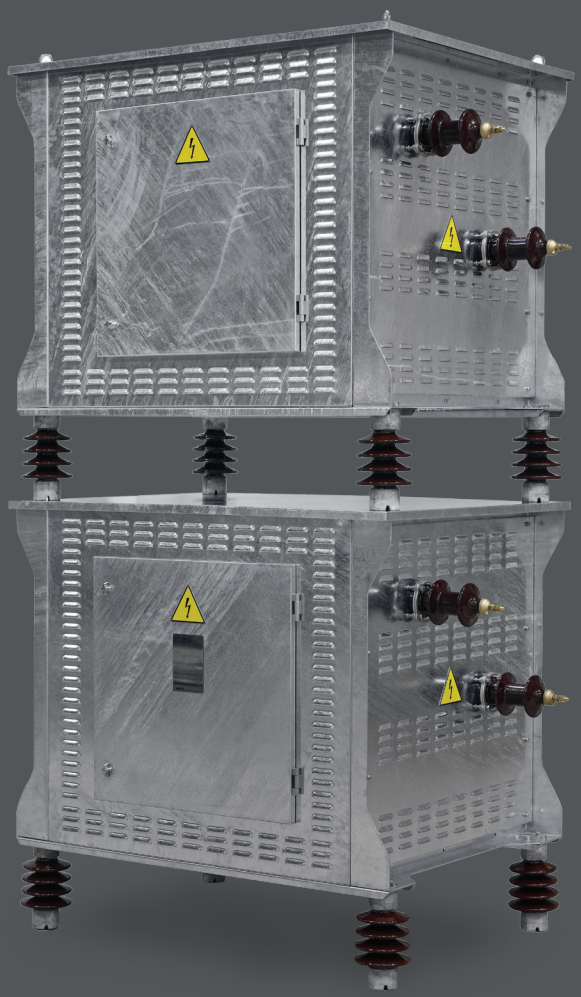
Filter Resistors



FR Series

FRF | FRC | FRL | FRD | FRH

aktif
ELEKTROTEKNİK

Filter Resistors
FR Series

Aktif manufactures resistors for special applications. These resistors consist of Harmonic Filter Resistors, RC Snubber Filters, Current Limiting Resistors, Ferroresonance/Damping Resistors and Discharge Resistors.

Harmonic Filter Resistors

Hassive harmonic filtration is the most efficient and cost-effective method to eliminate harmonics. The harmonic filter systems can in principle only consist of capacitor and reactor (LC). However, in this case, a change in the value of the capacitor or reactor due to manufacturing defect, aging or temperature can affect the filtering very seriously and may even cause the parallel resonance to increase even more harmonics. This sensitivity can be controlled by adding resistance to the filter circuit and the harmonic filter system can continue to work with the same efficiency for a long time. For low-voltage systems, harmonic filtering with a capacitor and a reactor is a more optimal solution due to low risk. However, considering the risk of changing the capacitance of the capacitor and the damages that may occur due to this, in medium voltage and high voltage systems, using harmonic filter resistance is a more optimum solution.

Standards

- IEC 60071
- IEC 60060-1
- IEC 60529
- EN ISO 1461

Application Areas

- Arc Furnaces
- Mining Industry
- Iron and Steel Industry

Technical Specifications

- Suitable up to 36 kV rated voltage
- Stainless steel resistance material
- Special mechanical and electrical design to withstand high temperature and inrush current
- Design and tests in accordance with IEC 60071-1 and CIGRË WG 14.30 Section 17 Resistors and other special specifications
- IP23 Protection Level

Advantages

- Easy access and maintenance to the resistor blocks on site thanks to blocks independently mounted to the frame
- Fully-modular, rigid, strong enclosure design with resistor blocks mounted to the frame for safety lifting from the upper or lower side
- Frame suitable for side by side (horizontal) or stacked (vertical) installation

Options

- Requested inductance limits
- Stainless steel, aluminum enclosure
- Painting enclosure in desired color code
- Side or top entry or exit with bushings
- Modular elevation legs suitable for extreme environmental conditions
- Special design for high altitude

RC Snubber Filter

In order to attenuate the transient voltage that occur during the commissioning loads of inductive character, the snubber capacitor which do not allow sudden changes in the voltage and the series-dependent damping resistance are used. RC snubber filters are connected parallel to the network as close as possible to the load causing transient voltage. During the transient voltages occurring at high frequencies, the RC filters' impedance decreases to low value, prevent over-voltage of the mains voltage and damp the oscillation very soon.

