PHF
PASSIVE FILTERS

The PHF series IREM passive filters are characterized by a high capacity to attenuate harmonic disturbances and are designed to be applied in systems where current harmonic distortion must be reduced within defined limits.

The use of passive filters contributes to reduce the thermal and electrical overload caused by harmonic currents in installations that include variable speed motor drives, UPS, power rectifiers and other non-linear three-phase loads.

Typical applications include loads present in air conditioning, water treatment, oil sector and industrial automation processes in general.



HARMONICS IN ELECTRIC POWER SUPPLY

High harmonic distortion values and anomalous voltage values of the neutral with respect to the earth potential can cause equipment failures, leading to production downtime and expensive repairs to the electrical distribution network.

It is essential that the user is aware of the expensive problems and dangers associated with high levels of harmonics, especially in consideration of the important increase in the use of non-linear devices.

Harmonic components can significantly affect the electrical distribution network by acting on all of the connected structures and equipment.

Harmonic distortions cause the following problems in an installation:

- ✔ Conductor overtemperatures, in particular the neutral one in presence of single-phase distorted loads;
- ✔ MV/LV Transformer overtemperatures;
- ✔ Harmonic distortion of the voltage caused by the saturation of the MV/LV transformers;
- ✔ Overheating of standard power supply transformers with consequent expensive downtime and repairs or replacement of the transformer;
- ✔ Resonance with other reactive components on the same power line (e.g. power factor correction banks);
- ✔ Poor power factor;
- ✔ Resonance producing overvoltages;
- ✔ Increase in electricity supply costs due to harmonic losses;
- ✔ Interferences in telecommunication systems and equipment;
- ✔ Irregular operation of the control and protection relays;
- ✔ Intervention of automatic circuit breakers and other protective devices;
- ✔ Failure or malfunction of computers, motor drives, lighting circuits and other sensitive loads;

IREM PROPOSAL

Passive Filters (PHF) are additional filters usually installed on the power supply line of the drive.

The filters consist of a combination of inductor (filter inductor) -capacitor inserted in derivation from an asymmetrical series inductor (main inductor). The performance of the passive harmonic filters IREM PHF series are very high: they reduce the harmonic distortion in current from 100% of THDi to typical values lower than 5%; the filters are made up of capacitors that form a resonant circuit with a reactor that has a high impedance path at the fundamental frequency and a low impedance path at higher specific frequencies.

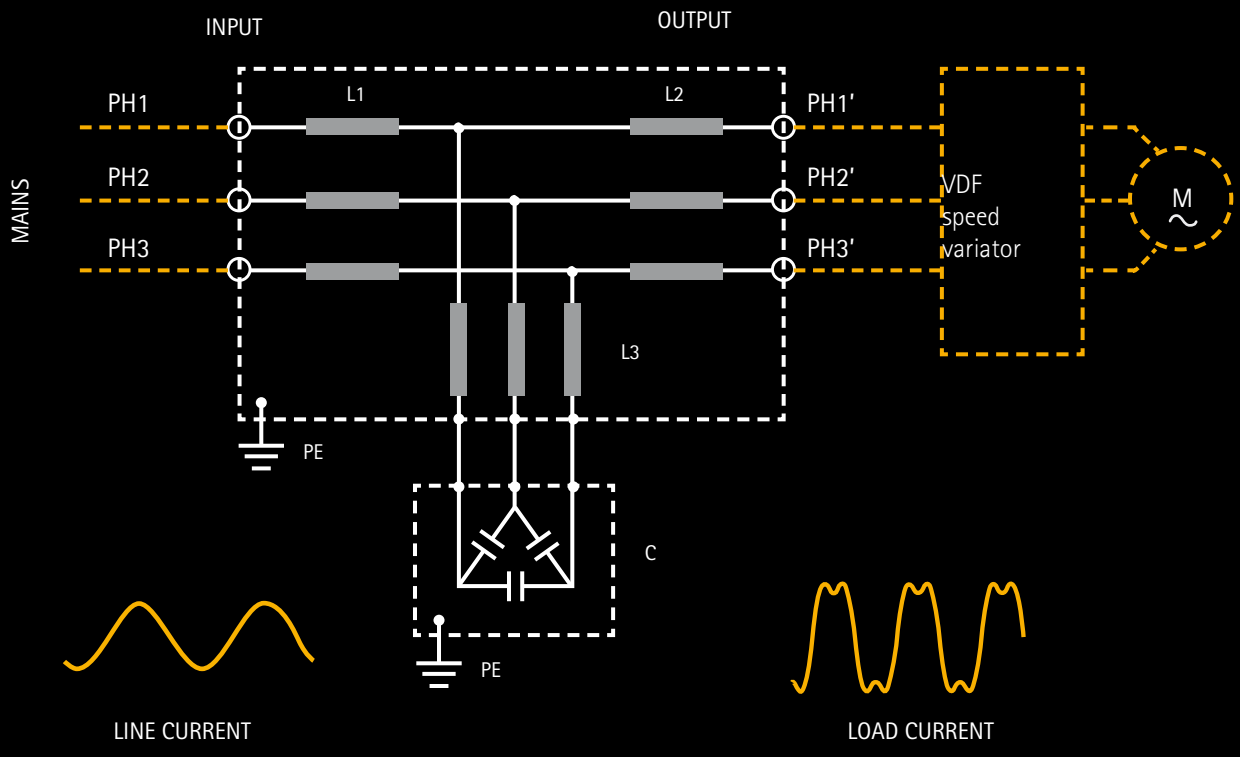
Passive filters are more commonly connected to individual loads in the system rather than to the common coupling point since the application requires a consistent load for effective harmonic mitigation.

