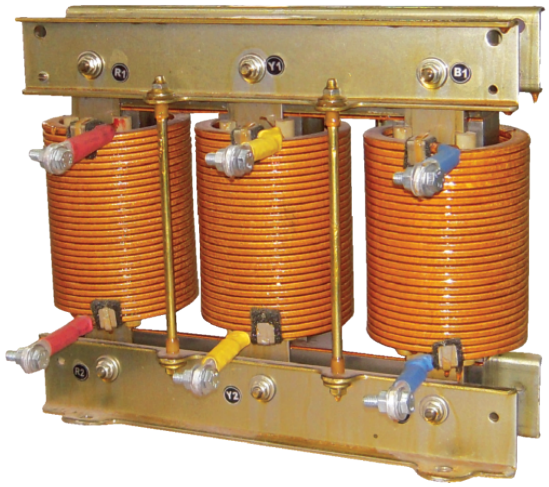
NEPTUNE

# Harmonic Circuit Filter Reactors 5.6%, 7% & 14% and Shunt Reactor

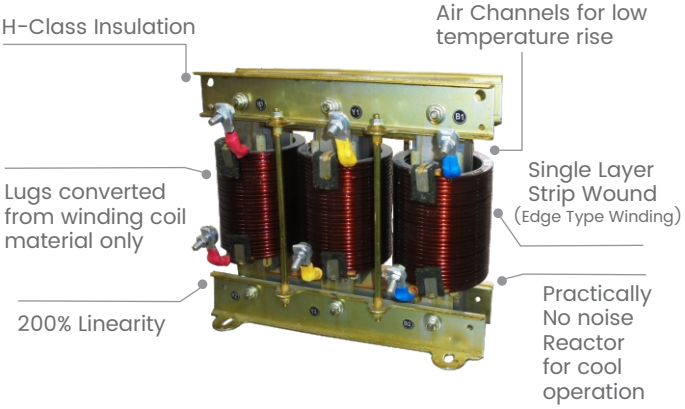


## Design Features

Neptune Harmonic Filter Reactors, in terms of design, operational capabilities and losses leave all other reactors available in market way behind. The three-phase filter reactors are designed with an iron core and air gap. The Harmonic Filter Reactors are made out of high quality material and very stringent quality control. 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 a very good degree of linearity and low losses.

Cheaper and non-linear reactors may trigger undesirable chain phenomena during periods of operation with high harmonic values, such as reduction in the inductance with consequent increase in the resonance frequency of the LC group, which would drain off more harmonic current, further reducing its inductance and overload the reactor more and more.

Neptune Harmonic Filter Reactors are available with filtering factor of 5.6%, 7% and 14% as per standard ratings. Any other filtering factor and rating can be developed on request.




## Series Combination

Neptune Reactors are designed to be used in series with capacitor bank to make Tuned or De-Tuned Filter Circuit as per the design requirement.

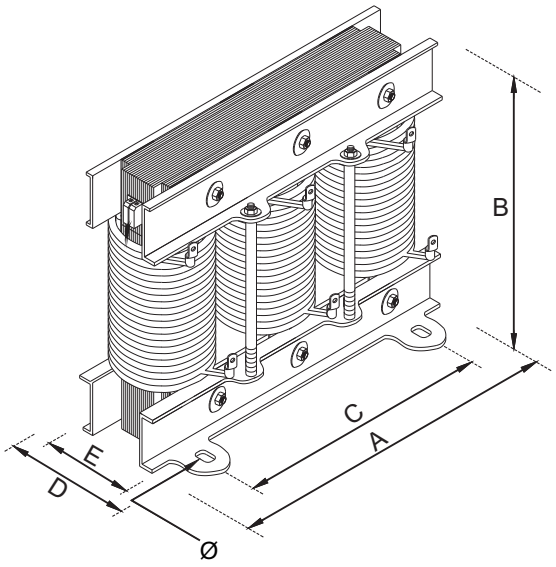
## Features

- Neptune Reactors are designed with many low loss features in comparison to other brands available in market
- Single layer strip wound type construction for better cooling and heat dissipation resulting in lower losses
- Capable of withstanding very high harmonic overload Ambient Temp. (Max. Temp. sustained) up to 60°C
- Step core type design for lower losses
- Vacuum Impregnated
- Linearity (withstand capability on resonance freq. and high harmonic current variation) - 200% (L>0.95 x Ln)
- Strip wound conductor (Al. / Cu.) has been converted into terminals (instead of Lugs) to avoid temperature rise across the joints
- H-Class Insulation, 180°C
- High Temp. disconnection above 155°C