Standards

- IEC 60071
- IEC 60060-1
- IEC 60529
- EN ISO 1461

Application Areas

- Arc Furnaces
- Mining Industry
- Iron and Steel Industry

Technical Specifications

- Suitable up to 36 kV rated voltage
- Stainless steel resistance material
- Special mechanical and electrical design to withstand high temperature and inrush current
- Design and tests in accordance with IEC 60071-1 and CIGRË WG 14.30 Section 17 Resistors and other special specifications
- IP23 Protection Level

Advantages

- Easy access and maintenance to the resistor blocks on site thanks to blocks independently mounted to the frame
- Fully-modular, rigid, strong enclosure design with resistor blocks mounted to the frame for safety lifting from the upper or lower side
- Frame suitable for side by side (horizontal) or stacked (vertical) installation.
- High internal insulation and high mechanical resistance against to shocks and sagging thanks to the use of large surface satiated bushings and M16 shear connectors

Options

- Requested inductance limits
- Stainless steel, aluminum enclosure
- Painting enclosure in desired color code
- Side or top entry or exit with bushings
- Modular elevation legs suitable for extreme environmental conditions
- Special design for high altitude

Current Limiting Resistors

Current limiting resistors are used to reduce the transient current and to adjust the test current to the desired value at power laboratories and some special applications. Current limiting resistors are especially designed and manufactured according to their intended purpose.

Ferroresonance / Damping Resistors

Ferroresonance is a nonlinear resonance phenomenonthat affects power networks. Circuit must contain at least below circuit elements as it can be definedas ferroresonance:

- Non-linear saturable inductance (example; transformer)
- Capacitor
- Resistor

In a circuit consists of these elements; by changingthe values of an electrical component, the values of current and voltage values on the terminals at other components change suddenly.

When the voltage transformers' protection windings are used as circuit in Figure-1 (a fixed ohmic resistor is connected to ends of open-delta connection) third harmonic currents flows and thus the resonance is prevented. The advantages of this resistor; it doesn't affect measurement precision and doesn't cause to any loss under normal operation conditions. Open-delta circuit should be grounded from only one point shown as Figure-1. Resistor damps only unbalanced situations. On balanced situations, there is no current flow at open-delta circuit.

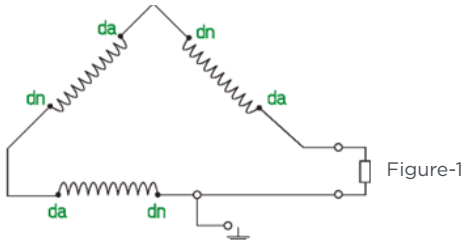
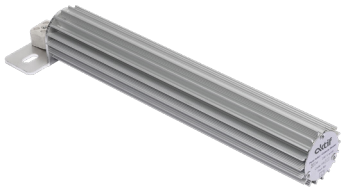


Figure-1

Standards

- IEC 60664-1
- IEC 60529



Application Areas

- Voltage Transformers
- Power Transformers

Ferroresonance Technical Specifications

- High cooling surface aluminum
- IP5X protection degree
- Stainless steel resistance element

Damping Technical Specifications

- Different voltage up to 36 kV
- Stainless steel resistance element
- Optional protection degree from IP00 to IP55

Discharge Resistors

Discharge resistors are used to discharge the capacitors and batteries. Discharging the capacitors and batteries may be compulsory for maintenance. Discharging may be for safety reasons or in order to do load testing at power laboratories and some special applications. Discharge resistors are especially designed and manufactured according to their intended purpose.

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