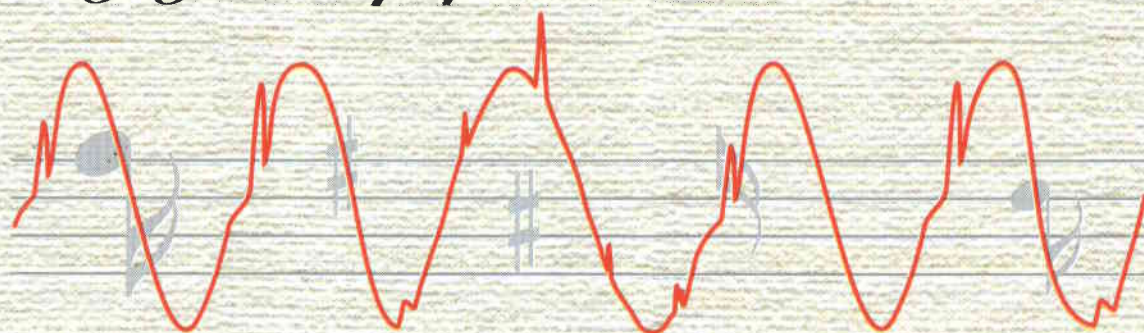
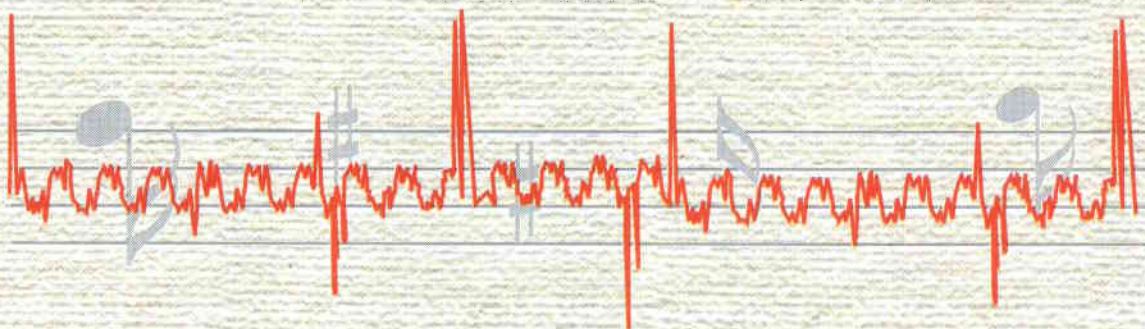


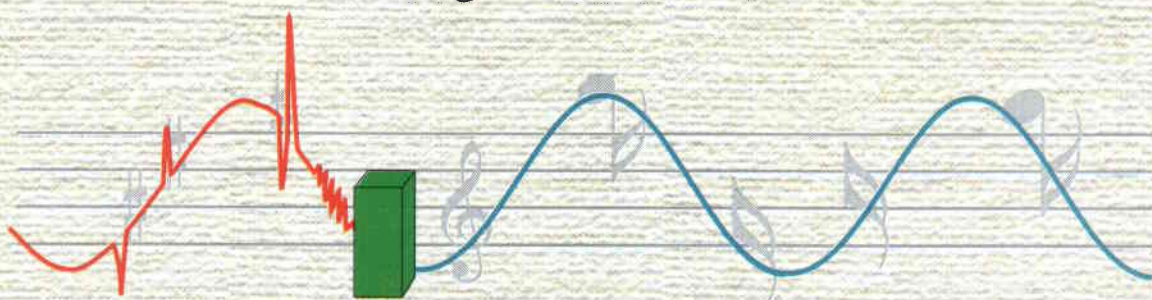
If your Equipment is the Orchestra



and Production, the Symphony.



Its about Time you eliminated the Noise.



