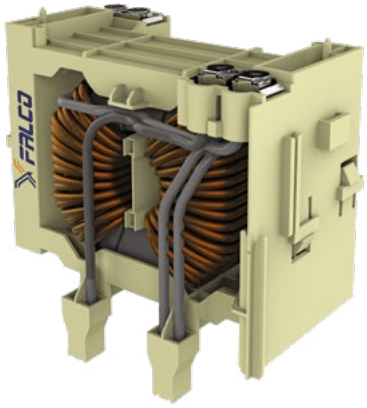
FALCO

MAGNETIC COMPONENTS

PFC INDUCTORS

Inductors in the PFC circuit shape the input current waveform to reduce the phase angle between voltage and current (harmonic distortion reduction).



FEATURES

- Cores with low loss material, such as Ferrite and Powder Alloy to raise circuit efficiency.
- Toroidal geometry allows the use of thicker conductors that results in low DC resistance yielding higher current capacity up to 1000A.
- Energy density up to 1.5 J/dm3 (L = 60 µH @ 500A in 5dm3).
- Insulation systems Class B (130°C), F(155°C), H(180°C) or N(200°C).

APPLICATION

- IT & Data Centers: AC/DC Power Supplies, 3 phase UPS (Rectifier block).
- EV Charging infrastructure: Active Front End block of DC Chargers.
- Industrial Plants: Active Harmonic Filters .

OUTPUT INDUCTORS

Output inductors filter the current ripple resulting from the switching frequency by storing/releasing energy.

FEATURES

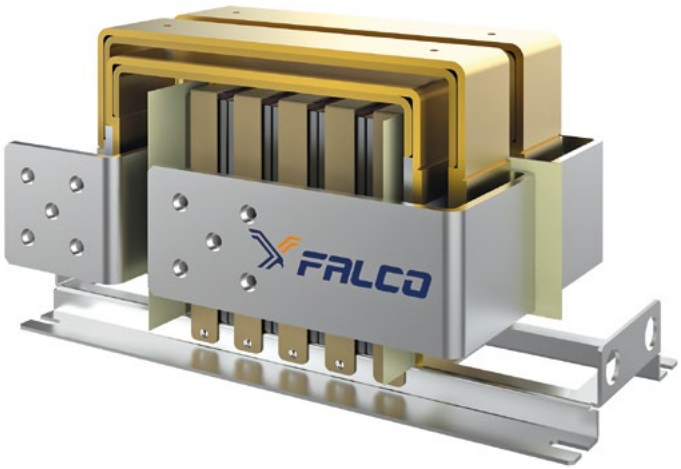
- Powder Alloy core materials are used to achieve low saturation at peak ripple current values.
- A soft roll-off of Inductance vs DC Bias is achieved by using materials with low permeabilities like 26µ, 40µ, 60µ.
- Edge wound flat wires minimize DC resistance yielding higher current capacity.
- Energy density up to 2 J/dm3 (L = 60 µH @ 900A in 12dm3).
- Insulation systems Class B (130°C), F(155°C), H(180°C) or N(200°C).

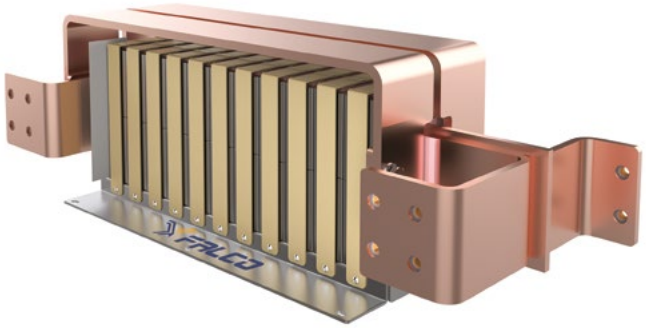
APPLICATION

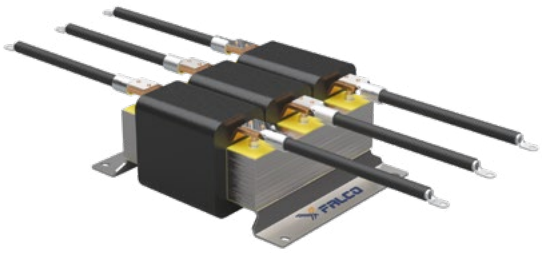
- IT & Data Centers: AC/DC Power Supplies, 3 phase UPS (Inverter block).
- EV Charging infrastructure: Output filter block of DC Chargers.
- Solar String Inverters: Inverter Block.
- Energy storage converters: Output filter block of DC/DC(or DC/AC) converter.

COMMON MODE CHOKES

Common Mode Chokes block high-frequency noise (common mode currents) while allowing low-frequency signals pass, featuring coupled windings on a single high permeability core, wound in opposite direction.







FEATURES

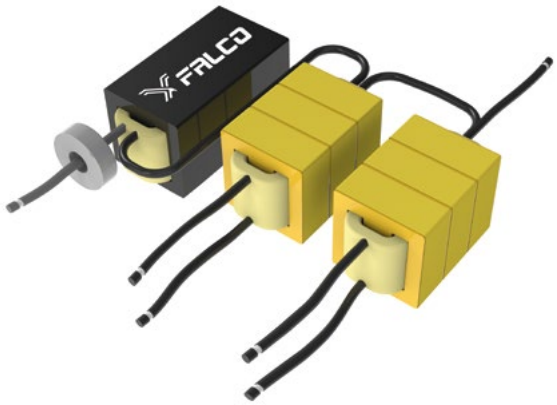
- Cores with high permeability such as ferrite and nanocrystalline allow to achieve high impedance.
- Laser welded bars (Copper or Aluminum) are used to minimize DC resistance yielding higher current capacity.
- Available solutions up to 2000A rated current.
- Insulation systems Class B (130°C), F(155°C), H(180°C) or N(200°C).

