



# Harmonic Filter for VFD's

- > Reduced Harmonic Distortion
- > Improved Power Factor
- > Increased VFD Uptime



## Introduction

Powernac series Harmonic Filter for VFD's are simple and effective way to control harmonics generated by VFD's at the source point. The filter design typically reduces current harmonic distortion (THD-I) to less than 5% at full load. For various other loading condition please refer to specifications below. These Filters offer much superior performance over other filtering methods including 12 pulse / 18 pulse harmonic reduction techniques. They are suitable for wide range of applications.

Since this Filter uses all passive components L, C and R therefore it offers reliable and maintenance free operation for a very long period of time.

These Filters improve power factor of load and network thus offering dual advantage of harmonic reduction and reactive power compensation. Apart from this it offers isolation to VFD so as to protect it from high harmonic distortion from supply side. It improves the uptime of VFD manifold thus increasing VFD operational reliability in critical & process application.

## Specifications

Technology	: Wide range Harmonic Filtration technology
Type	: 3P 3W
Output Load Type	: 6 Pulse Variable Rectifier Load
Supply Voltage	: 415VAC ± 10%, 3 Phase
Frequency	: 50Hz ± 1Hz
Input Voltage Unbalance	: 1% Max
Duty	: Continuous
Operating Ambient Temp.	: -20 °C to +50 °C
Total Current Harmonic	: <9% at 30% Load
Distortion @	: <8% at 50-60% Load
THD-V <2%	: <8% at 60-90% Load
Voltage Unbalance <1%	: <5% at 90-100% Load
Protection	: IP40

## Typical Applications

- AC or DC Motor Drives
- Protection of VFD
- Industries with high density of VFD loads
- HVAC Systems
- Water Treatment Facilities
- Fans and Pumps
- Elevators
- IEEE 519 Compliance

## Design Features

- Reduce THD-(I) and THD (V) to help IEEE-519 requirements
- THD-I of 8% Max at 50% load, 5% Max at full load
- Saves energy by eliminating the wasted energy associated with harmonics, therefore reducing the true RMS KVA demanded from Utility power source.
- Increase VFD's reliability by absorbing transients and voltage resulting in increased uptime of VFD.
- Increases equipment's life by reducing heat associated with harmonic currents
- Improves Power Factor of network.

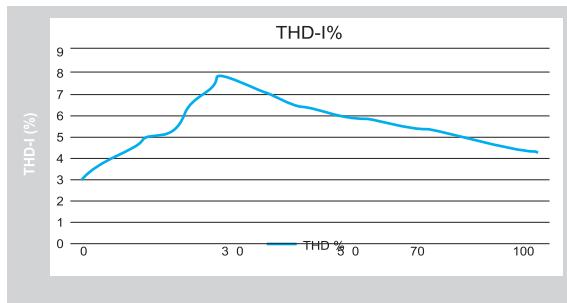
## Harmonic Reduction at Mains incoming (PCC)

Actual THD-I reduction on Mains shall depend on total coverage of harmonic generating loads in network installed with filter. Using the filter in isolation on some harmonic generating load shall lead to lesser reduction in THD-I. Moreover, to get optimum result THD-V at the point of connection should be <2% and voltage unbalance should be <1%.

Readings on 75 KW Filter connected to 75 KW VFD  
(Voltage THD was 2.8% for the following readings)

Loading	THD - (I)	PF
30%	7.8%	0.92 lead
50%	6.4%	0.96 lead
70%	5.8%	0.99 lead
100%	4.9%	0.99 lag

THD-I % on various Loading of VFD



## Harmonic Filter for VFD's

Standard Harmonic Filter for VFD's Dimension

Part No.	Suitable for Drive	Dimensions W x D x H (mm)
NECPL-2.2-415-3P3W	2.2 KW	450 x 700 x 400
NECPL-4-415-3P3W	4 KW	450 x 700 x 400
NECPL-5.5-415-3P3W	5.5 KW	450 x 700 x 400
NECPL-7.5-415-3P3W	7.5 KW	550 x 800 x 450
NECPL-11-415-3P3W	11 KW	550 x 800 x 450
NECPL-15-415-3P3W	15 KW	550 x 1025 x 450
NECPL-18.5-415-3P3W	18.5 KW	550 x 1025 x 450
NECPL-22-415-3P3W	22 KW	550 x 1225 x 550
NECPL-30-415-3P3W	30 KW	550 x 1325 x 550
NECPL-37-415-3P3W	37 KW	550 x 1425 x 550
NECPL-45-415-3P3W	45 KW	550 x 1425 x 550
NECPL-55-415-3P3W	55 KW	550 x 1425 x 550
NECPL-75-415-3P3W	75 KW	650 x 1625 x 650
NECPL-90-415-3P3W	90 KW	650 x 1625 x 650
NECPL-110-415-3P3W	110 KW	650 x 1625 x 850
NECPL-132-415-3P3W	132 KW	650 x 1625 x 850
NECPL-160-415-3P3W	160 KW	850 x 1625 x 850
NECPL-185-415-3P3W	185 KW	850 x 1625 x 850
NECPL-200-415-3P3W	200 KW	850 x 1625 x 850
NECPL-250-415-3P3W	250 KW	850 x 1625 x 850
NECPL-300-415-3P3W	300 KW	850 x 1625 x 850