*The Neel Noise Cut-off Transformer,
eliminates noise, completely.*

Noise Cut - off Transformer

The Electrical Noises are generated due to :

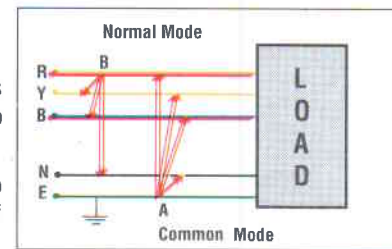
- Switching of electrical utilities like Capacitors, MCCB's, ACB's... etc. Larger the inductance of the system and larger the current change during switching, larger the magnitude of electrical noise.
- The inductive loads like big Motors, Compressors, Overhead Cranes, Elevators, Presses etc. also generates substantial switching noise.
- Switching equipments like Invertors, Converters, SMPS etc., generate electrical noise due to switching of Thyristors, Transistors, Relays etc.
- Welding systems pollutes earthing systems and add notches in the wave form, generating harmonics.
- Lightening, precipitation of the static charges and electrical discharges in the atmosphere are the natural cause of generation of various electrical noises.

Types

Electrical Noise can be classified into :

A) Common Mode : Occurs between ground and the current carrying conductors including neutral. Being high frequency noises, they don't get attenuated due to distance and therefore reach farther. They are the common source of troubles.

B) Normal Mode : Occurs between two current carrying conductors like line to neutral or line to line. These are generated and created due to switching actions of utilities & equipment. They are generally of high magnitude, causing device failures.

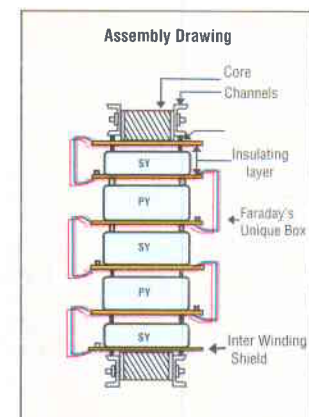


Effects

- Electrical noises are observed to occur over a wide band of frequency ranging from 1 KHz to 100 MHz and above. In magnitude also observed to be as high as 4-6000 Volts on 3 phase supply system.
- The high frequency noise can interfere with digital electronic equipments causing untraceable data entry, change of programme, loss of memory, erratic behaviour etc.
- The high voltage spikes can cause the failure of Thyristors or Transistor, Micro Processors and other sensitive devices.
- The radiated noise can interfere in operation of remote control equipment like Cranes, Digital controls or Telecommunication Equipment.

Construction

- Noise Cut-off Transformers are designed with split winding construction & bifilar Connections to reduce over all Capacitance of the winding.
- The use of high insulating materials and special shielding techniques result in attenuating common mode and minimising transverse mode noise.
- The core and its magnetic properties are properly selected to exhibit sufficient leakage inductance to provide greatest possible attenuation of normal mode power line noise, consistent with the Transfer of Fundamental power frequency. But all higher frequencies are blocked.
- The use of Faraday's Unique Box shielding and special shielding techniques totally block the transfer of electric noise even by static charge, by way of proximity or R. F. Noises.
- Due to better regulation, it does not generate common mode impedance coupling effect.



Performance

- All the types of electrical noise, predominantly common mode noises can be eliminated by Noise Cut-off Transformers. Since it isolates primary and secondary or separates neutral to ground bond on the secondary side, can be used to create separately derived source to combat current loops.
- The Noise Cut-off Transformers are available in different levels of noise attenuation capabilities. The most commonly used are 100 & 120 dB. The coupling capacitance between primary and secondary is direct 1:1 relationship with dB levels. Some of the graphs herewith indicate different types of electrical noise observed in typical Engineering Industries & successfully eliminated.



Uses

Noise Cut-Off Transformers are commonly used to :

- Protect the Computers, CNC Machines and Telecommunications equipment from damage due to electrical noise, spikes etc.
- If ground potential of system units are different from each other and are exposed to the effects of instability at high frequencies.
- If ground of the equipment cannot be earthed.
- When no slightest current leakage is permitted in the equipment. Especially for computers and CNC controls less than 100 micro Amps is only permitted.
- To shield large number of electronic equipment which individually also are producing different types of electrical noise at a common busbar typically CNC machines, Drives, Hardening equipment etc. The use of NCT, being bidirectional, prevents damage due to circulating noise interference within them.
- To protect against strong lightning, impulse noise, bus short-circuit, accidental discharge of capacitors etc.
- When multiple Noise Cut-off transformers are used, the suppression effects increase in proportion.

Therefore, the effects of cascading Noise Cut-off Transformers is remarkable.

With the use of Noise Cut-off Transformers

A) No impedance matching is required. B) Characteristics are symmetrical to allow suppression effect to work in both ways. C) No secondary effects, such as noise generated by series resonance at some frequency as with filters and other similar devices.

