster equipment's** are present.

Harmonics Filters are used to reduce Harmonics from the electrical network / system.

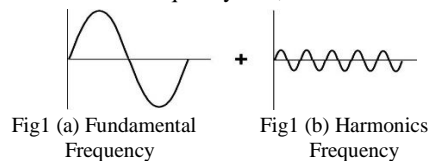
First, our technical executive analyse full system and as per system requirements to reduce voltage and current harmonics level compliances to IEEE STD 519. We provide tuned or detuned filter.

SHARDA manufactures Capacitors and Reactors which is used in Harmonics filter has sturdy design with considering all electrical and mechanical parameters to achieve harmonics level to IEEE standard level in system.

Current carrying capacity of reactor is 300% to the rated current. The temperature of the reactor increase at time of full working is only 10% to 20% beyond the ambient temperature.

CONCEPT OF HARMONICS

Harmonics are integral multiple of some fundamental frequency that, when added together result is distorted waveform as shown in below figure 1 (a), 1 (b) & 2



Above figures, shows the graph of fundamental as well as harmonics frequency, respectively and the below figure shows how it looks when harmonics enters in to the system.



Fig 2 Addition of Fundament & Harmonics Frequency

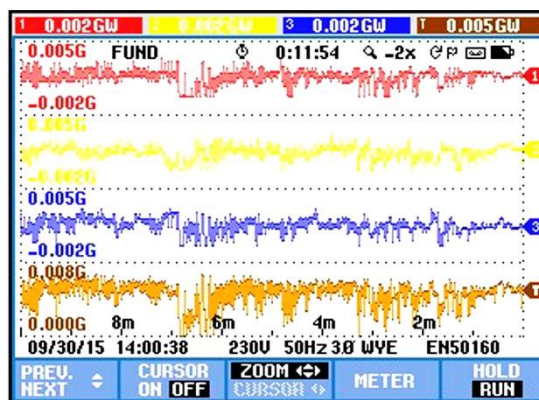


Fig. 3 picture of Harmonics present in system

The nature of electrical wave form is as per above figure when **Harmonics** presents in Electrical network / system.

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SYMPTOMS OF HARMONICS WHEN IT PRESENT IN SYSTEM

- Increase KVA Demand.
- Neutral Over loading & excessive N-G Voltage.
- Excessive Capacitor current, frequent capacitor failure.
- Overheating of transformer.
- Error in electricity metering i.e. erratic meter reading.

CAUSES OF HARMONICS

Harmonics are generated by various sources which inherently have non-linear load like VFD, Diode, Computer, & all electronics equipment's. That is generally where frequency as well as voltage conversion system are used. These loads use current in a pulsating manner at times of feed harmonic currents back in to the wiring. In non-linear load current waveform is different from voltage waveform. The major equipment's which generates Harmonics,

- | | |
|--|---------------------|
| 1. AC / DC Drives Used in Rolling Mill, CCM etc. | 4. Electronics Load |
| 2. Variable Frequency Drives | 5. Booster |
| 3. LED | 6. Converters |

STANDARD HARMONIC LIMIT AS PER IEEE

Institute Electrical & Electronics Engineering (IEEE) has set recommended limit on both current & voltage distortion in IEEE 519-1992

Voltage Harmonics Distortion Limit

Sr. No.	Bus Voltage at PCC	Individual Voltage Distortion	Total Voltage Distortion
1	Below 69 kV	3.0	5.0
2	69 kV to 161 kV	1.5	2.5
3	161 kV & above	1.0	1.5

Harmonics Current Distortion Limit

Sr No.	Isc/I}	<11	11≤h<17	17≤h<23	23≤h<25	35≤h	Total current Distortion
1	<20	4	2	1.5	0.6	0.3	5
2	20-50	7	3.5	2.5	1	0.5	8
3	50-100	10	4.5	4	1.5	0.7	12
4	100-1000	12	5.5	5	2	1	15
5	>1000	15	7.0	6	2.5	1.4	20

Where,

I_{sc}: Maximum short-circuit current at the Point of Common Coupling (PCC)

I_L: Maximum demand load current (Fundamental) at the PCC.

Even harmonics are limited to 25% of odd harmonics limits above. Current distortion that result in a DC offset, for example, half wave converter are not allowed.

HARMONICS FILTER CONSISTS of,

1. Double Dielectric type ultra heavy duty All PP Capacitor
2. Dry type Aluminum / Copper Reactor (percentage of reactance is depends on harmonics level)
3. Conducting Material : 99% pure Aluminum foil
4. Housing — CRCA / Stainless steel Panel.
5. Busbar – Aluminum / Copper.
6. Finish – Anti corrosive & UV Protected powder coating.

FEATURES of CAPACITOR USED IN HARMONICS FILTER

- Imported raw material
- Impregnated under high Vacuum Non-PCB insulating fluid.
- Less Losses
- High performance Anti UV Protection based paint coated
- Special design constructions for compliance to high seismic requirement.

FEATURES of REACTOR USED IN HARMONICS FILTER

- Aluminum / Copper wound reactors.
- Foil based winding to minimize eddy current losses.
- 300% linearity to withstand heavy fluctuation of current.
- All reactors are impregnated to circulate in all core.
- Special design constructions for compliance to high seismic requirement.

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PRODUCT RANGE

Sr. No.	Product Description	Product Code
Harmonics Filter (As per Bill of Material)		
1	50 kVAR	SE&CHF400050
2	75 kVAR	SE&CHF400075
3	100 kVAR	SE&CHF400100
4	150 kVAR	SE&CHF400150
5	200 kVAR	SE&CHF400200
6	250 kVAR	SE&CHF400250
7	300 kVAR	SE&CHF400300

** Note: We provides Harmonics Filter as per system / customer requirement.

BILL OF MATERIAL

Sr. No.	Description
01	APP type LV / LT Ultra Heavy duty Capacitor (specially design for Harmonics Filter)
02	Harmonics Filter Series Reactor
03	MCCB for each capacitor step for manual operation
04	Fabrication 14/16 gauge front operated
05	Non corrosive Powder coating after seven tank process.
06	Hinges
07	Lock with panel Key
08	Eye Bolts
09	Aluminum Bus Bar EC grade with HSS sleeves
10	Power & Control cable for all outgoing feeder
11	G.I. Plated hardware, Gasket, Epoxy Insulator
12	Misc. Material like end screw, lugs, PVC channel, Spiral connection etc. , SMC support for bus bar

TECHNICAL DATA SHEET

Sr. No.	Description	Technical data
1	Make	SHARDA Electronics & Co. Plot No. J-32 MIDC Kupwad Sangli, 416436, Maharashtra, India. Make : SHARDA
2	IS Reference	IS 5553
3	Type of winding	Copper / Aluminum
4	Rated Banking Output	50 kVAR to 4000 kVAR
5	Rated Voltage	380 volt to 1000 volt
6	Frequency	50 / 60 Hz
7	Detuning Factor	0.2%, 0.4%, 2%, 5.67%, 7%, 14%
8	Linearity	200 %
9	Ambient Temperature	50°C
10	Insulation Class	F class
11	Cooling Method	Iron core, Natural Cooling (AN)
12	Temperature Sensor	Normally Closed at 140 °C
13	Installation	Indoor, LT panel Mounted
14	Altitude	1000 meter above sea level
15	Max Cont. Current	135% for continues

For More details on products and services

Plases communicate our Techno-commercial executive (+91-9503435575) or visit us at www.shardacapacitor.com

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