## Technical Specifications

| | | |
|---|---|---|
| Rated Voltage | : | 3 x 415/440V |
| Rated (KVAr) | : | 5 KVAR - 100 KVAR |
| Frequency | : | 50 Hz |
| Constructional Max. Voltage | : | 1000 V |
| Test Voltage | : | 3000 V |
| Filtering factors / Tuning freq. | : | 5.6% (210 Hz),<br>7% (189 Hz)<br>12.5% (141 Hz)<br>14% (133 Hz) |
| Tolerance of inductance | : | ±3% |
| Linearity (L> 0.95 x Ln) | : | 200% |
| Ambient temperature | : | + 60°C |
| Winding material | : | AL. (Cu. on request) |
| Insulation class | : | H, 180°C |
| Cooling method | : | Natural cooling (AN) |
| Installation | : | Indoor |
| Protection degree | : | IP 00 |
| Operating altitude | : | 1000m above sea level at Rated operation \ |
| Temp. sensor (NC) | : | 155°C |
| Reference standard | : | IEC 61558-2-20 |

*Specifications are subject to change without notifications




Harmonic Circuit Filter Reactors
5.6%, 7% and 14%

## Reactors Dimension

| | Type | A | B | C | D | E | Ø |
|---|---|---|---|---|---|---|---|
| **7%** | 5 | 225 | 195 | 130 | 105 | 80 | 6 |
| | 7.5 | 225 | 195 | 130 | 105 | 80 | 6 |
| | 10 | 260 | 225 | 155 | 115 | 82.5 | 6 |
| | 12.5 | 225 | 225 | 155 | 115 | 82.5 | 6 |
| | 15 | 290 | 255 | 155 | 118 | 82 | 6 |
| | 20 | 290 | 250 | 165 | 120 | 80 | 6 |
| | 25 | 290 | 255 | 170 | 125 | 85 | 6 |
| | 50 | 360 | 300 | 185 | 140 | 105 | 8 |
| | 75 | 400 | 350 | 191 | 150 | 110 | 8 |
| | 100 | 400 | 350 | 225 | 155 | 115 | 10 |
| **14%** | 5 | 260 | 225 | 155 | 115 | 82.5 | 6 |
| | 7.5 | 290 | 255 | 155 | 118 | 82 | 6 |
| | 10 | 290 | 250 | 165 | 120 | 80 | 6 |
| | 12.5 | 290 | 255 | 170 | 125 | 85 | 6 |
| | 25 | 360 | 300 | 185 | 140 | 105 | 8 |
| | 50 | 400 | 330 | 225 | 158 | 115 | 10 |
| | 100 | 500 | 410 | 295 | 195 | 145 | 13 |

## Shunt Reactor

Shunt reactors are mainly used in places with long power transmission and distribution lines. These cables have a capacitive characteristic at longer distances. This capacitive characteristic causes the system to become overcompensated. This results in penalties in electricity bills because of high capacitive demand.

They are also recommended to be used in Data Centers or other buildings having a lot of loads with high power factor. There can be issues in DG set operations wherein voltage can fluctuate if power factor of the network is more than 0.95 lagging.

Furthermore, this capacitive characteristic causes the line voltage to increase and may damage sensitive equipment connected to it. This problem can also be observed in industrial zones, wide campuses, solar farms etc.

The solution for this problem is loading the system inductively with shunt reactors. These reactors can be used as single or three phase. They will utilize necessary inductive load for the system to stop over compensation.

## The main problem caused by leading power factor

- Penalties in electricity bills
- Increasing in line voltage
- Breakdown in sensitive equipment
- Active energy passing through the system is decreased by capacitive effect.

## Shunt Reactor Features

- Rating available upto 50 KVAR
- Single or three phase Shunt Reactors
- Highly permeable iron core
- High quality aluminium windings
- Thermal switching protection against overheating
- Low losses, high efficiency
- Vacuum impregnated
- Manufactured under ISO 9001 quality management system

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