Air Core Reactor

Reactors are either series or shunt connected. Series reactors are generally used as current-limiting reactors while shunt capacitors are often used to provide reactive compensations. Some of the application are explained below:

Type of reactors:

- Damping reactor for capacitor banks
- Thyristor control reactors
- Current-limiting reactors
- Neutral-earthing reactors
- Filter Reactors
- Shunt Reactors

❖ Damping reactor for capacitor banks:

The transient switching and inrush currents of a shunt capacitor bank can be limited by a damping reactor connected in serries with the bank; damping reactors are comparable to series reactor with low reactance.

❖ Thyristor control reactors:

Thyristor controlled reactors, called TCR-reactors, are used in static var compensation systems. TCR-reactors are similar to the shunt reactors, but the current is continuously controlled by thyristor valves. The tree phase reactor is delta connected. Each phase reactor is split into two coils and the thyristors are connected between the coils. TCR-reactors are available up to 36Kv and up to 180MVA Power.

❖ Current-limiting reactors:

Current-limiting reactors are mainly used o limit short-circuit current, i.e . To prevent fault currents from rising to values dangerous for the equipment. Normal types of breakers, cables and equipment can thus be used instead of those with higher short-circuit power rating. This means saving money.

❖ Neutral-earthing reactors:

A neutral-earthing reactor is connected between the neutral point of a three phase system and earth. Its purpose is to limit the line to earth current of a directly earthed network or to reduce the line to earth current of an insulated line to a value suitable for protection.

❖ Filter Reactors

The filter has two functions, namely to produce capacitive reactive power at basic frequency and to filter out harmonics, a harmonic filter is designed to have a small impedance between phase and earth or between the phases at required harmonic frequency. Therefore the harmonic current will flow into the filter and into the network. Normally each required harmonic frequency has a separate filter circuit. For higher harmonic frequencies a wide-bank filter is used. We manufacture filter reactors according to the customer's specification. Our filters reactors may be equipped with off-load tapping to make an accurate tuning possible at required frequency. Regulation is to meet the customer's demands.

❖ Shunt Reactors:

Shunt reactors are used to compensate for capacitive reactive power generated by long lightly loaded transmission lines. Shunt reactors are switched on/off by breakers and are normally connected to the tertiary winding of the main transformer. Reactors are available up to 36Kv voltage level and 100MVA power.

Detuned Filter

- Power factor correction capacitors may cause resonance between capacitors and network in the power system with harmonics producing loads.
- Detuned reactor connects in series with capacitor can avoid this resonance and absorb some for the particular harmonics current.
- Detuned filter is the most efficient and cost effective solution in most of this harmonics problems**.**

Design and Construction

- The Farakoh's detuned reactor are designed; manufactured and test conformed to the last version of IEC No.289 and other standards are available upon request.
- The core is made from high quality and high permeability steel sheets and carefully stacked leading to low iron losses and filling factor. Suitable designed core clamping system ensures an operation free from vibration and low noise.
- The winding are made of high quality copper or aluminum in connection with cable lug terminals.
- The Farakoh's reactor are completely impregnated under vacuum condition and immersed in polyester resin and dried in oven chamber of 150°which cause the reductions of noise level and increase in corrosion resistance.

Technical Specification

Standard: IEC 289

Design: dry-type, Iron Core

Enclosure: IP 00 for indoor use to mounted with metal enclosure up to IP 23

Cooling: natural Self-cooled

Harmonic loading:

U_{H3}=0.5% Un(duty cycle 100%)

U_{H5}=0.5% Un(duty cycle 100%)

U_{H7}=0.5% Un(duty cycle 100%)

Thermal loading: I_{TH}=1.05 Ieff

Magnetic linearity: L_{LIN}=1.2*∑I with L>0.95*Ln

Tolerances of the inductance: ±3% of Ln

Power frequency withstand: Coil to core 6Kv-1min according to IEC 76-3

Lightning Impulse withstand: 50KV

The following ratings are typical standards of detuned reactor

Other ratings are available upon request

Model	Capacitor (3 Phase-Kvar)	P Factor (%)	System Voltage (KV)	Rated current (A)	Inductance (1 Phase) mH	Dimension	Weight (app-Kg)
FPB450/7	450	7	6.3	50	19.65	400x240x360	90
FPB725/7	725	7	6.3	80	12.2	400x240x360	115
FPB600/6	600	6	7.2	58	16.5	400x240x360	100
FPB500/6	500	6	7.2	48	19.8	400x240x360	90

Iron Core Reactor

Detuned reactor for power capacitor

Up to 11Kv , indoor use

Problems caused by Harmonics

Resonance in the industries, utilities and communication systems have ,the following effects:

- Damages on the capacitor banks
- Flow of high harmonic currents into the power network
- Mechanical resonance on rotating electrical machines
- Damages on the solid state devices
- Metering Errors
- Disturbance of data processing equipment and electronic control equipment

APPLICATIONS:

The Farakoh's detuned reactors are intended to be used, particularly, in series with the medium voltage power capacitors which to be used for power factor correction of Ac power systems. Which feed the harmonic producing equipment, moreover, according to increasing use of nonlinear loads in M.V networks, applying these reactors are inevitable