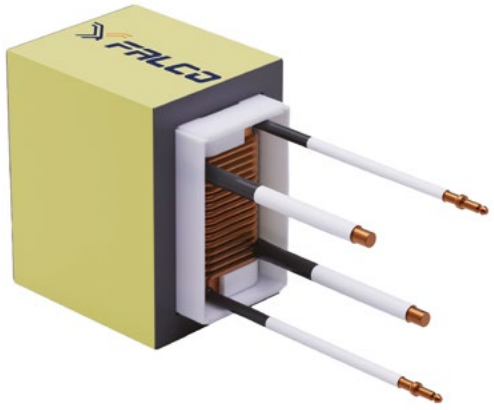
APPLICATION

- IT & Data Centers: EMI Filter block of AC/DC Power Supplies.
- EV Charging infrastructure: EMI Filter block of DC Chargers.
- Solar Central Inverters: EMI Filter block of inverter.

HIGH-FREQUENCY POWER TRANSFORMERS

High-frequency power transformers operate at frequencies significantly higher than conventional grid power transformers (50/60 Hz), typically in the range of 10 to 100K Hz. These transformers can be up to 10 times smaller than their lower-frequency equivalents.





FEATURES

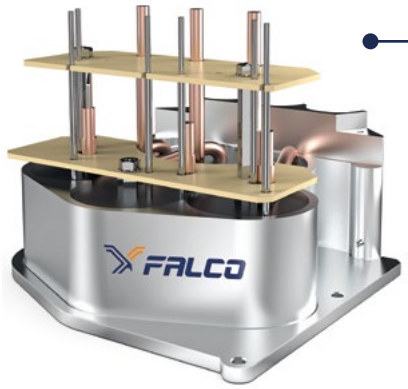
- Ferrite and nanocrystalline materials minimize losses at high frequency compared to steel lamination materials used in traditional transformers.
- Power density up to 6 kW/dm3. L = 0.6 mH @ 40Khz for 25kW power converter solution is available in 4dm3 size.
- Litz wire (multiple insulated strands) solutions are used to mitigate the skin effect which causes current to crowd at the conductor's surface at high frequency and increase resistance. Available Litz wire construction up to 30,000 strands of AWG44 enameled wire, built in sub-bundles of 1000 strands (e.g. 10 bundles x 100 strands or further complex pattern).
- Insulation systems Class B (130°C), F(155°C), H(180°C) or N(200°C).

APPLICATION

- IT & Data Centers: AC/DC Power Supplies.
- EV Charging infrastructure: DC Chargers.
- Solar micro Inverters: DC/AC insulation Transformer.
- Smart Grid Integration: solid state transformer (SST).

HEATSINK INTEGRATED MAGNETICS

Falco can develop heat dissipation solutions for magnetic components such as encapsulation, cold plates, or integrated liquid cooling. 3D modeling and thermal simulation allow us to optimize the design before prototyping. Our experience in material selection and construction methods is a knowledge base that allows us to accelerate and optimize the design.



ENCAPSULATED

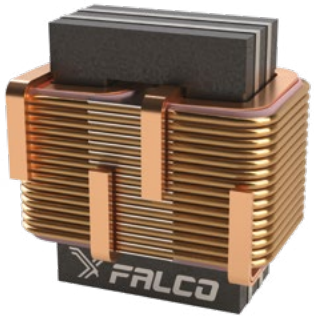
Encapsulation within a heatsink protects, insulates and transfers heat to ensure optimal performance and longevity of the component. It replaces air with a solid, thermally conductive material to dissipate heat, and protect against environmental damage.

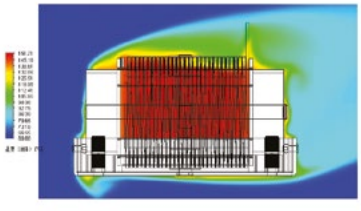
COLD PLATE MOUNTED

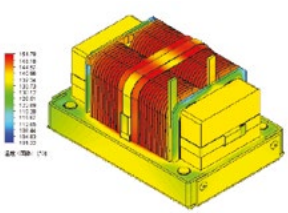
Component is integrated into a heatsink with imbedded cooling coils.

INTEGRATED LIQUID COOLING

Cooling coils are wrapped directly on the electro-magnetic component and encapsulated resulting in further heat dissipation.







THERMAL TRANSFER ANALYSIS

Verification of the thermal performance can be simulated before sampling by using thermal simulation software. The simulation allows us to adjust the design to improve the heat transfer before validating with a sample.

MAGNETIC COMPONENTS ASSEMBLIES

Falco has developed an expertise in integrating larger magnetic components into rack assemblies for the power conversion industry.

Integration of multiple Common Mode Chokes and Inductors within a single rack saves space, optimizes electrical connection points, and makes assembly of the magnetics into the power converter easier.

FEATURES

- Design of custom racks to house large heavy inductors.
- Terminations with cables or bars according to needs.
- Orientation of Inductors to maximize the cooling effect of forced airflow present in final customer equipment.
- Other components such as Current Transformers, Capacitors, and Shunt resistors can be integrated for a more complete solution.

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