Technical Specifications

	Input	Output	Rating	Common Mode Attenuation
Single Phase	110/ 220 V	110/ 220 V	0.4, 1,2,3, 5, 8, 10, 15, 20, 25	120 dB.
Three Phase	415V*	415V	1, 2, 3, 5, 8, 15, 25, 30, 40, 50, 60, 75, 100, 125, 150, 200, 225, 250 & 300	100 dB Standard & 120 dB on request

* Non Standard voltages can also be supplied.

Regulation : 2-4% for 100% change in current @ unity P.F.

Connections : Delta/Star for 3 phase

Operating power factor : 0.75 lagging to 0.75 leading

Dielectric strength : 2500 V for 60 secs.

Resistance : Greater than 1000 Mega Ohms

Coupling capacitance : 0.1pf for 100dB 0.05pf for 120 dB.

Leakage current : less than 20 micro Amps.

Comparison with Isolation (Shielded) Transformer

Technically, any transformers that have no direct current path between its primary and secondary windings provides "isolation". Other commonly used transformers, even if they have a separate primary & secondary winding, are intended to convert the input voltage to a more useful level and do very little to attenuate the passage of noise or transients from primary to secondary. Even though both are separately wound Transformers, they are substantially different with respect to construction, specification and performance characteristics.

In Shielded Transformer, 4 low impedance paths exist for noises to pass to secondary and vice versa. (as shown in drawing). A) The high value of coupling capacitance, B) Maximum linkage of magnetic field, C) The leakage current, D) Static transfer of electrical noises.

By Function

- Noise Cut-off (Ultra Isolation) Transformer**
1. High Noise Attenuating Characteristics 100/120 dB.
 2. No Electrical switching noises amplified and noises are not allowed to secondary of the transformer.
 3. Electro static & Electro magnetic noises due to welding also attenuated.
 4. Magnetically sensitive equipments can work near the installations.

Isolation (Shielded) Transformer

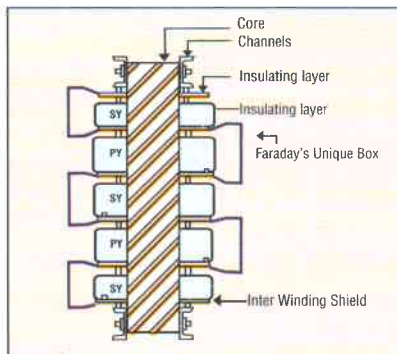
Poor Noise Attenuating
Typical 20 dB.
Amplifies electrical noises between 100 Khz-1MHz an area where maximum switching noises are generated.
Noises are passed on through secondary to load.
Magnetically sensitive equipments cannot work near the installations due to high electromagnetic field generated.

By Electrical Parameters

Parameter	Noise Cut-off (Ultra Isolation) Transformer	Isolation(Shielded)Transformer
Coupling Capacitance	Better than 0.1 Pico farads (10^{-12})	1-10 Micro Farads (10^{-6})
Inductance	Substantially high	Minimum
Resistance	Greater than 1000 mega Ohms	Greater than 50 mega Ohms
Leakage Current	Less than 20 Micro Amps (10^{-6})	Less than 5 Milli Amps (10^{-3})
Noise Attenuation	Better than 100 dB= 1/1,00,000	20 dB maximum= 1/10
Electro Static Static & Electro magnetic Noise	Yes, eliminates	Cannot eliminate

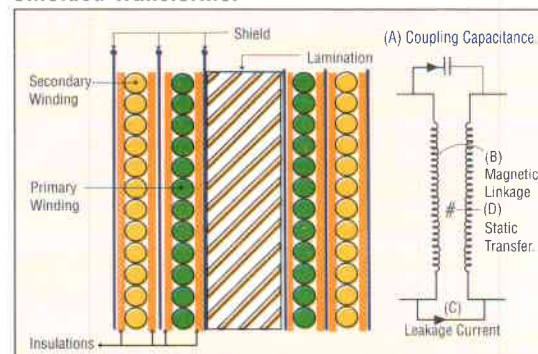
By Construction

Noise Cut off Transformer



Consumes extra quantity and better quality of copper, lamination etc.(50-70 %) with high content of special grade insulating materials

Shielded Transformer



Normal content of Copper, lamination & of insulating materials etc.



Total Power Solutions and more....

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