

Tuned Harmonic Filters

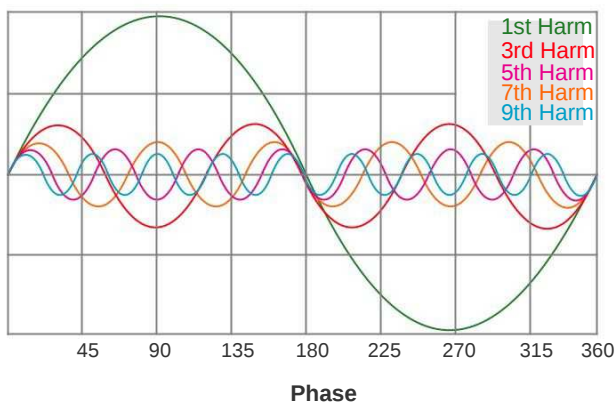
Automatic Thyristor Switched



The increasingly frequent use of non-linear loads in industrial facilities and commercial facilities (inverters, fluorescent lamps, welders, DC drives, VFDs, UPS etc.) creates elevated distortions in the waveform of circulating current.

In the presence of a "non-linear" load the current waveform will deviate from the ideal pattern and break down the wave according to the Fourier theorem will show evidence of harmonics whose number and amplitude will increase with the degree of distortion in the current waveform.

The parameter used to determine the level of harmonic distortion present in an electrical network is (Total Harmonic Distortion) THD % of voltage & current.



Some of the Negative Effects which Harmonics can generate:

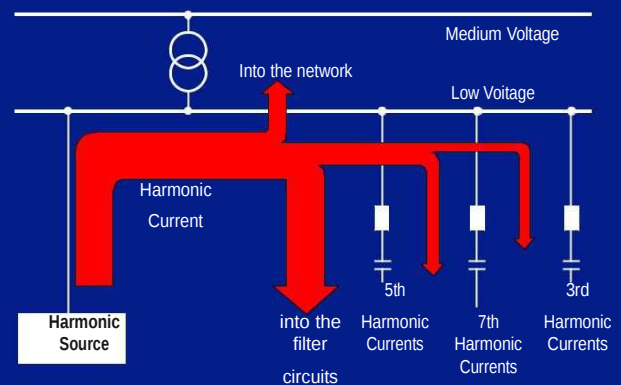
- Malfunctioning and failure in electronic equipments
- Overheating and failure in transformers and cables
- Overload and failure in capacitor banks, contactors & switchgears in APFC System
- Low efficiency of transformers and cables
- Tripping of protections without apparent reason •

Overload and failures in motors

- Interferences in communication network

There can be many other problems which ultimately results in downtime of the network. Due to high harmonic distortion lifecycle of equipment is reduced and it increases the maintenance cost. Right solution in network at right time and location can upto great extent minimize the negative effects of harmonics.

Neptune has been designing and offering Automatic Thyristor Switched multiple Toned Filter Circuits since last many years. They are designed to absorb the dominant harmonics from the network there by bringing down the THD-I levels to acceptable limits as per IEEE 519 or IEC 61000. Chances of Resonance in the network is eliminated. At the same time they offer reactive power to the network, there by improving the power factor of the same. The other major advantage is that it eliminates the need for separate power factor correction system there by saving on initial capital cost.



The design of these filters is carried out in advanced simulation software taking into account all aspects of network like fault levels, level of harmonic generating loads, Power factor, individual harmonic components, resonance point etc. Accordingly final design is implemented to get desired results.

Components

Capacitors used in Toned Filter Circuits are normally rated at voltage levels between 690V to 800V for stability and long life of toned circuit.

Harmonic Filter Reactors are the most important component of Toned System. In terms of design, operational capabilities and losses they have many unmatched features. They three-phase reactors are designed with an iron core and air gap.

These Reactors are made out of high quality material . It has been designed with properties like low temperature rise and lower flux density so that it can operate in worst conditions of ambient and harmonic overloads. They offer very high degree of linearity and low losses.

Dimensions

Multiple Tuned Harmonic Filter System for 415V- 440V/50Hz

Part No.	Output kVAR	Output per step kVAR	Switching Sequence	Dimensions W x D x H (mm)
MTHF125-415-50	125 KVAR	12.5 KVAR	1:1:2:2:4	1450 x 850 x 2125
MTHF150-415-50	150 KVAR	12.5 KVAR	1:1:2:4:4	1450 x 850 x 2125
MTHF175-415-50	175 KVAR	12.5 KVAR	1:1:2:2....	1450 x 850 x 2125
MTHF200-415-50	200 KVAR	25 KVAR	1:1:2:2....	1450 x 850 x 2125
MTHF300-415-50	300 KVAR	50 KVAR	1:1:2:2....	1850 x 1150 x 2125
MTHF400-415-50	400 KVAR	50 KVAR	1:1:1.....	1850 x 1150 x 2125
MTHF500-415-50	500 KVAR	100 KVAR	1:1:1.....	2450 x 1150 x 2125
MTHF600-415-50	600 KVAR	100 KVAR	1:1:1.....	2450 x 1150 x 2125
MTHF700-415-50	700 KVAR	100 KVAR	1:1:1.....	3050 x 1150 x 2125
MTHF800-415-50	800 KVAR	100 KVAR	1:1:1.....	3250 x 1150 x 2125
MTHF900-415-50	900 KVAR	100 KVAR	1:1:1.....	3850 x 1150 x 2125
MTHF1000-415-50	1000 KVAR	100 KVAR	1:1:1.....	3850 x 1150 x 2125
MTHF1200-415-50	1200 KVAR	100 KVAR	1:1:1.....	4450 x 1150 x 2125

Specifications

Enclosure Design	: Standardized bolted Modular Sheet Steel Enclosure-Non compartmentalized. Compartmentalized on request
Enclosure Finish	: Epoxy Powder Coated, in grey (RAL 7035) structure finish
Rated Design Voltage	: 415V-440V, 50Hz, 3 Phase 3 Wire (Design available for 380V, 400V, 480V, 690V, 750V - 50/60Hz)
Output Rating	: Refer to the table Other output ratings, switching combination or design voltages are available upon request
Duty	: Continuous
Capacitors	: DUCA POWER Super Heavy Duty series used are rated at 525V, 690V and 800V, 50/60Hz as per network voltage
Reactors	: H-Class, Single layer Wound (Tuned to 3rd, 4th, 5th, 7th and other Dominant harmonics)
Switching	: Heavy Duty Thyristor Switched, SCR-SCR type for 415/440V network
Modular Controller	: 3 Phase, 3 CT Input, CT Input 1A / 5A with inbuilt Power Quality and Load Manager
Incoming / Outgoing	: MCCB / ACB as incomer and HRC Fuses for backup protection (other combinations on request)
Ambient Temperature	: 50 °C max. short time 40 °C average in 24 hours 35 °C annual average -10 °C low limit
Protection Class	: IP 40

*Specifications are subject to change without notifications