



Low Pass Harmonic Filter For mitigation of all VFD harmonic frequencies

Section 1- General

1.1 Low Pass Harmonic Filter to mitigate all harmonic frequencies

The low pass harmonic filter is designed to filter all harmonic frequencies associated with 3-phase (6-pulse) non-linear loads and to improve electrical system power quality by reducing upstream system harmonic current and voltage distortion. The low pass filter provides broad band attenuation of all frequencies above the fundamental frequency through the 50th harmonic.

- 1.1.1 The filter shall connect in series with a 6-pulse non-linear load.
- 1.1.2 The filter shall be suitable for 6-pulse, variable torque, voltage source inverter type loads and may be de-rated for current source and constant torque loads.
- 1.1.2 The filter shall not require any additional input reactors regardless of source impedance.
- 1.1.3 The filter shall be suitable for use on a generator with minimum capacity 33% greater than filter rating and impedance up to 15% impedance.

1.2 Electrical Ratings:

- 1.2.1 System Voltage: [208, 230, 380, 400, 415, 480, 600, 690].
- 1.2.2 System Frequency: [50 hertz, 60 hertz, other]
- 1.2.3 Load Rating: 2.2kW (3HP) to 1500kW (2000HP) or amperes to 3000 A. [Specify rating].

Section 2 – Basic Product Requirements

2.1 The Low Pass Harmonic Filter shall meet the following basic requirements:

- 2.1.1 The filter shall reduce harmonic current distortion to IEEE-519 limits [at PCC, at filter input terminals] when load is operating at full load, with line voltages are balanced within +/- 1%. The percent current distortion measurement is adjusted by subtracting the system percent voltage distortion.
- 2.1.2 The filter shall consist of only passive elements.
- 2.1.3 Reactors used in filter must have per phase inductance balanced within 3% of nominal value so as not to cause unbalanced current to flow in the system.
- 2.1.4 The filter shall be suitable for use with or without an internal DC choke or input line reactor.
- 2.1.5 The filter shall not increase or decrease load voltage by more than 5%.
- 2.1.6 Capacitors shall be low ESR, with +/- 4% tolerance or better and must be temperature rated for 85C.
- 2.1.7 The filter shall be a standard catalog item for the manufacturer.
- 2.1.8 Product warranty period shall be 1 year.

2.2 Construction:

- 2.2.1 Three-phase, 3-wire.
- 2.2.2 Filter shall be suitable for free convection air cooling, no fans required.
- 2.2.3 Maximum ambient temperature shall be 40C [other].
- 2.2.4 Temperature rise shall be 115C [80C, other]
- 2.2.5 Construction shall be [open panel, Nema 1, Nema 3R, component kits, other]
- 2.2.6 Efficiency shall be 98.5% minimum at full load at 25C ambient temperature.
- 2.2.7 Construction shall be in accordance with UL, CSA and ANSI requirements.

Section 3 - Acceptable Manufacturer

- 3.1 The approved and acceptable low pass harmonic filter is the Type LPF Series as manufactured by APQ, LLC.