The passive harmonic filter is installed in series with the line and therefore must be chosen according to the current absorbed by the load or by the group of loads. IREM passive harmonic filters guarantee excellent attenuation and do not need to be tuned with reference to the impedance parameters of the installation site.

PASSIVE FILTERS FOR HARMONICS
PHF SERIES

GENERAL CHARACTERISTICS

Input voltage	from 380Vac to 480Vac, on demand from 208Vac to 240Vac and 690Vac
Frequency	50Hz or 60 Hz to be defined in order phase
Rated current	from 10 to 800A
Attenuation THDi	<5%
Dielectric test phase - phase	2400 Vdc (2 sec.)
Dielectric test phase - ground	3200 Vdc (2 sec.)
Protection degree IP	IP00 integrable in cabinet IP21, IP54 indoor or IP54 outdoor
Overload	4 x Rated current 1 second 2 x Rated current 10 seconds 1.5 x Rated current 10 minutes
Climate class	-40 /+85° C
MTBF at 40°C	250.000 h



PASSIVE FILTERS FOR HARMONICS
PHF SERIES

THREE-PHASES 380-480V 50HZ OR 60HZ PROTECTION DEGREE IP00 (to be integrated in cabinet)

Model	*Voltage (Vac)*	*Current (A)*	*THDi (%)*	*Inductor height (mm)*	*Inductor width (mm)*	*Inductor length (mm)*	*Capacitor group height (mm)*	*Capacitor group width (mm)*	*Capacitor group length (mm)*	*Weight (Kg)*
PHF-10G	480	10	5	285	180	90	166	130	59	2
PHF-16G	480	16	5	260	380	240	166	130	59	4
PHF-24G	480	24	5	160	380	240	260	210	135	6
PHF-32G	480	32	5	180	380	240	260	210	135	6
PHF-38G	480	38	5	200	460	300	300	320	135	7
PHF-45G	480	45	5	200	450	300	300	320	135	7
PHF-60G	480	60	5	220	470	300	300	320	234	8
PHF-75G	480	75	5	210	550	360	210	320	234	8
PHF-90G	480	90	5	210	550	360	300	320	234	12
PHF-110G	480	110	5	290	530	360	300	320	234	15
PHF-150G	480	150	5	320	530	360	350	320	334	16
PHF-180G	480	180	5	320	670	480	350	320	334	18
PHF-210G	480	210	5	340	670	480	350	320	334	20
PHF-260G	480	260	5	350	670	480	350	320	334	30
PHF-320G	480	320	5	380	610	480	350	320	334	33
PHF-380G	480	380	5	390	740	600	350	320	334	35
PHF-470G	480	470	5	420	660	600	670	382	300	40
PHF-580G	480	580	5	460	710	600	670	382	300	50
PHF-650G	480	650	5	460	760	600	670	382	300	55
PHF-750G	480	750	5	460	760	600	670	382	300	60

Model with different voltage, frequency and capacitor capacity available on demand.
IREM Passive Filters are designed to supply the declared current in continuous service and in the most demanding conditions.

A GLOBAL LEADING PLAYER

SINCE 1947 MORE THAN 1,000,000 EQUIPMENT ALL OVER THE WORLD

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