



COIL INNOVATION

The Power that Connects

HIGH-PERFORMANCE

AIR-CORE, DRY-TYPE REACTORS



ENGINEERING EXCELLENCE

IN AIR-CORE, DRY-TYPE REACTOR TECHNOLOGY

COIL Innovation's air core, dry-type reactors are engineered for the most demanding power and voltage levels worldwide. Our AC reactors deliver exceptional performance with reactive

power ratings of up to **240 MVar per coil** and **installation capabilities up to 765 kV**. For DC applications, the equivalent AC power can reach an impressive **300 MVar** per coil unit, with sys-

tem voltages reaching **1100 kV**. To guarantee outstanding product performance and reliability, COIL Innovation operates state-of-the-art testing facilities, ensuring uncompromising quality assurance throughout every stage of production. Our advanced testing capabilities set industry benchmarks and ensure that each reactor meets global performance expectations.

ENGINEERED FOR EXTREME CONDITIONS

We also provide proven solutions for high seismic environments, ultra low noise requirements, and challenging environmental conditions. Every solution is tailored precisely to customer specifications, ensuring reliable performance and long term value in even the most demanding applications.

**Power.
Precision.
Reliability.**





PRODUCTS

**Reliability,
efficiency and
sustainability –
combined in
an innovative
COIL solution.**

COIL Innovation's air-core, dry-type reactors are used wherever electrical energy must be transmitted or distributed safely, efficiently and reliably. They are a key component of modern power delivery and industrial systems, making a significant contribution to the protection and performance optimization of electrical networks.

Thanks to their linear electrical behavior and consistently stable performance, air-core reactors have established themselves as a future-proof solution over recent decades. Their cost advantages across the entire life cycle — along with increasing demands driven by modern power electronics and semiconductor technologies — make this design indispensable.

Built with high-performance, outdoor-rated insulation materials and advanced integrated manufacturing technologies, our air-core, dry-type reactors support high power ratings and voltage levels—even in demanding test and research environments. They are environmentally friendly, fire-resistant, and require virtually no maintenance, ensuring reliable operation.

COIL Innovation stands for durable, sustainable and high-performance coil solutions tailored to customer needs — engineered for the electrical energy systems of today and tomorrow.

The Power that Connects

HVDC

COIL Innovation offers a broad range of reactors for HVDC and power-electronics applications, which can be divided into several functional categories. DC smoothing reactors are installed on the DC side of the system to effectively reduce ripple currents, favorably influence resonant frequencies, and thereby increase the overall stability of the HVDC link. During fault events, these reactors also limit the maximum available fault current and protect sensitive semiconductor components such as thyristor valves from transient overvoltages, which may be caused by grid disturbances or lightning events. In modular, multi-arm converters, converter reactors are employed to limit internal circulating currents between converter arms, reducing the rise of DC fault currents, decoupling individual control loops, and enabling precise control of active and reactive power. At the same time, they act as inductive protection for the valve modules against transient phenomena originating from the AC network, ensuring stable dynamic behavior of the converter as a whole. In relation to power-quality performance, AC and DC filter reactors are utilized. These are



typically combined with capacitors and resistors to form filter circuits that produce a defined harmonic response. They block harmonic currents or divert them through low-impedance paths to ground, thereby improving current quality on both the AC and DC sides and reducing harmonic distortion typically produced by power-electronic

converters. COIL Innovation also manufactures specialized PLC filter reactors, damping reactors and high-frequency filter reactors, each optimized for specific frequency bands or damping requirements. As series-connected components, they provide high impedance at selected high-frequency ranges, preventing the penetration of

high-frequency harmonics into either the AC or DC system. In doing so, they stabilize the operation of HVDC installations and power-electronic systems, support the reliable transmission of sensitive control signals, and effectively dampen undesired resonance phenomena within the wider system.

DC Smoothing Reactors

Phase/Arm/Converter Reactors

PLC Filter/Damping/High-Frequency Filter Reactors

AC and DC HVDC Filter Reactors

LINE TRAPS



Line traps are reactors installed in high-voltage transmission lines to block high-frequency communication signals while ensuring that the power-frequency current remains unaffected. These components prevent carrier-frequency communication signals from leaving the line section for which

they are intended, thereby safeguarding reliable communication over the transmission network. Line traps incorporate electronic tuning units that define their blocking characteristics, ensuring that communication signals remain on the designated transmission path while electrical

energy transport continues without interference. The international distribution of carrier-frequency line traps manufactured by COIL Innovation is managed by ARTECHE, a Spain-based company that holds an exclusive agreement with COIL Innovation.



HV CURRENT LIMITING REACTORS

Current-limiting reactors intentionally increase circuit inductance, slowing current rise and reducing maximum short-circuit current. This relieves stress on load-side switchgear, transformers, power electronics and cables.

Applications include load-flow regulation, load balancing and bus-coupling. Installable at voltages up to 765 kV AC.



HV SHUNTS



Compensation reactors specifically reduce the voltage level by offsetting the capacitive reactive power present in the electrical network with inductive reactive power, thereby ensuring a stable system voltage. High-voltage shunt reactors feed directly

into high- and extra-high-voltage grids.

High-voltage shunts are connected directly to the electrical system and may be designed with either fixed or variable inductance. Their design requires

extensive expertise in high-voltage engineering, transient electrical phenomena, environmental influences, mechanical requirements and conservative design limits to ensure safe, reliable and long-term operation.



MV SHUNTS

Medium-voltage shunt reactors are compensation reactors which feed either directly into medium voltage networks or indirectly into high-voltage grids by connecting to the tertiary winding of a transformer. They are designed for voltage levels up to 60kV.



FACTS

FACTS systems are used to flexibly and rapidly regulate power flow, voltage and system stability in AC transmission networks. They increase the transfer capacity of existing grids, improve network stability, and reduce losses and disturbances. Different types of air-core reactors are used depending on the system.

MSCDN

Phase Reactors

TCR

Special Applications (TCSC, MSR)

COMPLEMENTARY APPLICATIONS

Air-core reactors can be used in a wide range of applications, including harmonic filters, short-circuit current limitation in medium-voltage feeders or ground-fault currents, and limiting the rate of change of current.

Neutral Grounding Reactors

Filter Reactors

Test Reactors

Special Applications

COIL Innovation develops and manufactures a broad range of air-core reactors for medium- and high-voltage applications. These include:

Neutral grounding reactors, installed between the transformer neutral and earth to limit ground-fault currents and enhance grid safety.

Filter reactors, used together with capacitors and resistors in filter systems to reduce unwanted harmonic currents through defined filter characteristics.

Test reactors for high-voltage and high-power laboratories, used for current limitation or in synthetic test circuits for the development and quality assurance

of circuit breakers and power electronic components.

COIL Innovation also provides specialized solutions such as arc-suppression reactors, reactors for railway mobility applications, duplex coils and further custom designs.



COIL Innovation supplies:

MSCDN reactors, which limit inrush currents, damp oscillations and resonances, reduce harmonics, and increase operational and system stability.

Phase reactors for STATCOMs, protecting converters from overcurrents, providing precise reactive-power control, attenuating high-frequency harmonics, ensuring stable control behavior,

and shielding the grid from steep voltage and current transients generated by power electronics.

TCR reactors, the central component of the controllable reactive-power branch in SVC systems, enabling fast, stepless and secure AC-voltage regulation.

MSR reactors, providing robust, stepped inductive reactive power with low design complexity, ensuring stable grid voltages.

TCSC systems, featuring a series capacitor bank with a parallel thyristor-controlled reactor, enabling stepless adjustment of the electrical line length and highly flexible capacitive-reactive power control.



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